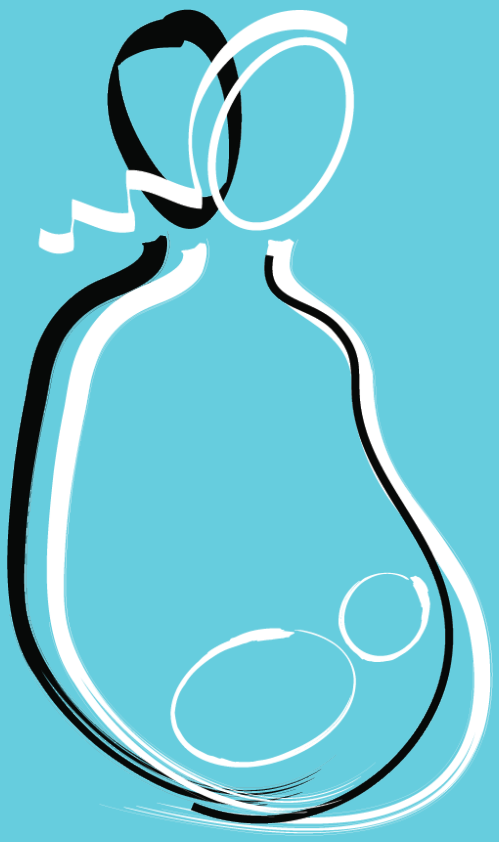
WHO recommendations

Intrapartum care for a positive childbirth experience



World Health Organization

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Intrapartum care for a positive childbirth experience

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Foreword

It has been more than two decades since the World Health Organization (WHO) issued technical guidance dedicated to the care of healthy pregnant women and their babies – *Care in normal birth: a practical guide*. The global landscape for maternity services has changed considerably since that guidance was issued. More women are now giving birth in health care facilities in many parts of the world, and yet suboptimal quality of care continues to impede attainment of the desired health outcomes. While in some settings too few interventions are being provided too late to women, in other settings women are receiving too many interventions that they do not need too soon.

WHO has released several recommendations to address specific aspects of labour management and the leading causes of maternal and newborn mortality and morbidity in response to the needs of countries. The focus of the global agenda has also gradually expanded beyond the survival of women and their babies, to also ensuring that they thrive and achieve their full potential for health and well-being. These efforts have been catalysed by the Global Strategy for Women's, Children's and Adolescents' Health (2016–2030), and the Every Woman Every Child movement. In addition, the third goal of the 2030 agenda for sustainable development affirms global commitment to ensuring healthy lives and the promotion of well-being for all at all ages.

One of the WHO strategic priorities over the next five years for achieving Sustainable Development Goal (SDG) targets is to support countries to strengthen their health systems to fast-track progress towards achieving universal health coverage (UHC). WHO is supporting countries to ensure that all people and communities have access to and can use the promotive, preventive and curative health services that are appropriate to their needs, and that are effective and of sufficient quality, while not exposing them to financial hardship. An integral part of these efforts is the design of the package of essential services across the spectrum of health disciplines, including reproductive, maternal, newborn, child and adolescent health, from which a set of basic service-delivery indicators can be identified for use in monitoring countries' progress towards UHC.

This guideline is a consolidated set of new and existing recommendations on essential labour and childbirth practices that should be provided to all pregnant women and their babies during labour and childbirth irrespective of socioeconomic setting. It promotes the delivery of a package of labour and childbirth interventions that is critical to ensuring that giving birth is not only safe but also a positive experience for women and their families. It highlights how woman-centred care can optimize the quality of labour and childbirth care through a holistic, human rights-based approach. By outlining a new model of intrapartum care that is adaptable to individual country contexts, the guideline enables substantial cost-savings through reduction in unnecessary interventions during labour and childbirth.

We encourage health care providers to adopt and adapt these recommendations, which provide a sound foundation for the provision of person-centred, evidence-based and comprehensive care for women and their newborn babies.

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Work on this guideline was initiated by Olufemi Oladapo, Mercedes Bonet and A. Metin Gülmezoglu of the Department of Reproductive Health and Research. Olufemi Oladapo coordinated the guideline development project. Ana Pilar Betrán, Mercedes Bonet, A. Metin Gülmezoglu, Olufemi Oladapo, João Paulo Souza and Joshua Vogel of the Department of Reproductive Health and Research, and Maurice Bucagu and Anayda Portela of the Department of Maternal, Newborn, Child and Adolescent Health, were the members of the WHO Steering Group, which managed the guideline development process. The following WHO headquarters' staff contributed to the guideline development process at various stages: Rajat Khosla, Frances McConville and Özge Tunçalp. Mavjuda Babamuradova, Karima Gholbzouri, Bremen De Mucio, Mari Nagai and Leopold Ouedraogo were WHO regional advisors who contributed to the guideline technical consultations.

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Acronyms and abbreviations

ABO	adverse birth outcome
aOR	adjusted odds ratio
CERQual	Confidence in the Evidence from Reviews of Qualitative research
CI	confidence interval
cRCT	cluster randomized controlled trial
CTG	cardiotocography
DOI	declaration of interest
EB	evidence base
EtD	evidence-to-decision
FHR	fetal heart rate
FIGO	International Federation of Gynecology and Obstetrics
GBS	group B streptococcus
GDG	Guideline Development Group
GRADE	Grading of Recommendations Assessment, Development and Evaluation
GRC	Guidelines Review Committee
GREAT	Guideline-driven, Research priorities, Evidence synthesis, Application of evidence, and Transfer of knowledge
HIC	high-income country
HIE	hypoxic-ischaemic encephalopathy
HIV	human immunodeficiency virus
HRP	UNDP-UNFPA-UNICEF-WHO-World Bank Special Programme of Research, Development and Research Training in Human Reproduction
IA	intermittent auscultation
ICM	International Confederation of Midwives
IM	intramuscular
IV	intravenous
LMIC	low- and middle-income country
MCA	Department of Maternal, Newborn, Child and Adolescent Health (at WHO)
MD	mean difference
MLCC	midwife-led continuity of care
NGO	nongovernmental organization
OASI	obstetric anal sphincter injury
OMBU	on-site midwife-led birthing unit
OR	odds ratio
PCA	patient-controlled analgesia
PCG	Pregnancy and Childbirth Group (of the Cochrane Collaboration)
PICO	population (P), intervention (I), comparator (C), outcome (O)
PMNCH	The Partnership for Maternal, Newborn & Child Health

PPH	postpartum haemorrhage
RCOG	Royal College of Obstetricians and Gynaecologists
RCT	randomized controlled trial
RHR	Department of Reproductive Health and Research (at WHO)
RMC	respectful maternity care
RR	risk ratio
SMD	standardized mean difference
TWG	Technical Working Group
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
USA	United States of America
USAID	United States Agency for International Development
WHO	World Health Organization

Executive summary

Introduction

The majority of approximately 140 million births that occur globally every year are among women without risk factors for complications for themselves or their babies at the beginning and throughout labour. Nevertheless, the time of birth is critical to the survival of women and their babies, as the risk of morbidity and mortality could increase considerably if complications arise. In line with the targets of Sustainable Development Goal 3 – ensure healthy lives and promote well-being for all at all ages – and the new Global Strategy for Women's, Children's and Adolescents' Health (2016–2030), global agendas are expanding their focus to ensure that women and their babies not only survive labour complications if they occur but also that they thrive and reach their full potential for health and life.

In spite of the considerable debates and research that have been ongoing for several years, the concept of "normality" in labour and childbirth is not universal or standardized. There has been a substantial increase over the last two decades in the application of a range of labour practices to initiate, accelerate, terminate, regulate or monitor the physiological process of labour, with the aim of improving outcomes for women and babies. This increasing medicalization of childbirth processes tends to undermine the woman's own capability to give birth and negatively impacts her childbirth experience. In addition, the increasing use of labour interventions in the absence of clear indications continues to widen the health equity gap between high- and low-resource settings.

This guideline addresses these issues by identifying the most common practices used throughout labour to establish norms of good practice for the conduct of uncomplicated labour and childbirth. It elevates the concept of experience of care as a critical aspect of ensuring high-quality labour and childbirth care and improved woman-centred outcomes, and not just complementary to provision of routine clinical practices. It is relevant to all healthy pregnant women and their babies, and takes into account that childbirth is a physiological process that can be accomplished without complications for the majority of women and babies.

The guideline recognizes a "positive childbirth experience" as a significant end point for all women undergoing labour. It defines a positive childbirth experience as one that fulfils or exceeds a woman's prior personal and sociocultural beliefs and expectations, including giving birth to a healthy baby in a clinically and psychologically safe environment with continuity of practical and emotional support from a birth companion(s) and kind, technically competent clinical staff. It is based on the premise that most women want a physiological labour and birth, and to have a sense of personal achievement and control through involvement in decision-making, even when medical interventions are needed or wanted.

This up-to-date, comprehensive and consolidated guideline on essential intrapartum care brings together new and existing World Health Organization (WHO) recommendations that, when delivered as a package, will ensure good-quality and evidence-based care irrespective of the setting or level of health care. The recommendations presented in this guideline are neither country nor region specific and acknowledge the variations that exist globally as to the level of available health services within and between countries. The guideline highlights the importance of woman-centred care to optimize the experience of labour and childbirth for women and their babies through a holistic, human rights-based approach. It introduces a global model of intrapartum care, which takes into account the complexity and diverse nature of prevailing models of care and contemporary practice.

Target audience

The recommendations in this guideline are intended to inform the development of relevant national- and local-level health policies and clinical protocols. Therefore, the target audience includes national and local public health policy-makers, implementers and managers of maternal and child health programmes, health care facility managers, nongovernmental organizations (NGOs), professional societies involved in the planning and management of maternal and child health services, health care professionals (including nurses, midwives, general medical practitioners and obstetricians) and academic staff involved in training health care professionals.

Guideline development methods

Throughout this guideline, the term "healthy pregnant women" is used to describe pregnant women and adolescent girls who have no identified risk factors for themselves or their babies, and who otherwise appear healthy. The guideline was developed using standard operating procedures in accordance with the process described in the *WHO handbook for guideline development*. Briefly, these

procedures include: (i) identification of priority questions and outcomes; (ii) evidence retrieval and synthesis; (iii) assessment of the evidence; (iv) formulation of the recommendations; and (v) planning for implementation, dissemination, impact evaluation and updating of the guideline. The quality of the scientific evidence underpinning the recommendations was graded using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) and Confidence in the Evidence from Reviews of Qualitative research (CERQual) approaches, for quantitative and qualitative evidence, respectively. Up-to-date systematic reviews were used to prepare evidence profiles for priority questions. The GRADE evidence-to-decision (EtD) framework, an evidence-to-decision tool that includes intervention effects, values, resources, equity, acceptability and feasibility criteria, was used to guide the formulation of recommendations by the Guideline Development Group (GDG) – an international group of experts assembled for the purpose of developing this guideline – at two technical consultations in May and September 2017. In addition, relevant recommendations from existing WHO guidelines approved by the Guidelines Review Committee (GRC) were systematically identified and integrated into this guideline for the purpose of providing a comprehensive document for end-users.

Recommendations

The WHO technical consultations led to 56 recommendations on intrapartum care: 26 of these are newly developed recommendations and 30 are recommendations integrated from existing WHO guidelines. Recommendations are presented according to the intrapartum care context to which they are relevant, namely, care throughout labour and birth, care during the first stage of labour, care during the second stage of labour, care during the third stage of labour, immediate care of the newborn, and immediate care of the woman after birth. Based on assessments of the GRADE EtD criteria, which informed the direction, and in some instances the specific context of the recommendation, the GDG classified each recommendation into one of the following categories defined below:

- **Recommended:** This category indicates that the intervention or option should be implemented.
- **Not recommended:** This category indicates that the intervention or option should not be implemented.
- **Recommended only in specific contexts:** This category indicates that the intervention or option is applicable only to the condition, setting or population specified in the recommendation, and should only be implemented in these contexts.
- **Recommended only in the context of rigorous research:** This category indicates that there are important uncertainties about the intervention or option. In such instances, implementation can still be undertaken on a large scale, provided that it takes the form of research that is able to address unanswered questions and uncertainties related both to effectiveness of the intervention or option, and its acceptability and feasibility.

To ensure that each recommendation is correctly understood and applied in practice, the contributing experts provided additional remarks where needed. Where the GDG recommended an intervention or option only in specific contexts or only in the context of rigorous research, further detail was included about the particular context and which key issues needed to be examined, respectively. Users of the guideline should refer to these remarks, which are presented directly beneath each recommendation in the full version of the guideline. The recommendations on intrapartum care for a positive childbirth experience are summarized in the table below.

At the technical consultations, the implementation considerations for individual recommendations and for the guideline as a whole were discussed. The GDG agreed that, to achieve a positive childbirth experience for women and their babies, the recommendations in this guideline should be implemented as a package of care in all settings, by kind, competent and motivated health care professionals working where essential physical resources are available. Health systems should aim to implement this WHO model of intrapartum care to empower all women to access the type of woman-centred care that they want and need, and to provide a sound foundation for such care, in accordance with a human rights-based approach.

Derivative products of this guideline will include labour monitoring tools for its application at different levels of care. In accordance with the process for updating WHO maternal and perinatal health guidelines, a systematic and continuous process of identifying and bridging evidence gaps following guideline implementation will be employed. In the event that new evidence (that could potentially impact the current evidence base for any of the recommendations) is identified, the recommendation will be updated. WHO welcomes suggestions regarding additional questions for inclusion in future updates of the guideline.

Summary list of recommendations on intrapartum care for a positive childbirth experience

Care option	Recommendation	Category of recommendation
Care throughout labour and birth		
Respectful maternity care	1. Respectful maternity care – which refers to care organized for and provided to all women in a manner that maintains their dignity, privacy and confidentiality, ensures freedom from harm and mistreatment, and enables informed choice and continuous support during labour and childbirth – is recommended.	Recommended
Effective communication	2. Effective communication between maternity care providers and women in labour, using simple and culturally acceptable methods, is recommended.	Recommended
Companionship during labour and childbirth	3. A companion of choice is recommended for all women throughout labour and childbirth.	Recommended
Continuity of care	4. Midwife-led continuity-of-care models, in which a known midwife or small group of known midwives supports a woman throughout the antenatal, intrapartum and postnatal continuum, are recommended for pregnant women in settings with well functioning midwifery programmes.[a]	Context-specific recommendation
First stage of labour		
Definitions of the latent and active first stages of labour	5. The use of the following definitions of the latent and active first stages of labour is recommended for practice. — The latent first stage is a period of time characterized by painful uterine contractions and variable changes of the cervix, including some degree of effacement and slower progression of dilatation up to 5 cm for first and subsequent labours. — The active first stage is a period of time characterized by regular painful uterine contractions, a substantial degree of cervical effacement and more rapid cervical dilatation from 5 cm until full dilatation for first and subsequent labours.	Recommended
Duration of the first stage of labour	6. Women should be informed that a standard duration of the latent first stage has not been established and can vary widely from one woman to another. However, the duration of active first stage (from 5 cm until full cervical dilatation) usually does not extend beyond 12 hours in first labours, and usually does not extend beyond 10 hours in subsequent labours.	Recommended
Progress of the first stage of labour	7. For pregnant women with spontaneous labour onset, the cervical dilatation rate threshold of 1 cm/hour during active first stage (as depicted by the partograph alert line) is inaccurate to identify women at risk of adverse birth outcomes and is therefore not recommended for this purpose.	Not recommended
	8. A minimum cervical dilatation rate of 1 cm/hour throughout active first stage is unrealistically fast for some women and is therefore not recommended for identification of normal labour progression. A slower than 1-cm/hour cervical dilatation rate alone should not be a routine indication for obstetric intervention.	Not recommended
	9. Labour may not naturally accelerate until a cervical dilatation threshold of 5 cm is reached. Therefore the use of medical interventions to accelerate labour and birth (such as oxytocin augmentation or caesarean section) before this threshold is not recommended, provided fetal and maternal conditions are reassuring.	Not recommended

[a] Integrated from *WHO recommendations on antenatal care for a positive pregnancy experience*.

Care option	Recommendation	Category of recommendation
Labour ward admission policy	10. For healthy pregnant women presenting in spontaneous labour, a policy of delaying labour ward admission until active first stage is recommended only in the context of rigorous research.	Research-context recommendation
Clinical pelvimetry on admission	11. Routine clinical pelvimetry on admission in labour is not recommended for healthy pregnant women.	Not recommended
Routine assessment of fetal well-being on labour admission	12. Routine cardiotocography is not recommended for the assessment of fetal well-being on labour admission in healthy pregnant women presenting in spontaneous labour. 13. Auscultation using a Doppler ultrasound device or Pinard fetal stethoscope is recommended for the assessment of fetal well-being on labour admission.	Not recommended Recommended
Perineal/pubic shaving	14. Routine perineal/pubic shaving prior to giving vaginal birth is not recommended.[a]	Not recommended
Enema on admission	15. Administration of enema for reducing the use of labour augmentation is not recommended.[b]	Not recommended
Digital vaginal examination	16. Digital vaginal examination at intervals of four hours is recommended for routine assessment of active first stage of labour in low-risk women.[a]	Recommended
Continuous cardiotocography during labour	17. Continuous cardiotocography is not recommended for assessment of fetal well-being in healthy pregnant women undergoing spontaneous labour.	Not recommended
Intermittent fetal heart rate auscultation during labour	18. Intermittent auscultation of the fetal heart rate with either a Doppler ultrasound device or Pinard fetal stethoscope is recommended for healthy pregnant women in labour.	Recommended
Epidural analgesia for pain relief	19. Epidural analgesia is recommended for healthy pregnant women requesting pain relief during labour, depending on a woman's preferences.	Recommended
Opioid analgesia for pain relief	20. Parenteral opioids, such as fentanyl, diamorphine and pethidine, are recommended options for healthy pregnant women requesting pain relief during labour, depending on a woman's preferences.	Recommended
Relaxation techniques for pain management	21. Relaxation techniques, including progressive muscle relaxation, breathing, music, mindfulness and other techniques, are recommended for healthy pregnant women requesting pain relief during labour, depending on a woman's preferences.	Recommended
Manual techniques for pain management	22. Manual techniques, such as massage or application of warm packs, are recommended for healthy pregnant women requesting pain relief during labour, depending on a woman's preferences.	Recommended
Pain relief for preventing labour delay	23. Pain relief for preventing delay and reducing the use of augmentation in labour is not recommended.[b]	Not recommended
Oral fluid and food	24. For women at low risk, oral fluid and food intake during labour is recommended.[b]	Recommended
Maternal mobility and position	25. Encouraging the adoption of mobility and an upright position during labour in women at low risk is recommended.[b]	Recommended
Vaginal cleansing	26. Routine vaginal cleansing with chlorhexidine during labour for the purpose of preventing infectious morbidities is not recommended.[a]	Not recommended
Active management of labour	27. A package of care for active management of labour for prevention of delay in labour is not recommended.[b]	Not recommended

[a] Integrated from *WHO recommendations for prevention and treatment of maternal peripartum infections.*
[b] Integrated from *WHO recommendations for augmentation of labour.*

Care option	Recommendation	Category of recommendation
Routine amniotomy	28. The use of amniotomy alone for prevention of delay in labour is not recommended.[a]	Not recommended
Early amniotomy and oxytocin	29. The use of early amniotomy with early oxytocin augmentation for prevention of delay in labour is not recommended.[a]	Not recommended
Oxytocin for women with epidural analgesia	30. The use of oxytocin for prevention of delay in labour in women receiving epidural analgesia is not recommended.[a]	Not recommended
Antispasmodic agents	31. The use of antispasmodic agents for prevention of delay in labour is not recommended.[a]	Not recommended
Intravenous fluids for preventing labour delay	32. The use of intravenous fluids with the aim of shortening the duration of labour is not recommended.[a]	Not recommended
Second stage of labour		
Definition and duration of the second stage of labour	33. The use of the following definition and duration of the second stage of labour is recommended for practice. — The second stage is the period of time between full cervical dilatation and birth of the baby, during which the woman has an involuntary urge to bear down, as a result of expulsive uterine contractions. — Women should be informed that the duration of the second stage varies from one woman to another. In first labours, birth is usually completed within 3 hours whereas in subsequent labours, birth is usually completed within 2 hours.	Recommended
Birth position (for women without epidural analgesia)	34. For women without epidural analgesia, encouraging the adoption of a birth position of the individual woman's choice, including upright positions, is recommended.	Recommended
Birth position (for women with epidural analgesia)	35. For women with epidural analgesia, encouraging the adoption of a birth position of the individual woman's choice, including upright positions, is recommended.	Recommended
Method of pushing	36. Women in the expulsive phase of the second stage of labour should be encouraged and supported to follow their own urge to push.	Recommended
Method of pushing (for women with epidural analgesia)	37. For women with epidural analgesia in the second stage of labour, delaying pushing for one to two hours after full dilatation or until the woman regains the sensory urge to bear down is recommended in the context where resources are available for longer stay in second stage and perinatal hypoxia can be adequately assessed and managed.	Context-specific recommendation
Techniques for preventing perineal trauma	38. For women in the second stage of labour, techniques to reduce perineal trauma and facilitate spontaneous birth (including perineal massage, warm compresses and a "hands on" guarding of the perineum) are recommended, based on a woman's preferences and available options.	Recommended
Episiotomy policy	39. Routine or liberal use of episiotomy is not recommended for women undergoing spontaneous vaginal birth.	Not recommended
Fundal pressure	40. Application of manual fundal pressure to facilitate childbirth during the second stage of labour is not recommended.	Not recommended

[a] Integrated from *WHO recommendations for augmentation of labour.*

Care option	Recommendation	Category of recommendation
Third stage of labour		
Prophylactic uterotonics	41. The use of uterotonics for the prevention of postpartum haemorrhage (PPH) during the third stage of labour is recommended for all births.[a]	Recommended
	42. Oxytocin (10 IU, IM/IV) is the recommended uterotonic drug for the prevention of postpartum haemorrhage (PPH).[a]	Recommended
	43. In settings where oxytocin is unavailable, the use of other injectable uterotonics (if appropriate, ergometrine/methylergometrine, or the fixed drug combination of oxytocin and ergometrine) or oral misoprostol (600 µg) is recommended.[a]	Recommended
Delayed umbilical cord clamping	44. Delayed umbilical cord clamping (not earlier than 1 minute after birth) is recommended for improved maternal and infant health and nutrition outcomes.[b]	Recommended
Controlled cord traction (CCT)	45. In settings where skilled birth attendants are available, controlled cord traction (CCT) is recommended for vaginal births if the care provider and the parturient woman regard a small reduction in blood loss and a small reduction in the duration of the third stage of labour as important.[a]	Recommended
Uterine massage	46. Sustained uterine massage is not recommended as an intervention to prevent postpartum haemorrhage (PPH) in women who have received prophylactic oxytocin.[a]	Not recommended
Care of the newborn		
Routine nasal or oral suction	47. In neonates born through clear amniotic fluid who start breathing on their own after birth, suctioning of the mouth and nose should not be performed.[c]	Not recommended
Skin-to-skin contact	48. Newborns without complications should be kept in skin-to-skin contact (SSC) with their mothers during the first hour after birth to prevent hypothermia and promote breastfeeding.[d]	Recommended
Breastfeeding	49. All newborns, including low-birth-weight (LBW) babies who are able to breastfeed, should be put to the breast as soon as possible after birth when they are clinically stable, and the mother and baby are ready.[e]	Recommended
Haemorrhagic disease prophylaxis using vitamin K	50. All newborns should be given 1 mg of vitamin K intramuscularly after birth (i.e. after the first hour by which the infant should be in skin-to-skin contact with the mother and breastfeeding should be initiated).[d]	Recommended
Bathing and other immediate postnatal care of the newborn	51. Bathing should be delayed until 24 hours after birth. If this is not possible due to cultural reasons, bathing should be delayed for at least six hours. Appropriate clothing of the baby for ambient temperature is recommended. This means one to two layers of clothes more than adults, and use of hats/caps. The mother and baby should not be separated and should stay in the same room 24 hours a day.[f]	Recommended

[a] Integrated from *WHO recommendations for the prevention and treatment of postpartum haemorrhage.*
[b] Integrated from the *WHO Guideline: delayed cord clamping for improved maternal and infant health and nutrition outcomes.*
[c] Integrated from *WHO Guidelines on basic newborn resuscitation.*
[d] Integrated from *WHO Recommendations for management of common childhood conditions: evidence for technical update of pocket book recommendations.*
[e] Integrated from *WHO recommendations on newborn health.*
[f] Integrated from *WHO recommendations on postnatal care of the mother and newborn.*

Care option	Recommendation	Category of recommendation
Care of the woman after birth		
Uterine tonus assessment	52. Postpartum abdominal uterine tonus assessment for early identification of uterine atony is recommended for all women.[a]	Recommended
Antibiotics for uncomplicated vaginal birth	53. Routine antibiotic prophylaxis is not recommended for women with uncomplicated vaginal birth.[b]	Not recommended
Routine antibiotic prophylaxis for episiotomy	54. Routine antibiotic prophylaxis is not recommended for women with episiotomy.[b]	Not recommended
Routine postpartum maternal assessment	55. All postpartum women should have regular assessment of vaginal bleeding, uterine contraction, fundal height, temperature and heart rate (pulse) routinely during the first 24 hours starting from the first hour after birth. Blood pressure should be measured shortly after birth. If normal, the second blood pressure measurement should be taken within six hours. Urine void should be documented within six hours.[c]	Recommended
Postnatal discharge following uncomplicated vaginal birth	56. After an uncomplicated vaginal birth in a health care facility, healthy mothers and newborns should receive care in the facility for at least 24 hours after birth.[c,d]	Recommended

[a] Integrated from *WHO recommendations for the prevention and treatment of postpartum haemorrhage*.
[b] Integrated from *WHO recommendations for prevention and treatment of maternal peripartum infections*.
[c] Integrated from *WHO recommendations on postnatal care of the mother and newborn*.
[d] For the newborn, this includes an immediate assessment at birth, a full clinical examination around one hour after birth and before discharge.

1. Background

Globally, approximately 140 million births occur every year *(1)*. The majority of these are vaginal births among pregnant women with no identified risk factors for complications, either for themselves or their babies, at the onset of labour *(2, 3)*. However, in situations where complications arise during labour, the risk of serious morbidity and death increases for both the woman and baby. Over a third of maternal deaths and a substantial proportion of pregnancy-related life-threatening conditions are attributed to complications that arise during labour, childbirth or the immediate postpartum period, often as result of haemorrhage, obstructed labour or sepsis *(4, 5)*. Similarly, approximately half of all stillbirths and a quarter of neonatal deaths result from complications during labour and childbirth *(6)*. The burden of maternal and perinatal deaths is disproportionately higher in low- and middle-income countries (LMICs) compared to high-income countries (HICs). Therefore, improving the quality of care around the time of birth, especially in LMICs, has been identified as the most impactful strategy for reducing stillbirths, maternal and newborn deaths, compared with antenatal or postpartum care strategies *(7)*.

Over the last two decades, women have been encouraged to give birth in health care facilities to ensure access to skilled health care professionals and timely referral should the need for additional care arise. However, accessing labour and childbirth care in health care facilities may not guarantee good quality care. Disrespectful and undignified care is prevalent in many facility settings globally, particularly for underprivileged populations, and this not only violates their human rights but is also a significant barrier to accessing intrapartum care services *(8)*. In addition, the prevailing model of intrapartum care in many parts of the world, which enables the health care provider to control the birthing process, may expose apparently healthy pregnant women to unnecessary medical interventions that interfere with the physiological process of childbirth.

Studies have shown that a substantial proportion of healthy pregnant women undergo at least one clinical intervention during labour and birth, such as labour induction, oxytocin augmentation, caesarean section, operative vaginal birth or episiotomy *(9, 10)*. In addition, women in labour continue to be subjected to ineffective and potentially harmful routine interventions, such as perineal shaving, enemas, amniotomy, intravenous fluids, antispasmodics and antibiotics for uncomplicated vaginal births *(11)*. This interventionist approach is not adequately sensitive to the woman's (and her family's) personal needs, values and preferences, and can weaken her own capability during childbirth and negatively impact her childbirth experience *(11)*. Furthermore, the questionable use of technologies in high-resource settings, even when the clinical benefits are unclear, has further widened the equity gap for pregnant women and newborns in disadvantaged populations.

As highlighted in the World Health Organization (WHO) framework for improving quality of care for pregnant women during childbirth, experience of care is as important as clinical care provision in achieving the desired person-centred outcomes *(12)*. However, non-clinical intrapartum practices, such as provision of emotional support through labour companionship, effective communication and respectful care, which may be fairly inexpensive to implement, are not regarded as priorities in many settings. Similarly, birthing options that respect women's values and promote choice during the first and second stages of labour are not consistently provided. These non-clinical aspects of labour and childbirth care are essential components of the experience of care that should complement any necessary clinical interventions to optimize the quality of care provided to the woman and her family.

In the context of a shortage of skilled health care professionals in low-resource settings, the medicalization of normal childbirth can overburden front-line health workers, with resultant poor quality of intrapartum care and poor birth outcomes. It is therefore important that intrapartum clinical interventions are implemented only when there is clear evidence that they can improve outcomes and minimize potential harms *(13)*.

To safely monitor labour and childbirth in any setting, a clear understanding of what constitutes normal labour onset and progress is essential. However, consensus around the definitions of the onset and duration of the different phases and stages of "normal" labour is lacking *(14)*. The routine use of the partograph has been widely promoted by WHO; however, the validity of the most important components of its cervicograph, the alert and action lines, has been called into question in the last decade, as the findings of several studies suggest that labour can indeed be slower than the limits proposed in the 1950s *(15–18)*, on which these lines

are based. The question of whether the current cervicograph design can safely and unequivocally identify healthy labouring women at risk of adverse outcomes has become critical to clinical guidance on intrapartum care, and a careful consideration of the evidence supporting its use was required.

This up-to-date, comprehensive and consolidated guideline on intrapartum care for healthy pregnant women and their babies brings together new and existing WHO recommendations that, when delivered as a package of care, will ensure good quality and evidence-based care in all country settings. In addition to establishing essential clinical and non-clinical practices that support a positive childbirth experience, the guideline highlights unnecessary, non-evidence-based and potentially harmful intrapartum care practices that weaken women's innate childbirth capabilities, waste resources and reduce equity.

1.1 Target audience

The primary target audience for this guideline is health care professionals who are responsible for developing national and local health protocols and those directly providing care to pregnant women and their newborns in all settings. This includes midwives, nurses, general medical practitioners, obstetricians and managers of maternal and child health programmes. The guideline will also be of interest to professional societies involved in the care of pregnant women, nongovernmental organizations (NGOs) involved with promotion of woman-centred maternity care, and implementers of maternal and child health programmes.

1.2 Scope of the guideline

This guideline focuses on the care of all healthy pregnant women and their babies during labour and childbirth in any health care setting. Based on the premise that all women deserve high-quality intrapartum care, the guideline includes practices that are essential for the care of all pregnant women, regardless of their risk status. For the purposes of this guideline, the term "healthy pregnant women" is used to describe pregnant women and adolescent girls who have no identified risk factors for themselves or their babies, and who otherwise appear to be healthy. The management of pregnant women who develop labour complications and those with high-risk pregnancies who require specialized intrapartum care is outside the scope of this guideline. This guideline is therefore complementary to existing WHO guidance on *Managing complications in pregnancy and childbirth: a guide for midwives and doctors (19)*.

The priority questions and outcomes that guided evidence synthesis and decision-making for this guideline are listed in Annex 1. They cover essential care that should be provided throughout labour and childbirth, and interventions specific to the first and second stages of labour. The priority questions and outcomes for existing WHO recommendations that have been integrated into this guideline, including those relevant to the third stage of labour and care of the woman and newborn after birth, can be found in the respective guidelines from which they have been drawn.

2. Methods

This document represents WHO's normative support for using evidence-informed policies and practices in all countries. This document was developed using the standard operating procedures described in the *WHO handbook for guideline development (20)*. In summary, the process included: (i) identifying priority questions and outcomes; (ii) retrieval of the evidence; (iii) assessment and synthesis of the evidence; (iv) formulation of the recommendations; and (v) planning for the dissemination, implementation, impact evaluation and updating of the guideline.

2.1 WHO Steering Group

The WHO Steering Group, comprising staff members from the WHO Department of Reproductive Health and Research (RHR) and the WHO Department of Maternal, Newborn, Child and Adolescent Health (MCA), of the Family, Women's and Children's Health (FWC) Cluster, supervised the guideline development process. The group drafted the initial scope of the guideline, identified priority questions and outcomes, prepared the guideline planning proposal, and identified systematic review teams, guideline methodologists and members of the Guideline Development Group (GDG). Additionally, the Steering Group supervised the evidence retrieval, assessment and synthesis, organized the GDG meetings (technical consultations), prepared draft recommendations for the GDG to review, prepared the final guideline document, and managed its publication and dissemination. The members of the Steering Group are listed in Annex 2.

2.2 Guideline Development Group

The WHO Steering Group identified 18 external experts and stakeholders from the six WHO regions to form the GDG. This was a diverse group of individuals with expertise in research, clinical practice, policy and programmes, and guideline development methods relating to intrapartum care practices and service delivery, in addition to two patient/consumer representatives. The members were identified in a way that ensured geographic representation and gender balance, and they had no important conflicts of interest (see section 2.13). A short biography of the GDG members was published on the WHO RHR departmental website for public review and comment prior to the first GDG meeting.

Selected members of this group participated in a scoping meeting held in April 2016, and provided input into the final version of the priority questions and outcomes that guided the evidence review. The GDG examined and interpreted the evidence and formulated the final recommendations at two face-to-face meetings in May and September 2017. The group also reviewed and approved the final guideline document. The list of GDG members can be found in Annex 2.

2.3 External Review Group

This group included five technical experts and stakeholders with an interest in the provision of evidence-based intrapartum care. The group was geographically representative and gender balanced, and the members had no important conflicts of interest (see section 2.13). The External Review Group (ERG) peer-reviewed the final guideline document to identify any factual errors and comment on clarity of the language, contextual issues and implications for implementation. The ERG ensured that the guideline decision-making processes considered and incorporated the contextual values and preferences of persons affected by the recommendations, including pregnant women and adolescent girls, health care professionals and policy-makers. It was not within the remit of this group to change recommendations that were formulated by the GDG. The members of the ERG are listed in Annex 2.

2.4 Technical Working Group

The Technical Working Group (TWG) comprised guideline methodologists and systematic review teams. An independent consultant from the Evidence-Based Medicine Consultancy in Bath, United Kingdom, and technical experts from Centro Rosarino de Estudios Perinatales (CREP) in Rosario, Argentina, served as guideline methodologists. In relation to quantitative evidence on the effects of different prioritized interventions, the Cochrane Pregnancy and Childbirth Group (PCG) provided input on the scoping of the guideline priority questions and supervised the updating of relevant systematic reviews following the standard processes of the Cochrane Collaboration. The methodologists from CREP appraised the evidence from these systematic reviews using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) methodology *(21)*.

Where there were no suitable systematic reviews (Cochrane or non-Cochrane) for priority questions and other considerations relevant to the domains of

the GRADE evidence-to-decision (EtD) frameworks, new systematic reviews of quantitative or qualitative studies were conducted by experts from CREP, Argentina, and from the University of Central Lancashire and King's College London, United Kingdom, in collaboration with the WHO Steering Group.

The Steering Group worked closely with members of the TWG to review the evidence and prepare the GRADE EtD frameworks. Members of the TWG are listed in Annex 2.

2.5 External partners and observers

Representatives of the International Federation of Gynecology and Obstetrics (FIGO), the International Confederation of Midwives (ICM), the Royal College of Obstetricians and Gynaecology (RCOG), the United Nations Population Fund (UNFPA) and the United States Agency for International Development (USAID) were invited to the final face-to-face GDG meeting in September 2017 to serve as observers (see Annex 2). These organizations are potential implementers of the guideline with a history of collaboration with the WHO RHR and MCA Departments in guideline dissemination and implementation.

2.6 Identifying priority questions and outcomes

The WHO Steering Group, in consultation with the systematic review teams, guideline methodologists and selected members of the GDG, drafted the priority questions for this guideline. To develop these questions, a rigorous scoping exercise to identify and map clinical practices, interventions and health outcomes related to intrapartum care commenced in January 2016. First, a scoping literature review was performed to define the population of interest for the guideline and to explore what constitutes "normal" labour and childbirth in clinical practice across settings, based on a search of the PubMed and Latin American and Caribbean Health Sciences Literature (LILACS) databases. Next, a preliminary literature search of existing clinical guidelines and key systematic reviews on intrapartum interventions was performed, using the following sources: Cochrane Database of Systematic Reviews, LILACS, National Guidelines Clearinghouse, PubMed, and web pages of professional societies (including FIGO, the European Board & College of Obstetrics and Gynaecology [EBCOG], the American College of Obstetricians and Gynecologists [ACOG], RCOG, the Royal Australian and New Zealand College of Obstetricians and Gynaecologists [RANZCOG] and the ICM) and health agencies (including the United Kingdom's National Institute for Health and Care Excellence [NICE], the Agency for Healthcare Research & Quality [AHRQ] of the United States Department of Health & Human Services, and the Institute for Clinical Systems Improvement [ICSI], based in the United States of America].

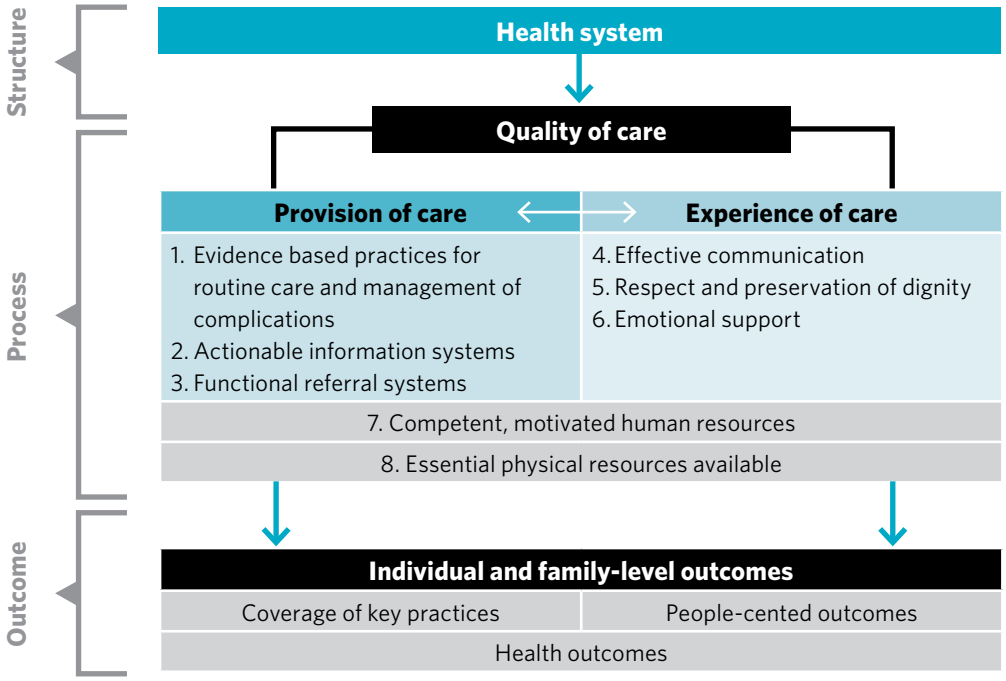
This exercise generated about 140 potential interventions that could be applied during the intrapartum period, starting before labour admission through to the immediate postpartum period. The interventions were then classified according to the WHO quality of care framework for maternal and newborn health (Figure 2.1) *(12)* to ensure that the ensuing recommendations would respond to the domains of intrapartum care quality in terms of both provision and experience of care.

The scoping exercise also informed the choice of potential outcomes for the guideline, particularly through the review of outcomes used in Cochrane systematic reviews related to intrapartum care interventions. To prioritize outcomes, a total of 44 international experts and stakeholders in the field of maternal and child health, including those who later participated in a guideline scoping meeting, were invited to rank the potential outcomes identified through the above exercise, using an electronic survey. Survey participants ranked the relative importance of outcomes on a 9-point scale ranging from 1 (not important) to 9 (critical). Using all the responses, the median score was calculated for each outcome, to identify a set of outcomes that are "critical" (median scores ≥ 7) and "important but not critical" (median scores 4–6) as a basis for making decisions about the recommendations.

Based on these initial steps, the WHO Steering Group developed a framework for discussion at a guideline scoping meeting, held in Geneva in April 2016, the aim of which was to prioritize guideline questions and to define the scope of the guideline in terms of focus, population of interest, interventions and outcomes. At this meeting, it was decided that the scope of this guideline should prioritize essential interventions that can be applied in low-, middle- and high-income settings, and that would be applicable to all pregnant women, regardless of their risk status ("low" or "high") at the beginning of labour. Highly specialized labour interventions for the management of complications such as labour dystocia, fetal distress and meconium staining were considered beyond the scope of this guideline.

The key thematic areas for essential intrapartum care were discussed in the light of interventions that are already covered in existing WHO guidelines. Considering the resources available, the group

Figure 2.1 WHO quality of care framework for maternal and newborn health



agreed to limit the scope of prioritized questions to those that have not already been addressed by existing WHO guidelines, with the caveat that existing recommendations (that were developed according to WHO standard procedures) would be integrated into the final guideline document. However, the exception to this was the prioritization of the question related to companionship during labour and childbirth, for which several new trials were identified following the publication of the supporting Cochrane review *(22)*.

In determining the guideline focus, the scoping process highlighted the need to identify women-centred interventions and outcomes for intrapartum care. To this end, a qualitative systematic review was conducted to understand what women want, need and value during childbirth *(23)*. The findings of this review suggested that the primary outcome for all pregnant women undergoing childbirth is a "positive childbirth experience" (as defined in Box 2.1).

Based on the outcome prioritization exercise described above and discussions at the scoping meeting, a set of outcomes that were considered critical and important to women (and their families) was prioritized for the intrapartum period. However, due to important differences between the types of prioritized interventions and the range of potential outcomes, and with due consideration for what matters to pregnant women undergoing labour, these outcomes were further prioritized separately for individual guideline questions. Informed by the qualitative review of women's views, the list of outcomes was complemented with the outcome "maternal birth experience" (including maternal satisfaction with care, women's mental and psychological health assessment, rating of childbirth experience, and sense of control) to reflect women's perception of the quality of care for all interventions prioritized. For questions related to definitions and duration of phases and stages of labour and diagnostic performance of 1-cm/hour cervical dilatation threshold, the outcomes include characteristic features and duration of phases of labour, and sensitivity and specificity of test thresholds, respectively.

BOX 2.1

Positive childbirth experience

Women want a positive childbirth experience that fulfils or exceeds their prior personal and sociocultural beliefs and expectations. This includes giving birth to a healthy baby in a clinically and psychologically safe environment with continuity of practical and emotional support from birth companion(s) and kind, technically competent clinical staff. Most women want a physiological labour and birth, and to have a sense of personal achievement and control through involvement in decision-making, even when medical interventions are needed or wanted.

Table 2.1 WHO intrapartum care guideline work streams

Work streams	Methodology	Assessment of evidence
Definitions and duration of first and second stages of labour; patterns of normal labour progression	Systematic reviews of observational studies	Modified GRADE
Diagnostic test accuracy (DTA) of 1-cm/hour cervical dilatation threshold	DTA reviews	GRADE
Effects of individual interventions for clinical and non-clinical practices from labour admission until birth	Systematic reviews of effectiveness studies	GRADE
Woman- and maternity staff-centred domains for values, acceptability, feasibility of implementing practices, and equity issues related to intrapartum care	Qualitative evidence synthesis; mixed-methods reviews	GRADE-CERQual; GRADE
Resource implications for individual interventions	Systematic reviews or single studies	As applicable

CERQual: Confidence in the Evidence from Reviews of Qualitative research *(25)*; GRADE: Grading of Recommendations Assessment, Development and Evaluation *(21)*

In summary, this scoping and consultation process led to the identification of priority questions and outcomes related to the effectiveness of clinical and non-clinical practices aimed at achieving a positive childbirth experience that includes a healthy mother and a healthy baby. These questions and outcomes are listed in Annex 1.

2.7 Integration of recommendations from published WHO guidelines

In order to harmonize and consolidate all recommendations that are relevant to the care of healthy pregnant women and their newborn babies into a single document, existing WHO recommendations that were within the scope of essential intrapartum care were identified and integrated into this guideline. Only recommendations published from 2012 onwards in other WHO guidelines approved by the Guidelines Review Committee (GRC) were included. These integrated recommendations cover other critical components of intrapartum care for which questions were not prioritized. These include third stage of labour, care of the newborn immediately after birth, and care of the woman after birth. Recommendations and their corresponding remarks have been integrated from their parent guidelines without modification, as these recommendations were considered to be current.

2.8 Focus and approach

The focus of this guideline is on the essential intrapartum care practices that all pregnant women and adolescent girls should receive to facilitate a positive childbirth experience. To help decision-makers consider a range of factors relating to each intervention or option evaluated, the GRADE EtD framework tool was used, which includes the following domains: effects (benefits and harms), values, resources, equity, acceptability and feasibility *(24)*. The preparatory work for the guideline was organized into five work streams to synthesize and examine evidence across the EtD framework domains (Table 2.1).

2.9 Evidence identification and retrieval

Evidence to support this guideline was derived from a number of sources by the systematic review teams and methodologists working in collaboration with the WHO Steering Group. Evidence on effects was mainly derived from Cochrane systematic reviews of randomized controlled trials (RCTs). The Steering Group, in collaboration with the Cochrane PCG and methodologists from CREP, first identified all relevant Cochrane systematic reviews that addressed the prioritized questions. The Cochrane systematic reviews were based on studies identified from searches of the Cochrane PCG Trials Register.[1] In instances where the Cochrane reviews identified were found to be out of date, review authors were invited to update their Cochrane reviews in accordance with the standard process of the Cochrane PCG and with the support of Cochrane PCG staff.

Where no systematic review was identified for a priority question, a new systematic review was

[1] The Cochrane Pregnancy and Childbirth Group (PCG) Trials Register is maintained by the Cochrane PCG's Trial Search Coordinator and contains trials identified from: monthly searches of the Cochrane Central Register of Controlled Trials (CENTRAL); weekly searches of MEDLINE; weekly searches of Embase; hand-searches of 30 journals and the proceedings of major conferences; weekly "current awareness" alerts for a further 44 journals; and monthly BioMed Central email alerts. For further information, see: http://pregnancy.cochrane.org/pregnancy-and-childbirth-groups-trials-register

commissioned from external experts. In this instance, the external experts were asked to prepare a standard protocol before embarking on the review, including: a clear PICO (population, intervention, comparator, outcome) question; criteria for identification of studies, including search strategies for different bibliographic databases; methods for assessing risk of bias; and a data analysis plan. The protocol was reviewed and endorsed by the Steering Group and selected content experts among the GDG members. The entire systematic review development process was iterative, with the methodologists in constant communication with the Steering Group to discuss challenges and agree on solutions.

Qualitative reviews focused on: what matters to women and health care providers in terms of intrapartum care; health care professionals' views of barriers and facilitators to uptake and delivery of intrapartum care interventions; acceptability of practices to women and health care professionals; feasibility of implementing the interventions; how the outcomes impacted by an intervention are valued by women and other stakeholders; and general or specific perceptions on equity relating to the interventions prioritized *(26)*. In addition, qualitative evidence related to labour companionship and respectful maternity care (RMC) were derived from two qualitative systematic reviews specifically addressing these questions *(27, 28)*. To inform the question on effective communication by health care providers, a further mixed-methods review was conducted. The search strategies for evidence identification and retrieval for these reviews can be found in the respective publications.

Evidence on cost-effectiveness was identified by a systematic review of the literature, from 1 January 1996 to 20 February 2017, using the MEDLINE electronic database. Evidence was retrieved on costs and cost-effectiveness of intrapartum care in general, and cost-effectiveness of specific intrapartum interventions, including fetal monitoring, clinical pelvimetry, communication, companionship, birth positions, episiotomy and pain relief methods. The "related articles" feature of PubMed was used to identify additional relevant studies.

2.10 Quality assessment and grading of the evidence

Quality assessment of primary studies included in the reviews

The assessment of the quality of individual studies included in Cochrane reviews follows a specific and explicit method of risk-of-bias assessment using six standard criteria outlined in the *Cochrane handbook for systematic reviews of interventions (29)*. Each included study is assessed and rated by reviewers to be at low, high or unclear risk of bias for sequence generation, allocation concealment, blinding of study personnel and participants, attrition, selective reporting and other sources of bias, such as publication bias. The assessment along these domains provides an overall risk of bias for each included study that indicates the likely magnitude and direction of the bias and how it is likely to impact the review findings. For the new systematic reviews on effectiveness of interventions, which were commissioned by the WHO Steering Group, each included study was assessed for risk of bias according to the Cochrane review methodology.

Studies identified for qualitative reviews were subjected to a simple quality appraisal system using a validated instrument that rated studies against 11 pre-defined criteria and then allocated a score ranging from A to D, with D indicating the presence of significant flaws that are very likely to affect the credibility, transferability, dependability and/or confirmability of the study. Studies scoring D were excluded on grounds of poor quality *(30)*.

Quality assessment of the review evidence

The GRADE approach to appraising the quality of quantitative evidence *(21)* was used for all the critical outcomes identified in the PICO questions, and a GRADE evidence profile was prepared for each quantitative outcome for each priority question. Accordingly, the certainty of evidence for each outcome was rated as "high", "moderate", "low" or "very low", based on a set of criteria. By default, RCTs were considered to provide high-certainty evidence, while non-randomized trials and observational studies provide low-certainty evidence. This baseline quality rating was then downgraded based on consideration of study design limitations (risk of bias), inconsistency, imprecision, indirectness and publication bias. For observational studies, other considerations, such as magnitude of effect, could lead to upgrading of the rating if there were no limitations that indicated a need for downgrading. The systematic review teams and methodologists from CREP graded the quantitative review evidence in accordance with standard operating procedures approved by the WHO Steering Group.

The findings of the qualitative reviews were appraised for quality using the GRADE-CERQual (Confidence in the Evidence from Reviews of Qualitative research) tool *(25)*. The GRADE-CERQual tool, which uses a similar approach

conceptually to other GRADE tools, provides a transparent method for assessing and assigning the level of confidence that can be placed in evidence from reviews of qualitative research. The systematic review team used the GRADE-CERQual tool to assess the confidence in qualitative review findings – a level of confidence was assigned to the evidence domains on values, acceptability and feasibility according to four components: methodological limitations of the individual studies; adequacy of data; coherence; and relevance to the review question of the individual studies contributing to a review finding.

2.11 Formulation of the recommendations

The WHO Steering Group supervised and finalized the preparation of evidence profiles and evidence summaries in collaboration with the TWG using the GRADE EtD framework. The EtD tool includes explicit and systematic consideration of evidence on prioritized interventions in terms of specified domains: effects, values, resources, equity, acceptability and feasibility. For each priority question, judgements were made on the impact of the intervention on each domain, in order to inform and guide the decision-making process. Using the EtD framework template, the Steering Group and TWG created summary documents for each priority question covering evidence on each domain, as described below.

Effects: The evidence on the critical outcomes was summarized in this domain to answer the questions: "What are the desirable and undesirable effects of the intervention/option?" and "What is the certainty of the evidence on effects?" Where benefits clearly outweighed harms for outcomes that are highly valued by pregnant women, or vice versa, there was a greater likelihood of a clear judgement in favour of or against the intervention, respectively. Uncertainty about the net benefits or harms, and small net benefits usually led to a judgement that did not favour the intervention or the comparator. The higher the certainty of evidence of benefits across outcomes, the higher the likelihood of a judgement in favour of the intervention. In the absence of evidence of benefits, evidence of potential harm led to a recommendation against the option. Where evidence of potential harm was found for interventions that were also found to have evidence of important benefits, depending on the level of certainty and likely impact of the harm, such evidence of potential harm was more likely to result to a context-specific recommendation for the intervention (and the context is explicitly stated within the recommendation).

Values: This relates to the relative importance assigned to the outcomes of the intervention by those affected by them, how such importance varies within and across settings, and whether this importance is surrounded by any uncertainty. The question asked was: "Is there important uncertainty or variability in how much women value the main outcomes associated with the intervention/option?" Interventions that resulted in outcomes that most women consistently value regardless of settings were more likely to lead to a judgement in favour of the intervention. This domain, together with the "effects" domain (see above), informed the "balance of effects" judgement.

Resources: This domain addressed the questions: "What are the resources associated with the intervention/option?" and "Is the intervention/option cost-effective?" The resources required to implement the reviewed intrapartum care interventions mainly include the costs of providing supplies, training, equipment and skilled human resources. A judgement in favour of or against the intervention was likely where the resource implications were clearly advantageous or disadvantageous, respectively. Cost evaluation relied on reported estimates obtained during the evidence retrieval process; the *OneHealth Model: intervention treatment assumptions report (31); the WHO compendium of innovative health technologies for low-resource settings (32)*; as well as the experiences and opinions of the GDG members. Where available, direct evidence from systematic reviews of cost-effectiveness informed this domain.

Acceptability: This domain addressed the question: "Is the intervention/option acceptable to women and health care providers?" Qualitative evidence from the systematic reviews on women's and providers' views and experiences across different labour practices informed the judgements for this domain. The lower the acceptability, the lower the likelihood of a judgement in favour of the intervention. If it was deemed necessary to recommend an intervention that was associated with low acceptability, the recommendation is accompanied by a strategy to address concerns about acceptability during implementation.

Feasibility: The feasibility of implementing an intervention depends on factors such as the resources, infrastructure and training requirements. This domain addressed the question: "Is it feasible for the relevant stakeholders to implement the intervention/option?" Qualitative evidence from the systematic reviews on women's and providers' views and experiences across different labour practices was used to inform judgements for this domain.

Where barriers were identified, it was less likely that a judgement would be made in favour of the intervention.

Equity: This domain encompasses evidence or considerations as to whether or not an intervention would reduce health inequities. Therefore, this domain addressed the question: "What is the anticipated impact of the intervention/option on equity?" The findings of qualitative systematic reviews on women's and providers' views and experiences, the 2015 WHO report on inequalities in reproductive, maternal, newborn and child health *(33)*, and a review on facilitators and barriers to facility-based birth *(8)*, as well as the experiences and opinions of the GDG members, were used to inform this domain. An intervention was likely to be recommended if its proven (or anticipated) effects reduce (or could reduce) health inequalities among different groups of women and their families.

For each of the above domains, additional evidence of potential harms or unintended consequences are described in the "additional considerations" subsections. Such considerations were derived from studies that might not have directly addressed the priority question but provided pertinent information in the absence of direct evidence. These were extracted from single studies, systematic reviews or other relevant sources.

The WHO Steering Group provided the EtD frameworks, including evidence summaries, GRADE evidence profiles, and other documents related to each recommendation, to GDG members as soon as the documents were drafted, and several weeks in advance of the face-to-face meetings. The GDG members were asked to review and electronically provide comments on the documents before the GDG meetings. During the face-to-face meetings at the WHO headquarters in Geneva, Switzerland, in May and September 2017, under the leadership of the GDG chairperson for each meeting, GDG members collectively reviewed the frameworks, the draft recommendations and any comments received through preliminary feedback. The purpose of the meetings was to reach consensus on each recommendation, including its direction and in some instances the specific context, based on explicit consideration of the range of evidence presented in each EtD framework and the judgement of the GDG members. In line with other recently published WHO guidelines using EtD frameworks (34-36), the GDG classified each recommendation into one of the following categories defined below.

- **Recommended:** This category indicates that the intervention or option should be implemented.
- **Not recommended:** This category indicates that the intervention or option should not be implemented.
- **Recommended only in specific contexts:** This category indicates that the intervention or option is applicable only to the condition, setting or population specified in the recommendation, and should only be implemented in these contexts.
- **Recommended only in the context of rigorous research:** This category indicates that there are important uncertainties about the intervention or option. In such instances, implementation can still be undertaken on a large scale, provided that it takes the form of research that is able to address unanswered questions and uncertainties related both to effectiveness of the intervention or option, and its acceptability and feasibility.

For recommendations integrated from existing guidelines, information on the strength and quality of the evidence from the source guideline document has been presented in the accompanying remarks. For consistency, integrated recommendations have also been categorized according to the typology described above.

2.12 Decision-making during the GDG meetings

The GDG meetings were guided by the following protocol: the meetings were designed to allow participants to discuss the supporting evidence and each of the recommendations drafted by the WHO Steering Group, and to reach a consensus on the final wording of each recommendation after revision. Consensus was defined as the agreement by three quarters or more of the GDG, provided that those who disagreed did not feel strongly about their position. Strong disagreements would have been recorded as such in the guideline (there was no record of such disagreement in any of the GDG meetings). Where required, the GDG determined the context of recommendations by the same process of consensus, based on discussions about the balance of evidence on effects (benefits and harms) of the interventions across different contexts.

If the participants were unable to reach a consensus, the disputed recommendation, or any other decision, would be put to a vote. Voting would have been by a show of hands among members of the GDG. A recommendation or decision would stand if more than two thirds of the GDG voted in support of it, unless the disagreement was related to a safety concern, in which case the WHO Secretariat could choose not to issue a recommendation on the subject. WHO staff at the meetings, external

technical experts involved in the collection and grading of the evidence, and observers were not eligible to vote. If the issue to be voted upon involved primary research or systematic reviews conducted by any of the participants who had declared an academic conflict of interest, those individuals were allowed to participate in the discussion, but were not allowed to vote on the issue in question.

2.13 Declaration of interests by external contributors

In accordance with the *WHO handbook for guideline development (20)*, all GDG, TWG and ERG members, and external collaborators were asked to declare in writing any competing interests (whether academic, financial or other) at the time of the invitation to participate in the guideline development process. The standard WHO form for declaration of interests (DOI) was completed and signed by each expert and sent electronically to the responsible technical officer. The WHO Steering Group reviewed all the DOI forms before finalizing experts' invitations to participate. All experts were instructed to notify the responsible technical officer of any change in relevant interests during the course of the process, in order to review and update conflicts of interest accordingly. In addition, experts were requested to submit an electronic copy of their curriculum vitae along with the completed DOI form. The Steering Group collated and reviewed signed DOI forms and curriculum vitae, and determined whether a conflict of interest existed. Where any conflict of interest was declared, the Steering Group determined whether it was serious enough to affect the individual's ability to make objective judgements about the evidence or recommendations. To ensure consistency, the Steering Group applied the criteria for assessing the severity of a conflict of interest as provided in the *WHO handbook for guideline development (20)*.

All findings from the received DOI statements were managed in accordance with the WHO DOI guidelines on a case-by-case basis. Where a conflict of interest was not considered significant enough to pose any risk to the guideline development process or reduce its credibility, the expert was only required to declare the conflict of interest at the GDG meeting and no further action was taken. Conflicts of interest that warranted action by WHO staff arose where experts had performed primary research or a systematic review related to any guideline recommendations; in such cases, the experts were restricted from participating in discussions and/or formulating any recommendation related to the area of their conflict of interest. At the GDG face-to-face meetings, members were required again to state any conflicts of interest openly to the entire group, and were required to submit a signed and updated version of their earlier DOI statements. A summary of the DOI statements and information on how conflicts of interest were managed are included in Annex 3.

2.14 Document preparation and peer review

Following the final GDG meeting, an independent consultant and the responsible technical officer from the WHO Steering Group prepared a draft of the full guideline document to accurately reflect the deliberations and decisions of the GDG. Other members of the Steering Group provided comments on the draft guideline document before it was sent electronically to the GDG members for further comments. The document was revised based on the feedback received from the GDG and then sent to the ERG for peer review. The ERG members were asked to review the revised draft of the guideline to identify any errors of fact, comment on the clarity of the language, and to raise any issues related to implementation, adaptation and contextual considerations. The Steering Group carefully evaluated the input of the peer reviewers for inclusion in the final guideline document and made further revisions to the draft as needed. After the GDG meetings and external peer review, further modifications to the guideline by the Steering Group were limited to corrections of factual errors and improvements in language to address any lack of clarity. The revised final version was returned electronically to the GDG for their approval.

2.15 Presentation of guideline content

A summary list of the recommendations is presented in the executive summary of this guideline. For each recommendation, a summary of the evidence on effects, values, resources, equity, acceptability, feasibility, and other considerations reviewed at the two GDG meetings can be found in the "Evidence and recommendations" section (Section 3). The language used to interpret the evidence on effects is consistent with the Cochrane Effective Practice and Organization of Care (EPOC) approach *(37)*.

The WHO Steering Group has integrated into this guideline a number of existing WHO recommendations that are relevant to routine intrapartum care from other recent WHO guidelines. In all instances, these recommendations are identical to those published in the respective source guidelines. To ensure that the integrated information

is complete, the strength of the recommendation and certainty of the evidence as originally published for the existing recommendation has been included in the remarks section. Such recommendations include an additional remark providing a direct web address for the source guideline. Guideline users are referred to the respective WHO source guidelines for more details on these integrated recommendations.

3. Evidence and recommendations

This guideline includes 56 evidence-based recommendations on intrapartum care – 26 new recommendations adopted by the Guideline Development Group (GDG) at the 2017 meetings, and 30 existing recommendations relevant to intrapartum care that were integrated from previously published WHO guidelines. Sections 3.1–3.6 outline the narrative summaries and the corresponding recommendations, grouped and presented according to the timing of the practice ranging from labour onset through to the immediate postnatal period.

The corresponding GRADE tables for the recommendations are referred to in this section as "evidence base" (EB) tables, and are numbered according to the specific recommendations to which they refer. These tables are presented separately in the Web annex of this document.[1] Evidence-to-decision (EtD) tables with GDG judgements related to the evidence and considerations for all domains are presented in the "Summary of evidence and considerations" sub-sections for each recommendation.

3.1 Care throughout labour and birth

3.1.1 Respectful maternity care

RECOMMENDATION 1

Respectful maternity care – which refers to care organized for and provided to all women in a manner that maintains their dignity, privacy and confidentiality, ensures freedom from harm and mistreatment, and enables informed choice and continuous support during labour and childbirth – is recommended. *(Recommended)*

Remarks

- Provision of respectful maternity care (RMC) is in accordance with a human rights-based approach to reducing maternal morbidity and mortality. RMC could improve women's experience of labour and childbirth and address health inequalities.
- There is limited evidence on the effectiveness of interventions to promote RMC or to reduce mistreatment of women during labour and childbirth. Given the complex drivers of mistreatment during facility-based childbirth, reducing mistreatment and improving women's experience of care requires interventions at the interpersonal level between a woman and her health care providers, as well as at the level of the health care facility and the health system.
- Effective communication and engagement among health care providers, health service managers, women and representatives of women's groups and women's rights movements is essential to ensure that care is responsive to women's needs and preferences in all contexts and settings.
- Interventions should aim to ensure a respectful and dignified working environment for those providing care, acknowledging that staff may also experience disrespect and abuse in the workplace and/or violence at home or in the community.

Summary of evidence and considerations

Effects of the interventions (EB Table 3.1.1)

Evidence on the effects of respectful maternity care (RMC) interventions on birth outcomes was derived from a systematic review of five studies that were conducted in Africa (Kenya, South Africa [2 studies], Sudan and the United Republic of Tanzania) *(38)*. The review found no studies from high-income countries (HICs). Two of the included studies were cluster randomized controlled trials (1 cRCT with only 2 sites and the other with 10 sites) and three were before–after studies. Control (or pre-intervention) sample sizes ranged from 120 to 2000 participants across studies and post-intervention samples ranged from 105 to 1680 participants. Most of the interventions included multiple components, with an emphasis on community engagement as well

[1] Available at: www.who.int/reproductivehealth/publications/intrapartum-care-guidelines/en/index.html

as on changes on the part of the staff to increase RMC and reduce disrespect and abuse. Types of components included in the RMC interventions were: training in values and attitudes transformation; training in interpersonal communication skills; setting up quality improvement teams; monitoring of disrespect and abuse; staff mentorship; improving privacy in wards (e.g. with curtains or partitions between beds); improving staff conditions (e.g. providing tea for those on shift); maternity open days; community workshops; mediation/alternative dispute resolution; counselling of community members who have experienced disrespect and abuse; providing a method for submitting complaints; and educating women on their rights. One intervention was focused on companionship in labour, with an emphasis on RMC, and one was focused on a communication-building package with staff. The nature of "usual practice" was not reported in any of these studies.

All the studies reported on aspects of disrespectful or respectful care based on women's self-report. In two studies, self-reported data were accompanied by researchers' observational data. One study presented data on episiotomy, but none of the other studies provided data on the clinical outcomes pre-specified to guide decision-making for this recommendation. Data were not pooled due to heterogeneity across studies in study design and the definitions and reporting of outcomes. Data were relatively sparse and all of the studies were at unclear or high risk of bias. Therefore, the level of certainty of the evidence was downgraded for risk of bias for all outcomes.

Comparison: RMC intervention compared with usual practice (no RMC intervention)

Maternal outcomes

Birth experience

Respectful care: Three studies (1 cRCT and 2 before–after studies) reported on the experience of respectful care. Moderate-certainty evidence suggests that women are probably more likely to report experiencing respectful care with RMC interventions than without RMC interventions (1 cRCT, approximately 3000 participants, adjusted odds ratio [aOR] 3.44, 95% CI 2.45–4.84). This finding is supported by the observational studies: one before–after study reported that 22.8% versus 0% of participants rated respect as "excellent" at postpartum follow-up, and the other reported that respectful care was experienced by 94.7% versus 89.7%, in the post- and pre-intervention groups, respectively.

Maternal satisfaction: Low-certainty evidence derived from one cRCT suggests that there may be little or no difference between having an RMC intervention and not having one in terms of the proportion of women reporting being very satisfied with care (aOR 0.98, 95% CI 0.91–1.06).

Quality of care: Moderate-certainty evidence from one cRCT suggests that RMC probably leads to more frequent experiences of good-quality care overall (approximately 3000 participants, aOR 6.19, 95% CI 4.29–8.94). Observational data are consistent with this evidence.

Experience of mistreatment

Experience of disrespectful or abusive care: One cRCT and two before–after studies reported this outcome. Moderate-certainty evidence suggests that RMC probably reduces experiences of disrespectful or abusive care by about two thirds (1 cRCT, approximately 3000 participants, aOR 0.34, 95% CI 0.21–0.57). Observational data are consistent with the cRCT, with an estimated 40% reduction in disrespectful or abusive care after the RMC intervention in one study, and a 52% reduction in another.

Lack of privacy: One cRCT and two before–after studies reported this outcome; the evidence was of very low certainty, however, as a range of different measures and inconsistent findings were reported.

Physical abuse: Moderate-certainty evidence from four studies (2 cRCTs and 2 before–after studies) suggests that RMC interventions probably reduce physical abuse. One cRCT reported a reduction in physical abuse in the intervention arm from a baseline average of 2% to 1% at follow-up and an increase in the control arm from a baseline average of 3% to 4% at follow-up. The other cRCT (approximately 3000 participants) reported an aOR of 0.22 (95% CI 0.05–0.97). One before–after study found that observed physical abuse reduced from 3.5% before the RMC intervention (677 participants) to 0.4% afterwards (523 participants), and the other reported a reduction in observed fundal pressure from 3.4% (208 participants) before to 0.2% (459 participants) after, as well as a reduction in "episiotomy without anaesthesia" from 4.3% before to 0% after.

Verbal abuse: Low-certainty evidence based on three studies (1 cRCT, and 2 before–after studies) suggests that there may be little or no difference in verbal abuse, as the estimates of effect in two studies (1 cRCT and 1 before–after study) included the possibility of increase in verbal abuse, while the third study showed an absolute reduction in verbal abuse of 49%.

Neglect/abandonment: Low-certainty evidence based on four studies (2 cRCTs, and 2 before–after studies) suggest that RMC interventions may reduce neglect and abandonment. One cRCT found a 64% reduction (approximately 3000 participants; aOR 0.36, 95% CI 0.19–0.71) and the other cRCT reported an increase from 12% to 16%. The observational studies found no clear difference.

Non-dignified care: Low-certainty evidence from one cRCT suggests that RMC may reduce non-dignified care (approximately 3000 women, aOR 0.58, 95% CI 0.30–1.12). This evidence is supported by a before–after study during which researchers found large reductions in various aspects of non-dignified care (e.g. the provider not introducing herself to the woman, failure to provide a clean bed for the woman, and the woman not being cleaned after birth).

Non-consented care and detention: Evidence on these outcomes is of very low certainty, partly because it was derived from before–after studies with design limitations.

Perineal/vaginal trauma

Episiotomy: The findings of one small study suggested that RMC interventions may reduce episiotomy (low-certainty evidence). The episiotomy rate was reduced by an average of 13% (from 34% to 21%) in the RMC arm of this study compared with an average of just 1% (from 40% to 39%) in the control arm.

Mode of birth, duration of labour, use of pain relief

The review found no evidence on these outcomes.

Fetal and neonatal outcomes

Perinatal hypoxia-ischaemia: The review found no evidence on this outcome.

Additional considerations

The systematic review evidence on RMC is derived from studies conducted only in Africa and might not be generalizable to other regions.

Values

A qualitative review *(28)* on RMC included 67 qualitative studies conducted in 32 countries, including countries in sub-Saharan Africa (6 countries), Asia (7), Oceania (1), Europe (8), the Middle East and North Africa (5), North America (2) and Latin America (3). The studies reported on the experiences of women, family members, and multiple cadres of health care providers and administrators. The review concluded that women placed high value on RMC, and this finding was consistent across countries and settings (high confidence in the evidence).

The findings indicate that women consistently appreciate and value RMC, and providers perceive RMC to be a critical component of providing safe, good-quality care (high confidence in the evidence). Globally, women's and providers' perspectives on what constitutes RMC are also quite consistent. These stakeholders identify the key components of RMC as: being free from harm and mistreatment; having privacy and confidentiality; dignified care; receiving information and being supported in the process of informed consent; continuous access to family and community support; high-quality physical environment and resources; equitable maternity care; effective communication; having choices and the opportunity to make decisions; availability of competent and motivated human resources; and receiving efficient, effective and continuous care.

The evidence shows that there is some variability in the relative importance of some aspects of RMC. For example, women living in HICs emphasize their rights to decision-making and active participation in their childbirth experience (moderate confidence in the evidence). Comparatively, women in lower-income countries are less likely to demand personal choices and decision-making over their childbirth process (moderate confidence in the evidence).

Resources

No research evidence was found on the costs or cost-effectiveness of RMC.

Additional considerations

Developing a policy that promotes RMC needs to address multiple RMC domains, in terms of interactions between individual women and health care providers, as well as interactions at the health system level. System-level quality improvement is likely to require resources to sustain staff behaviour change. This may include restructuring clinical training curricula for midwives, nurses and physicians, increasing the numbers of health care providers on staff, improving remuneration and respect for staff, and upgrading the physical environment. The design of the labour ward may present a key barrier to some components of RMC (e.g. labour companionship) in many settings. However, several aspects of RMC, particularly those at the interpersonal level (e.g. improving communication, respecting women's choices during labour and childbirth, reducing physical and verbal abuse, improving privacy and maintaining confidentiality), would require comparatively few resources to address them.

Table 3.1 Main resource requirements for respectful maternity care (RMC)

Resource	Description
Staff	■ Adequate numbers of competent, trained, supervised and adequately remunerated skilled birth attendants with an appropriate skills mix, working in multidisciplinary teams that are able to provide dignified and continuous care to all women
Training	■ Health care facility management: sensitized and oriented to RMC, and trained to develop and apply RMC policies ■ Staff: regular practice-based, in-service training on RMC provision to enable effective delivery of RMC services that meet the social, cultural and linguistic needs of women (cultural competence); pre-service training; and orientation of new staff ■ Outreach staff: training for effective community engagement, particularly with a focus on including women's voices and providing opportunities for community interaction with the service management and staff members, e.g. facility open days ■ Other: orientation sessions for service users and companions
Supplies	■ Written, up-to-date standards and benchmarks that outline clear goals, operational plans and monitoring mechanisms for RMC ■ Provisions for staff in labour ward, e.g. refreshments ■ Health education materials, in an accessible written or pictorial format and available in the languages of the communities served by the health care facility ■ A standard informed consent form ■ Information (written or pictorial, e.g. as leaflets) for the woman and her companion ■ Essential medicines for labour and childbirth care available in sufficient quantities at all times in the labour and childbirth areas
Equipment	■ Basic and adequate equipment for labour and childbirth that is available in sufficient quantities at all times in the labour and childbirth areas
Infrastructure	■ Enhanced physical environment: • Rooming-in to allow women and their babies to remain together • Clean, appropriately illuminated, well ventilated labour, childbirth and neonatal areas that allow for privacy and are adequately equipped and maintained • Continuous energy supply in the labour, childbirth and neonatal areas • Clean and accessible bathrooms for use by women in labour • Safe drinking water, and a hand hygiene station, with soap or alcohol-based hand rubs • Curtains, screens, partitions and sufficient bed capacity • Facilities for labour companions, including physical private space for the woman and her companion ■ On-site pharmacy and a medicine and supplies stock management system that is managed by a trained pharmacist or dispenser
Supervision and monitoring	■ Regular supportive supervision by labour ward/facility lead ■ Staff meetings to review RMC practices ■ Easily accessible mechanism (e.g. a box) for service users and providers to submit complaints to management ■ Establishment of accountability mechanisms for redress in the event of mistreatment or violations ■ Establishment of informed consent procedures

Equity

No direct evidence on the impact of RMC on equity was found. However, indirect evidence from a qualitative review on facilitators and barriers to facility-based birth *(8)* indicates that mistreatment and abuse by health workers is a substantial barrier to the use of facility-based birth services in low- and middle-income countries (LMICs) (high confidence in the evidence). This suggests that mistreatment contributes to health inequalities related to the use of facility-based birth services.

Further indirect evidence from the RMC qualitative review *(28)* indicates that respecting the culture, values and beliefs of individual women and local communities is important to women (high confidence in the evidence). The evidence also indicates that providing the same standard of maternity care for all, regardless of age, ethnicity, race, sexuality, religion, socioeconomic status, HIV status, language or other characteristics is important to women (moderate confidence in the evidence).

Inequity can result from receiving judgemental care from health care providers, and ensuring non-judgemental care for women may be important to improve equity (low confidence in the evidence).

Additional considerations

A policy of RMC is in accordance with the general principles of the Human Rights Council's 2012 *Technical guidance on the application of a human-rights-based approach to the implementation of policies and programmes to reduce preventable maternal morbidity and mortality (39)*, as indicated by the statements presented in Box 3.1.

Acceptability

Findings from a qualitative review *(28)* indicate that women appreciate RMC across countries and settings (high confidence in the evidence). Stakeholders (including women, providers and administrators) emphasized the theoretical importance of providing and ensuring RMC for all women. Review findings also suggest that efforts to address or improve RMC may be acceptable to health care providers (high confidence in the evidence). However, in environments where resources are limited, health care providers believe that RMC could increase their workload and could reduce their ability to provide quality care to all women. For example, they perceive that RMC could require spending more time with individual women, which may compromise care for other women who are left unattended. Thus, acceptability among health care providers may vary, depending on the available time and the specific RMC intervention. The review found little evidence on acceptability of specific RMC interventions that have been implemented.

Additional considerations

Mistreatment of women during childbirth is often due to existing social norms and in some settings it may be regarded by health care providers and other stakeholders as acceptable *(40–42)*.

BOX 3.1

Selected statements from the UN Human Rights Council indicating support of RMC

- A human rights-based approach is about health and not isolated pathologies; it is premised upon empowering women to claim their rights, and not merely avoiding maternal death or morbidity.
- Measures are required to address the social determinants of women's health that affect the enjoyment of civil, political, economic, social and cultural rights. [This includes gender discrimination, and marginalization based on ethnicity, race, caste, national origin and other grounds.]
- Human rights require "particular attention to vulnerable or marginalized groups".
- Applying a rights-based approach to the reduction of maternal mortality and morbidity depends upon a just, as well as an effective, health system.
- The design, organization and coordination of the components of the health system should be guided by fundamental human rights principles, including non-discrimination/equality, transparency, participation and accountability.
- Ensuring women's sexual and reproductive health rights requires meeting standards with regard to health facilities, goods and services.
- States are required to use "maximum available resources" for the progressive realization of economic, social and cultural rights; if resource constraints make it impossible for the State to fulfil women's sexual and reproductive health rights immediately, the State must demonstrate that it has used all the resources at its disposal to do so as a matter of priority.

Source: United Nations, 2012 *(39)*.

Feasibility

Evidence from a qualitative review *(28)* suggests that most health care providers would like to provide respectful, dignified and woman-centred care but may feel unable to do so due to resource constraints (high confidence in the evidence). Addressing some aspects of RMC, such as improving the physical environment and ensuring adequate numbers of trained staff, is likely to be resource-intensive, and therefore feasibility and sustainability of these aspects may be limited in poorly resourced settings. Thus, the introduction of RMC policies is most likely to be feasible in settings where resources are adequate. Nevertheless, the fact that all five studies demonstrating impact of RMC policies *(38)* were conducted in low-resource settings implies that they are feasible where increasing RMC in the health system is prioritized on the health care agenda.

Additional considerations

While RMC may be viewed positively by stakeholders in a general sense, changing cultural norms and established behaviours in health care facilities is often challenging, particularly in settings where mistreatment of women during childbirth is considered to be socially acceptable *(40–42)*.

Table 3.2 Summary of judgements: Respectful maternity care (RMC) intervention compared with no RMC intervention

Desirable effects	– Don't know	– Varies		– Trivial	– Small	– Moderate	✓ Large
Undesirable effects	– Don't know	– Varies		– Large	– Moderate	– Small	✓ Trivial
Certainty of the evidence	– No included studies			– Very low	✓ Low	– Moderate	– High
Values				– Important uncertainty or variability	– Possibly important uncertainty or variability	✓ Probably no important uncertainty or variability	– No important uncertainty or variability
Balance of effects	– Don't know	– Varies	– Favours usual care	– Probably favours no RMC intervention	– Does not favour RMC or no RMC intervention	– Probably favours RMC	✓ Favours RMC
Resources required	✓ Don't know	– Varies	– Large costs	– Moderate costs	– Negligible costs or savings	– Moderate savings	– Large savings
Certainty of evidence of required resources	✓ No included studies			– Very low	– Low	– Moderate	– High
Cost-effectiveness	✓ Don't know	– Varies	– Favours usual care	– Probably favours no RMC intervention	– Does not favour RMC or no RMC intervention	– Probably favours RMC	- Favours RMC
Equity	– Don't know	– Varies	– Reduced	– Probably reduced	– Probably no impact	✓ Probably increased	– Increased
Acceptability	– Don't know	✓ Varies		– No	– Probably No	– Probably Yes	– Yes
Feasibility	– Don't know	✓ Varies		– No	– Probably No	– Probably Yes	- Yes

3.1.2 Effective communication

RECOMMENDATION 2

Effective communication between maternity care providers and women in labour, using simple and culturally acceptable methods, is recommended. *(Recommended)*

Remarks

- In the absence of a standardized definition of "effective communication", the GDG agreed that effective communication between maternity care staff and women during labour and childbirth should include the following, as a minimum.
  - Introducing themselves to the woman and her companion and addressing the woman by her name;
  - Offering the woman and her family the information they need in a clear and concise manner (in the language spoken by the woman and her family), avoiding medical jargon, and using pictorial and graphic materials when needed to communicate processes or procedures;
  - Respecting and responding to the woman's needs, preferences and questions with a positive attitude;
  - Supporting the woman's emotional needs with empathy and compassion, through encouragement, praise, reassurance and active listening;
  - Supporting the woman to understand that she has a choice, and ensuring that her choices are supported;
  - Ensuring that procedures are explained to the woman, and that verbal and, when appropriate, written informed consent for pelvic examinations and other procedures is obtained from the woman;
  - Encouraging the woman to express her needs and preferences, and regularly updating her and her family about what is happening, and asking if they have any questions;
  - Ensuring that privacy and confidentiality is maintained at all times;
  - Ensuring that the woman is aware of available mechanisms for addressing complaints;
  - Interacting with the woman's companion of choice to provide clear explanations on how the woman can be well supported during labour and childbirth.
- Health systems should ensure that maternity care staff are trained to national standards for competency in interpersonal communication and counselling skills.

Summary of evidence and considerations

Effects of the intervention (EB Table 3.1.2)

Evidence on the impact of effective communication on birth outcomes was sought from a mixed-methods systematic review *(43)*. The review authors considered interventions to improve communication between maternity staff and women – including the use of health education materials, job aids, training of providers on interpersonal communication and counselling – in terms of their impact on the birth outcomes pre-specified for this guideline question. Two RCTs were included: a stepped-wedge cluster RCT (cRCT) from the Syrian Arab Republic *(44)* and a sub-analysis of an RCT from the United Kingdom *(45)*. The study from the Syrian Arab Republic evaluated the impact of interventions to improve resident doctors' communication skills on women's satisfaction with doctors' interpersonal and communication skills during the women's labour and childbirth. The study from the United Kingdom evaluated the impact of training on patient-actor perceptions of care from doctors and midwives during simulated obstetric emergencies.

The trial conducted in the Syrian Arab Republic evaluated a specifically designed communication skills training package provided to all resident doctors at four hospitals (137 doctors), which covered characteristics and principles of effective communication, how to overcome barriers to effective communication, and how to improve interactions with patients. Effectiveness was assessed among 2000 women who gave birth to a live baby. The primary outcome was women's satisfaction with interpersonal and communication skills of doctors during labour and childbirth measured at two weeks after birth using a modified

version of the Medical Interview Satisfaction Scale (MISS-21). Secondary outcomes included the communicative behaviour of doctors as documented using observational checklists and measured two to three weeks after implementation of the training package.

The United Kingdom study, 140 midwives and doctors were randomized to one of four obstetric emergency training interventions: a 1-day course at a local hospital, a 1-day course at a simulation centre, a 2-day course with teamwork training at a local hospital, or a 2-day course with teamwork training at a local simulation centre. Training content included lectures, video clips and activities to demonstrate components of teamwork. Pre- and post-training, participants managed three standardized simulated obstetric emergencies (eclampsia, postpartum haemorrhage [PPH] and shoulder dystocia) in a delivery room in their own hospital. Outcomes assessed included the quality of care in relation to communication, safety and respect, on the three simulated emergencies three weeks after training. A five-point Likert scale was used for patient-actor responses to statements such as: "I felt well informed due to good communication". Patient-actors in this study were experienced midwives who were blinded to the group allocation.

Comparison: Effective communication by health care staff compared with usual practice

The first study *(44)*, from the Syrian Arab Republic, found little or no difference in women's satisfaction scores (very low-certainty evidence). Findings related to women's views on specific aspects of their doctor's communication with them during labour (e.g. Did the doctor identify themselves prior to a medical examination? Did the doctor greet them? Did the doctor look at them when talking to them?) were similar across trial groups. There was also very low-certainty evidence that observational checklist scores (comparing pre- and post-intervention communicative behaviour among clinicians) were similar before and after the training intervention.

The second study *(45)*, from the United Kingdom, found very low-certainty evidence for the following outcomes for the PPH scenario: improvement in patient-actors' perceptions of care after clinician training for management of the three obstetric emergencies, regardless of whether they were cared for by a multidisciplinary team or an individual; and training of teams at the local hospital may lead to improved perceptions of care among patient-actors in relation to safety and communication, when compared with training at a central simulation centre. For the eclampsia scenario, very low-certainty evidence suggests that there may be little or no difference in patient-actors' perceptions of care scores related to communication. For shoulder dystocia, very low-certainty evidence on individual clinicians' care scores also suggests no improvement in patient-actor perceptions of communications following local hospital-based training.

The same study evaluated whether perceptions of care (through the use of patient-actors) in relation to communication was influenced by the addition of teamwork training to clinical training in the three simulated obstetric emergency scenarios. The teamwork training comprised a 1-day course, including lectures, video clips and non-clinical activities, which emphasized the importance of effective communication between members of the multi-professional team. Very low-certainty evidence suggests that there may be little or no difference in perceptions of care related to communication for any of the simulated obstetric emergency scenarios when teamwork was added to the clinical training.

Additional considerations

The review found no evidence on the other maternal or any fetal/neonatal outcomes pre-specified for this guideline question.

Values

The findings of a review of qualitative studies looking at what matters to women during intrapartum care *(23)* indicate that most women, especially those giving birth for the first time, are apprehensive about labour and childbirth, adverse birth outcomes and certain medical interventions, and they value the support and reassurance of health care professionals who are sensitive to their needs (high confidence in the evidence). Where interventions are required, most women would like to receive relevant information from technically competent health care providers in a manner they can understand (high confidence in the evidence). Findings of another qualitative evidence synthesis *(28)* that focused on RMC indicate that women consistently appreciate and value effective communication as one of the key components of RMC (high confidence in the evidence).

Resources

No research evidence on the cost or cost-effectiveness of communication interventions was found.

Additional considerations

Communication interventions are likely to be cost-effective if they improve the quality of maternity

Table 3.3 Main resource requirements for effective communication

Resource	Description
Staff	■ Adequate numbers of skilled birth attendants with an appropriate skill mix, working in multidisciplinary teams, and trained facilitators
Training	■ Core education curricula at pre- and in-service levels, which include training on communication that reflects women's social, cultural and linguistic needs, where relevant to labour and childbirth ■ Development or adaptation of training strategies to promote, sustain and assess the communication skills of maternity care staff during provision of labour and childbirth care ■ Regular in-service training on communication during labour and childbirth
Supplies	■ Health education materials or tools to clearly communicate progress of labour (e.g. cervical dilatation 0–10 cm pictorial chart) to women and their companions of choice during labour and childbirth
Equipment	■ No special equipment required ■ Some decision-support tools could be helpful (e.g. electronic screen-based tools) ■ Variable, depending on type and content of training
Infrastructure	■ Training facilities to support development of skills and competencies in effective communication
Supervision and monitoring	■ Support for all clinical staff who provide care for women in labour to attend communication training ■ Regular supportive supervision and review by labour/facility lead with positive clinician support ■ Regular multidisciplinary meetings to discuss and review communication approaches for women during labour and childbirth

care, reduce medical interventions and improve birth outcomes; however, direct evidence on their impact is lacking. The main cost associated with communication interventions for women during labour, childbirth and the immediate postnatal period is training of maternity staff, which can be targeted at both pre- and in-service levels. This will require resources, as training to inform and sustain behaviour change among health care professionals might require a variety of approaches, including lectures, workshops and one-to-one training sessions. Sustaining clinical training will also require resources to provide ongoing practice development. From the perspectives of women and their families, resource requirements associated with effective communication interventions are likely to be negligible.

Equity

No direct evidence on the impact of communication interventions on equity was found. Indirect evidence from a qualitative review of barriers and facilitators to uptake of facility-based birth services indicates that perceived poor quality of care is probably a significant barrier to uptake by women in LMICs (high confidence in the evidence) *(8)*. Poor or abusive health care provider communication could influence decisions about where to give birth in subsequent pregnancies *(8)*, and further undermine equity if it discourages marginalized women, particularly in LMICs, from giving birth in a facility.

Effective communication by health care providers that happens in partnership with women and their families could help women feel informed and could plausibly also empower disadvantaged women to speak up about the care they receive.

Acceptability

From the mixed-methods systematic review *(43)*, no direct evidence was found on the acceptability of communication interventions provided to women in labour. However, findings from a qualitative systematic review of women's views and experiences of intrapartum care *(26)* indicate that women appreciate communication in many forms including positive reassurance to allay anxiety, active listening skills to accommodate women's choices and concerns, and empathy to establish trust and understanding (high confidence in the evidence).

Findings on health care provider views from one of the studies included in the mixed-methods review, from the Syrian Arab Republic *(44)*, suggest that attendance at training to enhance competencies and skills in communication is acceptable to health care professionals and may be viewed positively by them (very low confidence in the evidence).

Feasibility

Again, findings from one study *(44)* in the mixed-methods review suggest that there may be several barriers to implementation of communication interventions for health care professionals attending training workshops, including time pressures, workload pressures and hospital routines (very low confidence in the evidence). Low social status of women, type of facility and cultural attitudes of staff towards women may also impact the feasibility of implementation (very low confidence in the evidence). Evidence from a qualitative systematic review exploring health care professionals views and experiences of delivering intrapartum care *(26)* suggests that time pressures and workload considerations sometimes limit their capacity to communicate with women in the sensitive, engaging manner that women want (high confidence in the evidence).

Additional considerations

In the mixed-methods review *(43)*, both trials implemented and evaluated their training intervention in a relatively short time (around three weeks), and further consideration needs to be given to how organizations prepare, monitor and sustain the effects of training interventions to enhance communication outcomes of interest and how much time is needed to "embed" change in practice. Findings suggest that without necessary systems change – especially in settings with high patient volume, poor workforce resources and lack of team working – implementation of communication interventions during labour and childbirth may not be feasible in the longer term.

Cultural attitudes towards women, especially marginalized women, are also likely to have an important influence on whether communication interventions are supported.

Table 3.4 Summary of judgements: Communication interventions compared with no communication interventions

Desirable effects	✓ Don't know	– Varies		– Trivial	– Small	– Moderate	– Large
Undesirable effects	✓ Don't know	– Varies		– Large	– Moderate	– Small	– Trivial
Certainty of the evidence	– No included studies			✓ Very low	– Low	– Moderate	– High
Values				– Important uncertainty or variability	– Possibly important uncertainty or variability	✓ Probably no important uncertainty or variability	– No important uncertainty or variability
Balance of effects	– Don't know	– Varies	– Favours no communication intervention	– Probably favours no communication intervention	✓ Does not favour communication intervention or no communication intervention	– Probably favours communication intervention	– Favours communication intervention
Resources required	✓ Don't know	– Varies	– Large costs	– Moderate costs	– Negligible costs or savings	– Moderate savings	– Large savings
Certainty of evidence of required resources	✓ No included studies			– Very low	– Low	– Moderate	– High
Cost-effectiveness	✓ Don't know	– Varies	– Favours no communication intervention	– Probably favours no communication intervention	– Does not favour communication intervention or no communication intervention	– Probably favours communication intervention	– Favours communication intervention
Equity	– Don't know	– Varies	– Reduced	– Probably reduced	– Probably no impact	✓ Probably increased	– Increased
Acceptability	– Don't know	– Varies		– No	– Probably No	✓ Probably Yes	– Yes
Feasibility	– Don't know	✓ Varies		– No	– Probably No	– Probably Yes	– Yes

3.1.3 Companionship during labour and childbirth

RECOMMENDATION 3

A companion of choice is recommended for all women throughout labour and childbirth.
(Recommended)

Remarks

- The companion in this context can be any person chosen by the woman to provide her with continuous support during labour and childbirth. This may be someone from the woman's family or social network, such as her spouse/partner, a female friend or relative, a community member (such as a female community leader, health worker or traditional birth attendant) or a doula (i.e. a woman who has been trained in labour support but is not part of the health care facility's professional staff).
- The GDG discussed the issues of privacy, cultural preferences and resource use, which are often raised as barriers to implementing this intervention, and agreed that simple measures to allow female relatives to accompany women during labour could be used as cost-effective and culturally sensitive ways to address these concerns. If labour companionship is implemented in settings where labour wards have more than one bed per room, care should be taken to ensure that all women have their privacy and confidentiality maintained (e.g. by consistent use of dividers/curtains).
- The GDG noted that countries and policy-makers are often reluctant to implement this intervention in clinical practice in spite of the supporting evidence, which has been available for many years, even though the intervention is routinely applied in private facilities. The group agreed that extra efforts are needed to encourage potential implementers at various levels of health care delivery to implement this intervention.
- It is important that women's wishes are respected, including those who prefer not to have a companion.
- Finding a companion of choice to support labour might not be easy for marginalized or vulnerable women, or if women live far from health care facilities, or if the companion requires payment. Health care facilities need to take this into account and consider steps to ensure that support is always available for all women during labour.
- A number of WHO guidelines recommend continuous companionship during labour and childbirth, including *WHO recommendations: optimizing heath worker roles to improve access to key maternal and newborn health interventions through task shifting (34)*, *WHO recommendations for augmentation of labour (46)* and *WHO recommendations on health promotion interventions for maternal and newborn health (47)*.

Summary of evidence and considerations

Effects of the intervention (EB Table 3.1.3)

Evidence for this recommendation was derived from a Cochrane systematic review in which 26 trials involving 15 858 women contributed data *(22)*. The trials were conducted in Australia, Belgium, Botswana, Brazil, Canada, Chile, Finland, France, Greece, Guatemala, Iran, Mexico, Nigeria, South Africa, Sweden, Thailand, Turkey and the USA. Most trials *(20)* recruited women around the time of admission to hospital for childbirth. In 15 of the trials, the facility setting did not usually permit women to have someone with them in labour, whereas in 11 trials, the facility permitted women to be accompanied by a partner or family member. Labour support interventions were very similar across the trials – including comforting touch, praise and encouragement – and they were usually continuously provided during established labour. Epidural analgesia was available to women in 14 of the trials, was not available in eight trials and its availability was unknown in four trials.

Comparison: Companionship during labour and childbirth compared with usual practice

Maternal outcomes

Mode of birth: Low-certainty evidence suggests that companionship during labour and childbirth may increase spontaneous vaginal birth (21 trials, 14 369 women, RR 1.08, 95% CI 1.04–1.12; absolute effect: 54 more per 1000 [from 27 to 81 more]) and reduce caesarean section (24 trials, 15 347 women, RR 0.75, 95% CI 0.64–0.88; absolute effect: 36 fewer per 1000 [from 17 to 52 fewer]). A subgroup analysis by

type of support person suggests that support people who are "not hospital staff and not chosen by the woman" may have the greatest effect (spontaneous vaginal birth: RR 1.15, 95% CI 1.05–1.26; and caesarean section: RR 0.61, 95% CI 0.45–0.83).

Low-certainty evidence also suggests that companionship during labour and childbirth may reduce instrumental vaginal birth (19 trials, 14 118 women, RR 0.90, 95% CI 0.85–0.96; absolute effect: 20 fewer per 1000 [from 8 to 30 fewer]). The review did not perform subgroup analysis by type of support person for this outcome.

Perineal trauma: Moderate-certainty evidence suggests that companionship during labour and childbirth probably makes little or no difference to perineal trauma (episiotomy or perineal tears) (4 trials, 8120 women, RR 0.97, 95% CI 0.92–1.01).

Duration of labour: Moderate-certainty evidence suggests that companionship during labour and childbirth probably reduces the length of labour (13 trials, 5429 women, mean difference [MD] 0.69 hours shorter, 95% CI 0.34–1.04 hours shorter).

Use of pain relief: Low-certainty evidence suggests that companionship during labour and childbirth may reduce use of any type of pain relief (15 trials, 12 433 women, RR 0.90, 95% CI 0.84–0.96; absolute effect: 75 fewer per 1000 [from 30 to 120 fewer]). Subgroup findings suggest that there may be little or no difference between types of support person for this outcome. Low-certainty evidence also suggests that companionship during labour and childbirth may reduce use of epidural analgesia in settings where it is used (9 trials, 11 444 women, RR 0.93, 95% CI 0.88–0.99; absolute effect: 48 fewer per 1000 [from 7 to 83 fewer]).

Augmentation of labour: Low-certainty evidence suggests that companionship during labour and childbirth may have little or no effect on augmentation of labour with synthetic oxytocin (17 trials, 12 833 women, RR 0.97, 95% CI 0.91–1.03). Subgroup findings suggest that this effect may not differ according to the type of support person.

Birth experience: Moderate-certainty evidence suggests that companionship during labour and childbirth probably reduces negative ratings of childbirth experience (11 trials, 11 133 women, RR 0.69, 95% CI 0.59–0.79; absolute effect: 55 fewer per 1000 [from 37 to 73 fewer]). Subgroup differences indicate that this effect is greatest when the support person is not a member of the hospital staff, regardless of whether or not the person was chosen by the woman.

Moderate-certainty evidence suggests that companionship during labour and childbirth probably makes little or no difference to the postpartum report by women of severe labour pain (4 trials, 2456 women, RR 1.00, 95% CI 0.83–1.21).

Low-certainty evidence suggests that companionship during labour and childbirth may reduce postpartum depression when the support person is not a hospital staff member and was not chosen by the woman (1 trial, 159 women, RR 0.17, 95% CI 0.09–0.33). However, moderate-certainty evidence suggests that when the support people are hospital staff, companionship during labour and childbirth probably has little or no effect on this outcome (1 trial, 5571 women, RR 0.86, 95% CI 0.73–1.02). Data on postpartum depression were not pooled due to a high level of inconsistency between the two studies contributing data.

Fetal and neonatal outcomes

Perinatal hypoxia-ischaemia: Moderate-certainty evidence suggests that companionship during labour and childbirth probably reduces low Apgar scores at 5 minutes (14 trials, 12 615 babies, RR 0.62, 95% CI 0.46–0.85; absolute effect: 6 fewer low scores per 1000 [from 2 to 9 fewer]).

Longer-term mother-infant outcomes: Low-certainty evidence suggests that companionship during labour and childbirth may make little or no difference to exclusive or any breastfeeding (4 trials, 5584 babies, RR 1.05, 95% CI 0.96–1.16). However, when the support person is not a hospital staff member and was not chosen by the woman, subgroup findings indicate that companionship during labour and childbirth probably increases exclusive or any breastfeeding (3 trials, 1025 women, RR 1.11, 95% CI 0.98–1.26).

Additional considerations

Other subgroup findings in the review suggest that the beneficial effects of companionship on several birth outcomes, including reductions in caesarean section and "negative childbirth experience", may be greatest in middle-income countries compared with HICs, and in settings where epidural is not available, where routine cardiotocography (CTG) is not performed, and where women were not previously permitted a companion during labour.

Although labour companionship was commenced in most included trials upon admission to the labour ward, companionship commenced in early labour (e.g. at home or before admission to the labour ward) could plausibly be more effective, as that is the time when many women experience anxiety

about how to cope with contractions, when to go the hospital and other practical considerations.

Values

Findings from a review of qualitative studies exploring perceptions and experiences of labour companionship indicate that women from both HIC and LMIC settings value the non-pharmacological pain relief measures that companions help to facilitate, including a soothing touch (holding hands, massage and counter pressure), breathing and relaxation techniques. Companions also help women to adopt alternative positions to ease pain, such as squatting, sitting on a ball and walking. Some women also find comfort in spiritual support, when their companions read holy texts or pray (high confidence in the evidence) *(27)*.

This review also found that women from both HIC and LMIC settings value feeling in control during labour and are confident in their ability to give birth. The findings indicate that companions help women to feel self-confident, and improve their self-esteem when they acknowledge and reinforce the women's efforts, provide encouragement and directions for how to maintain control, and ensure that women are aware of their choices (moderate confidence in the evidence) *(27)*.

Resources

No evidence on the cost or cost-effectiveness of companionship interventions in LMICs was found. In a high-income setting (USA) where doulas are reimbursed for their services, a cost-effectiveness study reported potential cost savings with doula care, based on an average doula remuneration of US$ 986 per birth, and lower preterm birth and caesarean section rates. In contrast, a 2015 cost-effectiveness analysis of volunteer companion support for disadvantaged childbearing women in the United Kingdom reported substantially higher costs per birth (£1862) *(48)*, as reductions in caesarean section and epidural use were small where they occurred. The major cost attributed to the United Kingdom programme was service provision (including: salaries/wages, premises, equipment and consumables), with other costs including volunteer recruitment, training (materials, catering, childcare) and travel expenses. The authors suggested that volunteer companion payment in the region of the United Kingdom national minimum wage could be considered (about £8 per hour).

A study on the establishment of a volunteer companion programme among student nurses and community members in the USA reported that the cost of running their programme was "minimal" *(49)*. In 2015, the programme charged volunteers US$ 35 per training course; this fee included a "doula bag" containing a handbook, birth ball, yoga blocks and various single-use comfort items, such as lotion and chewing gum.

Additional considerations

The evidence above suggests that the cost and cost-effectiveness of providing a volunteer companionship service in HICs can vary considerably, with the main cost being associated with service provision. The use of lay companions (family members or female friends) might constitute a relatively low-cost intervention from a provider perspective, as there are usually no remuneration costs for service or transport; however, user costs (companion transport costs and/or the loss of the companion's income from other activities) might be a barrier to uptake. From a provider perspective, there would be costs associated with orientating/training both lay companions and doulas and in ensuring that the infrastructure is adequate to support them (see Table 3.5).

The quantitative evidence on the effectiveness of labour companionship suggests that labour companionship can reduce caesarean section by 25%, instrumental vaginal birth by 10% and the use of pain relief by 10%. These reductions could plausibly lead to substantial cost savings.

Equity

Evidence from a qualitative systematic review on perceptions and experiences of labour companionship explored how women from minority groups experienced labour companionship. Immigrant, refugee and foreign-born women in HICs highlighted how lay companions from their own ethnic/religious/cultural community, who are trained as labour companions, were an important way for them to receive culturally competent care. These lay companions empowered women to ask questions, acted as their advocates, and ensured that their customs and traditions were respected. When women received this type of care, they felt more confident to give birth and less like "outsiders" in their new community (low confidence in the evidence) *(27)*.

Evidence from a review of barriers and facilitators to facility-based birth indicates that a lack of supportive attendance at facilities is probably a significant barrier to the uptake of facility-based birth by women in LMICs (moderate confidence in the evidence) *(8)*. Facility policies that limited the involvement of family members and traditional

Table 3.5 Main resource requirements for labour companionship

Resource	Description
Staff salaries	■ To provide orientation for labour companions and support or manage the companion service
Training of the companion	■ Orientation session on supportive labour companionship techniques (e.g. two 2-hour sessions for a family member or friend *(50)*, or a 1- or 2-day course *(49)* or longer for trained volunteers/doulas) ■ Refresher courses ■ Other training costs, including transportation costs for participants and venue hire
Supplies	■ Information, education and communication materials on supportive techniques ■ Incentives ■ Measures to support privacy and confidentiality, including dividers/curtains
Infrastructure	■ Basic accommodation facilities for companions, including a chair, space to change clothes, access to a toilet ■ Private physical space for the woman and her companion at the time of birth
Time	■ Companion time for training and provision of labour support (e.g. 8- to 12-hour shifts *(49)*, either paid or unpaid)
Supervision and monitoring	■ Establishment of a system of registering, integrating, coordinating and supporting volunteer and paid companions (those who are not family members or friends) within the health system

birth attendants were found in this review to induce anxiety in many women. The review also found clear evidence that previous negative childbirth experiences at facilities deters many women in LMICs from choosing to give birth at a facility (high confidence in the evidence) *(8)*.

Additional considerations

Improving support for women giving birth and facilitating a woman's choice with regard to a birth companion is an important component of respectful maternity care (RMC) and is in accordance with a human rights-based approach *(28, 39)*.

The findings of a qualitative review on perceptions and experiences of labour companionship *(27)* suggest that facilities in LMICs that ensure companionship for women in labour by family members, friends or community-based doulas could increase equity directly, through empowerment and advocacy, and indirectly, through increased uptake by women of facility-based birth. Equity could also be increased if companionship reduces the medicalization of childbirth (e.g. caesarean section, instrumental vaginal birth, epidural use) among women in high-resource settings.

In many countries, particularly HICs, women who want doulas pay for them privately *(51)*. Extending companionship of choice to underprivileged women in these settings would increase equity.

Acceptability

A qualitative systematic review on perceptions and experiences of labour companionship explored women's preferences for labour companionship. Women who preferred to have a labour companion present expressed the need for this person to be a caring, compassionate and trustworthy advocate. Women stated different preferences for their desired companion, including their husband or male partner, sister, mother, mother-in-law, doula, or a combination of different people. These differences among women, both between and within populations in HIC and LMIC settings, demonstrate the importance of giving women a choice of labour companion (high confidence in the evidence) *(27)*.

Feasibility

A qualitative systematic review on perceptions and experiences of labour companionship explored barriers and enablers to the implementation of labour companionship across different settings. Health care providers, women and male partners, particularly in LMIC settings, highlighted the physical space constraints of labour wards as a key barrier to implementing labour companionship, as it was perceived that privacy could not be maintained and wards would become overcrowded. Labour wards often had open floor plans, possibly with only a curtain to separate beds. In some cases, women were only allowed to have a female companion, in order to protect the privacy of other women in the ward, thus restricting their choices (high confidence in the evidence) *(27)*.

Furthermore, in settings where labour companionship was implemented, providers were often not trained on how to integrate this person into the woman's support team. This could lead to conflict between the provider, the companion and/or the woman, or a feeling that the companion/doula was "in the way" (moderate confidence in the evidence) *(27)*.

Table 3.6 Summary of judgements: Companionship compared with usual practice

Desirable effects	– Don't know	– Varies		– Trivial	– Small	– Moderate	✓ Large
Undesirable effects	– Don't know	– Varies		– Large	– Moderate	– Small	✓ Trivial
Certainty of the evidence	– No included studies			– Very low	– Low	✓ Moderate	– High
Values				– Important uncertainty or variability	– Possibly important uncertainty or variability	✓ Probably no important uncertainty or variability	– No important uncertainty or variability
Balance of effects	– Don't know	– Varies	– Favours usual practice	– Probably favours usual practice	– Does not favour companionship or usual practice	– Probably favours companionship	✓ Favours companionship
Resources required	– Don't know	✓ Varies	– Large costs	– Moderate costs	– Negligible costs or savings	– Moderate savings	– Large savings
Certainty of evidence of required resources	– No included studies			– Very low	✓ Low	– Moderate	– High
Cost-effectiveness	Don't know	✓ Varies	– Favours usual practice	– Probably favours usual practice	– Does not favour companionship or usual practice	– Probably favours companionship	– Favours companionship
Equity	– Don't know	– Varies	– Reduced	– Probably reduced	– Probably no impact	– Probably increased	✓ Increased
Acceptability	– Don't know	– Varies		– No	– Probably No	✓ Probably Yes	– Yes
Feasibility	– Don't know	✓ Varies		– No	– Probably No	– Probably Yes	– Yes

3.1.4 Continuity of care

RECOMMENDATION 4

Midwife-led continuity-of-care models, in which a known midwife or small group of known midwives supports a woman throughout the antenatal, intrapartum and postnatal continuum, are recommended for pregnant women in settings with well functioning midwifery programmes. *(Context-specific recommendation)*

Remarks

- This recommendation has been integrated from the *WHO recommendations on antenatal care for a positive pregnancy experience (35).*
- Midwife-led continuity-of-care (MLCC) models are models of care in which a known and trusted midwife (case-load midwifery), or small group of known midwives (team midwifery), supports a woman throughout the antenatal, intrapartum and postnatal period, to facilitate a healthy pregnancy and childbirth, and healthy parenting practices.
- MLCC models are complex interventions and it is unclear whether the pathway of influence that can produce these positive outcomes is the continuity of care, the midwifery philosophy of care or both. The midwifery philosophy inherent in MLCC models might or might not be enacted in standard midwife practice in other models of care. Policy-makers in settings without well functioning midwife programmes should consider implementing this model only after successfully scaling up the number (and improving the quality) of practising midwives. In addition, stakeholders might wish to consider ways of providing continuous care through providers other than midwives, because women value continuity of care.
- The panel noted that with this model of care it is important to monitor resource use, and provider burnout and workload, to determine whether caseload or team care models are more sustainable in individual settings.
- MLCC requires that well trained midwives are available in sufficient numbers for each woman to see one or only a small group of midwives throughout her pregnancy and during childbirth. This model may therefore require a shift in resources to ensure that the health system has access to a sufficient number of midwives with reasonable caseloads.
- The introduction of MLCC may lead to a shift in the roles and responsibilities of midwives as well as other health care professionals who have previously been responsible for antenatal and postnatal care. Where this is the case, implementation is likely to be more effective if all relevant stakeholders are consulted and human resources departments are involved. In some settings, government-level consultation with professional organizations could also aid the implementation process.
- The need for additional one-off or continuing training and education should be assessed, and any necessary training should be provided.
- The evidence supporting this recommendation can be found in the source guideline document, available at: http://apps.who.int/iris/bitstream/10665/250796/1/9789241549912-eng.pdf

3.2 First stage of labour

3.2.1 Definitions of the latent and active first stages of labour

RECOMMENDATION 5

The use of the following definitions of the latent and active first stages of labour is recommended for practice.

— **The latent first stage is a period of time characterized by painful uterine contractions and variable changes of the cervix, including some degree of effacement and slower progression of dilatation up to 5 cm for first and subsequent labours.** *(Recommended)*

— **The active first stage is a period of time characterized by regular painful uterine contractions, a substantial degree of cervical effacement and more rapid cervical dilatation from 5 cm until full dilatation for first and subsequent labours.** *(Recommended)*

Remarks

- The GDG acknowledged that the "latent first stage" (or the "latent phase") is sometimes described as the "early" or "passive" first stage. However, the group favoured the continued use of "latent first stage" (or the "latent phase") since this is the oldest and most familiar terminology, and because introduction of a new term might require additional training with minimal or no additional value. Likewise, the use of "active first stage" (or the "active phase") to describe the period of accelerative labour during the first stage is preferred to other terms such as "established" labour.

Summary of evidence and considerations

Definitions of latent and active phases of the first stage of labour

No studies specifically investigating birth outcomes based on the use of different definitions of phases of the first stage of labour were identified. Evidence on the definitions of onset of latent and active phases of the first stage of labour was derived from three systematic reviews: (i) a systematic review of the definitions of onset and features of latent and active phases of the first stage of labour as defined for healthy pregnant women labouring spontaneously in research contexts and clinical practice, and the scientific rationale underpinning such definitions *(14)*; (ii) a systematic review on the duration of labour which also evaluated the definitions of phases of labour *(52)*; and (iii) a systematic review of cervical dilatation patterns which provides evidence on the dilatation threshold for the onset of active phase as indicated by the beginning of rapid progression of cervical dilatation *(53)*.

The first review *(14)* included 62 studies conducted in 24 low-, middle- and high-income countries: Australia (1 study), Austria (1), Bahrain (1), Canada (1), France (1), Germany (6), India (1), Iran (3), Ireland (1), Israel (2), Italy (4), Jordan (1), Kuwait (1), New Zealand (1), Nigeria (4), Norway (3), Pakistan (1), Philippines (1), Saudi Arabia (1), South Africa (2), Republic of Korea (2), Sweden (1) and the USA (22). Most of the studies were published between 2005 and 2013. They included retrospective cohort studies (29), prospective cohort studies (18) and RCTs *(7)*, while the remaining studies *(8)* employed a range of qualitative, case–control, mixed methods or other research designs.

The second systematic review *(52)* included 37 studies conducted in 17 low-, middle- and high-income countries (China, Colombia, Croatia, Egypt, Finland, Germany, Israel, Japan, Republic of Korea, Myanmar, Nigeria, Norway, Taiwan [China], Uganda, the United Kingdom, the USA and Zambia), and involving over 200 000 women of different ethnic origins and socioeconomic status. These studies primarily evaluated the duration of phases and stages of labour among women who presented with spontaneous labour and were considered to be at low risk of developing complications, and secondarily evaluated the definitions of the phases of stages of labour as applied in the included studies.

The third systematic review *(53)* included seven observational studies conducted in China (2 studies), Japan (1 study), Nigeria and Uganda (1 study in both countries) and the USA (3 studies). The studies reported data for 99 712 "low-risk" women with spontaneous labour onset, vaginal birth and no adverse perinatal outcomes, and they evaluated the time needed for cervical dilatation to progress centimetre by centimetre through the first stage of labour, and the corresponding rate of change (slope) from one level of cervical dilatation to the next.

Findings

Latent phase onset and features: In the first review, all 13 studies that defined the latent phase of the first stage of labour included the presence of regular painful uterine contractions, while 11 included cervical dilatation in the definition. Three studies (23%) stated that during the onset of the latent phase there should be at least one painful uterine contraction every 8–10 minutes, and one study stated there should be at least two painful contractions every 10 minutes; none of these studies included duration of each contraction in their definition. Onset of latent phase was most commonly defined as cervical dilatation of less than 4 cm (7 studies); however, less than 3 cm and less than or equal to 2 cm, were used in three studies and one study, respectively. One study defined the end of the latent phase according to parity, indicating that a cervical dilatation of 3 cm marked the end of the latent phase for nulliparous women and 4 cm for parous women. Few studies included physiologic signs (e.g. "bloody show" and amniotic fluid leakage) in their definitions.

In the second review, six studies defined the latent phase using inconsistent measures of cervical dilatation, including less than 2.5 cm, less than 3 cm or less than 4 cm. One study defined the latent phase as "the duration of labour before presentation to hospital", while in another it was "the length of time from the reported onset of regular contractions until the time of the examination where the slope of the cervical dilatation progress was > 1.2 cm/hour".

The third review provides no additional information regarding the definition of the latent phase.

Active phase onset and features: In the first review, 20 (60%) of the 33 studies that defined the active phase of the first stage of labour included the presence of regular painful uterine contractions, while 27 (82%) included cervical dilatation in the definition. The frequency of painful uterine contractions was largely not specified among studies including contractions as part of the definition, but was described as at least 2–3 contractions in 10 minutes in six studies. One study indicated that onset of active labour is characterized by contractions that are 20–25 seconds in length, while two studies stated that contractions in the active phase should be more than 40 seconds long.

The onset of the active phase was most commonly defined as cervical dilatation of 4 cm or more (14 studies); however, definitions of 2 cm or more, and 3–4 cm, were used in 2 and 10 studies, respectively. Four studies characterized onset of the active phase as the point at which the cervix begins to dilate more than 1 cm per hour. Six studies included substantial cervical effacement in the definition of the onset of active labour, ranging from at least 75% up to 100% effacement. Two studies included physiologic signs (e.g. "bloody show" and amniotic fluid leakage) in their definitions of the onset of the active phase.

In the second review, 11 studies inconsistently defined the onset of the active phase based on cervical dilatation thresholds of 1.5 cm (1 study), 2.5 cm (1), 3 cm (1), 4 cm (6) or 5 cm (1). In one study, the active phase was defined as the time spent to achieve full cervical dilatation from the time of arrival at the hospital. All studies consistently defined the end of the active phase as 10 cm.

In the third review, the pooled median time for cervical dilatation to advance by 1 cm in nulliparous women was longer than 1 hour until a dilatation of 5 cm was reached, when the median dilatation rate became 1.09 cm/hour (6 studies, 42 648 women). The transition to more rapid cervical dilatation progression started between 5 and 6 cm, after which the median dilatation rate doubled. Likewise, the pooled median time for cervical dilatation to advance by 1 cm in parous women (parity ≥ 1) was longer than 1 hour until a dilatation of 5 cm was reached, when the median dilatation rate became 1.49 cm/hour (3 studies, 56 823 women).

Additional considerations

There is no evidence to support the basis for or the impact of any particular definition of latent phase on birth outcomes. However, the onset of active phase as defined by the cervical dilatation threshold of at least 5 cm was based on a review that included women with spontaneous labour and normal perinatal outcomes *(53)*.

Values

Findings from a review of qualitative studies looking at what matters to women during intrapartum care *(23)* indicate that most women want a normal birth with good outcomes for mother and baby.

Additional considerations

Evidence from other studies suggests that women are less likely than health care providers to recognize defined, time-bound phases of labour *(54)*, and their ability to cope is more likely to be dependent on a variety of inter-related factors, including the level of pain experienced, the nature of the environment and their perceived level of support *(55)*.

Table 3.7 Main resource requirements for adopting new definitions of the latent and active phases of the first stage of labour

Resource	Description
Training	■ Practice-based training for health care providers to increase knowledge on in-hospital and outpatient supportive care for the latent phase of the first stage of labour
Supplies	■ Revised training manuals and clinical protocols for health care providers and those in pre-service training ■ Educational materials for women on what comprises onset of the latent and active phases, and when to go to a facility for assessment ■ Revised paper partograph indicating the starting point of the active phase
Infrastructure	■ Where all women are directly admitted to the hospital regardless of the phase of labour, sufficient beds should be provided in the maternity/antenatal ward where necessary supportive care (e.g. pain relief) can be provided to women prior to reaching cervical dilatation of 5 cm
Supervision and monitoring	■ Ongoing supervision and monitoring with regular auditing and review of outcomes related to application of the new definition of the active phase

Resources

No review evidence on resource requirements in direct relation to the definitions of the phases of the first stage of labour was found.

Additional considerations

Application of the 5-cm cervical dilatation threshold as the benchmark for the onset of the active phase of the first stage of labour might be cost-effective because it has the potential to reduce the use of interventions to accelerate labour and birth (caesarean section, oxytocin augmentation) and linked interventions (e.g. cardiotocography, pain relief, antibiotics). This is supported by evidence from observational studies which shows that labour interventions are reduced in women admitted in the active phase of labour (based on a threshold of 4 cm or less) compared with the latent phase, without increasing maternal or perinatal morbidity. While the new 5-cm threshold for the onset of active phase may further reduce the likelihood of interventions, it might also increase health care costs as a result of reorganization of labour ward infrastructure, revision of labour ward admission policies, and additional training for health workers so that they can apply the new definitions in practice.

Equity

No evidence on the impact on equity was found.

Additional considerations

Unnecessary oxytocin augmentation of labour and caesarean section are highly inequitable interventions that could be reduced if the standard care for the active first stage is only applied after the woman has reached a cervical dilatation threshold of 5 cm.

Acceptability

No direct evidence on acceptability of any specific definition of the first stage of labour to stakeholders – women and health care providers – was found.

Additional considerations

Evidence from other studies suggests that women are less likely than health care providers to recognize defined, time-bound phases of labour *(54)*, and their ability to cope is more likely to be dependent on a variety of inter-related factors, including the level of pain experienced, the nature of the environment and their perceived level of support *(55)*. Given that 4 cm of cervical dilatation has been widely adopted and used in practice for decades as the limit of the latent first stage of labour, acceptance of a new cut-off by clinicians is not expected to be rapid.

Feasibility

No direct evidence on the feasibility of adopting or implementing these definitions in labour ward protocols was found.

Additional considerations

While the implementation of a new threshold for recognizing the onset of the active first stage in labour protocols might be relatively straightforward in settings where all women in labour are admitted at any phase of the first stage of labour, it is likely to face challenges in settings where the policy is to admit women only when they are in active first stage, due to the need for reorganization of care.

Table 3.8 Summary of judgements: Adopting new definitions compared with existing definitions for the first stage of labour

Desirable effects	– Don't know	✓ Varies		– Trivial	– Small	– Moderate	– Large
Undesirable effects	✓ Don't know	– Varies		– Large	– Moderate	Small	– Trivial
Certainty of the evidence	– No included studies			– Very low	✓ Low	– Moderate	– High
Values				– Important uncertainty or variability	– Possibly important uncertainty or variability	✓ Probably no important uncertainty or variability	– No important uncertainty or variability
Balance of effects	– Don't know	– Varies	– Favours existing limits	– Probably favours existing definitions	– Favours neither new or existing definitions	✓ Probably favours new definitions	– Favours increased limits
Resources required	✓ Don't know	– Varies	– Large costs	– Moderate costs	– Negligible costs or savings	– Moderate savings	– Large savings
Certainty of evidence of required resources	✓ No included studies			– Very low	– Low	– Moderate	– High
Cost-effectiveness	✓ Don't know	– Varies	– Favours existing limits	– Probably favours existing definitions	– Favours neither new or existing definitions	– Probably favours new definitions	– Favours increased limits
Equity	– Don't know	– Varies	– Reduced	– Probably reduced	– Probably no impact	✓ Probably increased	– Increased
Acceptability	– Don't know	– Varies		– No	– Probably No	✓ Probably Yes	– Yes
Feasibility	– Don't know	✓ Varies		– No	– Probably No	– Probably Yes	- Yes

3.2.2 Duration of the first stage of labour

RECOMMENDATION 6

Women should be informed that a standard duration of the latent first stage has not been established and can vary widely from one woman to another. However, the duration of active first stage (from 5 cm until full cervical dilatation) usually does not extend beyond 12 hours in first labours, and usually does not extend beyond 10 hours in subsequent labours. *(Recommended)*

Remarks

- The GDG acknowledges the very low certainty of evidence on the duration of the latent phase of the first stage of labour, resulting in part from the difficulty in ascertaining the actual onset of labour, and chose not to establish a standardized duration for the latent first stage for the purpose of decision-making during labour.
- The expected duration of the active phase of the first stage of labour depends on the reference threshold used for its onset. The established boundaries for the active first stage were rounded 95th percentile values from evidence on the duration of the progress of cervical dilatation from 5 cm to 10 cm.
- The median duration of active first stage is 4 hours in first labours and 3 hours in second and subsequent labours, when the reference starting point is 5 cm cervical dilatation.
- The GDG emphasized that the decision to intervene when the first stage of labour appears to be prolonged must not be taken on the basis of duration alone.
- Health care professionals should support pregnant women with spontaneous labour onset to experience labour and childbirth according to each individual woman's natural reproductive process without interventions to shorten the duration of labour, provided the condition of the mother and baby is reassuring, there is progressive cervical dilatation, and the expected duration of labour is within the recommended limits.
- Health care professionals should advise healthy pregnant women that the duration of labour is highly variable and depends on their individual physiological process and pregnancy characteristics.

Summary of evidence and considerations

Duration of the first stage of labour

Evidence was derived from a systematic review of 37 studies evaluating the duration of spontaneous labour in women without risk factors for complications *(52)*. The studies were published between 1960 and 2016 in 17 low-, middle- and high-income countries (China, Colombia, Croatia, Egypt, Finland, Germany, Israel, Japan, Korea, Myanmar, Nigeria, Norway, Taiwan [China], Uganda, the United Kingdom, the USA and Zambia), and involving over 200 000 women of different ethnic origins and socioeconomic status. Most (34) of the included studies were conducted in tertiary hospitals. Labour interventions such as amniotomy, oxytocin augmentation, epidural analgesia and instrumental vaginal birth for both nulliparous and parous women varied widely across studies. Studies were also considered for inclusion if the rate of first stage caesarean section was less than 1%. Studies were not pooled due to heterogeneity in population characteristics, labour interventions and definitions of the onset of the different phases of labour.

Findings

Nulliparous latent phase: As shown in Table 3.9, very low-certainty evidence from two studies reported a median duration of the latent phase of the first stage of labour of 6.0–7.5 hours without any indication of the percentile distributions. One of these studies reported the latent phase as the period from the onset of regular contractions until the slope of labour record was more than 1.2 cm/hour while the other defined the latent phase as the "duration of labour before presentation" (at hospital).

Very low-certainty evidence from two studies presenting duration of the latent phase as mean and standard deviations reported mean durations of 5.1 and 7.1 hours, with estimated statistical ("maximum") limits of 10.3 and 11.5 hours, respectively. One of these two studies reported the latent phase as from admission to hospital until 4 cm

Table 3.9 Duration of the latent first stage in nulliparous and parous women

NULLIPAROUS WOMEN						
Study	N	Median cervical dilatation on admission (cm)	Definition of reference points	Median duration (h)	5th percentile (h)	95th percentile (h)
Peisner 1985 *(56)*	1544	0.5	Reported onset of contractions until slope of labour record > 1.2 cm/h	7.5	NR	NR
Ijaiya 2009 *(57)*	75	5.0	Duration of labour before presentation	6.0	NR	NR
		Median cervical dilatation on admission (cm)	Definition of reference points	Mean duration (h)	SD (h)	+2SD (h)
Juntunen 1994 *(58)*	42	NR	Not defined	5.1	3.2	11.5
Velasco 1985 *(59)*	74	NR	From admission until 4 cm	7.1	1.6	10.3
PAROUS WOMEN						
Study	N	Median cervical dilatation on admission (cm)	Definition of reference points	Median duration (h)	5th percentile (h)	95th percentile (h)
Peisner 1985 (P = 1) *(56)*	720	4.5	Reported onset of contractions until slope of labour record > 1.5 cm/h	5.5	NR	NR
Peisner 1985 (P ≥ 1) *(56)*	581	4.5	Reported onset of contractions until slope of labour record > 1.5 cm/h	4.5	NR	NR
Ijaiya 2009 *(57)*	163	6.0	Duration of labour before presentation	5.0	NR	NR
Study	N	Median cervical dilatation on admission (cm)	Definition of reference points	Mean duration (h)	SD (h)	+2SD (h)
Juntunen 1994 (P = 2/3) *(58)*	42	NR	Not defined	3.2	2.3	7.8[a]
Juntunen 1994 (GM) *(58)*	42	NR	Not defined	2.2	1.6	5.4[a]
Velasco 1985 *(59)*	37	NR	From admission until 4 cm	5.7	1.5	8.7[a]

GM: grand multiparity; h: hour; NR: not reported; P: parity; SD: standard deviation; [a] Value estimated by systematic review authors.
Source: Abalos et al., 2018 *(52)*.

cervical dilatation while the other did not provide any reference points.

Parous latent phase: Very low-certainty evidence from two studies presenting data reported median durations of the latent phase of 4.5 and 5.5 hours (Table 3.9). However, no percentile distributions were reported. One of these studies reported the latent phase as the period from the onset of regular contractions until the slope of labour record was more than 1.2 cm/hour while the other defined the latent phase as the "duration of labour before presentation" (at hospital).

Very low-certainty evidence from two studies suggests that the mean duration of the latent phase ranges from 2.2 to 5.7 hours and statistical ("maximum") limits were estimated as 5.4–8.7 hours. One of these studies defined the latent phase as the period from hospital admission until 4 cm dilatation.

Nulliparous active phase: Table 3.10a shows the median duration of labour according to the reference points used for the onset and completion of the active phase of the first stage of labour. Moderate-certainty evidence from two studies suggests that the median duration of the active phase when the starting reference point was 4 cm was 3.7–5.9

Table 3.10a Duration of the active first stage: nulliparous women

Study	N	Labour interventions			Reference points (cm)	Median duration (h)	5th percentile (h)	95th percentile (h)
		Amniotomy (%)	Oxytocin (%)	Epidural (%)				
Zhang 2010 *(17)*	8 690	NR	20	8	4–10	3.7	NR	16.7
Zhang 2010 *(16)*	5 550	NR	47[a]	8[a]	4 (or 4.5)–10	5.3	NR	16.4
Oladapo 2018 *(62)*	715	NR	40[a]	0.0	4–10	5.9	2.4	14.5
Zhang 2010 *(16)*	2 764	NR	47[a]	84[a]	5 (or 5.5)–10	3.8	NR	12.7
Oladapo 2018 *(62)*	316	NR	40[a]	0.0	5–10	4.3	1.6	11.3
Oladapo 2018 *(62)*	322	NR	40[a]	0.0	6–10	2.9	0.9	9.3
						Mean duration (h)	SD (h)	+2SD (h)
Albers 1996 *(63)*	347	NR	0.0	NR	4–10	7.7	5.9	19.4
Albers 1999 *(64)*	806	0.0	0.0	NR	4–10	7.7	4.9	17.5
Jones 2003 *(65)*	120	NR	0.0	0.0	4–10	6.2	3.6	13.4
Juntunen 1994 *(58)*	42	57.1	0.0	42.9	4–10	3.1	1.5	6.1[b]
Velasco 1985 *(59)*	74	0.0	0.0	0.0	4–10	3.9	1.6	7.1[b]
Schiff 1998 *(66)*	69	NR	NR	NR	4–10	4.7	2.6	9.9[b]
Kilpatrick 1989 *(67)*	2 032	NR	0.0	0.0	NR	8.1	4.3	16.7[b]
Lee 2007 *(68)*	66	NR	NR	0.0	NR	3.6	1.9	7.4[b]
Schorn 1993 *(69)*	18	NR	18.0	NR	NR	15.4	6.6	28.6

NR: not reported; SD: standard deviation; [a] Value reported for entire study population; [b] Value estimated by systematic review authors.
Source: Abalos et al., 2018 *(52)*.

hours (with 95th percentile thresholds of 14.5–16.7 hours). When the starting reference point was 5 cm, the median duration was 3.8–4.3 hours (with 95th percentile thresholds of 11.3–12.7 hours). The only study reporting 6 cm as the starting reference point reported the median duration of the active phase as 2.9 hours and the 95th percentile duration as 9.5 hours.

For studies reporting means, moderate-certainty evidence suggests that the mean duration of labour progressing from 4 to 10 cm dilatation was 3.1–8.1 hours, with statistical limits of 7.1–19.4 hours. One study reported a mean duration of 4.7 hours and statistical limits of 9.9 hours for the active phase with a starting reference point of 3 cm. However, no study reporting a mean duration of the active phase with a starting reference point of 5 or 6 cm was included in the review.

Parous active phase: According to Table 3.10b, moderate-certainty evidence from two studies suggests that the median duration of the active phase for women with parity of 1 and parity of more than 1, with onset defined as 4 cm, was 2.2–4.7 hours, with a range of 13.0–14.2 hours for 95th percentile thresholds. One study presenting data separately for women with parity of 1 and parity of more than 1, with reference points for active phase starting from 5 cm, reported median durations of

Table 3.10b Duration of the active first stage: parous women

Study	N	Labour interventions			Reference points (cm)	Median duration (h)	5th percentile (h)	95th percentile (h)
		Amniotomy (%)	Oxytocin (%)	Epidural (%)				
Zhang 2010 (P = 1) *(17)*	6 373	NR	20.0	11	4–10	2.4	NR	13.8
Zhang 2010 (P = 2+) *(17)*	11 765	NR	12.0	8	4–10	2.2	NR	14.2
Oladapo 2018 (P = 1) *(62)*	491	NR	29.8[a]	0.1	4–10	4.6	1.7	13.0
Oladapo 2018 (P = 2+) *(62)*	626	NR	26.7[a]	0.0	4–10	4.7	1.7	13.0
Oladapo 2018 (P = 1) *(62)*	292	NR	29.8[a]	0.1	5–10	3.4	1.2	10.1
Oladapo 2018 (P = 2+) *(62)*	385	NR	26.7[a]	0.0	5–10	3.1	0.9	10.8
Oladapo 2018 (P = 1) *(62)*	320	NR	29.8[a]	0.1	6–10	2.2	0.6	7.5
Oladapo 2018 (P = 2+) *(62)*	414	NR	26.7[a]	0.0	6–10	2.4	0.8	7.4
						Mean duration (h)	SD (h)	+2SD (h)
Albers 1996 *(63)*	602	NR	NR	NR	4–10	5.7	4.0	13.7
Albers 1999 *(64)*	1 705	0.0	0.0	0.0	4–10	5.6	4.1	13.8
Jones 2003 *(65)*	120	NR	0.0	0.0	4–10	4.4	3.4	11.6
Juntunen 1994 (P = 2/3) *(58)*	42	69.0	0.0	2.4	4–10	2.7	1.4	5.5[b]
Juntunen 1994 (GM) *(58)*	42	71.4	0.0	9.5	4–10	2.8	1.5	5.8[b]
Velasco 1985 *(59)*	37	0.0	0.0	0.0	4–10	2.1	1.4	4.9[b]
Schiff 1998 *(66)*	94	NR	NR	NR	NR	3.3	1.9	7.1[b]
Kilpatrick 1989 *(67)*	3 767	NR	NR	0.0	NR	5.7	3.4	12.5
Schorn 1993 *(69)*	30	NR	18.0	NR	Not defined	13.2	5.3	23.9

GM: grand multiparity; NR: not reported; P: parity; SD: standard deviation; [a] Value reported for entire study population; [b] Value estimated by systematic review authors.
Source: Abalos et al., 2018 *(52)*.

3.4 and 3.1 hours, and 95th percentile thresholds of 10.1 and 10.8 hours, respectively. The same study reported median durations of 2.2 and 2.4 hours and 95th percentile thresholds of 7.5 and 7.4 hours, respectively, when the starting reference point for the active phase was 6 cm.

For studies presenting mean duration of labour, moderate-certainty evidence suggests that the mean duration of the active phase when the starting reference point was 4 cm was 2.1–5.7 hours, with statistical limits from 4.9–13.8 hours. Two other studies in this category did not report the starting points for the active first stage.

Sensitivity analysis excluding studies with any intervention (augmentation, instrumental vaginal birth and second-stage caesarean section) shows a similar range of mean durations for the active phase starting at 4 cm. This sensitivity analysis did not include any studies reporting median labour duration.

Additional considerations

The definitions of the onset of the latent phase were very uncertain in the available studies reporting median and mean durations of the latent phase of the first stage of labour. Despite the very low certainty of the evidence regarding the duration

of the latent phase in nulliparous and parous women, the reported data compares favourably with the observations in Friedman's pioneer work on "normal" duration of labour *(60, 61)*, which did not meet the criteria for inclusion in the review. Friedman reported the duration of the latent phase in nulliparous women as a mean of 8.6 hours, median of 7.5 hours and a statistical maximum of 20.6 hours; and in parous women as a mean of 5.3 hours, median of 4.5 hours and a statistical maximum of 13.6 hours.

While the data available for the duration of the active first stage of labour with reference points starting from 4 and 5 cm in nulliparous and parous women are also consistent with the mean and median durations reported by Friedman, the statistical maximums reported by Friedman are considerably shorter than the upper limits in the reports presented in the systematic review *(53, 60, 61)*. This substantial difference in the upper limits between Friedman's earlier studies and those provided in the review cannot be accounted for by the fact that the "deceleration phase" was not included in the duration of active phase reported by Friedman.

Values

Findings from a review of qualitative studies looking at what matters to women during intrapartum care *(23)* indicate that most women want a normal birth with good outcomes for mother and baby, but acknowledge that medical intervention may sometimes be necessary.

Additional considerations

Women generally place a high value on the total duration of labour, although the relative importance of how long or how short labour is may be context dependent. Evidence from other studies suggests that women are less likely than health care providers to recognize defined, time-bound phases of labour *(54)*, and their ability to cope is more likely to be dependent on a variety of inter-related factors, including the level of pain experienced, the nature of the environment and their perceived level of support *(55)*.

Resources

No review evidence on resource requirements relating to duration of labour was found.

Additional considerations

Using limits of labour duration informed by the respective 95th percentile thresholds as the benchmark for identifying unduly prolonged first stage of labour might be cost-effective as it has the potential to reduce the use of interventions to accelerate labour and expedite birth (caesarean section, oxytocin augmentation). However, it might increase costs associated with supportive care such as pain relief and labour companionship.

In certain settings where physicians attend to all women in labour, the use of limits of labour duration based on 95th percentile thresholds for managing labour might result in increased costs if women with longer labours are attended by professionals with higher salaries.

It is likely that facilitating the use of upper limits would lead to increased bed costs for women who have vaginal births due to longer labour ward stays. The estimated cost of a facility bed per day varies widely across regions, as shown by the WHO-CHOICE example estimates (2007–2008) *(70)*. Increases in bed costs associated with longer labours might have less impact on health care costs in LMICs than in HICs, where bed costs form a larger proportion of costs for childbirth services. On the other hand, if the use of oxytocin augmentation

Table 3.11 Main resource requirements for adopting new upper limits of duration of labour

Resource	Description
Training	■ Practice-based training for health care providers
Supplies	■ Revised training manuals and clinical protocols for health care providers and those in pre-service training ■ Educational materials for women on what comprises "normal" labour in terms of its duration and when birth should be expected ■ Revised paper partograph
Infrastructure	■ Sufficient beds in the labour ward to support women who labour for longer than the average for their population
Supervision and monitoring	■ Ongoing supervision and monitoring with regular audit and review of outcomes related to extending the upper limits to diagnose prolonged labour, when fetal and maternal conditions are reassuring

is reduced and fewer caesarean sections are performed as a result of extending the safe upper limits of the duration of labour, the overall bed costs and health care resource use could be reduced due to shorter postnatal stays.

Equity

No evidence on the impact on equity was found.

Additional considerations

One of the common indications for primary caesarean section is prolonged labour based on the expectation that the active phase of the first stage of labour (which traditionally starts from 4 cm) should not last longer than 12 hours *(71)*. However, caesarean section is a highly inequitable intervention as it is unlikely to be promptly received by disadvantaged women in resource-poor settings. Application of safe upper limits for the management of all women in labour has the potential to reduce inequity that is associated with over-medicalization of childbirth.

Acceptability

Findings from a review of qualitative studies looking at what matters to women during intrapartum care *(23)* indicate that most pregnant women would prefer a shorter labour (low confidence in the evidence). However, when asked after childbirth, women are more likely to report a positive labour experience if they are able to "go with the flow" where the optimal length of labour is tailored to the individual regardless of standardized time limits (moderate confidence in the evidence).

Additional considerations

There is evidence to suggest that women are more likely to report both very short and very long labour in negative terms *(26, 72, 73)*.

Feasibility

In a review of qualitative evidence looking at providers' views and experiences of delivering intrapartum care *(26)*, the capacity to accommodate longer labours may be constrained by staff shortages and organizational time pressures (high confidence in the evidence). Local protocols and informal rules may also limit the ability of health care staff to provide personalized care *(26)*.

Additional considerations

Allowing for a longer duration of labour might not necessarily lead to longer stays at health care facilities or an increased staff workload, particularly if unnecessary obstetric interventions (which lead to longer hospital stays) are reduced.

Table 3.12 Summary of judgements: Adopting new upper limits compared with existing limits for duration of labour

Desirable effects	– Don't know	– Varies		– Trivial	– Small	✓ Moderate	– Large
Undesirable effects	– Don't know	– Varies		– Large	– Moderate	✓ Small	– Trivial
Certainty of the evidence	– No included studies			– Very low	✓ Low	– Moderate	– High
Values				– Important uncertainty or variability	– Possibly important uncertainty or variability	✓ Probably no important uncertainty or variability	– No important uncertainty or variability
Balance of effects	– Don't know	– Varies	– Favours existing limits	– Probably favours existing limits	– Favours neither new or existing limits	✓ Probably favours adopting new upper limits	– Favours increased limits
Resources required	✓ Don't know	– Varies	– Large costs	– Moderate costs	– Negligible costs or savings	– Moderate savings	– Large savings
Certainty of evidence of required resources	– No included studies			✓ Very low	– Low	– Moderate	– High

Cost-effectiveness	✓ Don't know	– Varies	– Favours existing limits	– Probably favours existing limits	– Favours neither new or existing limits	– Probably favours adopting new upper limits	– Favours adopting new upper limits
Equity	– Don't know	– Varies	– Reduced	– Probably reduced	– Probably no impact	✓ Probably increased	– Increased
Acceptability	– Don't know	– Varies		– No	– Probably No	✓ Probably Yes	– Yes
Feasibility	– Don't know	✓ Varies		– No	– Probably No	– Probably Yes	– Yes

3.2.3 Progress of the first stage of labour

RECOMMENDATION 7

For pregnant women with spontaneous labour onset, the cervical dilatation rate threshold of 1 cm/hour during active first stage (as depicted by the partograph alert line) is inaccurate to identify women at risk of adverse birth outcomes and is therefore not recommended for this purpose.
(Not recommended)

Remarks

- There is insufficient evidence to support the use of the alert line as a classifier to detect women at risk of adverse birth outcomes.
- The GDG acknowledged that in hospital settings the use of the alert line and attempts to maintain cervical dilatation progression of 1 cm/hour lead to unnecessary interventions due to the perception that labour progress is pathologically slow.
- While the GDG agreed to recommend not using the 1-cm/hour threshold and the alert line for assessing satisfactory cervical dilatation progress, the group identified the development and selection of an appropriate tool for monitoring labour progression (especially cervical dilatation patterns) as a research priority.
- Women with suspected slow labour progress should be carefully evaluated to exclude developing complications (e.g. cephalo-pelvic disproportion) and to determine whether their emotional, psychological and physical needs in labour are being met.
- The preset lines on the cervicograph are only one element of the existing WHO partograph. Health care professionals should continue to plot cervical dilatation versus time on the cervicograph as well as other partograph parameters (including fetal heart rate, caput succedaneum, moulding, status of amniotic fluid, fetal descent, maternal temperature, blood pressure and urinary output) to monitor the well-being of the woman and her baby and identify risks for adverse birth outcomes. In health care facilities where interventions such as augmentation and caesarean section cannot be performed and where referral-level facilities are difficult to reach, the alert line could still be used for triaging women who may require additional care. In this instance, plotting should commence from a cervical dilatation of 5 cm, which signifies the onset of active first stage of labour for most women.
- This recommendation supersedes the recommendation of active phase partograph with a four-hour action line in the *WHO recommendations for augmentation of labour (46)*.

Summary of evidence and considerations

a. Diagnostic test accuracy of the 1-cm/hour cervical dilatation rate threshold (Table 3.13)

Evidence on the diagnostic test accuracy (DTA) of using the 1-cm/hour threshold to diagnose risk of adverse birth outcomes (ABOs) was derived from a systematic review that included eleven observational studies, involving over 17,000 women, which were conducted in Brazil, Ecuador, India, Indonesia, Iran, Malaysia, Mali, Nigeria, Senegal, South Africa, Thailand and Uganda *(74)*. All the studies were conducted in secondary or tertiary care facilities.

The reference standards for ABOs were variously defined in these studies: Apgar score less than 7 at 1 minute, Apgar score less than 7 at 5 minutes, birth asphyxia, and composite adverse outcomes including fresh stillbirths and neonatal resuscitation, fresh stillbirths and Apgar score of 7 or less at 1 minute, fresh stillbirths and Apgar score less than 7 at 5 minutes, fresh stillbirths and birth asphyxia, and severe ABO (the latter defined as occurrence of any of the following: stillbirth, early neonatal death, neonatal use of anticonvulsant, neonatal cardiopulmonary resuscitation, Apgar score less than 6 at 5 minutes, maternal death or organ dysfunction associated with labour dystocia, or uterine rupture). Women with risk factors were not specifically excluded from any of these studies. The inconsistencies between the studies with regard to the outcome definitions, baseline prevalence and findings precluded meta-analysis of the results, and resulted in the evidence being assessed as low certainty.

Diagnostic test accuracy (DTA) findings: Table 3.13 presents the DTA results of individual studies. The findings suggest that the sensitivity of the 1-cm/hour threshold (alert line) ranges from 28.8% to 100.0% and the specificity ranges from 22.8% to 93.1%, depending on the reference standard applied. Findings from the largest study (n = 8489 women) with an ABO rate of 2.3%, and a sensitivity and specificity of 56.7% (95% CI 49.7–63.5%) and 51.1% (95% CI 50.1–52.2%), respectively, have been used to illustrate the effects of the test results at different ABO prevalence levels in Table 3.14.

Table 3.14 shows that using the 1-cm/hour dilatation rate threshold may correctly identify 6 out of 10 women with ABOs (true positive) when the population prevalence of ABOs is 1% (10 per 1000 births), or 28 out of 50 women with ABOs when the population prevalence of ABOs is 5% (50 per 1000 women) (low-certainty evidence). The table also shows that this test strategy may miss 4 out of 10 women with ABOs (false negative) when the population prevalence of ABOs is 1%, or 22 out of 50 women when the population prevalence of ABOs is 5% (low-certainty evidence).

In addition, the test strategy may incorrectly identify 484 out of 990 women without ABOs as being at risk when they are not (false positive) when the population prevalence of ABOs is 1%, or may incorrectly identify 465 out of 950 women without ABOs as being at risk when they are not when the population prevalence of ABOs is 5% (low-certainty evidence). As a consequence of such misclassification, a large proportion of women without a true risk of ABOs could be offered inappropriate, unnecessary and potentially harmful labour interventions.

Certainty of the evidence on DTA: The certainty of the evidence on DTA is low overall, as the evidence is derived from observational studies and DTA findings were inconsistent across the included studies, in part due to heterogeneity in the definitions of ABOs employed by the different studies.

Certainty of the evidence on the effects of the test strategy: There is no review evidence of direct benefits or risks associated with using the test strategy. The test strategy by itself does not bear a risk of direct harm to the woman in labour, as it requires comparing the cervical dilatation plots of the woman against a pre-set alert line on the partograph. However, the panel assumed that the need to make this comparison could necessitate additional pelvic examinations, which are inconvenient to the woman and carry additional risk of peripartum infection.

Certainty of evidence of management's effects: There is no direct review evidence on the effects of management associated with using the 1-cm/hour line to identify women at risk of ABOs during labour.

Indirect evidence was derived from a Cochrane review on the use of amniotomy and oxytocin augmentation compared with routine care for the treatment of labour delay (3 trials, 280 women) *(75)*. This review found very low-certainty evidence which showed that while amniotomy and oxytocin might reduce caesarean section, there is no evidence that they reduce ABOs.

Certainty of the evidence on test results and subsequent management: There is no direct review evidence on the link between the test results and the subsequent management decisions, i.e. whether women with a given test result (crossing alert line or not) would be managed according to that result and the certainty about this link.

Table 3.13 Diagnostic test accuracy of using the 1-cm/hour threshold (alert line) to diagnose risk of adverse birth outcomes (ABOs) for 11 included studies

Country reference (year of publication) [ABO as defined in the study]	Alert line status	ABO		Percentage crossing alert line	Prevalence of ABO	Sensitivity (95% CI)	Specificity (95% CI)	Positive likelihood ratio (95% CI)	Negative likelihood ratio (95% CI)	Diagnostic Odds Ratio (95% CI)	J statistic (95% CI)
		Present	Absent								
Senegal (1992) *(78)* [Fresh stillbirths and neonatal resuscitation at birth]	Crossed	19	62	8.4%	6.8%	28.8% (19.3–40.6)	93.1% (91.3–94.6)	4.18 (2.67–6.56)	0.76 (0.66–0.89)	5.47 (3.03–9.89)	21.9% (10.9–33.0)
	Not crossed	47	839								
Indonesia, Malaysia and Thailand (1994) *(79)* [Fresh stillbirths and Apgar score ≤ 7 at 1 minute]	Crossed	65	585	16.6%	3.8%	44.2% (36.4–52.3)	84.4% (83.2–85.6)	2.84 (2.34–3.46)	0.66 (0.57–0.76)	4.30 (3.07–6.03)	28.7% (20.5–36.8)
	Not crossed	82	3175								
South Africa 2006 *(80)* [Fresh stillbirths and Apgar score < 7 at 5 minutes]	Crossed	30	433	75.9%	8.0%	61.2% (47.3–73.6)	22.8% (19.5–26.5)	0.79 (63.2–99.6)	1.70 (1.16–2.49)	0.47 (0.25–0.86)	-16.0% (-30.0 to -1.9)
	Not crossed	19	128								
Ecuador 2008 *(81)* [Apgar score < 7 at 5 minutes]	Crossed	3	289	58.4%	0.6%	100.0% (43.9–100.0)	41.9% (37.6–46.2)	1.72 (1.60–1.85)	NA	NA	41.9% (37.6–46.2)
	Not crossed	0	208								
Nigeria (2008) *(82)* [Fresh stillbirth and birth asphyxia]	Crossed	27	186	46.0%	11.2%	51.9% (38.7–64.9)	54.7% (49.9–59.5)	1.15 (0.87–1.52)	0.88 (0.65–1.18)	1.31 (0.73–2.33)	6.7% (-7.7–21.1)
	Not crossed	25	225								
Brazil (2009) *(83)* [Apgar score < 7 at 5 minutes]	Crossed	441	107	36.0%	90.4%	32.0% (29.64–34.56)	26.7% (20.2–34.42)	0.44 (0.39–0.50)	2.54 (1.94–3.34)	0.17 (0.12–0.25)	-41.2% (-48.8 to -33.6)
	Not crossed	935	39								
Mali *(84)* [Apgar score < 7 at 1 minute]	Crossed	2	98	42.9%	1.3%	66.7% (20.8–93.9)	57.4% (50.9–63.6)	1.56 (0.69–3.53)	0.58 (0.12–2.89)	2.69 (0.24–30.13)	24.1% (-29.7–77.8)
	Not crossed	1	132								

Country reference (year of publication) [ABO as defined in the study]	Alert line status	ABO		Percentage crossing alert line	Prevalence of ABO	Sensitivity (95% CI)	Specificity (95% CI)	Positive likelihood ratio (95% CI)	Negative likelihood ratio (95% CI)	Diagnostic Odds Ratio (95% CI)	J statistic (95% CI)
		Present	Absent								
India (2014) *(85)* [Apgar score < 7 at 5 minutes]	Crossed	43	53	19.2%	17.2%	50.0% (39.7–60.3)	87.2% (83.6–90.0)	3.91 (2.81–5.42)	0.57 (0.46–0.71)	6.81 (4.08–11.36)	37.2% (26.2–48.2%)
	Not crossed	43	361								
Iran (2006) *(86)* (Apgar score < 7 at 1 minute]	Crossed	10	30	29.4%	9.6%	76.9% (49.7–91.8)	75.6% (67.3–82.4)	3.15 (2.05–4.85)	0.31 (0.11–0.83)	10.33 (2.67–40.0)	52.5% (28.4–76.7)
	Not crossed	3	93								
India (2016) *(87)* [Birth asphyxia]	Crossed	7	106	56.5%	4.5%	77.8% (45.3–93.7)	44.5% (37.6-51.6)	1.4 (0.97–2.03)	0.5 (0.15–1.71)	2.8 (0.57–13.86)	22.3% (-5.8%–50.3%)
	Not crossed	2	85								
Nigeria and Uganda (2018) *(88)* [Fresh stillbirths and Apgar score < 7 at 5 minutes or neonatal resuscitation during hospital stay]	Crossed	152	4011	49.0%	3.0%	59.8% (53.7–65.7)	51.3% (50.2–52.4)	1.23 (1.11–1.36)	0.78 (0.67–0.91)	1.57 (1.22–2.02)	11.1% (5.0–17.3)
	Not crossed	102	4224								
Nigeria and Uganda (2018) *(88)* [Severe ABO][a]	Crossed	110	4053	49.0%	2.3%	56.7% (49.7–63.5)	51.1% (50.1–52.2)	1.16 (1.02–1.32)	0.85 (0.72–100)	1.37 (1.03–1.83)	7.8% (0.80–14.9%)
	Not crossed	84	4242								

[a] Severe ABO was defined as the occurrence of any of the following: stillbirth, early neonatal death, neonatal use of anticonvulsant, neonatal cardiopulmonary resuscitation, Apgar score less than 6 at 5 minutes, maternal death or organ dysfunction associated with labour dystocia, or uterine rupture.

Source: Souza et al., 2018 *(74)*.

Table 3.14 Illustrative test results at different prevalence levels of adverse birth outcomes (ABOs) based on diagnostic test accuracy of the largest study

Sensitivity: 56.7% (95% CI 49.7–63.5%)
Specificity: 51.1% (95% CI 50.1–52.2%)

Test result (crossing the alert line)	No. of results per 1000 women tested according to prevalence of ABOs (95% CI)		
	ABO prevalence 1%	ABO prevalence 2.5%	ABO prevalence 5%
True positives (women correctly identified as having an ABO)	6 out of 10 *(5–6)*	14 out of 25 *(12–16)*	28 out of 50 *(25–32)*
False negatives (women incorrectly classified as not having an ABO)	4 out of 10 *(4–5)*	11 out of 25 *(9–13)*	22 out of 50 *(18–25)*
True negatives (women correctly identified as not having an ABO)	506 out of 990 (496–517)	498 out of 975 (488–509)	485 out of 950 (476–496)
False positives (women incorrectly classified as having an ABO)	484 out of 990 (473–494)	477 out of 975 (466–487)	465 out of 950 (454–474)

Source: Souza et al., 2018 *(88)*.

With the exception of trial settings, the implementation of a specific management protocol in a timely fashion according to whether or not a woman crosses the 1-cm/hour threshold during labour is suboptimal. Evidence from cross-sectional and qualitative studies suggests that the partograph is incorrectly applied in many settings, and that even when it is correctly used health care providers face challenges in initiating necessary actions due to lack of resources *(76, 77)*.

Values

Findings from a review of qualitative studies looking at what matters to women during intrapartum care *(23)* indicate that most women want a normal childbirth with good outcomes for mother and baby, and do not appreciate unnecessary medical interventions, including additional vaginal examinations that the test strategy may warrant (high confidence in the evidence). Most women, especially those giving birth for the first time, are apprehensive about labour and childbirth (high confidence in the evidence) and about particular medical interventions, such as caesarean section (high confidence in the evidence).

Resources

No direct review evidence on resource use or cost-effectiveness of using the 1-cm/hour threshold was found.

Additional considerations

The use of the 1-cm/hour threshold could have large cost implications (and might not be cost-effective) due to the high proportion of women falsely identified as being at risk of ABO (high false-positive rate), who might then be subjected to intensified monitoring, interventions to accelerate labour and birth (particularly augmentation and caesarean section), and consequent iatrogenic complications.

A review of childbirth costs shows that in HIC settings caesarean section costs ranged from €3909 to €7354, compared to vaginal birth costs, which ranged from €1274 to €5343 *(89)*. Data from a study in one low-income country, which was included in the review, reported that caesarean section hospital costs (US$ 162) were four times higher than vaginal childbirth costs (US$ 40), and user costs were thrice as high for women undergoing caesarean section (US$ 204) compared with those undergoing vaginal birth (US$ 79) *(90)*.

Increased referral workload from lower-level to referral-level health care facilities, as a result of high false-positive rates, would require substantial health care resources both at the source of the referrals and the referral-level facilities.

Equity

No review evidence on the impact of the test strategy on equity was found.

Additional considerations

The most common indication for oxytocin augmentation of labour and primary caesarean section is "failure of labour to progress" *(71)*. However, unnecessary augmentation of labour and caesarean section are highly inequitable

interventions as they are unlikely to be promptly received by disadvantaged women.

Acceptability

In a review of qualitative studies exploring health care professionals' views of intrapartum care, with a separate sub-analysis of papers exploring staff attitudes towards the partograph *(26)*, these studies, which were conducted mainly in LMICs, showed that health care professionals generally agreed that it was a useful way of monitoring labour progression (especially as an indicator for referral) but acceptance of benefit did not necessarily translate into practical use.

Additional considerations

The above findings are consistent with those of a review on barriers and incentives to partograph use among staff in LMICs *(77)*, and also consistent with a more recent realist review of partograph use in a variety of settings *(76)*.

Feasibility

In a review of qualitative evidence looking at health care professionals' views and experiences of delivering intrapartum care *(26)*, findings from the sub-analysis of staff attitudes towards partograph use highlight inadequate training, confusion about who records the partograph and resource constraints (initial and ongoing costs) as potential feasibility concerns in low-resource settings. Staff felt that they were poorly trained and thus lacked confidence in using the partograph. They found it difficult to use and workload pressures often led to retrospective completion and/or inconsistent recording, especially when women arrived already in advanced labour. In some instances, staff felt compelled to complete the partograph to alleviate potential fears of litigation.

Additional considerations

In a realist review of partograph use, findings highlight poor availability, inadequate staffing levels, lack of clear policy on use, limited knowledge and inadequate training as potential barriers to partograph use, particularly in low-resource settings *(76)*.

Table 3.15 Summary of judgements: Diagnostic test accuracy of a 1-cm/hour cervical dilatation rate threshold

Test accuracy	– Don't know	– Varies		– Very inaccurate	✓ Inaccurate	– Accurate	– Very accurate
Desirable effects	– Don't know	– Varies		✓ Trivial	– Small	– Moderate	– Large
Undesirable effects	– Don't know	– Varies		✓ Large	– Moderate	– Small	– Trivial
Certainty of test accuracy	– No included studies			– Very low	✓ Low	– Moderate	– High
Certainty of evidence of effects of test strategy	✓ No included studies			– Very low	– Low	– Moderate	– High
Certainty of evidence of management's effects	– No included studies			✓ Very low	– Low	– Moderate	– High
Certainty of evidence of test result/ management	✓ No included studies			– Very low	– Low	– Moderate	– High
Overall certainty of effects	– No included studies			– Very low	✓ Low	– Moderate	– High
Values				– Important uncertainty or variability	– Possibly important uncertainty or variability	✓ Probably no important uncertainty or variability	– No important uncertainty or variability

Balance of effects	– Don't know	– Varies		✓ Does not favour the test strategy	– Probably does not favour the test strategy	– Probably favours the test strategy	– Favours the test strategy
Resources required	– Don't know	– Varies	✓ Large costs	– Moderate costs	– Negligible costs or savings	– Moderate savings	– Large savings
Certainty of evidence of required resources	✓ No included studies			– Very low	– Low	– Moderate	– High
Cost-effectiveness	– Don't know	– Varies		– Does not favour the test strategy	✓ Probably does not favour the test strategy	– Probably favours the test strategy	– Favours the test strategy
Equity	– Don't know	– Varies	– Reduced	✓ Probably reduced	– Probably no impact	– Probably increased	– Increased
Acceptability	– Don't know	✓ Varies		– No	– Probably No	– Probably Yes	– Yes
Feasibility	– Don't know	– Varies		✓ No	– Probably No	– Probably Yes	– Yes

RECOMMENDATION 8

A minimum cervical dilatation rate of 1 cm/hour throughout active first stage of labour is unrealistically fast for some women and is therefore not recommended for identification of normal labour progression. A slower than 1-cm/hour cervical dilatation rate alone should not be an indication for obstetric intervention. *(Not recommended)*

RECOMMENDATION 9

Labour may not naturally accelerate until a cervical dilatation threshold of 5 cm is reached. Therefore the use of medical interventions to accelerate labour and birth (such as oxytocin augmentation or caesarean section) before this threshold is not recommended, provided fetal and maternal conditions are reassuring. *(Not recommended)*

Remarks

- These recommendations aim to prevent iatrogenic adverse maternal and perinatal outcomes by minimizing unnecessary medical interventions, and to improve maternal birth experience.
- Evidence shows important variations in the distribution of cervical dilatation patterns among women without risk factors for complications, with many women experiencing progression slower than 1 cm/hour for the most part of their labours and yet still achieving vaginal birth with normal birth outcomes.
- Although this guidance offers health care professionals a benchmark against which to evaluate women in labour, it does not imply that labour facilitated accordingly cannot result in adverse outcomes. Other known and unknown variables can contribute to adverse outcomes.
- Before considering any medical interventions, women with suspected delay in labour progression should be carefully evaluated to exclude developing complications (e.g. cephalo-pelvic disproportion) and to determine whether their emotional, psychological and physical needs in labour are being met.

Summary of evidence and considerations

b. Cervical dilatation patterns in women with normal perinatal outcomes (EB Table 3.2.3)

Evidence was derived from a systematic review that included seven observational studies from the USA (3 studies), China, Japan, Nigeria and Uganda (1 study each), all of which were published between 2002 and 2017 *(53)*. The studies reported data for a total of 99 971 "low-risk" women with spontaneous labour onset, who completed the first stage of labour and gave birth without adverse perinatal outcomes. The studies were conducted in secondary or tertiary health care facilities. The study populations were generally of the nationality corresponding to where the studies were conducted, with USA studies including a multiracial mix of White, African American, Hispanic and Asian women. All studies provided data for nulliparous women (n = 43 148) while three studies also provided data for parous women (n = 56 823).

Baseline observations of women at labour admission showed that for nulliparous women, the median cervical dilatation was between 3 cm and 4 cm with variable degrees of effacement, and for parous women it was between 3.5 cm and 5 cm with a considerable proportion of women with a well effaced cervix. In terms of interventions received during labour, oxytocin augmentation ranged from 0% (in the Chinese study) to 50% (in a USA study) for nulliparous women; and between 12% and 45% (in two USA studies) for parous women. Epidural analgesia use was largely restricted to the USA studies for both parity groups.

Of the seven studies examining nulliparous women, four were considered to be at low risk of bias, two at moderate risk and one at high risk of bias. All three studies examining parous women were assessed to be at low risk of bias. Six studies reported data in terms of median and 5th and/or 95th percentiles, while the other study reported data in terms of mean and standard deviation.

Findings

Time to advance by 1 cm (traverse time) in nulliparous women (EB Table 3.2.3[i]): The pooled median times from six studies shows how long it took nulliparous women to advance from 2 cm of cervical dilatation to full dilatation (Table 3.16). It also shows the range of the corresponding 95th percentiles of the studies that contributed to the pooled medians. This evidence shows that the median time to progress from 2 cm to 3 cm was 5.28 hours, while from 3 cm to 4 cm it was 2.00 hours, and from 4 cm to 5 cm it was 1.46 hours, after which the time interval between one level of cervical dilatation and the next decreased rapidly until it was half an hour to progress from 9 cm to 10 cm. However, the range of 95th percentile distribution of the studies suggests that some women progressed even slower throughout the first stage of labour and yet attained full dilatation. The 95th percentiles of the times reported by individual studies suggest that it was not uncommon for some women to take as long as 7 hours to advance from 2 cm to 3 cm, 4 hours from 3 cm to 4 cm, 4 hours from 4 cm to 5 cm and at least 1 hour to progress from 9 cm to 10 cm. Except for the 2 cm to 3 cm dilatation, the certainty of evidence for these traverse times was assessed as high in all cases.

One study reporting mean (instead of median) time to advance by 1 cm showed similar patterns as those reporting medians.

Rate of change (slope) centimetre by centimetre in nulliparous women: Based on the pooled median times described above, cervical dilatation rate was less than 1 cm/hour until 5 cm was reached, at which point the rate became 1.09 cm/hour. While the transition to more rapid progress started between 5 cm and 6 cm, it was only after 6 cm that

Table 3.16 Time to advance centimetre by centimetre in nulliparous women

Cervical dilatation	No. of studies	Pooled median traverse time (hours)	95th percentiles (range, hours)	Median rate of dilatation (cm/hour)	Certainty of evidence
2 – 3 cm	3	5.28	7.20–15.00	0.19	Low
3 – 4 cm	6	2.00	4.20–17.70	0.50	High
4 – 5 cm	6	1.46	4.00–15.70	0.68	High
5 – 6 cm	6	0.92	2.50–10.70	1.09	High
6 – 7 cm	6	0.70	1.80–9.30	1.43	High
7 – 8 cm	6	0.55	1.40–6.80	1.82	High
8 – 9 cm	5	0.52	1.30–4.40	1.92	High
9 – 10 cm	5	0.49	1.00–2.60	2.04	High

the dilatation rate doubled. Based on the lowest of the range of 95th percentile data across studies, there were always women whose rate of dilatation did not reach the 1-cm/hour threshold until they reached 9 cm dilatation. The data show that it was not uncommon for women to achieve full cervical dilatation despite rates slower than 1 cm/hour for a larger part of their labours. The overall certainty of evidence was assessed as high except for the certainty of the evidence on the rate between 2 cm and 3 cm, which was assessed as low.

The only study reporting mean time to advance by 1 cm showed rates of change from one level of cervical dilatation to the next that were similar to those in studies reporting medians.

Time to advance by 1 cm (traverse time) in parous women (parity = 1+) (EB Table 3.2.3[ii]): The pooled median times from three studies shows how long it took parous women to advance from 3 cm of cervical dilatation to full dilatation (Table 3.17). This evidence suggests that the median time to progress from 3 cm to 4 cm was 2.38 hours, while from 4 cm to 5 cm it was 1.17 hours, following which the interval decreased rapidly as cervical dilatation progressed towards 10 cm. Similar to nulliparous women, the range of 95th percentile distribution of the studies suggests that some women progressed much slower throughout the first stage of labour and yet attained full dilatation. The 95th percentiles of the times reported by individual studies suggest that it was not uncommon for some women to take as long as 14 hours to advance from 3 cm to 4 cm, 3 hours to advance from 4 cm to 5 cm, and only after 8 cm was the time to progress 1 cm always less than 1 hour. Except for the time to progress from 3 cm to 4 cm dilatation, the certainty of evidence for each of these traverse times were all assessed as high.

Rate of change (slope) centimetre by centimetre in parous women (parity = 1+): Based on the pooled median times described above, cervical dilatation rate was less than 1 cm/hour until 5 cm was reached, at which point the rate became 1.49 cm/hour. Compared to the dilatation rate between 4 cm and 5 cm, the rate increased sharply and almost doubled between 5 cm and 6 cm and then rose rapidly as dilatation progressed towards 10 cm. Based on the lowest of the range of 95th percentile data across studies, there were always women whose rate of dilatation did not reach the 1-cm/hour threshold until they reached 7 cm dilatation. The overall certainty of evidence was assessed as high except for the certainty of the evidence on the rate between 3 cm and 4 cm, which was assessed as low.

Additional considerations

Based on the review findings, the transition point at which labour starts to accelerate (correlating with the onset of the "active phase") could be considered to be 5 cm in both nulliparous and parous women. The fastest dilatation rates occurred between 7 cm and 10 cm for both nulliparous and parous women, but were faster in parous women (i.e. steeper slope). Cervical dilatation patterns before the transition point appear to be highly variable and individual for both nulliparous and parous women. Labour progression demonstrates a hyperbolic rather than a linear curve, which is slower at the start of the traditional active phase (e.g. at 4 cm dilatation) and faster in advanced first stage.

Values

Findings from a review of qualitative studies looking at what matters to women during intrapartum care *(23)* indicate that most women want a normal childbirth with good outcomes for mother and baby, but acknowledge that medical intervention may sometimes be necessary. Most women, especially those giving birth for the first time, are apprehensive about childbirth (high confidence in the evidence) and of certain interventions, although in certain contexts and/or situations women welcome medical interventions in order to shorten labour (low confidence in the evidence).

Table 3.17 Time to advance centimetre by centimetre in parous women

Cervical dilatation	Number of studies	Pooled median traverse time (hours)	95th percentiles (range, hours)	Median rate of dilatation (cm/hour)	Certainty of evidence
3 – 4 cm	1	2.38	14.18–17.85	0.42	Low
4 – 5 cm	3	1.17	3.30–8.05	0.85	High
5 – 6 cm	3	0.67	1.60–6.24	1.49	High
6 – 7 cm	3	0.44	1.20–3.67	2.27	High
7 – 8 cm	3	0.35	0.70–2.69	2.86	High
8 – 9 cm	2	0.28	0.60–1.00	3.57	High
9 – 10 cm	2	0.27	0.50–0.90	3.70	High

Table 3.18 Main resource requirements for facilitating slow-yet-normal cervical dilatation patterns

Resource	Description
Training	Practice-based training for health care providers
Supplies	Revised training manuals and clinical protocols for health care providers and those in pre-service training Promotional materials for women on what comprises "normal" labour and when to go to a facility for assessment Revised paper partograph
Infrastructure	Sufficient beds in the labour ward to support longer labour
Supervision and monitoring	Ongoing supervision and monitoring with regular audit and review of outcomes related to application of slower dilatation patterns for labour management

Additional considerations

Evidence from other studies suggests that women are less likely than health care providers to recognize defined, time-bound phases of labour *(54)*, and their ability to cope is more likely to be dependent on a variety of inter-related factors, including the level of pain experienced, the nature of the environment and their perceived level of support *(55)*.

Resources

No review evidence on resource requirements was found.

Additional considerations

Application of slow-yet-normal cervical dilatation patterns as the benchmark for managing the first stage of labour might be cost-effective as it has the potential to reduce the use of interventions to accelerate labour and birth (e.g. caesarean section, oxytocin augmentation) and linked interventions (e.g. continuous cardiotocography, pain relief, antibiotics).

In certain middle- and high-income country settings where physicians attend to all women in labour, the use of slow-yet-normal dilatation patterns for managing labour is likely to result in increases in health care resource use.

It is likely that facilitating slow-yet-normal labours would lead to increased bed costs for vaginal births due to longer labour ward stays for women. The estimated cost of a facility bed per day varies widely across regions, as shown by the WHO-CHOICE example estimates (2007–2008) *(70)*. Increases in bed costs associated with longer labours might have less impact on health care costs in LMICs than in HICs, where bed costs form a larger proportion of costs for childbirth services. On the other hand, if the use of oxytocin augmentation is reduced and fewer caesarean sections are performed as a result of facilitation of slow-yet-normal cervical dilatation patterns, the overall bed costs and health care resource use could be reduced due to shorter postnatal stays.

Equity

No evidence on the impact on equity was found.

Additional considerations

The most common indication for oxytocin augmentation and primary caesarean section is "failure of labour to progress", based on the expectation that normal labour progression is at least 1 cm/hour during the active phase, which traditionally starts from 4 cm *(71)*. However, unnecessary augmentation of labour and caesarean section are highly inequitable interventions as they are unlikely to be promptly received by disadvantaged women even when indicated. Application of slow-yet-normal dilatation patterns to labour management for all women has the potential to reduce inequity that is associated with over-medicalization of childbirth.

Acceptability

Findings from a review of qualitative studies looking at what matters to women during intrapartum care *(23)* indicate that most pregnant women would prefer a shorter labour (low confidence). However, when asked after childbirth, women are more likely to report a positive labour experience if they are able to "go with the flow" where the optimal length of labour is tailored to the individual regardless of standardized time limits (moderate confidence).

Additional considerations

There is evidence to suggest that women are more likely to report both very short and very long labour in negative terms *(26, 72, 73, 91)*.

Feasibility

In a review of qualitative evidence looking at providers' experiences of delivering intrapartum care *(26)*, the capacity to accommodate longer labours may be constrained by staff shortages and organizational time pressures (high confidence in the evidence). Local protocols and informal rules may also limit the ability of health care staff to provide personalized care *(26)*.

Additional considerations

In a realist review of partograph use, findings highlight poor availability of equipment, inadequate staffing levels, lack of clear policy on use, limited knowledge and inadequate training as potential barriers to partograph use, particularly in low-resource settings *(76)*.

Table 3.19 Summary of judgements: Application of slow-yet-normal cervical dilatation patterns for labour management

Desirable effects	– Don't know	– Varies		– Trivial	– Small	✓ Moderate	– Large
Undesirable effects	– Don't know	– Varies		– Large	– Moderate	✓ Small	– Trivial
Certainty of the evidence	– No included studies			– Very low	– Low	✓ Moderate	– High
Values				– Important uncertainty or variability	✓ Possibly important uncertainty or variability	– Probably no important uncertainty or variability	– No important uncertainty or variability
Balance of effects	– Don't know	– Varies	– Favours the alternative options	– Probably favours the alternative option	– Favours neither slow-yet-normal nor alternative option	✓ Probably favours slow-yet-normal	– Favours slow-yet-normal
Resources required	– Don't know	✓ Varies	– Large costs	– Moderate costs	– Negligible costs or savings	– Moderate savings	– Large savings
Certainty of evidence of required resources	– No included studies			✓ Very low	– Low	– Moderate	– High
Cost-effectiveness	– Don't know	✓ Varies	– Favours the alternative option	– Probably favours the alternative option	– Favours neither slow-yet-normal nor alternative option	– Probably favours slow-yet-normal	– Favours slow-yet-normal
Equity	– Don't know	– Varies	– Reduced	– Probably reduced	– Probably no impact	✓ Probably increased	– Increased
Acceptability	– Don't know	– Varies		– No	– Probably No	✓ Probably Yes	– Yes
Feasibility	– Don't know	✓ Varies		– No	– Probably No	– Probably Yes	– Yes

3.2.4 Labour ward admission policy

RECOMMENDATION 10

For healthy pregnant women presenting in spontaneous labour, a policy of delaying labour ward admission until active first stage is recommended only in the context of rigorous research.
(Research-context recommendation)

Remarks

- Until further evidence becomes available, a woman presenting to facilities in labour should be admitted and supported appropriately, even when in early labour, unless her preference is to await active labour at home.
- For women admitted to the labour ward during latent first stage, medical interventions to accelerate labour and childbirth should be avoided if maternal and fetal well-being are reassuring.
- The GDG made this a "research-context" recommendation as it was concerned that the limited evidence on effects applies to active first stage of labour with onset defined by a cervical dilatation of 4 cm or less, and not to active first stage with onset defined by a cervical dilatation of 5 cm or more, as recommended in this guideline. The group noted this as a research priority.
- It should be clear that this recommendation refers to delaying admission to the labour ward (i.e. to the childbirth area), not delaying admission to the maternity waiting areas, where women in early labour await active labour, or delaying admission to the health care facility. In addition, delaying labour ward admission does not mean delayed first contact with a health care provider or delayed assessment on admission. A comprehensive maternal and fetal assessment by a health care professional on presentation at a facility is essential to ensure undiagnosed or developing complications are excluded.
- Facilities currently applying a policy of delaying labour ward admission should consider implementing this research-context recommendation in the light of the revised definition of the onset of active labour.
- Routine observations to assess maternal and fetal well-being should be performed as needed on all women awaiting admission to the labour ward.
- Birth plans need to be individualized according to the woman's needs and preferences.
- For women in the latent first stage of labour and their companions, clean, comfortable waiting rooms should be available, with space for women to walk around, and easy access to clean, serviced toilets, and food and drinking water.
- Facility reorganization strategies, such as on-site midwife-led birthing units (OMBUs) and alongside midwifery units (AMUs), could be considered to meet the needs of women in early labour, instead of a policy of delaying labour ward admission.

Summary of evidence and considerations

Effects of the intervention (EB Table 3.2.4)

The evidence was derived from a Cochrane systematic review that included pregnant women without risk factors in early labour *(92)*. Only one trial conducted in the Canada, involving 209 nulliparous pregnant women, was directly relevant to this guideline question; the evidence from this trial is described below *(93)*. In this trial, after ascertaining that the women were not in active labour (defined in the study as the presence of regular, painful contractions and cervical dilatation greater than 3 cm), the women in the intervention group were given support, encouragement and advice, and instructed to walk around outside the facility or return home until labour became more active, with instructions on when to return. If it was not clear whether a woman in the intervention group was in active labour or not, she was asked to remain in the assessment area for several hours, where armchairs and magazines were available to her and her partner, until re-assessment. The intervention group was compared with a control group of women who were admitted directly to labour ward after the initial assessment.

Comparison: delaying admission compared with direct admission to the labour ward

Maternal outcomes

Mode of birth: Evidence on the effect of delaying versus direct admission to the labour ward on caesarean section and instrumental vaginal birth is of very low certainty, mainly due to small sample size and few events.

Duration of labour: Low-certainty evidence suggests that the duration of labour from the point of hospital admission may be shorter for women in the group where admissions were delayed (1 trial, 209 women; MD -5.20 hours [shorter], 95% CI -7.06 to -3.34 hours shorter).

Use of pain relief options: Low-certainty evidence suggests that there may be a reduction in the use of epidural analgesia with a policy of delaying admission (1 trial, 209 women, RR 0.87, 95% CI 0.78–0.98). In this trial, with an epidural rate of approximately 90% in the control group, the absolute difference in epidural is estimated at 118 fewer epidurals per 1000 (from 18 to 199 fewer) with a policy of delaying admission.

Augmentation of labour: Low-certainty evidence suggests that delaying admission may reduce oxytocin augmentation compared with direct admission (1 trial, 209 women, RR 0.57, 95% CI 0.37–0.86). In this trial, with an oxytocin augmentation rate of 40% in the control group, the absolute difference in oxytocin augmentation is estimated at 174 fewer per 1000 (from 57 to 271 fewer) with a policy of delaying admission.

Birth experience: Low-certainty evidence suggests that satisfaction scores may be higher with a policy of delaying admission than direct admission (1 trial, 201 women, MD 16 points higher, 95% CI 7.53–24.47 higher).

Fetal and neonatal outcomes

Perinatal hypoxia-ischaemia: Evidence on Apgar scores less than 7 at 5 minutes is of very low certainty, mainly due to the small sample size and few events.

Birth before arrival: The evidence is very uncertain due to no events occurring in this small trial.

Perinatal mortality: The trial did not report this outcome.

No other perinatal outcomes were reported in this trial.

Additional considerations

Other relevant outcomes were reported in the trial *(93)* but not in the Cochrane review *(92)*.

Duration of the second stage of labour: This was shorter for the women in the group where admission was delayed compared with the direct admission group (76.8 vs 95 minutes; P = 0.045); and

Amniotomy: This occurred with similar frequency in both groups (49/105 vs 56/104; P = 0.368).

The effects of delaying admission to the labour ward as presented in the Cochrane systematic review depend on the health system model of intrapartum care for healthy pregnant women and may not be applicable to countries where uncomplicated births occur in primary care facilities, such as clinics and on-site midwife-led birthing units (OMBUs), which tend to offer less medicalized care than hospital-based intrapartum care *(94)*.

Several observational studies with sample sizes ranging from 120 to 6121 women have evaluated the relationship between cervical dilatation at admission and subsequent medical interventions, including caesarean section and labour augmentation *(95–99)*. The findings across these studies are consistent. They show that women admitted in the latent phase of labour are more likely to have caesarean section, with caesarean section rates for the latent and active phase admission groups of these studies reported as 14.2% versus 6.2% (n = 6121 women) *(96)*, 18% versus 4% (n = 1202 women) *(97)*, 34.8% versus 18.6% (n = 354 women) *(98)*, 15.8% versus 6.9% (n = 216 women) *(95)*, and 10.3% versus 4.2% (n = 3220 women) *(99)*, respectively. These observational studies also consistently showed higher rates of oxytocin augmentation and a variety of other medical interventions (e.g. scalp pH, fetal scalp electrode monitoring of fetal heart rate, amniotomy, epidural) among the women admitted to the labour ward in early labour compared with those admitted in established, active labour.

The Cochrane systematic review *(92)* also evaluated "home assessment and support" for women in early labour versus telephone triage (a telephone call between a woman and a health care professional to determine if a woman needs labour ward admission). Three trials (6096 participants) conducted in the United Kingdom and Canada contributed data to this comparison. Women in the home assessment groups were given support and advice in their homes by a midwife or other trained health care professional, including advice on pain management techniques and when to proceed to the hospital. Women in the telephone triage group made their own decision to go to hospital, based on their telephone conversation with a nurse or other health care professional. The review found evidence (mainly graded as low certainty) suggesting that these interventions have little or no effect on

childbirth outcomes, including caesarean section, instrumental vaginal birth, oxytocin augmentation, epidural analgesia, serious maternal morbidity, Apgar scores less than 7 at 5 minutes, and perinatal death. However, low-certainty evidence from the review suggests that maternal satisfaction may be increased with the home assessment and support intervention.

Values

Findings from a qualitative review of what matters to women during intrapartum care *(23)* indicate that most women, especially those giving birth for the first time, are apprehensive about childbirth and of particular interventions (high confidence in the evidence).

The review also showed that, while most women want a normal childbirth, they understand that medical intervention is sometimes necessary to facilitate the birth of a healthy baby (high confidence in the evidence). In addition, in certain contexts and/or situations, women may welcome interventions to shorten labour or to provide relief from pain (low confidence in the evidence).

Additional considerations

Given the above, women who are anxious about giving birth might not value the effect of delaying admission on duration of labour ward stay, and might prefer direct admission to the labour ward, particularly if the alternative is to be sent home to await established labour. It is also plausible that women might appreciate the lower epidural and labour augmentation rates associated with delaying labour ward admission.

Evidence from other studies suggests that women are less likely than health care providers to recognize defined, time-bound phases of labour *(54)*, and their ability to cope is more likely to be dependent on a variety of inter-related factors, including the level of pain experienced, the nature of the environment and their perceived level of support *(55)*.

Resources

A 2015 cost-effectiveness analysis from the USA suggests that delaying admission to hospital compared with admission in the latent phase could result in cost savings of US$ 694 million annually in this HIC *(100)*. These findings were based on modelled estimates that 672 000 fewer epidurals, 67 232 fewer caesarean births, and 9.6 fewer maternal deaths would occur with a policy of delaying admission to hospital until active labour.

Additional considerations

There is no evidence on the cost-effectiveness of delaying admission versus direct admission to the labour ward in LMICs. Cost-effectiveness would depend on the health system model of intrapartum care. In LMIC settings, primary care models are often employed, as these are more cost-effective than hospital-based models *(94)*. Primary care models tend to offer less-medicalized intrapartum care than hospital-based models (e.g. no epidurals).

If women in early labour are sent home to await active labour, a policy of delaying admission could be associated with higher transport costs for women in all settings.

Table 3.20 Main resource requirements for delaying labour ward admission until active first stage

Resource	Description
Staff	Reorganization of existing staff with deployment of one or more staff members to a "delaying admission" waiting room
Training	In-service training to implement the new facility protocol, to provide the necessary support for delaying admission
Supplies	Fewer supplies needed with a policy of delaying admission than with direct admission, due to fewer vaginal examinations (gloves) and reduced use of augmentation (oxytocin, drip sets, intravenous [IV] fluids)
Equipment	Armchairs and other supportive resources such as a radio, music, a television set, magazines to provide comfort to the woman during the waiting period No difference in medical equipment, e.g. blood pressure monitors
Infrastructure	Clean, comfortable waiting room for women and their companions, with space for women to walk around Toilets and drinking water should be easily accessible
Supervision and monitoring	Good access to medical supervision Audit and review of babies born before arrival in the labour ward, and other key outcomes

Equity

No research evidence on the impact of delaying admission on equity was found.

Additional considerations

In HICs and among more advantaged women, unnecessary obstetric interventions to accelerate childbirth, including caesarean section and oxytocin augmentation, are very prevalent. Therefore, if the effect of delaying admission reduces these unnecessary and costly interventions as suggested by the USA cost-effectiveness analysis *(100)*, it might plausibly increase equity.

In LMICs, disadvantaged women often present late at health care facilities, or give birth before arrival or end up having an unplanned home birth, due to transport and financial barriers *(101–104)*; therefore, delaying admission in these settings might reduce equity.

Transport costs to get to health care facilities are a major consideration for disadvantaged women in all settings *(102, 105, 106)*. If women were required to return home to await established labour, providing disadvantaged women with transport funds would be necessary to ensure equity with this intervention.

Acceptability

As part of a qualitative review of women's experiences of intrapartum care *(26)*, the authors conducted a sub-analysis of women's views of hospital admission practices. Findings, which were from HICs only, suggest that women recognize and generally accept the message to stay at home for as long as possible but their experience of early labour is often more intense than expected (especially for nulliparous women), which prompts them to contact health care professionals, either by phone or visit, in search of clarity and reassurance (high confidence in the evidence). Women find it hard to accept that staying at home is the best thing to do when they have been led to believe that medical support is important for their safety (high confidence in the evidence). Women tend to view the hospital as a place of safety and are acutely aware that they might be sent home if they are not in "active" labour. The pressure of having to "get the timing right" places an additional strain on women and can leave them feeling anxious and vulnerable (high confidence in the evidence). The decision to go to a hospital or birthing facility is usually determined by their embodied experience of labour (often associated with level of pain) rather than a clinical assessment, and they can be left feeling disappointed, discouraged, frustrated and embarrassed if, on assessment, they are told to return home.

A similar sub-analysis of providers' experiences of admission practices suggests that health care professionals recognize women's needs for clarity and reassurance and they try to maintain a woman-centred approach either on the phone or in person (moderate confidence in the evidence). However, organizational pressures and time constraints often lead to them acting as gatekeepers to the labour ward, which can lead to an inconsistent approach to labour ward admittance (moderate confidence in the evidence).

Additional considerations

All of the above evidence was derived from studies conducted in HICs. Some evidence from LMICs suggests that women in these settings are more likely to arrive at health care facilities in established labour *(107)*.

Feasibility

As part of a qualitative review of women's experiences of intrapartum care *(26)*, the authors conducted a sub-analysis of women's views of hospital admission practices. Findings, which were from HICs only, indicate that the "stay at home" message is generally well recognized. However, for reasons of safety and reassurance, many women would prefer to be at or near the labour ward when their embodied experience of labour begins, regardless of clinical assessment (high confidence in the evidence). In situations where women are asked to return home by health care professionals, they would like clear advice and instructions about what signs and symptoms to expect and when to return to the labour ward (high confidence in the evidence).

A similar sub-analysis of providers' experiences of admission practices suggests that staff would tend to support the approach of delaying labour ward admission because it gives them the flexibility to manage organizational pressures relating to bed space and staff resources (moderate confidence in the evidence). However, findings also indicate that health care professionals may struggle to offer the kind of woman-centred care they wish to offer (and that women value) if this approach is adopted (moderate confidence in the evidence).

Additional considerations

All of the above evidence was derived from studies conducted in HICs.

Table 3.21 Summary of judgements: Policy of delaying labour ward admission compared with direct labour ward admission

Desirable effects	– Don't know	– Varies		– Trivial	– Small	✓ Moderate	– Large
Undesirable effects	✓ Don't know	– Varies		– Large	– Moderate	– Small	– Trivial
Certainty of the evidence	– No included studies			✓ Very low	– Low	– Moderate	– High
Values				– Important uncertainty or variability	– Possibly important uncertainty or variability	✓ Probably no important uncertainty or variability	– No important uncertainty or variability
Balance of effects	– Don't know	– Varies	– Favours direct admission	– Probably favours direct admission	– Does not favour direct admission or delaying admission	✓ Probably favours delaying admission	– Favours delaying admission
Resources required	– Don't know	– Varies	– Large costs	– Moderate costs	– Negligible costs or savings	✓ Moderate savings	– Large savings
Certainty of evidence of required resources	– No included studies			– Very low	✓ Low	– Moderate	– High
Cost-effectiveness	– Don't know	– Varies	– Favours direct admission	– Probably favours direct admission	– Does not favour direct admission or delaying admission	✓ Probably favours delaying admission	– Favours delaying admission
Equity	– Don't know	✓ Varies	– Reduced	– Probably reduced	– Probably no impact	– Probably increased	– Increased
Acceptability	– Don't know	✓ Varies		– No	– Probably No	– Probably Yes	– Yes
Feasibility	– Don't know	✓ Varies		– No	– Probably No	- Probably Yes	- Yes

3.2.5 Clinical pelvimetry on admission

RECOMMENDATION 11

Routine clinical pelvimetry on admission in labour is not recommended for healthy pregnant women.
(Not recommended)

Remarks

- Indirect evidence derived from studies of X-ray pelvimetry suggests that routine clinical pelvimetry in healthy pregnant women on admission in labour may increase caesarean section without a clear benefit for birth outcomes.
- Clinical pelvimetry is the assessment of the adequacy of the shape and size of the maternal pelvis (inlet, mid-pelvis and outlet) for vaginal birth through internal pelvic examination and should not be confused with a standard pelvic examination, which is required for the clinical assessment of cervical status, amniotic fluid, and fetal station and position at labour admission.
- Clinical pelvimetry might have a role in triaging women at high risk of cephalo-pelvic disproportion who reside in rural and remote areas; however, there is currently no evidence that this practice improves outcomes.
- In settings where clinical pelvimetry is routinely performed among healthy pregnant women on admission in labour, health care providers should be made aware that there is insufficient evidence to support this practice.
- All women presenting to a facility in labour should be clinically assessed by the maternity-care provider according to recommended clinical practice, which includes performing a digital vaginal examination, with the woman's consent, to assess the status (onset and extent) of labour.

Summary of evidence and considerations

Effects of the intervention (EB Table 3.2.5)

The evidence was derived from a Cochrane systematic review that included five RCTs *(108)*. The review authors did not find any trials evaluating clinical pelvimetry, therefore indirect evidence on the effects of X-ray pelvimetry on birth outcomes informed this recommendation. Three trials in the review were conducted in South Africa, Spain and the USA, and involved 769 women with cephalic singleton pregnancies at term. One was a trial from 1962 involving 305 labouring women; the other two involved 464 nulliparous women undergoing induction or augmentation of labour. All three trials evaluated radiological pelvimetry (specifically X-ray) compared with no pelvimetry. The remaining two trials were conducted in women with a previous caesarean section; evidence from these is not included in this guideline.

Comparison: Routine clinical pelvimetry compared with no pelvimetry

Evidence was downgraded for indirectness, as data were derived from studies of X-ray pelvimetry.

Maternal outcomes

Mode of birth: Low-certainty evidence suggests that caesarean section may be more frequent with pelvimetry than without pelvimetry (3 trials, 769 women, RR 1.34, 95% CI 1.19–1.52). The absolute effect of pelvimetry may be 73 more caesarean sections per 1000 (from 6 to 157 more).

Maternal morbidity: The three included trials provided no evidence on maternal morbidity.

Duration of labour: This outcome was not reported in the review.

Birth experience: Maternal satisfaction and other experiential aspects of pelvimetry were not evaluated in the review.

Fetal and neonatal outcomes

Perinatal hypoxia-ischaemia: Evidence on the effect of pelvimetry on "perinatal asphyxia" is very uncertain as it was derived from one trial with few events, which also had limitations in study design and indirectness. Other fetal and neonatal morbidity outcomes (Apgar scores < 7 at 5 minutes) were not reported in the relevant studies.

Perinatal mortality: Evidence for this outcome is of very low certainty due to few events, study limitations and indirectness.

Additional considerations

Clinical pelvimetry involves a digital examination of the internal aspect of the bony pelvis, which may be very uncomfortable for the woman, particularly when she is experiencing labour pains *(108)*. However, the review did not evaluate any maternal experiences associated with this procedure.

A higher caesarean section rate in the absence of evidence of benefits on other outcomes is undesirable in view of the potential additional morbidity and increased health care costs associated with caesarean section.

The diagnostic accuracy of clinical pelvimetry is uncertain; however, findings from some observational studies suggest that it might help to predict cephalo-pelvic disproportion among nulliparous women in some low-resource settings with limited access to caesarean section and a need for timely referral to a higher-level facility *(109, 110)*.

Values

Findings from a review of qualitative studies looking at what matters to women during intrapartum care *(23)* indicate that most women want a normal childbirth with good outcomes for mother and baby, but acknowledge that medical intervention may sometimes be necessary. Most women, especially those giving birth for the first time, are apprehensive about childbirth (high confidence in the evidence) and of certain interventions. Where interventions are introduced, women would like to receive relevant information from technically competent health care providers who are sensitive to their needs (high confidence in the evidence).

Additional considerations

Based on the findings of the review presented above, women might be unlikely to appreciate this medical intervention if it increases the chance of caesarean section without improving birth outcomes.

Resources

No review evidence on resource requirements or cost-effectiveness was found.

Additional considerations

The main cost of this intervention is staff time and, while the procedure itself may only take minutes, time is also required to counsel the woman on the reason for digital examination, to obtain her consent, and to explain the findings afterwards. As the intervention could lead to increased risk of caesarean section without improving substantive perinatal outcomes, it is unlikely to be cost-effective.

Equity

No direct evidence on the impact of clinical pelvimetry on equity was found. However, indirect evidence from a review of barriers and facilitators to facility-based birth indicates that digital vaginal examinations by health workers in facilities, which are perceived by women to be uncomfortable and dehumanizing, are an important barrier to the uptake of facility-based birth by marginalized women in LMICs (high confidence in the evidence) *(8)*.

Additional considerations

Based on the indirect evidence above, clinical pelvimetry, which can be more uncomfortable than a standard pelvic examination for assessment of progress of labour, could deter disadvantaged women from giving birth in a facility and further reduce equity. In addition, given that pelvimetry might increase the use of caesarean section in privileged women assessed as having a contracted pelvis, disadvantaged women with similar findings may not be able to receive similar levels of care, even when medically indicated.

Acceptability

There is no specific evidence on clinical pelvimetry from the qualitative systematic review on women's and providers' experiences of intrapartum care.

Table 3.22 Main resource requirements for clinical pelvimetry

Resource	Description
Training	Practice-based training on how to perform clinical pelvimetry
Supplies	Supplies for standard digital pelvic examination
Equipment	None
Staff time	Time to counsel women, obtain their consent and perform the procedure
Supervision and monitoring	Monitoring by the labour ward/clinic/facility lead as part of regular quality of care audit/review

However, general findings on women's experiences suggest that women would rather avoid medical interventions unless their baby is at risk (high confidence in the evidence) *(26)*. In addition, where an intervention is required, women would like to be informed about the procedure and treated by sensitive, kind and technically competent staff (high confidence in the evidence).

Additional considerations

Women may welcome a pelvic examination by the care provider, which provides reassurance about their chances of given birth vaginally. However, they may not readily accept clinical pelvimetry if the findings are likely to preclude them from undergoing a trial of labour, or heighten their fears of adverse events during labour.

Feasibility

There is no specific evidence on clinical pelvimetry from the qualitative systematic review on women's and providers' experiences of intrapartum care *(26)*. However, general findings on providers' experiences suggest that providers in certain contexts (particularly LMICs) may lack the time, training and/or resources to routinely perform clinical pelvimetry for all women presenting in labour (high confidence in the evidence).

Additional considerations

Clinical pelvimetry requires specific experience and expertise to examine with high certainty the internal diameters of the maternal pelvis in correlation with the size of the fetal head, to assess the likelihood of cephalo-pelvic disproportion during labour. This expertise is generally limited to higher-level hospitals, experienced midwives and obstetricians, and may not be readily available in lower-level hospitals and resource-limited settings.

Table 3.23 Summary of judgements: Clinical pelvimetry compared with no clinical pelvimetry

Desirable effects	✓ Don't know	– Varies		– Trivial	– Small	– Moderate	– Large
Undesirable effects	– Don't know	– Varies		– Large	– Moderate	✓ Small	– Trivial
Certainty of the evidence	– No included studies			✓ Very low	– Low	– Moderate	– High
Values				– Important uncertainty or variability	✓ Possibly important uncertainty or variability	– Probably no important uncertainty or variability	– No important uncertainty or variability
Balance of effects	– Don't know	– Varies	– Favours no pelvimetry	✓ Probably favours no pelvimetry	– Does not favour pelvimetry or no pelvimetry	– Probably favours pelvimetry	– Favours pelvimetry
Resources required	– Don't know	– Varies	– Large costs	– Moderate costs	✓ Negligible costs or savings	– Moderate savings	– Large savings
Certainty of evidence of required resources	✓ No included studies			– Very low	– Low	– Moderate	– High
Cost-effectiveness	– Don't know	– Varies	– Favours no pelvimetry	✓ Probably favours no pelvimetry	– Does not favour pelvimetry or no pelvimetry	– Probably favours pelvimetry	– Favours pelvimetry
Equity	– Don't know	– Varies	– Reduced	✓ Probably reduced	– Probably no impact	– Probably increased	– Increased
Acceptability	– Don't know	✓ Varies		– No	– Probably No	– Probably Yes	– Yes
Feasibility	– Don't know	✓ Varies		– No	– Probably No	– Probably Yes	– Yes

RECOMMENDATION 12

Routine cardiotocography is not recommended for the assessment of fetal well-being on labour admission in healthy pregnant women presenting in spontaneous labour. *(Not recommended)*

RECOMMENDATION 13

Auscultation using a Doppler ultrasound device or Pinard fetal stethoscope is recommended for the assessment of fetal well-being on labour admission. *(Recommended)*

Remarks

- Evidence shows that cardiotocography (CTG) on admission in labour probably increases the risk of caesarean section without improving birth outcomes. In addition, it increases the likelihood of a woman and her baby receiving a cascade of other interventions, including continuous CTG and fetal blood sampling, which adds to childbirth costs and might negatively impact a woman's childbirth experience.
- All stakeholders must be aware that the assessment of fetal condition at admission and regularly throughout labour, by auscultating the fetal heart rate, is a vital and integral part of providing quality intrapartum care. In the active first stage of labour, auscultation is usually performed every 15–30 minutes, whereas in the second stage it is usually performed every 5 minutes.
- The GDG was aware of the concern in the clinical and legal community about not performing an admission CTG because of the views of some clinicians that CTG is better at identifying at-risk babies than auscultation and that its use is therefore justified, even in women without apparent risk factors for labour complications. However, the GDG was confident that there is no evidence to support this view, and agreed that clinicians might be better protected from litigation by keeping good medical notes and records, which clearly indicate findings of auscultation, than by relying on admission CTG tracings in defence of clinical practice.

Summary of evidence and considerations

Effects of the intervention (EB Table 3.2.6)

The evidence was derived from a Cochrane systematic review that included four RCTs conducted in Ireland (1 trial) and the United Kingdom (3 trials) *(111)*. More than 13 000 women considered to be at low risk of complications during labour were randomized to CTG (lasting 15 minutes [1 trial] or 20 minutes [3 trials]) or usual monitoring with auscultation. The latter was performed using a handheld Doppler ultrasound device in one trial, either a Pinard fetal stethoscope or a Doppler ultrasound device in another trial, and the technique used for auscultation was not clearly stated for the other two trials. All trials were considered to be at low risk of bias.

Comparison: Cardiotocography (CTG) compared with auscultation on labour admission

Maternal outcomes

Mode of birth: Moderate-certainty evidence from four trials (11 338 women) shows that CTG on admission is probably associated with an increase in caesarean section (RR 1.20, 95% CI 1.00–1.44) but not increased instrumental vaginal birth (RR 1.10, 95% CI 0.95–1.27). The absolute difference in caesarean section is estimated at 7 more per 1000 with CTG on admission (from 0 to 16 more).

Birth experience: Trials did not report on women's satisfaction with the intervention or any other measures of childbirth experience.

Fetal and neonatal outcomes

Perinatal hypoxia-ischaemia: Moderate-certainty evidence suggests that it probably makes little or no difference to the rate of low Apgar scores (< 7 at 5 minutes) (4 trials, 11 324 babies, RR 1.00, 95% CI 0.54–1.85) or neonatal seizures (1 trial, 8056 babies, RR 0.72, 95% CI 0.32–1.61), and low-certainty evidence suggests that it may make little or no difference to hypoxic-ischaemic encephalopathy (1 trial, 2367 babies, RR 1.19, 955 CI 0.37–3.90). High-certainty evidence shows that, compared with auscultation, CTG on admission increases fetal blood sampling (3 trials, 10 757 women, RR 1.28,

95% CI 1.13–1.45). The absolute difference in effect is estimated at 21 more babies having fetal blood sampling per 1000 (from 10 to 34 more).

Fetal distress: The review did not report this outcome.

Perinatal mortality: Moderate-certainty evidence suggests that CTG on admission probably makes little or no difference to perinatal mortality (4 trials, 11 339 babies, RR 1.01, 95% CI 0.30–3.47).

Long-term infant outcomes: None of the studies reported data on severe neurodevelopmental disabilities.

Additional considerations

The review also reported on effects of admission CTG on the rates of other medical interventions. High-certainty evidence shows that CTG on admission has little or no effect on amniotomy (2 trials, 2694 women, RR 1.04, 95% CI 0.97–1.12), oxytocin augmentation of labour (2 trials, 11 324 women, RR 1.05, 95% CI 0.95–1.17) or use of epidural analgesia (3 trials, 10 757 women, RR 1.11, 95% CI 0.87 to 1.41). However, moderate-certainty evidence shows that CTG on admission probably increases the likelihood of continuous CTG monitoring during labour (3 trials, 10 753 women, RR 1.30, 95% CI 1.14 to 1.48). The absolute difference in effect is estimated at 125 more women receiving continuous CTG per 1000 (from 58 to 200 more).

Evidence from this review may not be applicable to LMICs as all trials were conducted in HICs.

Values

Findings from a qualitative review of what matters to women during intrapartum care *(23)* indicate that most women want a normal childbirth, but acknowledge that medical intervention may sometimes be necessary to facilitate the birth of a healthy baby (high confidence in the evidence). Most women, especially those giving birth for the first time, are apprehensive about childbirth (high confidence in the evidence) and of particular interventions, although in certain contexts and/or situations women welcome interventions to shorten labour or provide relief from pain (low confidence in the evidence). Where interventions are introduced, women would like to receive relevant information from technically competent health care professionals who are sensitive to their needs. Findings also showed that women want to be in control of their birth process and would like to be involved in decision-making around the use of interventions (high confidence in the evidence).

Resources

No research evidence on relative costs or cost-effectiveness of CTG compared with auscultation was found.

Additional considerations

In the absence of additional health benefits with CTG on admission, it is plausibly less cost-effective than auscultation with a Pinard fetal stethoscope or a Doppler ultrasound device, due to higher equipment and supply costs, as well as excessive use of caesarean section, and a cascade of other interventions. Some interventions, such as caesarean section, have significant resource implications for both the facilities and for the women undergoing them. There is a clear health cost saving in recommending that CTG is not used on labour admission.

Equity

No direct evidence on the impact of admission CTG (or CTG, in general) on equity was found.

Additional considerations

The moderate-certainty evidence that CTG on admission does not improve childbirth outcomes was derived from HICs only and may not be applicable to settings where marginalized women can only receive poor-quality antenatal care and where baseline risk of fetal mortality at labour admission may be higher.

Introduction of routine admission CTG might reduce equity if it leads to a cascade of unnecessary interventions that can only be accessed by more advantaged women and those in well resourced settings. In settings with high perinatal mortality rates, CTG interventions aimed at improving detection of the hypoxic fetus, with an appropriate increase in caesarean section, might increase equity by conferring greater benefit to the disadvantaged women.

Acceptability

In a review of qualitative studies exploring women's and providers' experiences of labour and childbirth, results suggest that some women find the use of CTG reassuring but feel restricted by the equipment and would prefer a more hands-on, woman-centred approach to care (low confidence in the evidence) *(26)*.

Findings from a sub-study of the review *(26)* showed that staff felt that CTG is overused, that it leads to unnecessary interventions and, from a midwifery

Table 3.24 Main resource requirements for assessment of fetal well-being on admission: cardiotocography (CTG), Doppler ultrasound device and Pinard fetal stethoscope

Resource	Description
Staff training	■ CTG: practice-based training on how to apply and interpret the findings *(112)* ■ Doppler: easy to use without additional training *(32)* ■ Pinard: practice-based training; can take experience to become proficient *(113)*
Supplies	■ CTG: ultrasound gel, thermal paper,[a] fuses *(112)* ■ Doppler: ultrasound gel, some require replaceable batteries (1.5V AA) *(112)* ■ Pinard: none
Equipment	■ CTG: machine costs US$ 1457.16 *(112)* ■ Doppler: device can cost US$ 95 to US$ 350 *(32, 112)* ■ CTG and Doppler: maintenance costs ■ Pinard: US$ 0.94 *(112)*
Infrastructure	■ CTG: requires a wall plug for power ■ Doppler: battery operated (batteries either need charging or replacing) ■ Pinard: none required
Staff time	■ CTG: test set-up time plus time to interpret the CTG by trained personnel ■ Doppler: minimum of 60 seconds ■ Pinard: variable, depending on provider experience
Supervision and monitoring	■ CTG: supervision is needed to accurately identify all the parameters of a non-reassuring CTG trace

[a] The cost of electrocardiograph (ECG) paper has been estimated at US$ 0.03 per use *(112)*. The cost of cardiotocography (CTG) paper varies but might plausibly be similar to this estimate for a 15–30 cm length (assuming a paper speed of 1 cm/minute).

perspective, undermines traditional, woman-focused skills (high confidence in the evidence). While some staff believe that the use of CTG offers reassurance, many do not trust the technology and feel pressured to use it in a defensive manner to temper organizational fears of litigation (high confidence in the evidence). In addition, some health care professionals do not feel sufficiently trained to interpret CTG tracings and acknowledge that understanding and interpretation can be inconsistent (high confidence in the evidence).

Findings also suggest that, where possible, health care professionals would prefer to use IA because they believe it offers more flexibility and leads to better outcomes (compared to CTG) (low confidence in the evidence).

Additional considerations

Qualitative review findings are from HIC settings only.

Feasibility

In a qualitative systematic review exploring health care professionals' views *(26)*, a sub-analysis on views on CTG and fetal monitoring showed that staff tend to believe that CTG is overused and may lead to unnecessary interventions (high confidence in the evidence). This is likely to have cost implications, which would reduce feasibility of responding to the findings in low-resource settings. Staff also believe that it is cheaper to use (compared with alternatives), but financial constraints often lead to poor maintenance and limited availability of accessories (low confidence in the evidence).

Additional considerations

Qualitative review findings are from HIC settings only. In low-resource settings, other higher priority health resource needs will discourage investment in procuring CTG machines and training health care staff to use them.

Table 3.25 Summary of judgements: Routine cardiotocography (CTG) on admission compared with auscultation of the fetal heart with Doppler ultrasound device or Pinard fetal stethoscope on admission

Desirable effects	– Don't know	– Varies		✓ Trivial	– Small	– Moderate	– Large
Undesirable effects	– Don't know	– Varies		– Large	– Moderate	✓ Small	– Trivial
Certainty of the evidence	– No included studies			– Very low	– Low	✓ Moderate	– High
Values				– Important uncertainty or variability	✓ Possibly important uncertainty or variability	– Probably no important uncertainty or variability	– No important uncertainty or variability
Balance of effects	– Don't know	– Varies	– Favours Pinard/ Doppler	✓ Probably favours Pinard/ Doppler	– Does not favour either admission CTG or Pinard/ Doppler	– Probably favours admission CTG	– Favours admission CTG
Resources required	– Don't know	– Varies	– Large costs	✓ Moderate costs	– Negligible costs or savings	– Moderate savings	– Large savings
Certainty of evidence of required resources	✓ No included studies			– Very low	– Low	– Moderate	– High
Cost-effectiveness	– Don't know	– Varies	– Favours Pinard/ Doppler	✓ Probably favours Pinard/ Doppler	– Does not favour either admission CTG or Pinard/ Doppler	– Probably favours admission CTG	– Favours admission CTG
Equity	– Don't know	✓ Varies	– Reduced	– Probably reduced	– Probably no impact	– Probably increased	– Increased
Acceptability	– Don't know	✓ Varies		– No	– Probably No	– Probably Yes	– Yes
Feasibility	– Don't know	✓ Varies		– No	– Probably No	– Probably Yes	– Yes

3.2.7 Perineal/pubic shaving

RECOMMENDATION 14

Routine perineal/pubic shaving prior to giving vaginal birth is not recommended. *(Not recommended)*

Remarks

- This recommendation has been integrated from the *WHO recommendations for prevention and treatment of maternal peripartum infections (114)*, in which the GDG for that guideline determined it to be a conditional recommendation based on very low-quality evidence.
- This recommendation applies to all hair shavings around the female external genital area within the context of vaginal birth. It does not apply to women being prepared for caesarean section.
- The decision regarding perineal/pubic shaving should be left to the woman and not the health care provider. In situations where a woman chooses to have perineal/pubic shaving prior to birth, she should be advised to arrange to be shaved wherever and by whomever she is most comfortable with (e.g. at home shortly before the time of labour and childbirth).
- The evidence supporting this recommendation can be found in the source guideline document, available at: http://apps.who.int/iris/bitstream/10665/186171/1/9789241549363_eng.pdf

3.2.8 Enema on admission

RECOMMENDATION 15

Administration of an enema for reducing the use of labour augmentation is not recommended. *(Not recommended)*

Remarks

- This recommendation has been integrated from the *WHO recommendations for augmentation of labour (46)*, in which the GDG for that guideline determined it to be a strong recommendation based on very low-quality evidence.
- The GDG noted that the routine use of enema has neither been shown to reduce the duration of labour nor confer any other clinical benefits. It is considered invasive and associated with discomfort for women.
- The GDG placed its emphasis on the feasibility of implementing this recommendation, the reduction in health care resource use and acceptability among caregivers and women, and therefore made a strong recommendation against this intervention.
- The evidence supporting this recommendation can be found in the source guideline document, available at: http://apps.who.int/iris/bitstream/10665/112825/1/9789241507363_eng.pdf

3.2.9 Digital vaginal examination

RECOMMENDATION 16

Digital vaginal examination at intervals of four hours is recommended for routine assessment of active first stage of labour in low-risk women. *(Recommended)*

Remarks

- This recommendation has been integrated from the *WHO recommendations for prevention and treatment of maternal peripartum infections (114)*, in which the GDG for that guideline determined it to be a strong recommendation based on very low-quality evidence.
- There is currently no direct evidence on the most appropriate frequency of vaginal examinations to prevent infectious morbidity in the mother and baby, and therefore this recommendation was based on consensus reached by the GDG, and it is in agreement with a similar recommendation in the 2014 *WHO recommendations for augmentation of labour (46)*.
- Priority must be given to restricting the frequency and total number of vaginal examinations. This is particularly crucial in situations when there are other risk factors for infection (e.g. prolonged rupture of amniotic membranes and long duration of labour).
- The GDG acknowledged that the frequency of vaginal examinations is dependent on the context of care and the progress of labour. The group agreed that vaginal examinations at intervals more frequent than specified in this recommendation may be warranted by the condition of the mother or the baby.
- Vaginal examinations of the same woman by multiple caregivers around the same time or at different time points should be avoided. The group noted that this practice is common in teaching settings where multiple cadres of staff (or students) perform vaginal examinations for learning purposes.
- The evidence supporting this recommendation can be found in the source guideline document, available at: http://apps.who.int/iris/bitstream/10665/186171/1/9789241549363_eng.pdf

3.2.10 Continuous cardiotocography (CTG) during labour

RECOMMENDATION 17

Continuous cardiotocography is not recommended for assessment of fetal well-being in healthy pregnant women undergoing spontaneous labour. *(Not recommended)*

Remarks

- In making this recommendation, the GDG placed its emphasis on evidence that suggests that continuous CTG increases caesarean section and other medical interventions, without being cost-effective, and with varying acceptability and feasibility. The GDG placed less emphasis on the small absolute reduction in neonatal seizures (1 fewer per 1000), which may or may not have further health consequences.
- Continuous CTG should not be used as a substitute for providing supportive, woman-centred intrapartum care.
- Continuous CTG can restrict other beneficial interventions during labour, such as having a choice of labour and birth positions, and being able to walk around freely, and can be stressful for women. While the GDG acknowledged that mobile continuous CTG is available, it agreed that the evidence on the effects of this newer technology is unknown.
- Stakeholders in countries with high perinatal mortality should consider how the coverage and documentation of intermittent auscultation (IA) could be improved.
- In countries and settings where continuous CTG is used defensively to protect against litigation, all stakeholders should be made aware that this practice is not evidence-based and does not improve birth outcomes. Clinicians might be better protected from litigation by keeping good medical notes and records, which clearly indicate findings of IA, than by relying on continuous CTG tracings in defence of clinical practice.

Summary of evidence and considerations

Effects of the intervention (EB Table 3.2.10)

The evidence was derived from a Cochrane systematic review comparing continuous CTG versus intermittent auscultation (IA) for assessment of fetal well-being during labour *(115)*. For the purposes of this guideline, only evidence derived from the low-risk subgroup of the review was included. These low-risk subgroup data were derived from four trials conducted in Australia (989 women), Ireland (10 053 women), the United Kingdom (504 women) and the USA (14 618 women), which reported their findings between 1978 and 1986. The study conducted in Ireland also included women with high-risk pregnancies, but these data were excluded from this analysis. Three trials were individual RCTs and one was a quasi-RCT (the USA study), which alternated interventions for each month of the trial. The latter study was assessed as being at a high risk of bias. The method of IA varied across trials to include auscultation using a Pinard fetal stethoscope and/or Doppler ultrasound device.

Comparison: Continuous cardiotocography (CTG) compared with intermittent auscultation (IA)

Maternal outcomes

Mode of birth: Low-certainty evidence from two trials (1431 women) suggests that caesarean section may be increased with continuous CTG compared with IA (RR 2.06, 95% CI 1.24–3.45). The absolute difference in effect is estimated at 30 more caesarean sections per 1000 women (from 7 to 70 more). Evidence on instrumental vaginal birth from these trials is of very low certainty.

Need for pain relief: Moderate-certainty evidence suggests that there is probably little or no difference in maternal analgesic requirements between these fetal monitoring methods (1 trial, 504 women, RR 0.92, 95% CI 0.79–1.07).

Birth experience: Evidence on birth experience, including inability to adopt preferred birth position, dissatisfaction with care, and perceived loss of control during labour, was not reported in the review.

Fetal and neonatal outcomes

Perinatal hypoxia-ischaemia: Moderate-certainty evidence suggests that continuous CTG probably reduces neonatal seizures compared with IA (3 trials, 25 175 babies, RR 0.36, 95% CI 0.16–0.79). The absolute difference in effect was estimated at 1 event fewer per 1000 babies (from 0 to 2 fewer). There were no data in the review on cord blood acidosis or cerebral palsy for the low-risk subgroup.

Perinatal mortality: This evidence is of very low certainty, due to study design limitations and very few events.

Long-term infant outcomes: Studies of women with low-risk pregnancies did not report cerebral palsy or other long-term infant outcomes.

Additional considerations

The evidence for the low-risk subgroup was consistent with the evidence for high-risk and mixed-risk subgroups. In the overall review analyses that included high-, low- and mixed-risk subgroups, the summary estimates suggest a difference between interventions in the effect on:

- neonatal seizures – reduced with continuous CTG (9 trials, 32 386 babies, RR 0.50, 95% CI 0.31–0.80);
- caesarean section – increased with continuous CTG (11 trials, 18 861 women, RR 1.63, 95% CI 1.29–2.07);
- instrumental vaginal birth – increased with continuous CTG (10 trials, 18 615 women, RR 1.15, 95% CI 1.01–1.33); and
- fetal blood sampling – increased with continuous CTG (2 trials, 13 929 babies, RR 1.24, 95% CI 1.05–1.47).

Summary estimates suggest little or no difference in effect on perinatal mortality, cerebral palsy, cord blood acidosis, hypoxic-ischaemic encephalopathy (HIE), oxytocin augmentation and epidural analgesia, among others.

Very few clinically relevant neonatal outcomes were reported consistently in the trials *(115)*. In addition, as long-term follow-up was not performed, the long-term effects of the reported neonatal seizures are not known.

The trials did not distinguish between nulliparous and parous women, or between women in spontaneous and induced labour. In addition, trials were relatively old and clinical practices used in them might differ from current practice; for example, in one trial, routine amniotomy was performed within an hour of admission in all women.

Continuous CTG compared with intermittent CTG was evaluated in an RCT conducted in Sweden among 4044 participants at low risk of complications *(116)*. In the intermittent group, CTG was performed for 10–30 minutes every 2.0–2.5 hours during the first stage of labour, and stethoscope auscultation was performed every 15–20 minutes in the periods between CTG. All women were monitored continuously in the second stage of labour. The review authors found no significant differences in caesarean section for fetal distress (1.2% vs 1.0%, respectively) or other birth outcomes, and concluded that intermittent CTG was as safe as continuous CTG for monitoring low-risk labour.

Values

Findings from a qualitative review of what matters to women during intrapartum care *(23)* indicate that most women want a normal childbirth, but acknowledge that medical intervention may sometimes be necessary to facilitate the birth of a healthy baby (high confidence in the evidence).

Where interventions are introduced, women would like to receive relevant information from technically competent health care professionals who are sensitive to their needs.

The findings also showed that women want to be in control of their birth process and would like to be involved in decision-making around the use of interventions (high confidence in the evidence).

Additional considerations

Evidence from the same qualitative review suggests that women might place a higher value on avoiding the risk of additional interventions (e.g. caesarean section, instrumental birth and fetal blood sampling) that make birth abnormal and which override their control of the birth process, without necessarily improving outcomes for them and their babies *(23)*.

In addition, continuous CTG during labour could negatively impact on a woman's sense of autonomy during the birth process, by increasing her discomfort and reducing her choices with regard to mobility and pain relief options.

Resources

No research evidence on relative costs or cost-effectiveness of CTG compared with IA was found.

Additional considerations

Auscultation with the Pinard fetal stethoscope is the least expensive method of fetal monitoring.

Table 3.26 Main resource requirements for assessment of fetal well-being during labour: cardiotocography (CTG), Doppler ultrasound device and Pinard fetal stethoscope

Resource	Description
Staff training	■ CTG: practice-based training on how to apply the equipment and how to interpret the findings *(112)* ■ Doppler: easy to use without additional training *(32)* ■ Pinard: practice-based training; can take experience to become proficient *(113)*
Supplies	■ CTG: ultrasound gel, thermal paper,[a] fuses *(112)* ■ Doppler: ultrasound gel, some require replaceable batteries (1.5V AA) *(112)* ■ Pinard: none
Equipment	■ CTG: a machine costs US$ 1457.16 *(112)*; one machine and one bed per woman for the duration of monitoring ■ Doppler: device can cost US$ 95 to US$ 350 *(32, 112)* ■ Pinard: US$ 0.94 *(112)* ■ Maintenance costs: highest for CTG; none for Pinard
Infrastructure	■ CTG: requires a wall plug for power and a stable electricity supply ■ Doppler: battery-operated (batteries either need charging or replacing) ■ Pinard: none required
Staff time	■ CTG: tracing needs regular monitoring and interpretation by trained personnel ■ Doppler: minimum of 60 seconds every 15 minutes ■ Pinard: variable, depending on provider experience

[a] The cost of electrocardiograph (ECG) paper has been estimated at US$ 0.03 per use *(112)*. The cost of cardiotocography (CTG) paper varies but might plausibly be similar to this estimate for a 15 to 30 cm length (assuming a paper speed of 1 cm/minute). Based on this estimate, paper might cost US$ 0.48 for a labour lasting 8 hours (US$ 0.03 x 16).

The evidence on beneficial effects of continuous CTG suggests that it might not be cost-effective when compared with IA since the only clear benefit is a small absolute reduction in neonatal seizures (with a rate of 1 fewer per 1000), and the long-term effects are unclear. Given that the use of CTG could also lead to moderate increases in costly labour interventions, such as caesarean section, instrumental vaginal birth and fetal sampling, which are associated with additional risks of morbidities for the mother and the baby, avoiding its use could lead to substantial cost savings. Health care costs related to procuring CTG equipment for the labour ward, with the associated maintenance costs, or use of ancillary resources such as pH monitoring, can instead be used to ensure access to other basic facilities. For instance, the cost of internal CTG monitoring as estimated in a Dutch study was €1316 per birth *(117)*.

Equity

No evidence on the impact of CTG on equity was found.

Additional considerations

Trials on the effects of continuous CTG compared with IA were conducted in HICs and the effect estimates may not be directly applicable to LMICs with high perinatal mortality rates. However, these effects of continuous CTG suggest that it could reduce equity if it leads to a cascade of unnecessary interventions.

WHO's 2015 *State of inequality* report indicates that women who are poor, least educated and residing in rural and remote areas have lower access to health intervention coverage than more advantaged women *(33)*. In these settings, it is likely that electronic fetal heart rate (FHR) monitoring of any sort is highly inequitable, due to variable quality of care and a lack of basic resources. Studies report that adequate monitoring of labour progress is often lacking in such settings, and that the FHR may only rarely be auscultated *(118–120)*. The introduction of continuous CTG into these settings could only further impact negatively on equity.

Acceptability

In a review of qualitative studies exploring women's and providers' experiences of labour and childbirth, results suggest that some women find the use of CTG reassuring but feel restricted by the equipment and would prefer a more hands-on, woman-centred approach (low confidence in the evidence) *(26)*. In addition, findings from a qualitative review looking

at what matters to women during intrapartum care suggest that women do not like to be left alone during labour and would prefer the presence of a sensitive and competent health care professional (high confidence in the evidence) *(23)*.

The findings of the qualitative review of experiences of labour and childbirth also showed that some health care professionals feel CTG is overused, that it leads to unnecessary interventions and, from a midwifery perspective, undermines traditional, woman-focused skills (high confidence in the evidence) *(26)*. While some staff believe that the use of CTG offers reassurance, many do not trust the technology and feel pressured to use it in a defensive manner to temper organizational fears of litigation (high confidence in the evidence). In addition, some health care professionals do not feel sufficiently trained to interpret CTG tracings and acknowledge that understanding and interpretation can be inconsistent (high confidence in the evidence). Findings also suggest that, where possible, health care professionals would prefer to use IA because they believe it offers more flexibility and leads to better outcomes (compared with CTG) (low confidence in the evidence).

Additional considerations

The qualitative findings were derived from HIC settings only *(26)*. Findings from a USA-based study exploring midwives' attitudes towards the use of intermittent fetal monitoring found that among 145 midwives, 72.4% agreed that intermittent monitoring should be the standard of care and 87.0% stated that they would be willing to provide it. However, 53.9% indicated that nurse–patient ratios were a problem in providing this service *(121)*.

In spite of the evidence indicating no clear clinical benefits, the views of some clinicians are that CTG is better at identifying at-risk babies than IA and that this justifies the additional risk of interventions, even in women without apparent risk factors for labour complications. However, CTG is likely to be particularly unacceptable for women and other health care professionals who believe that childbirth should be a natural, non-medicalized experience.

Feasibility

Findings from a qualitative systematic review of women's and health care providers' experiences of labour and childbirth suggest that women may find CTG irritating because it restricts their movement (low confidence in the evidence) *(26)*.

The review findings also indicate that staff believe CTG tends to be overused and may lead to unnecessary interventions (high confidence in the evidence). They also believe that it is cheaper to use (compared to fetal monitoring techniques) but that financial constraints may lead to poor maintenance and limited availability of accessories. In addition, some health care professionals believe that workload pressures combined with poor staffing levels lead to CTG being used (continuously) as a "babysitter" and as an inadequate substitute for woman-centred care.

Additional considerations

Qualitative findings are from HIC settings only. However, they suggest that women's views might impede the use of CTG in labour care settings whereas health care professionals' mixed views would impact its implementation differently depending on the context *(26)*.

Table 3.27 Summary of judgements: Continuous cardiotocography (CTG) compared with intermittent auscultation (IA) for fetal monitoring during labour

Desirable effects	– Don't know	– Varies		– Trivial	✓ Small	– Moderate	– Large
Undesirable effects	✓ Don't know	– Varies		– Large	– Moderate	– Small	– Trivial
Certainty of the evidence	– No included studies			– Very low	✓ Low	– Moderate	– High
Values				– Important uncertainty or variability	– Possibly important uncertainty or variability	✓ Probably no important uncertainty or variability	– No important uncertainty or variability
Balance of effects	– Don't know	– Varies	– Favours IA	✓ Probably favours IA	– Does not favour Continuous CTG or IA	– Probably favours Continuous CTG	– Favours Continuous CTG
Resources required	– Don't know	– Varies	✓ Large costs	– Moderate costs	– Negligible costs or savings	– Moderate savings	– Large savings

Certainty of evidence of required resources	✓ No included studies			– Very low	– Low	– Moderate	– High
Cost-effectiveness	– Don't know	– Varies	– Favours IA	✓ Probably favours IA	– Does not favour Continuous CTG or IA	– Probably favours Continuous CTG	– Favours Continuous CTG
Equity	– Don't know	– Varies	– Reduced	✓ Probably reduced	– Probably no impact	– Probably increased	– Increased
Acceptability	– Don't know	✓ Varies		– No	– Probably No	– Probably Yes	– Yes
Feasibility	– Don't know	✓ Varies		– No	– Probably No	– Probably Yes	– Yes

3.2.11 Intermittent fetal heart rate auscultation during labour

RECOMMENDATION 18

Intermittent auscultation of the fetal heart rate with either a Doppler ultrasound device or a Pinard fetal stethoscope is recommended for healthy pregnant women in labour. *(Recommended)*

Remarks

- There is some evidence to suggest that intermittent auscultation (IA) with a handheld Doppler ultrasound device, cardiotocography (CTG), or strict monitoring with Pinard fetal stethoscope could increase the detection of fetal heart rate (FHR) abnormalities, which may in turn reduce hypoxia-ischaemia outcomes. However, the impact on other substantive early and long-term infant outcomes is unclear.
- The GDG stressed that IA of the FHR during labour is essential for intrapartum care, irrespective if the device used, with strict adherence to clinical protocols. The group noted that monitoring of the FHR during labour is inadequate in many low- and middle-income country (LMIC) settings, and this problem needs to be strongly addressed through quality improvement initiatives in these settings.
- The GDG acknowledged the lack of evidence of comparative benefits of different IA protocols and variations in protocols across health care settings. However, the group agreed that standardization of protocol is important for health care planning and medico-legal purposes and, therefore, adopted the following protocol *(113)*.
  - Interval: Auscultate every 15–30 minutes in active first stage of labour, and every 5 minutes in the second stage of labour.
  - Duration: Each auscultation should last for at least 1 minute; if the FHR is not always in the normal range (i.e. 110–160 bpm), auscultation should be prolonged to cover at least three uterine contractions. Timing: Auscultate during a uterine contraction and continue for at least 30 seconds after the contraction.
  - Recording: Record the baseline FHR (as a single counted number in beats per minute) and the presence or absence of accelerations and decelerations.
- Regardless of the method used, a clear explanation of the technique and its purpose should be provided to the woman. The findings of the auscultation should be explained to the woman and the subsequent course of action made clear, to enable shared decision-making.
- The GDG noted that in some low-resource settings it is common to see faulty equipment, multiple types of equipment (due to donation from different development partners, or procurement from nearby countries) and shortages of batteries and other supplies. Use of equipment that requires electricity can be negatively impacted by power cuts in low-income country settings. Therefore, before switching from Pinard fetal stethoscope to Doppler device, it is important to ensure the appropriate resources are available to sustain implementation.

Summary of evidence and considerations

Effects of the intervention (EB Table 3.2.11)

Evidence was derived from a Cochrane systematic review that included three RCTs conducted in Uganda, the United Republic of Tanzania and Zimbabwe, involving 6241 women in labour, but only two studies (excluding the one from the United Republic of Tanzania) were included in the meta-analysis *(122)*.

The trial in Uganda (1987 women without risk factors) compared intermittent use of a Doppler ultrasound device with intermittent monitoring using a Pinard fetal stethoscope. Both methods were performed for 1 minute immediately after a contraction, and this was done every 30 minutes in the first stage, every 15 minutes in the second stage before bearing down, and every 5 minutes in second stage when bearing down.

The Zimbabwe trial (633 women) was a four-arm trial that compared intermittent cardiotocography (CTG), Doppler and two methods of Pinard FHR monitoring (strict and routine practice). In the CTG arm, an external transducer was applied for 10 minutes every half hour to monitor the FHR; it is unclear how consistently the transducer for contractions was applied. The Doppler and "strict" Pinard methods involved a research midwife auscultating the FHR for 1 minute during the last 10 minutes of every half hour, during and immediately after a contraction, whereas the midwives on duty performed auscultation in the "routine practice" arm. Women in this trial had obstetric or medical risk factors (excluding women with placental abruption or eclampsia) and were booked at or transferred to a referral hospital for childbirth. Where data from this trial were included in meta-analyses, the evidence was downgraded for indirectness.

Participants in both trials had term singleton pregnancies with cephalic presentation, and on admission they had cervical dilatation less than or equal to 7 cm and a FHR of 120–160 beats per minute.

Comparison 1: Intermittent monitoring with Doppler ultrasound device compared with routine Pinard fetal stethoscope

Two trials (Uganda and Zimbabwe) contributed data to this comparison.

Maternal outcomes

Mode of birth: The evidence on the effect of these methods on overall caesarean section (any indication) is of very low certainty. Moderate-certainty evidence, derived from the study that included women with risk factors for complications, suggests that intermittent Doppler probably increases caesarean section for fetal distress (1 trial, 627 women, RR 2.71, 95% CI 1.64–4.48) but probably makes little or no difference to instrumental vaginal birth (1 trial, 627 women, RR 1.35, 95% CI 0.78–2.32).

Birth experience: There was no evidence on maternal childbirth experience from these trials, including satisfaction, inability to adopt preferred position during labour, or perceived loss of control during labour.

Fetal and neonatal outcomes

Perinatal hypoxia-ischaemia: Low-certainty evidence suggests that intermittent Doppler may reduce hypoxic-ischaemic encephalopathy (HIE) (1 trial, 627 babies, RR 0.10, 95% CI 0.01–0.78) and neonatal seizures (RR 0.05, 95% CI 0.00–0.91). The absolute difference in HIE is estimated at 29 fewer per 1000 (from 7 to 31 fewer). Evidence on Apgar scores is of very low certainty.

Fetal distress: Low-certainty evidence suggests that a FHR abnormality may be detected more frequently with Doppler than with Pinard auscultation (2 trials, 2598 babies, RR 2.40, 95% CI 1.09–5.29) and that early and late decelerations are probably identified more frequently with Doppler (1 trial, 627 babies, RR 2.72, 95% CI 1.73–4.28) (moderate-certainty evidence).

Perinatal mortality: The evidence for this outcome is of very low certainty.

Long-term infant outcomes: These were not reported in the trials.

Additional considerations

The evidence for most outcomes was based on data from a study among women described as having "high-risk" pregnancies. From the evidence, it is uncertain whether increased identification of early and late decelerations and increased caesarean section for fetal distress translate to improved early and long-term infant outcomes.

Values

Findings from a review of qualitative studies looking at what matters to women during intrapartum care *(23)* indicate that most women want a normal childbirth with good outcomes for mother and baby, but acknowledge that interventions may sometimes be necessary. When interventions are being

considered, women would like to be informed about the nature of the interventions and, where possible, given a choice (high confidence in the evidence). They also value receiving care and attention from technically competent health care providers who are sensitive to their needs (high confidence in the evidence).

Additional considerations

The evidence on effects suggests that Doppler in LMICs may increase detection of FHR abnormalities, it probably increases subsequent caesarean section for fetal distress, and it may reduce perinatal hypoxia-ischaemia. Globally, women place a high value on avoiding severe newborn morbidity such as perinatal hypoxia-ischaemia and neonatal seizures and would be willing to have a healthy baby at the expense of increased caesarean section morbidity.

Resources

No research evidence on relative costs or cost-effectiveness of Doppler compared with Pinard was found.

Additional considerations

Pinard fetal stethoscope is the cheapest method of IA available.

Equity

No evidence on the impact of different types of fetal monitoring on equity was found.

Additional considerations

WHO's 2015 *State of inequality* report indicates that women who are poor, least educated and residing in rural and remote areas have lower access and less health intervention coverage than more advantaged women *(33)*. Studies report that adequate monitoring of labour progress is often lacking in such settings, and that the FHR may only rarely be auscultated *(118–120)*. While Doppler fetal monitors are easier to apply, they are scarce in rural and remote health care facilities as a result of competing health resource needs. The introduction of Doppler monitoring into clinical practice may attract additional costs and therefore its use is more likely in facilities that provide care for more advantaged women.

Acceptability

In a review of qualitative studies exploring women's experiences of labour and childbirth, results suggest that women would prefer a more hands-on, woman-centred approach to care and are likely to favour any technique that allows for this (high confidence in the evidence) *(26)*.

Findings on health care professionals' experiences of labour and childbirth from the same review *(26)*, show that staff like to use a Doppler device because it offers reassurance and potentially leads to better outcomes for women (compared with CTG) (low confidence in the evidence). In certain settings, health care professionals prefer to use a Pinard fetal stethoscope because it facilitates a more woman-centred approach to care (low confidence in the evidence).

Additional considerations

Qualitative findings from health care professionals were derived from high-income settings only.

Doppler also allows a woman to hear the fetal heartbeat, which provides reassurance and could add to its appeal over Pinard fetal monitoring.

Table 3.28 Main resource requirements for intermittent auscultation: Doppler ultrasound device and Pinard fetal stethoscope (comparison 1)

Resource	Description
Staff training	■ Doppler: fairly easy to use without additional training *(32)* ■ Pinard: practice-based training; can take some experience to become proficient *(113)*
Supplies	■ Doppler: ultrasound gel; some require replaceable batteries (1.5V AA) *(112)* ■ Pinard: none
Equipment	■ Doppler: device can cost US$ 95 to US$ 350 *(32, 112)* ■ Pinard: US$ 0.94 *(112)*
Infrastructure	■ Doppler: battery-operated (batteries either need charging or replacing) ■ Pinard: none required
Staff time	■ Doppler: variable (minutes), depending on provider experience ■ Pinard: variable (minutes), depending on provider experience

Feasibility

A qualitative systematic review of women's experiences of labour and childbirth found no feasibility concerns relating to the use of Doppler *(26)*.

The same review also explored health care professionals' views and found that staff believed that Doppler offers a more flexible approach to fetal monitoring and is less expensive to use compared with other similar monitoring equipment (low confidence in the evidence) *(26)*. However, findings also suggest that in certain low-income settings the resources associated with using Doppler – in terms of initial purchase costs, training and ongoing maintenance – may be restrictive (low confidence in the evidence).

Additional considerations

A Pinard fetal stethoscope is the least expensive option; however, Doppler is probably easier to use and therefore might be more feasible in settings with few midwives if the device is available and if equipment maintenance and a continuous supply of batteries is assured.

Table 3.29 Summary of judgements: Intermittent auscultation using Doppler ultrasound device compared with Pinard fetal stethoscope (comparison 1)

Desirable effects	– Don't know	– Varies		– Trivial	✓ Small	– Moderate	– Large
Undesirable effects	– Don't know	– Varies		– Large	– Moderate	– Small	✓ Trivial
Certainty of the evidence	– No included studies			– Very low	✓ Low	– Moderate	– High
Values				– Important uncertainty or variability	– Possibly important uncertainty or variability	✓ Probably no important uncertainty or variability	– No important uncertainty or variability
Balance of effects	– Don't know	– Varies	– Favours Pinard	– Probably favours Pinard	– Does not favour Doppler or Pinard	✓ Probably favours Doppler	– Favours Doppler
Resources required	– Don't know	– Varies	– Large costs	✓ Moderate costs	– Negligible costs or savings	– Moderate savings	– Large savings
Certainty of evidence of required resources	✓ No included studies			– Very low	– Low	– Moderate	– High
Cost-effectiveness	– Don't know	– Varies	– Favours Pinard	✓ Probably favours Pinard	– Does not favour Doppler or PInard	– Probably favours Doppler	– Favours Doppler
Equity	– Don't know	– Varies	– Reduced	✓ Probably reduced	– Probably no impact	– Probably increased	– Increased
Acceptability	– Don't know	✓ Varies		– No	– Probably No	– Probably Yes	– Yes
Feasibility	– Don't know	✓ Varies		– No	– Probably No	– Probably Yes	– Yes

Comparison 2: Intermittent cardiotocography (CTG) compared with routine Pinard fetal stethoscope

Evidence was derived from the four-arm trial conducted in Zimbabwe, which for this comparison involved 633 women and babies. The "routine practice" Pinard group received "usual care" from the midwives on duty. As mentioned above, participants in this study were women with risk factors for complications; therefore, this evidence has been downgraded for indirectness.

Maternal outcomes

Mode of birth: Moderate-certainty evidence suggests that intermittent CTG probably increases caesarean section compared with routine Pinard monitoring (RR 1.92, 95% CI 1.39–2.64), particularly for fetal distress (RR 2.92, 95% CI 1.78–4.80). Low-certainty evidence suggests that it probably makes little or no difference to instrumental vaginal birth (RR 1.46, 95% CI 0.86–2.49).

Birth experience: There was no evidence on any element of maternal birth experience from this trial, including satisfaction, inability to adopt preferred position during labour, or perceived loss of control during labour.

Fetal and neonatal outcomes

Perinatal hypoxia-ischaemia: Low-certainty evidence suggests that intermittent CTG may reduce hypoxic-ischaemic encephalopathy (HIE) (RR 0.20, 95% CI 0.04–0.90) and neonatal seizures (RR 0.05, 95% CI 0.00–0.89). The absolute difference in HIE based on this limited data set is estimated at 25 fewer per 1000 (from 3 to 30 fewer). Evidence on Apgar scores of less than 7 at 5 minutes is of very low certainty. Cord blood acidosis was not reported in this trial.

Fetal distress: Moderate-certainty evidence suggests that intermittent CTG probably increases the diagnosis of a FHR abnormality (RR 6.08, 95% CI 4.21–8.79), including early and late FHR decelerations (RR 2.84, 95% CI 1.82–4.45). The absolute difference in detecting early and late decelerations based on this limited data set is estimated at 134 more per 1000 (from 60 to 252 more).

Perinatal mortality: Evidence on this outcome is of very low certainty.

Long-term infant outcomes: These were not reported in this trial.

Additional considerations

The evidence for this comparison is based on data from a single study among women described as having "high-risk" pregnancies; therefore, the beneficial effects could be over-estimated. From the evidence, it is uncertain whether increased identification of early and late decelerations, and increased caesarean section for fetal distress, translated to improved early and long-term infant outcomes.

Values

Findings from a review of qualitative studies looking at what matters to women during intrapartum care *(23)* indicate that most women want a normal childbirth with good outcomes for mother and baby, but acknowledge that interventions may sometimes be necessary. When interventions are being considered, women would like to be informed about the nature of the interventions and, where possible, given a choice (high confidence in the evidence).

Additional considerations

The evidence on effects suggests that intermittent CTG in LMICs may increase detection of FHR abnormalities, and may reduce perinatal hypoxia-ischaemia at the expense of subsequent caesarean section for fetal distress. Globally, women place a high value on avoiding severe newborn morbidity such as perinatal hypoxia-ischaemia and may be willing to have a healthy baby at the expense of caesarean section morbidity.

Resources

No research evidence on relative costs or cost-effectiveness of different types of IA was found.

Equity

No evidence on the impact on equity was found.

Additional considerations

WHO's 2015 *State of inequality* report indicates that women who are poor, least educated and residing in rural and remote areas have lower access to health intervention coverage than more advantaged women *(33)*. Studies report that adequate monitoring of labour progress is often lacking in such settings, and that the FHR may only rarely be auscultated *(118–120)*. Electronic fetal monitors are scarce in rural and remote health care facilities as a result of other competing health resource needs. An investment in CTG will likely attract additional costs for the women and for the facilities and therefore its use is more likely in facilities that provide care for more

Table 3.30 Main resource requirements for intermittent auscultation: cardiotocography (CTG) and Pinard fetal stethoscope (comparison 2)

Resource	Description
Staff training	■ CTG: practice-based training on how to apply the equipment and how to interpret the findings *(112)* ■ Pinard: practice-based training; takes less experience to become proficient *(113)*
Supplies	■ CTG: ultrasound gel, thermal paper,[a] fuses *(112)* ■ Pinard: none
Equipment	■ CTG: a machine costs US$ 1457.16 *(112)*; one machine and one bed per woman for the duration of monitoring ■ Pinard: US$ 0.94 *(112)* ■ Maintenance costs: CTG (none for Pinard)
Infrastructure	■ CTG: requires a wall plug for power ■ Pinard: none required
Staff time	■ CTG: tracing needs regular monitoring and interpretation by trained personnel ■ Pinard: variable, depending on provider experience

[a] The cost of electrocardiograph (ECG) paper has been estimated at US$ 0.03 per use *(112)*. The cost of cardiotocography (CTG) paper varies but might plausibly be similar to this estimate for a 15 to 30 cm length (assuming a paper speed of 1 cm/minute). Based on this estimate, paper might cost US$ 0.48 for a labour lasting 8 hours (US$ 0.03 x 16).

advantaged women. CTG might also reduce equity if it leads to a cascade of interventions that can only be afforded by more advantaged women and those in well resourced settings.

Acceptability

In a review of qualitative studies exploring women's and health care providers' experiences of labour and childbirth, results suggest that some women find the use of CTG reassuring but feel restricted by the equipment and would prefer a more hands-on, woman-centred approach (low confidence in the evidence) *(26)*.

From the same review *(26)*, findings show that staff feel CTG is overused and may lead to unnecessary interventions (moderate confidence in the evidence). From a midwifery perspective, staff believe that CTG undermines traditional, woman-focused skills (moderate confidence in the evidence) and may be used to "babysit" when staffing levels are low (low confidence in the evidence). While some staff believe that the use of CTG offers reassurance, many do not trust the technology and feel pressured to use it in a defensive manner to temper organizational fears of litigation (high confidence in the evidence). In addition, some health care professionals do not feel sufficiently trained to interpret CTG tracings and acknowledge that understanding and interpretation can be inconsistent (high confidence in the evidence).

Additional considerations

Qualitative findings were derived from HIC settings only. New wireless methods of CTG may be more acceptable to women than existing CTG as they allow women to remain mobile during labour; these methods are undergoing evaluation for use in LMIC settings *(123)*.

Feasibility

Findings from a qualitative systematic review of women's views and experiences of labour and childbirth suggest that CTG may restrict women's movement (low confidence in the evidence) *(26)*.

The same review explored health care professionals' views and experiences of labour and childbirth; the findings indicate that many health care professionals believe CTG tends to be overused and might lead to unnecessary interventions (moderate confidence in the evidence). This is likely to have cost implications. Findings also suggest that, where possible, health care professionals prefer to use a Doppler device because of the greater flexibility it allows and because they believe it leads to better outcomes (compared with CTG). In addition, although health care professionals believe that CTG is cheaper to use (compared with other high-tech alternatives), they recognize that financial constraints may lead to poor maintenance and limited availability of accessories in certain contexts.

Additional considerations

These qualitative findings were derived from HIC settings only. A Pinard fetal stethoscope is likely to be the cheapest option in low-resource settings. The need for ongoing maintenance and supplies with CTG reduces its feasibility in LMICs.

Table 3.31 Summary of judgements: Intermittent cardiotocography (CTG) versus Pinard fetal stethoscope (comparison 2)

Desirable effects	– Don't know	– Varies		– Trivial	✓ Small	– Moderate	– Large
Undesirable effects	– Don't know	– Varies		– Large	– Moderate	✓ Small	– Trivial
Certainty of the evidence	– No included studies			– Very low	✓ Low	– Moderate	– High
Values				– Important uncertainty or variability	– Possibly important uncertainty or variability	✓ Probably no important uncertainty or variability	– No important uncertainty or variability
Balance of effects	– Don't know	– Varies	– Favours Pinard	– Probably favours Pinard	✓ Does not favour intermittent CTG or Pinard	– Probably favours intermittent CTG	– Favours intermittent CTG
Resources required	– Don't know	– Varies	✓ Large costs	– Moderate costs	– Negligible costs or savings	– Moderate savings	– Large savings
Certainty of evidence of required resources	✓ No included studies			– Very low	– Low	– Moderate	– High
Cost-effectiveness	– Don't know	– Varies	– Favours Pinard	✓ Probably favours Pinard	– Does not favour intermittent CTG or Pinard	– Probably favours intermittent CTG	– Favours intermittent CTG
Equity	– Don't know	– Varies	✓ Reduced	– Probably reduced	– Probably no impact	– Probably increased	– Increased
Acceptability	– Don't know	✓ Varies		– No	– Probably No	– Probably Yes	– Yes
Feasibility	– Don't know	✓ Varies		– No	– Probably No	– Probably Yes	– Yes

Comparison 3: "Strict" (or intensive) monitoring compared with "routine" monitoring with Pinard fetal stethoscope

Evidence for this comparison was derived from the Zimbabwe trial that included women with risk factors for complications (1 trial, 625 women and babies); therefore, it has been downgraded for indirectness.

Maternal outcomes

Mode of birth: Low-certainty evidence suggests that there may be little or no difference between intensive and routine Pinard monitoring in terms of caesarean section for any indication (RR 0.71, 95% CI 0.46–1.08), caesarean section due to fetal distress (RR 0.70, 95% CI 0.35–1.38) and instrumental vaginal birth (RR 1.21, 95% CI 0.69–2.11).

Birth experience: There was no evidence on maternal birth experience from this trial, including satisfaction, inability to adopt preferred position during labour, or perceived loss of control during labour.

Fetal and neonatal outcomes

Perinatal hypoxia-ischaemia: Evidence on Apgar scores less than 7 at 5 minutes, neonatal seizures and hypoxic-ischaemic encephalopathy (HIE) is of very low certainty.

Fetal distress: Moderate-certainty evidence suggests that intensive Pinard monitoring probably

increases the diagnosis of a FHR abnormality (RR 1.71, 95% CI 1.10–2.65), but may not do so for early and late FHR decelerations (RR 1.33, 95% CI 0.79–2.23) (low-certainty evidence).

Perinatal mortality: Evidence on this outcome is of very low certainty.

Long-term infant outcomes: These were not reported in this trial.

Additional considerations

From the evidence, it is uncertain whether increased identification of a FHR abnormality leads to improved birth and long-term infant outcomes.

Values

Findings from a review of qualitative studies looking at what matters to women during intrapartum care *(23)* indicate that most women want a normal childbirth with good outcomes for mother and baby, but acknowledge that medical intervention or assessment may sometimes be necessary. Where this is the case, they would like to receive relevant information from technically competent health care providers who are sensitive to their needs (high confidence in the evidence).

Resources

No research evidence on resources was found.

Additional considerations

The two study arms in the Zimbabwe study appear to reflect research-context (rigorous) practice versus typical daily (less-rigorous) practice. It is plausible that more rigorous fetal monitoring is more resource intensive in terms of staff time.

Main resource requirements: See resource requirements in comparison 2 (Table 3.30).

Equity

WHO's 2015 *State of inequality* report indicates that women who are poor, least educated and residing in rural and remote areas have lower access to health intervention coverage than more advantaged women *(33)*. In these settings, it is likely that FHR monitoring is less rigorous due to a lack of resources and poor quality of care. Studies report that adequate monitoring of labour progress is often lacking in such settings, and that the FHR may only rarely be auscultated *(118–120)*. Addressing this fundamental quality of care issue with appropriate training, supervision and monitoring could have an impact on equity, irrespective of the method of intermittent auscultation.

Acceptability

Findings from a qualitative systematic review of women's and providers' experiences of labour and childbirth *(26)* indicate that women are likely to appreciate the more intimate connection with a health care professional that this strict or intensive monitoring approach enables, provided the practice is conducted by kind, competent staff who are sensitive to their needs (high confidence in the evidence).

The review's findings also suggest that health care professionals like to deliver this kind of woman-centred care provided there are enough resources (staff) to cover the more labour-intensive nature of this approach (high confidence in the evidence).

Additional considerations

The qualitative evidence above suggests that if fetal monitoring were to be performed, women would prefer that competent staff perform it in such a way such that it detects fetal hypoxia in time to avert poor outcomes *(26)*. Women may feel that they are better looked after if their health care providers are providing strict monitoring of the well-being of their baby.

Feasibility

A qualitative systematic review of women's experiences of labour and childbirth found no feasibility concerns relating to the intensive use of Pinard fetal stethoscope.

The same review also explored health care professionals' experiences of providing intrapartum care and found that staff sometimes lacked the time to conduct monitoring using this approach and felt that accurate monitoring required skill and experience that was sometimes difficult to achieve in time-pressured situations (low confidence in the evidence) *(26)*.

Table 3.32 Summary of judgements: Strict compared with routine monitoring with Pinard fetal stethoscope (comparison 3)

Desirable effects	– Don't know	– Varies		✓ Trivial	– Small	– Moderate	– Large
Undesirable effects	– Don't know	– Varies		– Large	– Moderate	– Small	✓ Trivial
Certainty of the evidence	– No included studies			✓ Very low	– Low	– Moderate	– High
Values				– Important uncertainty or variability	– Possibly important uncertainty or variability	✓ Probably no important uncertainty or variability	– No important uncertainty or variability
Balance of effects	– Don't know	– Varies	– Favours routine monitoring	– Probably favours routine monitoring	✓ Does not favour strict or routine monitoring	– Probably favours strict monitoring	– Favours strict monitoring
Resources required	– Don't know	– Varies	– Large costs	– Moderate costs	✓ Negligible costs or savings	– Moderate savings	– Large savings
Certainty of evidence of required resources	✓ No included studies			– Very low	– Low	– Moderate	– High
Cost-effectiveness	– Don't know	– Varies	– Favours routine monitoring	– Probably favours routine monitoring	✓ Does not favour strict or routine monitoring	– Probably favours strict monitoring	– Favours strict monitoring
Equity	– Don't know	– Varies	– Reduced	– Probably reduced	– Probably no impact	✓ Probably increased	– Increased
Acceptability	– Don't know	– Varies		– No	– Probably No	✓ Probably Yes	– Yes
Feasibility	– Don't know	– Varies		– No	– Probably No	✓ Probably Yes	– Yes

3.2.12 Epidural analgesia for pain relief

RECOMMENDATION 19

Epidural analgesia is recommended for healthy pregnant women requesting pain relief during labour, depending on a woman's preferences. *(Recommended)*

Remarks

- The GDG agreed that while there is limited evidence on the impact of epidural analgesia compared with no epidural analgesia for pain relief during labour, epidural analgesia is a proven method for relieving pain related to surgery, including abdominal surgery, and chose to recommend it as a pain relief option.
- Health care professionals should be aware that women's desire for epidural analgesia might be moderated by the clinical context in which they receive antenatal and intrapartum care, whether labour is spontaneous or not, and their access to and knowledge of a range of other forms of pain relief measures.
- It is likely that the care context and the type of care provision and care provider have a strong effect on the need for labour pain relief, and on the kinds of choices women make in relation to this need.
- Both commonly used pharmacological options for pain relief during labour – epidural and opioid analgesic options – have advantages and disadvantages. Epidural analgesia appears to be the more effective pain relief option but compared with opioid analgesia it also requires more resources to implement and to manage its adverse effects, which are more common with epidural analgesia.
- To avoid complications and preserve as much motor function as possible, the lowest possible effective concentration of local anaesthetic should be used when administering epidural analgesia *(124)*.
- For women with epidural analgesia in the second stage of labour, it is recommended that a birth position of the individual woman's choice be facilitated, including an upright birth position. For women with epidural analgesia in the second stage of labour, delaying pushing for one to two hours after full dilatation or until the woman regains the sensory urge to bear down is recommended.

Summary of evidence and considerations

Effects of the intervention (EB Table 3.2.12)

This evidence is derived from a Cochrane systematic review, to which 43 trials contributed data *(125)*.

Comparison 1: Any epidural analgesia compared with placebo or no epidural analgesia

Seven trials involving 897 women compared epidural analgesia with no analgesia. Trials were conducted in hospital settings in China (3 trials) and in Brazil, India, Mexico and Turkey (1 trial each). Sample sizes of individual trials ranged from under 100 to just over 300 women. One trial took place between 1990 and 2000, three from 2010 onwards, and dates were not stated in the other three trials.

All trials used bupivacaine or ropivacaine for the epidural analgesia. Ropivacaine was supplemented with sufentanil in one trial; bupivacaine was supplemented with fentanyl in one trial and with tramadol in another. Patient-controlled epidural analgesia was used in two trials. Three trials used the combined spinal–epidural technique. Control groups included: no analgesia (4 trials, 637 women); no epidural analgesia but other analgesia (not specified) offered (2 trials, 190 women); and continuous support with non-pharmacological analgesia offered to both groups (1 trial, 70 women).

Maternal outcomes

Pain relief: It is uncertain whether epidural analgesia compared with no analgesia reduces pain scores, pain intensity or the need for additional analgesia during labour because the certainty of the evidence for all of these outcomes is very low.

Mode of birth: Moderate-certainty evidence suggests that epidural analgesia probably leads to fewer women undergoing caesarean birth compared with no analgesia (5 trials, 578 women, RR 0.46, 95% CI 0.23–0.90). It is uncertain whether epidural has an effect on instrumental births because the certainty of this evidence is very low.

Duration of labour: It is not clear whether epidural analgesia makes any difference to the length of

the first or second stages of labour compared with placebo, as the certainty of the evidence is very low.

Augmentation of labour: Low-certainty evidence suggests that epidural analgesia may make little or no difference to whether or not women receive oxytocin for labour augmentation (3 trials, 415 women, RR 0.89, 95% CI 0.63–1.24).

Birth experience: Low-certainty evidence from a single trial suggests that epidural may increase the proportion of women reporting they were satisfied or very satisfied with pain relief in labour (70 women, RR 1.32, 95% CI 1.05–1.65). Compared with no analgesia, it is uncertain whether epidural affects women's perceived feelings of poor control in childbirth because the certainty of this evidence is very low.

Side-effects: Review evidence on the relative effect of epidural compared with placebo or no intervention on hypotension, vomiting, fever, drowsiness or urinary retention is very uncertain.

Fetal and neonatal outcomes

Perinatal hypoxia-ischaemia: It is uncertain whether epidural analgesia has an effect on the number of babies born with Apgar scores of less than 7 at 5 minutes because the certainty of this evidence is very low.

Long-term outcomes: These were not reported in the included studies.

Mother–baby interaction and breastfeeding: These were not reported in any of the included trials.

Values

In a review of qualitative studies looking at what matters to women during intrapartum care *(23)*, findings suggest that most women, especially those giving birth for the first time, are apprehensive about childbirth (high confidence in the evidence), and in certain contexts and/or situations may welcome interventions that provide relief from pain (low confidence in the evidence). When interventions are being considered, women would like to be informed about the nature of the interventions and, where possible, given a choice (high confidence in the evidence).

A review of qualitative studies on women's experiences of the use of epidural analgesia when they request pain relief (from HICs only) highlights that women desire and value epidural analgesia when its use alleviates labour pain effectively, and they also value that it enables them to retain control over childbirth (moderate confidence in the evidence) *(126)*. However, some women are fearful of receiving an epidural injection due to potential pain and complications, and there were mixed views on whether the pain relief provided was actually effective or ineffective in their experience (low confidence in the evidence). Some women perceive that epidural analgesia helped them to have a positive childbirth experience (moderate confidence in the evidence). Women value the opportunity to make a choice about this method of pain relief and value the support of professionals and family members for their decision on pain-relief (low confidence in the evidence).

Additional considerations

All the included qualitative studies on the use of epidural analgesia were undertaken in high-income settings. Six were undertaken in the USA. It was not possible to identify, within the included studies, whether women had had augmentation, induction of labour or other forms of intervention that may have influenced how they valued the outcomes associated with this form of pain relief.

In some cultures, women might consider labour pain an integral part of childbirth and view physical expression of pain or discomfort as a sign of weakness. In addition, some women might view the use of epidural analgesia as an intervention that negatively impacts their sense of control during labour and childbirth.

Resources

No recent reviews on costs and cost-effectiveness were found; however, a 2002 USA review of the cost-effectiveness of epidural compared with opioid analgesia suggests that providing epidural analgesia for labour pain relief costs more than opioid analgesia *(127)*. In the review, the mean cost of a hospital-based vaginal birth was US$ 3117, and the incremental expected cost of providing epidural analgesia was estimated at US$ 338 (1998 values), primarily due to higher costs for health care professionals (estimated at US$ 238) and increased costs associated with complications (estimated at US$ 120). The costs modelled for epidural analgesia assumed more instrumental vaginal births (14% vs 10%), fever (24% vs 6%), oxytocin augmentation (45% vs 35%), urinary retention (2.7% vs 0.13%), postural puncture headache (1.5% vs 0%), hypotension requiring treatment (30% vs 0%) and a longer duration of labour (7 hours versus 6 hours for the first stage, and 1.75 hours versus 1.5 hours for the second stage) than opioid analgesia, in addition to a higher rate of less-common complications. Opioid analgesia costs assumed a higher incidence of respiratory depression among women receiving

Table 3.33 Main resource requirements for epidural analgesia

Resource	Description
Staff	■ An anaesthetist or other specialized health care professional with training in epidural insertion and management ■ An obstetrician or other specialized health care professional with training in performing instrumental birth
Training	■ Specialist medical training is required
Supplies	■ Infusion solution, sterile pack (including gloves, gown, hat, mask, sterile drapes), epidural insertion kit, intravenous catheter, appropriate medicines for resuscitation, oxygen
Equipment and infrastructure	■ Drip stand, infusion pump, full resuscitation equipment
Time	■ Time to administer the epidural analgesia ■ Time to monitor the woman and the baby during labour and after birth for side-effects
Supervision and monitoring	■ Specialist supervision and monitoring ■ Complications associated with epidural require specialist supervision and management by an anaesthetist and obstetrician (if assisted instrumental birth is required)

opioids (14% vs 2%), a higher incidence of neonatal resuscitation due to respiratory depression (4.5% vs 0.5%) and more pruritis (14% vs 12%). Caesarean section was assumed to occur at the same rate for epidural and opioid analgesia (20%).

Additional considerations

Findings from other studies suggest that costs per birth are substantially higher with epidural analgesia *(128, 129)*. For example, in an Australian study, epidural analgesia use alone was shown to increase the average cost of childbirth by up to 36% depending on the type of health care facility *(129)*. For nulliparous women giving birth in a public health care facility, epidural analgesia increased birth costs by 20%, and when combined with labour augmentation it attracted an additional 24% increase in costs (i.e. 44% increase in total). Findings from a Dutch study comparing routine epidural analgesia with analgesia on request reported that birth costs were higher by €322 (€60 to €355) with routine epidural analgesia, due to higher medication costs, a longer stay in hospital, and more caesarean sections and instrumental vaginal births *(130)*.

The health care professionals required to administer and monitor epidural analgesia, and to perform instrumental births, are probably the main cost component of this intervention. In the Dutch study, costs attributed to the procedure itself were much higher for epidural analgesia (€122) compared with opioid analgesia (€15).

In many settings, women undergoing epidural analgesia cannot be managed in midwife-led birthing units but, rather, are managed at a higher level of care (i.e. hospital obstetric units), such that bed costs are also likely to be higher. Labour ward stays are also likely to be longer with epidural, due to the potential for longer duration of labour and postpartum monitoring.

Equity

No direct evidence was found on the impact of pain relief via epidural analgesia on equity. Indirect evidence from a review of facilitators and barriers to facility-based birth *(8)* indicates that "neglect and delays in receiving care" probably acts as a barrier to facility-based birth (moderate confidence in the evidence). Such neglect and delays might be applicable to labour pain management.

In addition, the review also highlights that many women in LMICs fear "unfamiliar and undesirable" birth practices, which are barriers to facility-based birth (high confidence in the evidence) *(8)*. Some women could perceive epidural injections and other types of injections as unfamiliar and undesirable practices.

Additional considerations

WHO's 2015 *State of inequality* report concluded that there are still large gaps in skilled birth attendance coverage *(33)*. Epidural analgesia for pain relief is commonly used in HICs and among more advantaged women in LMICs. Due to its high resource implications, its availability within countries often varies between facilities and, for example, it is often not available in rural areas where women cannot afford it and the expertise is lacking

(127). Limited findings from one USA study suggest that women with different sociodemographic characteristics might receive a different level of access to epidural analgesia and/or a different level of participation in decision-making in relation to epidural use *(131)*.

Providing effective and timely labour pain relief to disadvantaged women might help to reduce inequalities in intrapartum care directly. Based on the evidence above, it might also impact equity indirectly, by encouraging more disadvantaged women to access facility-based care. However, particularly in LMIC settings, epidural analgesia might be perceived by some women as an unfamiliar and undesirable practice and could act as a barrier to facility-based birth, particularly for women who believe that labour and childbirth are natural processes that do not need intervention, and those who would prefer a traditional approach to pain management.

It has been argued that changing the attitudes of health care professionals and women surrounding labour pain and reducing the medicalization of labour discomfort could empower women to rediscover their innate birthing capabilities *(132)*, which might positively impact equity by reducing epidural analgesia use in high-resource settings.

Acceptability

In a qualitative systematic review exploring women's experiences of epidural analgesia usage *(126)* there were mixed views. Views were influenced by the availability of epidural analgesia and by accounts of others (moderate confidence in the evidence). Some women expressed an a priori desire for an epidural analgesia to help with a pain-free labour, to alleviate a fear of pain and/or to remain in control during labour (moderate confidence in the evidence), while others requested an epidural as a last resort, when the level of pain and/or sense of control over the labour was overwhelming and unmanageable (low confidence in the evidence).

There was evidence that epidural analgesia could help to facilitate a positive labour and childbirth experience by helping women to relax, restore/renew their energy levels and have a sense of control (moderate confidence in the evidence). However, although some women felt supported by health care professionals in their decision to use epidural analgesia, others felt pressurized or persuaded to do so (by health care professionals, through messages received via antenatal education or from family members) (low confidence in the evidence).

Some women who made a decision to receive an epidural analgesia had fears over the procedure and potential risks for themselves and/or their babies (low confidence in the evidence). They experienced negative physiological effects including pain and other complications associated with needle insertion (low confidence in the evidence). Some also felt disconnected from the baby and experienced a range of negative emotions including conflict, guilt, disappointment and a sense of failure (low confidence in the evidence). Some women reported restricted mobility following administration of epidural analgesia (low confidence in the evidence).

Pain relief afforded by epidural analgesia was considered effective for some, but not for all (low confidence in the evidence). Perceived lack of effectiveness was attributed to continuing pain, breakthrough pain and/or timing of administration (e.g. when it was administered too late for it to take effect).

Another qualitative systematic review on women's and health care professionals' experiences of labour and childbirth included health care professionals' views on epidural analgesia *(26)*; however, the evidence was of very low confidence. The evidence suggests that some midwives feel that epidural analgesia is incongruous with the midwifery philosophy, and associate it with side-effects, disconnection from the baby and the potential for further intervention. Evidence also suggests that some health care professionals believe that, if it is used, it may be more appropriate for nulliparous women or for those with an abnormal labour.

Additional considerations

The qualitative review findings on epidural analgesia *(26, 126)* are all from studies conducted in HIC settings where epidural usage is common.

Feasibility

Findings from a qualitative systematic review exploring women's and providers' experiences of labour and childbirth *(26)* indicate that some health care professionals in HICs may encourage women to use epidural analgesia because of a heavy workload and a lack of time to provide supportive options (very low confidence in the evidence).

A perceived lack of effectiveness of epidural analgesia use reported by women in some studies in another qualitative systematic review *(126)* was partly attributed to late administration (low confidence in the evidence), suggesting that there might be logistical issues in implementing this pain relief method.

Additional considerations

All of the findings on epidural analgesia in the qualitative reviews *(26, 126)* came from HIC settings where epidural analgesia is widely available. In lower-resource settings, where it is not so widely used, there are likely to be financial implications as well as additional training considerations, which may negatively impact on the feasibility of implementing this intervention.

Table 3.34 Summary of judgements: Epidural analgesia compared with placebo or no epidural analgesia

Desirable effects	– Don't know	– Varies		– Trivial	✓ Small	– Moderate	– Large
Undesirable effects	✓ Don't know	– Varies		– Large	– Moderate	– Small	– Trivial
Certainty of the evidence	– No included studies			✓ Very low	– Low	– Moderate	– High
Values				– Important uncertainty or variability	✓ Possibly important uncertainty or variability	– Probably no important uncertainty or variability	– No important uncertainty or variability
Balance of effects	– Don't know	– Varies	– Favours opioids or no epidural	– Probably favours opioids or no epidural analgesia	– Does not favour epidural analgesia or no analgesia	✓ Probably favours epidural analgesia	– Favours epidural analgesia
Resources required	– Don't know	– Varies	✓ Large costs	– Moderate costs	– Negligible costs or savings	– Moderate savings	– Large savings
Certainty of evidence of required resources	– No included studies			– Very low	✓ Low	– Moderate	– High
Cost-effectiveness	– Don't know	– Varies	– Favours no epidural analgesia	✓ Probably favours no epidural analgesia	– Does not favour epidural analgesia or no analgesia	– Probably favours epidural analgesia	– Favours epidural analgesia
Equity	– Don't know	– Varies	– Reduced	✓ Probably reduced	– Probably no impact	– Probably increased	– Increased
Acceptability	– Don't know	✓ Varies		– No	– Probably No	– Probably Yes	– Yes
Feasibility	– Don't know	✓ Varies		– No	– Probably No	– Probably Yes	– Yes

Comparison 2: Epidural analgesia compared with parenteral opioid analgesia

Thirty-five trials involving 10 835 women compared epidural analgesia with opioids *(125)*. Trials were conducted in hospital settings in Canada (3 trials), China (2), Egypt (2), Finland (2), India (2), Israel (2), the Netherlands (3), the United Kingdom (2) and the USA *(10)*, and one trial each in Denmark, France, Iran, Kuwait, Malaysia, Norway and Sweden. Sample sizes in individual trials varied considerably, ranging from less than 50 to more than 1000 women. Eleven trials were conducted between 1990 and 2000, six between 2000 and 2010, three between 2010 and 2013, and the dates were not stated in 14 trials.

Bupivacaine or levobupivacaine was used for the epidural analgesia in most of the studies when reported. Bupivacaine was supplemented with fentanyl in 10 of the studies and with tramadol in one study. Levobupivacaine was supplemented with fentanyl in one study. Only four of the studies used the combined spinal–epidural technique. Epidural use was discontinued in the second stage of labour in three studies. Opioids compared included pethidine (17 trials, 6889 women), butorphanol (1 trial, 100 women), fentanyl (3 trials, 447 women) and remifentanil (9 trials, 3462 women), while other opioids were used in the remaining trials. Opioids were administered as patient-controlled intravenous

analgesia in 19 trials, intravenous injection in 10 trials, and intramuscular injection in 5 trials (the route of administration was unclear in 1 trial).

Maternal outcomes

Pain relief: Low-certainty evidence suggests that epidural analgesia may reduce pain scores in women during labour compared with parenteral opioid analgesia (5 trials, 1133 women, standardized mean difference [SMD] -2.64, 95% CI -4.56 to -0.73; this equates to a difference of approximately 3 points lower on a 10-point scale). Low-certainty evidence suggests that women who receive epidural may be more likely than those receiving opioids to rate pain relief as excellent or very good (7 trials, 1911 women, RR 1.47, 95% CI 1.03–2.08). Low-certainty evidence suggests epidural may reduce the need for any additional analgesia (16 trials, 5099 women, RR 0.10, 95% CI 0.04–0.25).

Mode of birth: Low-certainty evidence suggests that epidural may increase instrumental vaginal birth, with 13.2% in the epidural analgesia group having an instrumental vaginal birth compared with 9.6% in the parenteral opioids group (31 trials, 10 343 women, RR 1.43, 95% CI 1.29–1.59). Moderate-certainty evidence suggests that epidural analgesia probably leads to little or no difference in the numbers of women undergoing caesarean birth (34 trials, 10 745 women, RR 1.07, 95% CI 0.97–1.19).

Duration of labour: Moderate-certainty evidence suggests that the length of the first stage of labour is probably increased by approximately 30 minutes for women receiving epidural analgesia compared with parenteral opioids (10 trials, 2654 women, MD 29.79 minutes, 95% CI 12.79–46.79) and low-certainty evidence suggests that the length of the second stage may be increased by approximately 15 minutes (MD 14.96, 95% CI 8.96–20.96).

Augmentation of labour: Low-certainty evidence suggests that augmentation of labour with oxytocin may be increased with epidural analgesia compared with parenteral opioids (20 trials, 8746 women, RR 1.11, 95% CI 1.01–1.22).

Birth experience: Low-certainty evidence from a single trial suggests that epidural analgesia may make little or no difference to women's perception of poor control in childbirth (334 women, RR 1.17, 95% CI 0.62–2.21) or to the number of women reporting they were satisfied or very satisfied with their childbirth experience (332 women, RR 0.95, 95% CI 0.87–1.03).

Side-effects: Low-certainty evidence suggests that epidural analgesia may increase the likelihood of hypotension, although there was considerable inconsistency across trials in the numbers of women reported to have hypotension (10 trials, 4212 women, RR 11.34, 95% CI 1.89–67.95). Moderate-certainty evidence suggests that epidural analgesia is probably associated with a reduced risk of respiratory depression requiring oxygen compared with opioids (5 trials, 2031 babies, RR 0.23, 95% CI 0.05–0.97). It is not clear whether, compared with opioid analgesia, epidural analgesia reduces nausea and vomiting, or maternal drowsiness, as the certainty of the evidence is very low. Low-certainty evidence suggests fever (temperature > 38 °C) may be increased with epidural analgesia (10 trials, 4671 women, RR 2.60, 95% CI 1.82–3.73). Moderate-certainty evidence suggests that, compared with parenteral opioids, the risk of urinary retention is probably increased with epidural analgesia (4 trials, 343 women, RR 9.20, 95% CI 2.28–37.11).

Fetal and neonatal outcomes

Perinatal hypoxia-ischaemia: Low-certainty evidence suggests that there is little or no difference in Apgar scores less than 7 at 5 minutes (23 trials, 9147 babies, RR 0.80, 95% CI 0.58–1.10). Moderate-certainty evidence suggests the number of babies with a cord arterial pH less than 7.2 is probably fewer with epidural analgesia than opioid analgesia (8 trials, 4783 babies, RR 0.81, 95% CI 0.69–0.94); however, low-certainty evidence suggests that there was little or no difference between groups for cord arterial pH less than 7.15 (3 trials, 480 babies, RR 1.17, 95% CI 0.64–2.14). Moderate-certainty evidence suggests that babies whose mothers received epidural analgesia rather than parenteral opioids are probably less likely to need naloxone administration (10 trials, 2645 babies, RR 0.15, 95% CI 0.10–0.23).

Long-term neonatal outcomes: These were not reported in any of the included trials.

Mother–baby interaction and breastfeeding: These were not reported in any of the included trials.

Values

In a review of qualitative studies looking at what matters to women during intrapartum care *(23)*, findings suggest that most women, especially those giving birth for the first time, are apprehensive about childbirth (high confidence in the evidence), and in certain contexts and/or situations may welcome interventions that provide relief from pain (low confidence in the evidence). When interventions are being considered, women would like to be informed about the nature of the interventions and, where possible, given a choice (high confidence in the evidence).

Findings from a review of qualitative studies on women's experiences during labour and childbirth (evidence derived from HICs only) highlights that women desire and value epidural analgesia when its use alleviates labour pain effectively, and they also value that it enables them to retain control over childbirth (moderate confidence in the evidence) *(26)*. However, some women are fearful of receiving an epidural injection due to potential pain and complications, and expressed mixed views on whether the pain relief provided was actually effective or ineffective in their experience (low confidence in the evidence). Some women perceive that epidural analgesia helped them to have a positive childbirth experience (moderate confidence in the evidence).

Women value the opportunity to make a choice about this method of pain relief and value the support of professionals and family members for their decision on pain-relief (low confidence in the evidence).

Additional considerations

All the included qualitative studies on the use of epidural analgesia were undertaken in high-income settings. Six were undertaken in the USA. It was not possible to identify, within the included studies, whether women had had augmentation, induction of labour or other forms of intervention that may have influenced how they valued the outcomes associated with this form of pain relief.

In some cultures, women might consider labour pain as an integral part of childbirth and view physical expression of pain or discomfort as a sign of weakness. In addition, some women might view the use of epidural analgesia as an intervention that negatively impacts their sense of control during labour and childbirth.

Resources

No recent reviews on costs and cost-effectiveness were found; however, a 2002 USA review of the cost-effectiveness of epidural compared with opioid analgesia suggests that providing epidural analgesia for labour pain relief costs more than opioid analgesia *(127)*. In the review, the mean cost of a hospital-based vaginal birth was US$ 3117, and the incremental expected cost of providing epidural analgesia was estimated at US$ 338 (1998 values), primarily due to higher costs for health care professionals (estimated at US$ 238) and increased costs associated with complications (estimated at US$ 120). Costs modelled for epidural analgesia assumed more instrumental vaginal births (14% vs 10%), fever (24% vs 6%), oxytocin augmentation (45% vs 35%), urinary retention (2.7% vs 0.13%), postural puncture headache (1.5% vs 0.0%), hypotension requiring treatment (30% vs 0%), and a longer duration of labour (7 vs 6 hours for the first stage, and 1.75 vs 1.50 hours for the second stage) than opioid analgesia, in addition to a higher rate of less-common complications. Opioid analgesia

Table 3.35 Main resource requirements for epidural and opioid analgesia

Resource	Description
Staff	■ Epidural analgesia: an anaesthetist or other specialized health care professional with training in epidural insertion and management; other trained staff, e.g. nurse trained in monitoring women with epidural analgesia ■ Opioid: a physician is usually needed to prescribe opioids (this varies between countries and settings); however, other staff, such as a midwife or nurse, can administer opioids
Training	■ Epidural analgesia: specialist medical training is required ■ Opioid: fairly easy to administer
Supplies	■ Epidural analgesia: infusion solution, sterile pack (including gloves, gown, hat, mask, sterile drapes), epidural insertion kit, skin cleaning solution, intravenous catheter, appropriate medicines for resuscitation, oxygen ■ Opioid: medicine (e.g. pethidine), needle, syringe, intravenous catheter (optional), skin cleaning solution, oxygen, appropriate medicines for resuscitation
Equipment and infrastructure	■ Epidural analgesia: drip stand, infusion pump, oxygen and full resuscitation equipment ■ Opioid: oxygen and full resuscitation equipment
Time	■ Staff time to administer and monitor epidural analgesia is substantially longer than the time to administer and monitor opioid use
Supervision and monitoring	■ Both epidural analgesia and opioids need supervision and monitoring ■ Complications associated with epidural usually require specialist supervision and management by an anaesthetist and obstetrician (if assisted instrumental birth is required)

costs assumed a higher incidence of respiratory depression among women receiving opioids (14% vs 2%), a higher incidence of neonatal resuscitation due to respiratory depression (4.5% vs 0.5%) and more pruritis (14% vs 12%). Caesarean section was assumed to occur at the same rate for epidural and opioid analgesia (20%).

Additional considerations

Findings from other studies suggest that costs per birth are substantially higher with epidural analgesia *(128, 129)*. For example, in an Australian study, epidural analgesia use alone was shown to increase the average cost of childbirth by up to 36% depending on the type of facility *(129)*. For primiparous women giving birth in a public health facility, epidural analgesia increased birth costs by 20%, and when combined with labour augmentation it attracted an additional 24% increase in costs (i.e. 44% increase in total). Findings from a Dutch study comparing routine epidural analgesia with analgesia on request reported that birth costs were higher by €322 (€60 to €355) with routine epidural analgesia, due to higher medication costs, a longer stay in hospital, and more caesarean sections and instrumental vaginal births *(130)*.

The health care professionals required to administer and monitor epidural analgesia, and to perform instrumental births, are probably the main cost component of this intervention. In the Dutch study, costs attributed to the procedure itself were much higher for epidural analgesia (€122) compared with opioid analgesia (€15).

In many settings, women undergoing epidural analgesia cannot be managed in midwife-led birthing units but, rather, are managed at a higher level of care (i.e. hospital obstetric units), such that bed costs are also likely to be higher. Labour ward stays are also likely to be longer with epidural, due to the potential for longer duration of labour and postpartum monitoring.

Equity

No direct evidence was found on the impact of pain relief via epidural analgesia on equity.

Indirect evidence from a review of facilitators and barrier to facility-based birth *(8)* indicates that "neglect and delays in receiving care" probably acts as a barrier to facility-based birth (moderate confidence in the evidence). Such neglect and delays might be applicable to labour pain management.

In addition, the review also highlights that many women in LMICs fear "unfamiliar and undesirable" birth practices, which are barriers to facility-based birth (high confidence in the evidence) *(8)*. Some women could perceive epidural injections and other types of injections as unfamiliar and undesirable practices.

Additional considerations

WHO's 2015 *State of inequality* report concluded that there are still large gaps in skilled birth attendance coverage *(33)*. Epidural analgesia for pain relief is commonly used in HICs and among more advantaged women in LMICs. Due to its high resource implications, its availability within countries often varies between facilities and, for example, it is often not available in rural areas where women cannot afford it and the expertise is lacking *(127)*. Limited findings from one USA study suggest that women with different sociodemographic characteristics might receive a different level of access to epidural analgesia and/or a different level of participation in decision-making related to epidural use *(131)*.

Providing effective and timely labour pain relief to disadvantaged women might help to reduce inequalities in intrapartum care directly. Based on the evidence above, it might also impact equity indirectly, by encouraging more disadvantaged women to access facility-based care. However, particularly in LMIC settings, epidural analgesia might be perceived by some women as an unfamiliar and undesirable practice and could act as a barrier to facility-based birth, particularly for women who believe that labour and childbirth are natural processes that do not need intervention, and those who would prefer a traditional approach to pain management.

It has been argued that changing the attitudes of health care professionals and women surrounding labour pain (and reducing the medicalization of labour discomfort) could empower women to rediscover their innate birthing capabilities *(132)*, which might positively impact equity by reducing epidural analgesia use in high-resource settings.

Acceptability

In a qualitative systematic review exploring women's intrapartum care experiences *(126)*, there were mixed views of epidural analgesia usage. Views were influenced by the availability of epidural analgesia, and by accounts of others (moderate confidence in the evidence). Some women expressed an a priori desire for an epidural analgesia to help with a pain-free labour, to alleviate a fear of pain and/or to remain in control during labour (moderate

confidence in the evidence), while others requested an epidural as a last resort, when the level of pain and/or sense of control over the labour was overwhelming and unmanageable (low confidence in the evidence).

There was evidence that an epidural could help to facilitate a positive labour and childbirth experience by helping women to relax, to restore/renew their energy levels, and to have a sense of control (moderate confidence in the evidence). However, although some women felt supported by health care professionals in their decision to use epidural analgesia, others felt pressurized or persuaded to do so (by health care professionals, through messages received via antenatal education of from family members) (low confidence in the evidence).

Some women who made a decision to receive an epidural analgesia had fears over the procedure and potential risks for themselves and/or their babies (low confidence in the evidence). They experienced negative physiological effects including pain and other complications associated with needle insertion (low confidence in the evidence). Some also felt disconnected from the baby and experienced a range of negative emotions including conflict, guilt, disappointment and a sense of failure (low confidence in the evidence). Some women reported restricted mobility following administration of epidural analgesia (low confidence in the evidence).

Pain relief afforded by epidural analgesia was considered effective for some, but not for all (low confidence in the evidence). Perceived lack of effectiveness was attributed to continuing pain, breakthrough pain and/or timing of administration (e.g. when it was administered too late for it to take effect).

Another qualitative systematic review on women's and health care providers' experiences of labour and childbirth included health care professionals' views on epidural analgesia *(26)*; however, the evidence was of very low confidence. The evidence suggests that some midwives feel that epidural analgesia is incongruous with the midwifery philosophy, and associate it with side-effects, disconnection from the baby and the potential for further intervention. Evidence also suggests that some health care professionals believe that, if it is used, it may be more appropriate for nulliparous women or for those with an abnormal labour.

Additional considerations

The qualitative review findings *(26, 126)* are all from studies conducted in HIC settings where epidural usage is common.

Feasibility

Findings from a qualitative systematic review of intrapartum care experiences *(26)* indicate that some health care professionals in HICs may encourage women to use epidural analgesia because of a heavy workload and a lack of time (very low confidence in the evidence).

A perceived lack of effectiveness of epidural analgesia use reported by women in some studies included in another systematic review *(126)* was partly attributed to late administration (low confidence in the evidence), suggesting that there might be logistical issues in implementing this pain relief method.

Additional considerations

All of the findings on epidural use in the qualitative reviews *(26, 126)* came from HIC settings where epidural analgesia is widely available. In lower-resource settings, where it is not so widely used, there are likely to be financial implications as well as additional training considerations, which may negatively impact on the feasibility of implementing this intervention.

Table 3.36 Summary of judgements: Epidural analgesia compared with opioid analgesia

Desirable effects	– Don't know	– Varies		– Trivial	– Small	✓ Moderate	– Large
Undesirable effects	Don't know	– Varies		– Large	✓ Moderate	– Small	– Trivial
Certainty of the evidence	– No included studies			– Very low	✓ Low	– Moderate	– High
Values				– Important uncertainty or variability	✓ Possibly important uncertainty or variability	– Probably no important uncertainty or variability	– No important uncertainty or variability
Balance of effects	– Don't know	– Varies	– Favours opioid analgesia	– Probably favours opioid analgesia	✓ Does not favour epidural analgesia or opioid analgesia	– Probably favours epidural analgesia	– Favours epidural analgesia
Resources required	– Don't know	– Varies	✓ Large costs	– Moderate costs	– Negligible costs or savings	– Moderate savings	– Large savings
Certainty of evidence of required resources	– No included studies			– Very low	✓ Low	– Moderate	– High
Cost-effectiveness	– Don't know	– Varies	– Favours opioid analgesia	✓ Probably favours opioid analgesia	– Does not favour epidural analgesia or opioid analgesia	– Probably favours epidural analgesia	– Favours epidural analgesia
Equity	– Don't know	– Varies	– Reduced	✓ Probably reduced	– Probably no impact	– Probably increased	– Increased
Acceptability	– Don't know	✓ Varies		– No	– Probably No	– Probably Yes	– Yes
Feasibility	– Don't know	✓ Varies		– No	– Probably No	– Probably Yes	– Yes

3.2.13 Opioid analgesia for pain relief

RECOMMENDATION 20

Parenteral opioids, such as fentanyl, diamorphine and pethidine, are recommended options for healthy pregnant women requesting pain relief during labour, depending on a woman's preferences. *(Recommended)*

Remarks

- Many women appreciate some form of pain relief in labour and would like a choice of options. The evidence suggests that opioids probably provide some relief from pain during labour, despite having some undesirable side-effects, such as drowsiness, nausea and vomiting.
- Despite being widely available and used, pethidine is not the preferred opioid option, as shorter-acting opioids tend to have fewer undesirable side-effects.
- Before use, health care providers should counsel women about the potential side-effects of opioids, including maternal drowsiness, nausea and vomiting, and neonatal respiratory depression, and about the alternative pain relief options available.
- It is important that health care providers take care to ensure that the correct dosage is administered, as opioid overdose can have serious consequences.
- Stakeholders should be aware that the care context and the type of care provision and care provider might have a strong effect on the need for labour pain relief, and on the kinds of choices women make in relation to this need.
- The GDG agreed that for women who suffer from current or previous opioid addiction, non-opioid methods of pain relief are preferred.
- Health care providers need to be trained to manage side-effects if they arise and must be aware that opioid medication should be securely stored with a register kept of its dispensing, to reduce the risk of abuse.

Summary of evidence and considerations

Effects of the intervention (EB Table 3.2.13)

This evidence is derived from an updated Cochrane systematic review, with 61 trials involving over 8000 women contributing data *(133)*. The trials were conducted in hospital settings in 21 countries: Argentina, Austria, Canada, China, Denmark, Egypt, Germany, Hong Kong Special Administrative Region, India, Iran, the Netherlands, Nigeria, Norway, Pakistan, Singapore, South Africa, Sweden, Thailand, Turkey, the United Kingdom and the USA. The trials were published between 1958 and 2017. Duration of labour was not reported in the review.

Comparison 1: Parenteral opioids compared with placebo or no opioids

Opioids that have been compared with placebo or no analgesia in RCTs include pethidine, pentazocine, tramadol and fentanyl.

Comparison 1.a. Pethidine (intramuscular [IM]) compared with placebo

Four trials involving 406 women compared IM pethidine with a saline placebo. The trials were conducted in hospital settings in Hong Kong Special Administrative Region, Iran (2 trials) and South Africa. Sample sizes in the individual trials ranged from 50 to 150. The trials were published between 1970 and 2014. Two trials used IM pethidine doses of 50 mg and two used doses of 100 mg. Use of subsequent doses was not well described. All used IM saline as placebo.

Maternal outcomes

Pain relief: Low-certainty evidence suggests that IM pethidine may reduce pain scores 30 minutes after administration (reduction of 40 mm on a 100-mm scale) (1 trial, 50 women, RR 25.00, 95% CI 1.56–400.54). Likewise, low-certainty evidence suggests that women receiving pethidine compared with placebo may be more likely to rate pain relief as "good" or "fair" 1 hour after administration (1 study, 116 women, RR 1.75, 95% CI 1.24–2.47). While

low-certainty evidence suggests that IM pethidine may reduce the use of other analgesia (1 trial, 50 women, RR 0.71, 95% CI 0.54–0.94), the evidence on its effect on epidural use is of very low certainty. It is unclear whether satisfaction with pain relief is improved with IM pethidine, as the certainty of the evidence is very low.

Mode of birth: Low-certainty evidence suggests that IM pethidine may make little or no difference to caesarean section rates (2 trials, 380 women, RR 0.79, 95% CI 0.50–1.26). Evidence on any effect on instrumental vaginal birth is of very low certainty.

Side-effects: Low-certainty evidence suggests that IM pethidine may increase maternal drowsiness during labour (2 trials, 166 women, RR 4.67, 95% CI 2.43–8.95). Moderate-certainty evidence suggests IM pethidine increases nausea and vomiting compared to placebo (3 trials, 406 women, RR 1.90, 95% CI 1.06–3.40).

Birth experience, mother–baby interaction, breastfeeding: These were not reported in any of the included trials.

Fetal and neonatal outcomes

Perinatal hypoxia-ischaemia (Apgar scores < 7): The evidence is of very low certainty.

Long-term adverse infant outcomes: These were not reported in any of the included trials.

Comparison 1.b. Pethidine (intravenous [IV]) compared with placebo

One trial with 240 women conducted in Egypt compared IV pethidine with placebo.

Maternal outcomes

Pain relief: Low-certainty evidence suggests that IV pethidine may reduce pain scores (1 trial, 240 women, MD -4.1, 95% CI -3.64 to -4.56).

Mode of birth: Evidence of any effect on instrumental vaginal birth and caesarean section is of very low certainty.

Side-effects: Low-certainty evidence suggests that nausea and vomiting may be increased for women receiving IV pethidine (1 trial, 240 women, RR 2.43, 95% CI 1.05–5.64). No other side-effects were reported.

Birth experience, mother–baby interaction, breastfeeding: These were not reported in the included trial.

Fetal and neonatal outcomes

Perinatal hypoxia-ischaemia: This was not reported in the included trial.

Long-term neonatal outcomes: These were not reported in the included trial.

Comparison 1.c. Pentazocine (IM) compared with placebo

One three-arm trial conducted in Pakistan involving 150 women compared pentazocine (IM, 30 mg) with a saline placebo. The trial was published in 2016.

Maternal outcomes

Pain relief: Low-certainty evidence suggests that IM pentazocine may make little or no difference to pain scores compared with placebo (1 trial, 89 women, MD -3.6, 95% CI -9.91 to 2.71).

Mode of birth: Low-certainty evidence suggests IM pentazocine may make little or no difference to caesarean or instrumental vaginal birth (1 trial, 89 women, RR 0.89, 95% CI 0.24–3.25 and RR 0.60, 95% CI 0.10–3.39, respectively).

Side-effects: None of the women in this trial reported vomiting. Other side-effects were not reported.

Birth experience, mother–baby interaction, breastfeeding: These were not reported in this trial.

Fetal and neonatal outcomes

No fetal or neonatal outcomes were reported in this trial.

Comparison 1.d. Tramadol (IM) compared with no analgesia

One trial involving 60 women compared women receiving tramadol (IM, 100 mg) with a group receiving no analgesia. The trial was conducted in a hospital setting in China, and published in 1994. The evidence of the effects of tramadol on labour pain relief and other outcomes is very uncertain.

Comparison 1.e. Fentanyl (IV) compared with no analgesia

One trial involving 70 women compared fentanyl (IV, 2 doses of 25 mcg, an hour apart) with a control group receiving no analgesia. The trial was conducted in a hospital setting in Iran, and published in 2016. The evidence of the effects of fentanyl on labour pain relief and other outcomes is very uncertain.

Summary of the main findings for comparison 1

The evidence suggests that pethidine may provide labour pain relief but may also be associated with more side-effects (nausea, vomiting and drowsiness) compared with placebo. Pentazocine may make little difference to pain scores. Evidence on the effects of tramadol and fentanyl on pain relief in labour and other outcomes is of very low certainty.

Additional considerations

The Cochrane systematic review *(133)* also included other comparisons – between different opioids, and between opioids and other analgesia (inhaled analgesia, transcutaneous electrical nerve stimulation [TENS] and complementary methods) – which were not presented in this framework; evidence on these options was predominantly from single studies and assessed in the review to be of low or very low certainty.

Evidence from another Cochrane systematic review *(125)* of epidural analgesia included a comparison of epidural analgesia with opioids (35 trials, 10 835 women). Findings suggest that epidural may be more effective in reducing pain during labour compared to parenteral opioids. With epidural analgesia, pain scores in women during labour may be reduced compared with parenteral opioid analgesia, women may be more likely to rate pain relief as excellent or very good, and the need for any additional analgesia may be reduced (all low-certainty evidence). However, epidural analgesia probably increases labour duration (moderate-certainty evidence) and may increase the need for interventions during labour (e.g. labour augmentation, instrumental vaginal birth) (low-certainty evidence). There is probably little or no difference between the two pain relief options in relation to low Apgar scores (low-certainty evidence).

Repeated use of opioid analgesics is associated with the development of psychological and physical dependence. In view of worldwide drug addiction problems and associated adverse events, there have been recent concerns expressed about prescribing opioids for the relief of acute and chronic pain *(134)*. These concerns are probably less applicable to use of opioids for pain relief in labour *(135, 136)*; however, the long-term effects of opioid analgesia on women and their offspring are not known.

Values

In a review of qualitative studies looking at what matters to women during intrapartum care *(23)*, findings suggest that most women, especially those giving birth for the first time, are apprehensive about childbirth (high confidence in the evidence), and in certain contexts and/or situations may welcome interventions that provide relief from pain (low confidence in the evidence). When interventions are being considered, women would like to be informed about the nature of the interventions and, where possible, given a choice (high confidence in the evidence).

A qualitative systematic review exploring women's experiences of opioid use during labour could only identify very low-confidence evidence *(126)*. The findings suggest that some women value opioids to help them cope with intense and unmanageable labour pains. Mixed responses were identified in terms of whether the pain relief was effective or ineffective and whether it had a positive or negative impact on their labour and childbirth experience.

The data available for this qualitative review were very limited: only three studies, including two in HICs and one in an upper-middle-income country. One study contained minimal data to inform the review, and one involved qualitative interviews with women involved in an RCT evaluating different opioid regimens. All participants were women who had requested pain relief.

It was not possible to identify, within the included studies, whether women had had augmentation, induction of labour or other forms of intervention that may have influenced their valuation of the outcomes associated with this form of pain relief.

Resources

No evidence on the relative cost or cost-effectiveness of the different opioid analgesics was found. However, a USA review of the cost-effectiveness of epidural analgesia compared with opioid analgesia found opioid analgesia to be more cost-effective than epidural analgesia, due to the higher costs of health care professionals associated with administering epidural, as well as higher costs associated with managing complications *(127)*.

Opioid administration in a Dutch study published in 2016 was associated with an estimated unit cost of €15 (about US$ 18) per procedure (including staff costs) *(130)*.

Additional considerations

While in some high-resource settings parenteral opioid medicines are considered relatively inexpensive, these medicines may not be accessible in all settings, and in some LMICs they may not be affordable *(136, 137)*.

Table 3.37 Main resource requirements for opioid analgesia

Resource	Description
Staff	■ A physician is usually needed to prescribe opioids (this is not the case in all countries; in some settings midwives can also prescribe opioids) ■ Other staff, such as a midwife or nurse, can administer opioids
Training	■ Usual health care provider training to administer medications; opioids are fairly easy to administer as an intravenous (IV) or intramuscular (IM) injection ■ Training to monitor and manage side-effects and complications
Supplies	■ Opioid (e.g. pethidine), needle, syringe, intravenous catheter (optional), skin cleansing solution ■ Anti-emetics for preventing or treating associated nausea/vomiting ■ Naloxone for reversing respiratory depression if necessary
Equipment and infrastructure	■ Oxygen saturation monitor
Time	■ An estimated 2–10 minutes to obtain, prepare and administer
Supervision and monitoring	■ Supervision of administration and monitoring for side-effects ■ Secure method of storing opioids and recording opioid use to avoid abuse

A dose of pethidine or fentanyl can cost less than US$ 1; tramadol can cost about US$ 1.30; diamorphine and meptazinol can cost around US$ 3 per dose; and remifentanil can cost around US$ 6.50 per dose. Naloxone (to reverse respiratory depression) costs about US$ 6 per dose.[1]

Equity

No direct evidence was found on the impact of pain relief with parenteral opioids on equity. Indirect evidence from a review of facilitators and barrier to facility-based birth *(8)* indicates that "neglect and delays in receiving care" probably acts as a barrier to facility-based birth (moderate confidence in the evidence). Such neglect and delays might be applicable to labour pain management.

The review also highlights that many women in LMICs fear "unfamiliar and undesirable" birth practices, which are barriers to facility-based birth (high confidence in the evidence). It is possible that some women might perceive injections to be unfamiliar and undesirable practices.

Additional considerations

WHO's 2015 *State of inequality* report concluded that there are still large gaps in skilled birth attendance coverage *(33)*. Providing effective and timely labour pain relief to disadvantaged women might help to reduce inequalities in intrapartum care directly. Based on the limited evidence above, it might also impact equity indirectly, by encouraging more disadvantaged women to access facility-based care. However, in LMIC settings, some women may perceive medical pain relief options as unfamiliar and undesirable, which could act as a barrier to facility-based birth, particularly for women who believe that labour and childbirth are natural processes that do not need intervention, and those who would prefer a traditional approach to pain management.

If women requesting pain relief are offered a choice of pharmacological and non-pharmacological (including traditional and cultural preferences) options, it might help to address inequalities in intrapartum care.

Women requesting pain relief should be informed of the effects (desirable and undesirable) of the respective pharmacological options and be empowered to participate in the decision-making processes relating to labour and childbirth, including pain management.

It has been argued that changing the attitudes of health care professionals and women surrounding labour pain (and reducing the medicalization of labour discomfort) could empower women to rediscover their innate birthing capabilities *(132)*, which might positively impact equity by reducing the medicalization of childbirth among more advantaged women.

Acceptability

In a qualitative systematic review exploring women's experiences of opioid use for pain relief during labour, there were mixed views *(126)*.

[1] British National Formulary website: https://bnf.nice.org.uk/

Some women requested opioids due to intense and unmanageable labour pains (very low confidence in the evidence). Opioids were reported to be an effective (very low confidence in the evidence) or ineffective form of pain relief (very low confidence in the evidence). Women continued to experience pain due to the pain relief method being ineffective, being provided too late or wearing off too early (very low confidence in the evidence).

Some women experienced negative physiological (e.g. sickness, distorted cognitive processes, inability to achieve a physiological birth) and psychological (e.g. disappointment) impacts (very low confidence in the evidence). However, other review findings highlight that opioids increased women's enjoyment, shortened and reduced the intensity of the contractions, and aided them to achieve a physiological birth (very low confidence in the evidence).

Following opioid use, some women were disappointed due to an over-reliance on staff to administer the medication for them, and a lack of caregiver support (very low confidence in the evidence). Women were also not always fully aware of the route of administration or the risks of opioid use (very low confidence in the evidence).

In another review that included health care provider experiences *(26)*, no qualitative accounts of health care professionals' views of opioid use in women during labour and childbirth were identified.

Additional considerations

Overall, the review on women's experiences of pain relief options *(126)* highlights the lack of high-quality qualitative evidence. While confidence in the evidence is very low, the majority of negative comments were expressed towards IM pethidine use, whereas opinions on intranasal and subcutaneous fentanyl were generally far more positive.

It was not possible to identify, within the included studies, whether women valued the outcomes associated with opioids differently if they had had augmentation, induction of labour or other forms of intervention.

It has been suggested in other studies that the care context and the type of care provision and care provider have a strong effect on the need for labour pain relief, and on the kinds of choices women make in relation to this need *(138, 139)*.

Feasibility

In a qualitative systematic review exploring women's experiences of opioid use during labour *(126)*, the lack of effectiveness of opioids to relieve pain was sometimes attributed to late administration (very low confidence in the evidence), which suggests the need for more timely and sensitive use of this pain relief method.

Additional considerations

In low-resource settings, where opioids are not so widely available and used, there are likely to be financial implications as well as additional training requirements for their administration and for the management of potential maternal and neonatal side-effects.

Table 3.38 Summary of judgements: Opioid analgesia compared with no opioid analgesia

Desirable effects	– Don't know	– Varies		– Trivial	– Small	✓ Moderate	– Large
Undesirable effects	– Don't know	– Varies		– Large	✓ Moderate	– Small	– Trivial
Certainty of the evidence	– No included studies			✓ Very low	– Low	– Moderate	– High
Values				– Important uncertainty or variability	✓ Possibly important uncertainty or variability	– Probably no important uncertainty or variability	– No important uncertainty or variability
Balance of effects	– Don't know	– Varies	– Favours no opioid	– Probably favours no opioid	✓ Does not favour opioid or no opioid	– Probably favours opioid	– Favours opioid
Resources required	– Don't know	– Varies	– Large costs	✓ Moderate costs	– Negligible costs or savings	– Moderate savings	– Large savings

Certainty of evidence of required resources	– No included studies			– Very low	✓ Low	– Moderate	– High
Cost-effectiveness	– Don't know	– Varies	– Favours no opioid	✓ Probably favours no opioid	– Does not favour opioid or no opioid	– Probably favours opioid	– Favours opioid
Equity	– Don't know	✓ Varies	– Reduced	– Probably reduced	– Probably no impact	– Probably increased	– Increased
Acceptability	– Don't know	✓ Varies		– No	– Probably No	– Probably Yes	– Yes
Feasibility	– Don't know	✓ Varies		– No	– Probably No	– Probably Yes	– Yes

Comparison 2: Parenteral opioids (various types) compared with pethidine

Comparison 2.a. Meptazinol (IM) compared with pethidine (IM)

Eight trials involving 2222 women compared IM meptazinol with IM pethidine. Trials were conducted in hospital settings in Denmark (2 trials), South Africa (2 trials) and the United Kingdom (6 trials). Sample sizes in individual trials ranged from 46 to 1100. The trials were published between 1981 and 1988.

Maternal outcomes

Pain relief: Compared with pethidine, it is not clear whether IM meptazinol makes any difference to pain scores, or to the use of additional analgesia or epidural, as the certainty of the evidence is very low. Low-certainty evidence suggests there may be little or no difference between groups for rating pain relief as "poor" (more than 60% in both groups) (1 trial, 801 women, RR 1.01, 95% CI 0.91–1.12).

Mode of birth: Low-certainty evidence suggests there may be little or no difference in assisted vaginal birth (3 trials, 1266 women, RR 1.00, 95% CI 0.81–1.22), while it is not clear whether there is a difference between meptazinol and pethidine for caesarean birth, as the certainty of the evidence is very low.

Side-effects: Moderate-certainty evidence suggests vomiting is increased with meptazinol (3 trials, 1589 women, RR 1.25, 95% CI 1.06–1.47), while low-certainty evidence suggests there is little or no difference between groups for maternal drowsiness (3 trials, 1590 women, RR 0.55, 95% CI 0.28–1.07).

Breastfeeding: It is not clear whether meptazinol affects breastfeeding, as the certainty of the evidence is very low.

Other maternal outcomes were not reported in the included trials.

Fetal and neonatal outcomes

Perinatal hypoxia-ischaemia: It is not clear whether meptazinol makes any difference to FHR changes or Apgar scores more than 7 at 5 minutes, as the certainty of the evidence is very low.

Side-effects: Low-certainty evidence suggests that meptazinol may make little or no difference to naloxone administration (1 trial, 975 babies, RR 0.89, 95% CI 0.77–1.02) or neonatal resuscitation (2 trials, 1333 babies, RR 1.0, 95% CI 0.95–1.05) in babies born at 36 weeks of gestation or later.

Long-term adverse infant outcomes: These were not reported in the included trials.

Comparison 2.b. Tramadol (IM) compared with pethidine (IM)

Six trials involving 483 women compared IM tramadol versus IM pethidine. Trials were conducted in hospital settings in Austria, Germany, Iran, Thailand, Turkey and the United Kingdom. Sample sizes in individual trials ranged from 45 to 160. The trials were published between 1980 and 2009.

Maternal outcomes

Pain relief: Low-certainty evidence suggests that compared with pethidine, tramadol may increase the number of women reporting poor pain relief (38.8% vs 25.4%) (4 trials, 243 women, RR 1.56, 95% CI 1.10–2.21). Compared with pethidine, it is not clear whether IM tramadol makes any difference to women's need for additional analgesia, as the certainty of the evidence is very low.

Mode of birth: The evidence on the effect of tramadol compared with pethidine on caesarean birth or assisted vaginal birth is of very low certainty.

Side-effects: Low-certainty evidence suggests that maternal sleepiness may be reduced with tramadol (5 trials, 409 women, RR 0.57, 95% CI 0.33–0.97),

but it is unclear if the opioids are any different in terms of vomiting, as the certainty of the evidence is very low.

Other maternal outcomes were not reported in the trials.

Fetal and neonatal outcomes

Perinatal hypoxia-ischaemia: When compared with pethidine, it is not clear whether tramadol makes any difference to low Apgar scores at 5 minutes, as no events were reported in either group.

Side-effects: It is unclear whether tramadol makes any difference to neonatal respiratory distress, as the certainty of the evidence is very low. There were no neonatal resuscitation events in trials where tramadol was compared with pethidine.

Long-term adverse infant outcomes: These were not reported in the trials.

Comparison 2.c. Tramadol (IM) with trifluprom azine compared with pethidine (IM) with trifluprom azine

A single trial with 40 women conducted in Germany which was published in 1992 compared IM tramadol with IM pethidine; both groups also received trifluprom azine (an antipsychotic sometimes used as an anti-emetic).

Maternal outcomes

Side-effects: It is not clear whether there is any difference between groups for vomiting or sleepiness, as the certainty of the evidence is very low.

Other maternal outcomes were not reported in the trial

Fetal and neonatal outcomes

Fetal/neonatal outcomes were not reported in the trial.

Comparison 2.d. Morphine or diamorphine (IM) compared with pethidine (IM)

Maternal outcomes

Pain relief: One trial involving 484 women in the United Kingdom which was published in 2014 compared IM diamorphine with pethidine. High-quality evidence suggests diamorphine probably slightly lowers maternal pain scores at 30 and 60 minutes compared with pethidine (MD -0.8, 95% CI -1.24 to -0.36 and MD -0.8, 95% CI -1.26 to 0.34, respectively, measured on a 10-point scale) and slightly increases the number of women satisfied with pain relief (RR 1.13, 95% CI 1.02–1.26). From another trial published in 1986 involving 135 women in Thailand, it is unclear whether IM morphine makes any difference to pain relief when compared with pethidine.

Moderate-certainty evidence suggests there is little or no difference in the need for additional analgesia between morphine or diamorphine compared with pethidine (2 trials, 574 women, RR 1.00, 95% CI 0.92–1.10).

Side-effects: Evidence on vomiting and sleepiness from the trial in Thailand with 135 women comparing IM morphine with pethidine is of very low certainty. Another trial in the United Kingdom with 161 women (133 analysed), published in 1999, examined diamorphine versus pethidine, with both groups receiving the anti-emetic prochlorperazine. Low-certainty evidence suggests that IM diamorphine plus prochlorperazine may reduce vomiting compared with pethidine plus prochlorperazine (RR 0.39, 95% CI 0.17–0.86).

Mode of birth: Moderate-certainty evidence suggests there is little or no difference between the groups for caesarean birth (RR 0.94, 95% CI 0.66–1.35) or assisted vaginal birth (RR 1.28, 95% CI 0.91–1.80).

Other maternal outcomes were not reported in these trials.

Fetal and neonatal outcomes

Perinatal hypoxia-ischaemia: Moderate-certainty evidence suggests there is little or no difference between diamorphine or morphine compared with pethidine in neonatal resuscitation (2 trials, 574 babies, RR 0.96, 95% CI 0.66–1.41).

Long-term adverse neonatal outcomes: These were not reported.

Comparison 2.e. Dihydrocodeine (IM) compared with pethidine (IM)

One trial conducted in South Africa with 196 women, which was published in 1970, is included in this comparison.

Maternal outcomes

Pain relief: The certainty of this evidence is very low.

Side-effects: The certainty of evidence on vomiting and sleepiness is very low.

Other maternal outcomes were not reported in the trial.

Fetal and neonatal outcomes

Fetal/neonatal outcomes were not reported in the trial.

Comparison 2.f. Pentazocine (IM) compared with pethidine (IM)

Six trials compared pentazocine with pethidine (IM); all the trials except one are more than 40 years old – the most recent was published in 1980. The certainty of the evidence for all but one of the outcomes reported is very low.

Maternal outcomes

Side-effects: Low-certainty evidence suggests nausea may be lower with pentazocine (3 trials, 391 women, RR 0.46, 95% CI 0.24–0.90).

Other maternal outcomes were not reported in the trials.

Fetal and neonatal outcomes

Fetal/neonatal outcomes were not reported in the trials.

Comparison 2.g. Nalbuphine (IM) compared with pethidine (IM)

Three trials with 430 women conducted in Argentina, Germany and the United Kingdom, and published between 1986 and 1999, are included in this comparison. The certainty of the evidence is very low for most of the outcomes reported.

Maternal outcomes

Pain relief: Low-certainty evidence from a single trial with 72 women suggests maternal satisfaction with pain relief may be reduced with nalbuphine (RR 0.73, 95% CI 0.55–0.96). Low-certainty evidence suggests that nalbuphine makes little or no difference to the use of epidural as additional analgesia (1 trial, 307 women, RR 1.65, 95% CI 0.55–4.94)

Side-effects: Moderate-certainty evidence suggests nausea and vomiting is less frequent with nalbuphine (1 trial, 72 women, RR 0.41, 95% CI 0.18–0.94).

Mode of birth: Low-certainty evidence suggests there may be little or no difference between groups for caesarean birth (1 trial, 310 women, RR 0.45, 95% CI 0.12–1.69).

Fetal and neonatal outcomes

Perinatal hypoxia-ischaemia: One study with 72 babies compared infant behavioural scores at 2–4 hours after birth and low-certainty evidence suggests slightly lower (worse) scores in infants whose mothers received nalbuphine (MD -3.7, 95% CI -1.26 to -6.14).

Long-term adverse neonatal outcomes: These were not reported in the trials.

Comparison 2.h. Phenazocine (IM) compared with pethidine (IM)

A single trial with 212 women conducted in the United Kingdom and published in 1970 compared IM phenazocine versus pethidine.

Maternal outcomes

Pain relief: The certainty of the evidence is very low for use of epidural analgesia as additional intervention.

Side-effects: Low-certainty evidence suggests vomiting may be less frequent with phenazocine (RR 0.39, 95% CI 0.20–0.78).

Other maternal outcomes were not reported in the trial.

Fetal and neonatal outcomes

Fetal/neonatal outcomes were not reported in the trial.

Comparison 2.i. Butorphanol (IM) compared with pethidine (IM)

A single trial with 80 women conducted in Germany and published in 1978 is included in this comparison. It is not clear whether the medications have any differential effect on outcomes, as the certainty of the evidence is very low for all outcomes reported.

Comparison 2.j. Fentanyl (IV) compared with pethidine (IV)

A single trial with 105 women conducted in the USA and published in 1989 is included in this comparison. The certainty of the evidence for most outcomes reported is very low.

Maternal outcomes

Pain relief: Low-certainty evidence suggests women receiving fentanyl may need slightly more doses of the medication (MD 0.4 higher, 95% CI 0.14–0.66 higher), but may report slightly reduced maternal pain scores 1 hour after administration compared with pethidine (MD 0.20 lower, 95% CI 0.34–0.06 lower).

Side-effects: Low-certainty evidence suggests maternal sedation may be slightly less with fentanyl (RR 0.05, 95% CI 0.00–0.82).

Fetal and neonatal outcomes

Perinatal hypoxia-ischaemia: Low-certainty evidence suggests that infant neurobehavioural scores at 1–2 hours after birth may be higher if mothers received fentanyl rather than pethidine (MD 1.30, 95% CI 0.15–2.45 higher).

Long-term adverse neonatal outcomes: These were not reported in the trial.

Comparison 2.k. Nalbuphine (IV) compared with pethidine (IV)

A single trial with 28 women conducted in the USA and published in 1995 examined this comparison.

Maternal outcomes

Mode of birth: The certainty of the evidence is very low for caesarean birth.

No other relevant maternal outcomes were reported in this trial.

Fetal and neonatal outcomes

Perinatal hypoxia-ischaemia: There were no babies with low Apgar scores at 5 minutes.

Long-term adverse neonatal outcomes: These were not reported in the trial.

Comparison 2.l. Phenazocine (IV) compared with pethidine (IV)

A single trial with 194 women conducted in the USA and published in 1964 examined this comparison. The certainty of the evidence is very low for all outcomes reported or there are no events. Most outcomes were not reported.

Fetal and neonatal outcomes

Perinatal death: None were reported (low-certainty evidence).

Comparison 2.m. Butorphanol (IV) compared with pethidine (IV)

Three studies with 330 women, all conducted in the USA and published between 1979 and 2005, compared IV butorphanol with IV pethidine.

Maternal outcomes

Pain relief: Low-certainty evidence suggests that pain scores may be slightly lower and pain relief slightly higher for women in the butorphanol group (1 trial, 80 women, MD -0.6, 95% CI -1.02 to -0.18 and MD 0.67, 95% CI 0.25 to 1.09, respectively). The certainty of the evidence is very low for use of epidural analgesia or the need for further analgesia.

Mode of birth: The certainty of the evidence is very low for assisted vaginal birth and caesarean section.

Side-effects: Low-certainty evidence suggests vomiting may be reduced with butorphanol (1 trial, 200 women, RR 0.04, 95% CI 0.00–0.67).

No other relevant maternal outcomes were reported in these trials.

Fetal and neonatal outcomes

Perinatal hypoxia-ischaemia: The evidence regarding low infant Apgar scores at 5 minutes is of very low certainty.

Long-term adverse neonatal outcomes: These were not reported in the trials.

Comparison 2.n. Morphine (IV) compared with pethidine (IV)

Two studies with 163 women conducted in Sweden (1996) and the USA (1961) provided data for this comparison.

Maternal outcomes

Pain relief: Low-certainty evidence suggests that women may be slightly less satisfied with pain relief with morphine (1 trial, 141 women, RR 0.87, 95% CI 0.78–0.98), and may be more likely to require additional doses of analgesia (1 trial, 143 women, RR 3.41, 95% CI 1.90–6.12).

Mode of birth: In a study with 20 women, no women required caesarean section.

No other guideline outcomes were reported in these trials.

Comparison 2.o. Alphaprodine (IV) compared with pethidine (IV)

A single USA trial published in 1958 with data for 395 women compared IV alphaprodine with IV pethidine.

Maternal outcomes

Side-effects: Moderate-certainty evidence suggests vomiting is less frequent with alphaprodine (RR 0.38, 95% CI 0.22–0.66).

No other relevant maternal outcomes were reported in these trials.

Fetal and neonatal outcomes

Perinatal hypoxia-ischaemia: The evidence on neonatal resuscitation is of very low certainty.

Long-term adverse neonatal outcomes: These were not reported in the trial.

Comparison 2.p. Patient-controlled analgesia (PCA) pentazocine compared with PCA pethidine

A single trial with 29 women conducted in South Africa examined this comparison. The certainty of the evidence is very low for all reported outcomes.

Comparison 2.q. PCA remifentanil compared with PCA pethidine

Three trials with 237 women conducted in the United Kingdom (2 trials) and the Netherlands (1 trial) published between 2001 and 2010 are included in this comparison.

Maternal outcomes

Pain relief: Low-certainty evidence suggests there may be little or no difference between groups for maternal pain scores in labour (2 trials, 122 women, MD -8.59, 95% CI -27.61 to 10.44). Moderate-certainty evidence suggests use of epidural analgesia is lower with remifentanil (2 trials, 122 women, RR 0.42, 95% CI 0.20–0.89).

Mode of birth: Low-certainty evidence suggests that there may be little or no difference for assisted vaginal or caesarean births (2 trials, 97 women, RR 0.96, 95% CI 0.46–2.00 and RR 1.81, 95% CI 0.60–5.46, respectively).

Birth experience: Moderate-certainty evidence suggests that satisfaction with childbirth experience was slightly higher with remifentanil (1 trial, 68 women, MD 1.1, 95% CI 0.46–1.74).

Side-effects: Moderate-certainty evidence from a single trial with 105 women suggests that sleepiness is slightly increased with remifentanil (MD 0.4, 95% CI 0.14–0.66). Low-certainty evidence suggests there may be little or no difference between groups for nausea and vomiting (2 studies, 119 women, RR 0.95, 95% CI 0.61–1.49).

Fetal and neonatal outcomes

Perinatal hypoxia-ischaemia: Low-certainty evidence suggests there may be little or no difference in Apgar scores at 5 minutes (1 trial, 17 infants, RR 0.13, 95% CI 0.01–2.16). The certainty of the evidence is very low for naloxone administration. Low-certainty evidence suggests there may be little or no difference in neurobehavioural scores in infants after 2 hours (1 trial, 56 infants, MD 0.6, 95% CI -0.66 to 1.86).

Long-term adverse neonatal outcomes: These were not reported in the trials.

Comparison 2.r. PCA nalbuphine compared with PCA pethidine

This comparison is examined in a single study with 60 women conducted in the United Kingdom published in 1987.

Maternal outcomes

Pain relief: Low-certainty evidence suggests that maternal pain scores in labour may be slightly reduced by PCA nalbuphine compared with PCA pethidine (MD -0.51, 95% CI -1.02 to 0). The relative effects of the interventions are unclear, as the certainty of the evidence is very low for all outcomes reported.

No other relevant maternal outcomes were reported in this trial.

Fetal and neonatal outcomes

Perinatal hypoxia-ischaemia: These outcomes were not reported in the trial.

Long-term adverse neonatal outcomes: These outcomes were not reported in the trial.

Comparison 2.s. PCA fentanyl compared with PCA pethidine

A single trial with data for 120 women is included in this comparison. The study was conducted in the Netherlands and published in 2010.

Maternal outcomes

Pain relief: Low-certainty evidence suggests there may be little or no difference between the interventions for maternal pain scores (MD -0.65, 95% CI -1.56 to 0.26). Moderate-quality evidence suggests that use of epidural analgesia is lower in women receiving PCA fentanyl (RR 0.44, 95% CI 0.21–0.92).

Mode of birth: Low-certainty evidence suggests there may be little or no difference between the interventions for assisted vaginal birth (RR 0.57, 95% CI 0.22–1.49) or caesarean birth (RR 0.25, 95% CI 0.03–2.34).

Side-effects: Low-certainty evidence suggests there may be little or no difference in maternal sleepiness scores (MD -0.16, 95% CI -0.25 to 0.13) or vomiting (RR 0.87, 95% CI 0.55–1.37).

Fetal and neonatal outcomes

Perinatal hypoxia-ischaemia: Low-certainty evidence suggests little or no difference in infant neurobehavioral scores at 2 hours after birth (MD 0.5, 95% CI -1.95 to 0.95).

Long-term adverse neonatal outcomes: These outcomes were not reported in the trial.

Comparison 2.t. PCA meptazinol compared with PCA pethidine

This comparison is examined in a single study of 10 women conducted in the United Kingdom. The certainty of all reported outcomes is very low.

Summary of the main findings for comparison 2

Diamorphine is associated with slightly better pain relief than pethidine and may be associated with less nausea and vomiting. Fentanyl may be associated with slightly better pain relief than pethidine, less maternal sedation, less epidural use and slightly better infant neurobehavioural scores after birth. Remifentanyl is probably associated with less frequent use of epidural analgesia but more drowsiness than pethidine; it may lead to higher satisfaction with birth experience scores. Nalbuphine may lead to less maternal satisfaction with pain relief and lower infant behavioural scores after birth; however, it probably causes less nausea and vomiting than pethidine. Most evidence on other opioids compared with pethidine is of very low certainty.

Values

Findings from a review of qualitative studies looking at what matters to women during intrapartum care *(23)* suggest that most women, especially those giving birth for the first time, are apprehensive about childbirth (high confidence in the evidence), and in certain contexts and/or situations may welcome interventions that provide relief from pain (low confidence in the evidence). When interventions are being considered, women would like to be informed about the nature of the interventions and, where possible, given a choice (high confidence in the evidence).

A qualitative systematic review exploring women's experiences of opioid use for pain relief during labour could only identify very low-confidence evidence *(126)*. The findings suggest that some women appear to value opioids to help them cope with intense and unmanageable labour pains. Mixed responses were identified in terms of whether the pain relief was effective or ineffective and whether it had a positive or negative impact on their labour and childbirth experience.

Additional considerations

The data available for the qualitative review on women's experiences of opioid use during labour were very limited – they were obtained from just three studies (2 in high-income countries and 1 in an upper-middle-income country) *(126)*. One of these studies contained minimal data to inform the review, and one involved qualitative interviews with women involved in an RCT of different opioid regimens. All participants were women who had requested pain relief.

It was not possible to identify, within the included studies, whether women had had augmentation, induction of labour or other forms of intervention that may have influenced their valuation of the outcomes associated with this form of pain relief.

Resources

No evidence on the relative cost or cost-effectiveness of the different opioid analgesics was found. However, a USA review of the cost-effectiveness of epidural analgesia compared with opioid analgesia found opioid analgesia to be more cost-effective than epidural analgesia, due to the higher costs of health care professionals associated with administering epidural, as well as higher costs associated with managing complications *(127)*.

Opioid administration in a Dutch study published in 2016 was associated with an estimated unit cost of €15 (about US$ 18) per procedure (including staff costs) *(130)*.

Additional considerations

While in some high-resource settings parenteral opioid medications are considered relatively inexpensive, these medications may not be accessible in all settings and in some LMICs they may not be affordable *(136, 137)*.

A dose of pethidine or fentanyl can cost less than US$ 1; tramadol can cost about US$ 1.30; diamorphine and meptazinol can cost around US$ 3 per dose; and remifentanil can cost around US$ 6.50 per dose. Naloxone (to reverse respiratory depression) costs about US$ 6 per dose.[1]

Equity

No direct evidence was found on the impact of pain relief with any parenteral opioids on equity.

Indirect evidence from a review of facilitators and barrier to facility-based birth *(8)* indicates that

[1] British National Formulary website: https://bnf.nice.org.uk/

Table 3.39 Main resource requirements for opioid analgesia

Resource	Description
Staff	■ A physician is usually needed to prescribe opioids (this is not the case in all countries; in some settings midwives can also prescribe opioids) ■ Other staff, such as a midwife or nurse, can administer opioids
Training	■ Usual health care provider training to administer medications; opioids are fairly easy to administer as an intravenous (IV) or intramuscular (IM) injection ■ Training to monitor and manage side-effects and complications
Supplies	■ Opioid (e.g. pethidine), needle, syringe, intravenous catheter (optional) ■ Anti-emetics for preventing or treating associated nausea/vomiting ■ Naloxone for reversing respiratory depression if necessary ■ Oxygen
Equipment and infrastructure	■ Resuscitation equipment
Time	■ An estimated 2–10 minutes to obtain, prepare and administer
Supervision and monitoring	■ Supervision of administration and monitoring for side-effects ■ Secure method of storing opioids and recording opioid use to avoid abuse

"neglect and delays in receiving care" probably acts as a barrier to facility-based birth (moderate confidence in the evidence). Such neglect and delays might be applicable to labour pain management.

The review also highlights that many women in LMICs fear "unfamiliar and undesirable" birth practices, which are barriers to facility-based birth (high confidence in the evidence). It is possible that some women might perceive injections to be unfamiliar and undesirable practices.

Additional considerations

If women requesting pain relief are informed about and offered a choice of pharmacological and non-pharmacological (including traditional and cultural preferences) options, it might help to address inequalities in intrapartum care, by giving women more control of their childbirth experience.

Women requesting pain relief should be informed of the effects (desirable and undesirable) of the respective available pharmacological options and be empowered to participate in the decision-making processes relating to labour and childbirth, including pain management.

Use of expensive opioid alternatives might have a negative impact on equity if these are preferentially used in high-resource settings and more advantaged populations.

It has been argued that changing the attitudes of health care professionals and women surrounding labour pain (and reducing the medicalization of labour discomfort) could empower women to rediscover their innate birthing capabilities *(132)*, which might positively impact equity by reducing the medicalization of childbirth among more advantaged women.

Acceptability

In a qualitative systematic review exploring women's experiences of opioid use for pain relief during labour, there were mixed views *(126)*.

Some women requested opioids due to intense and unmanageable labour pains (very low confidence in the evidence). Opioids were reported to be an effective (very low confidence in the evidence) or ineffective form of pain relief (very low confidence in the evidence). Women continued to experience pain due to the pain relief method being ineffective, being provided too late or wearing off too early (very low confidence in the evidence).

Some women experienced negative physiological (e.g. sickness, distorted cognitive processes, inability to achieve a physiological birth) and psychological (e.g. disappointment) impacts (very low confidence in the evidence). However, other review findings highlight that opioids increased women's enjoyment, shortened and reduced the intensity of the contractions, and aided them to achieve a physiological birth (very low confidence in the evidence).

Following opioid use, some women were disappointed due to an over-reliance on staff to administer the medication for them, and a lack of caregiver support (very low confidence in the evidence). Women were also not always fully aware

of the route of administration or the risks of opioid use (very low confidence in the evidence).

In another review that included health care provider experiences *(26)*, no qualitative accounts of health care professionals' views of opioid use were identified.

Additional considerations

Overall, the review on women's experiences of pain relief options *(126)* highlights the lack of high-quality qualitative evidence. While confidence in the evidence is very low, the majority of negative comments were expressed towards IM pethidine use, whereas opinions on intranasal and subcutaneous fentanyl were generally far more positive.

It has been suggested in other studies that the care context and the type of care provision and care provider have a strong effect on the need for labour pain relief, and on the kinds of choices women make in relation to this need *(138, 139)*.

Feasibility

In a qualitative systematic review exploring women's experiences of opioid use during labour *(126)*, the lack of effectiveness of opioids to relieve pain was sometimes attributed to late administration (very low confidence in the evidence), which suggests the need for more timely and sensitive use of this pain relief method.

Additional considerations

In lower-resource settings, where opioids are not so widely available and used, there are likely to be financial implications as well as additional training requirements for their administration and for the management of potential maternal and neonatal side-effects.

It is likely that the type of opioid used in different settings and countries would be influenced by the cost of the medication.

Table 3.40 Summary of judgements: Various opioid analgesia compared with pethidine

Desirable effects	– Don't know	✓ Varies		– Trivial	– Small	– Moderate	– Large
Undesirable effects	– Don't know	✓ Varies		– Large	– Moderate	– Small	– Trivial
Certainty of the evidence	– No included studies			✓ Very low	– Low	– Moderate	– High
Values				– Important uncertainty or variability	✓ Possibly important uncertainty or variability	– Probably no important uncertainty or variability	– No important uncertainty or variability
Balance of effects	– Don't know	✓ Varies	– Favours pethidine	– Probably favours pethidine	– Does not favour other opioid or pethidine	– Probably favours other opioid	– Favours other opioid
Resources required	– Don't know	✓ Varies	– Large costs	– Moderate costs	– Negligible costs or savings	– Moderate savings	– Large savings
Certainty of evidence of required resources	– No included studies			– Very low	✓ Low	– Moderate	– High
Cost-effectiveness	– Don't know	✓ Varies	– Favours no opioid	– Probably favours no opioid	– Does not favour opioid or no opioid	– Probably favours opioid	– Favours opioid
Equity	– Don't know	✓ Varies	– Reduced	– Probably reduced	– Probably no impact	– Probably increased	– Increased
Acceptability	– Don't know	✓ Varies		– No	– Probably No	– Probably Yes	– Yes
Feasibility	– Don't know	✓ Varies		– No	– Probably No	– Probably Yes	– Yes

3.2.14 Relaxation techniques for pain management

RECOMMENDATION 21

Relaxation techniques, including progressive muscle relaxation, breathing, music, mindfulness and other techniques, are recommended for healthy pregnant women requesting pain relief during labour, depending on a woman's preferences. *(Recommended)*

Remarks

- Most women desire some form of pain relief during labour, and qualitative evidence indicates that relaxation techniques can reduce labour discomfort, relieve pain and enhance the maternal birth experience.
- Health care professionals should be aware that the care context and the type of care provision and care provider could have a strong effect on the need for labour pain relief, and on the kinds of choices that women make in relation to this need.
- Non-pharmacological pain relief options can vary widely within and across settings and contexts, which might favour other techniques that are not considered in this guideline, such as water immersion, hypnobirthing, acupuncture and cultural and traditional practices that women might find soothing.
- Care providers should inform women that while relaxation techniques are unlikely to be harmful, the beneficial effects have very low certainty.

Summary of evidence and considerations

Effects of the intervention (EB Table 3.2.14)

The evidence on relaxation techniques for pain relief in labour is derived from a Cochrane systematic review, to which 15 trials involving 2248 women contributed data *(140)*. Trials were conducted in 10 countries: Brazil (2 trials), Iran (2 trials), Italy (2 trials), Norway, Sweden, Taiwan [China], Thailand (2 trials), Turkey (2 trials), the United Kingdom and the USA. Relaxation techniques evaluated included general relaxation techniques (e.g. progressive muscle relaxation, breathing techniques), music, yoga, audio analgesia (e.g. listening to calming sounds such as waves during labour) and mindfulness training.

Comparison 1: General relaxation techniques compared with usual care (no relaxation techniques)

Eight trials involving 1382 women contributed data to this comparison. Trials were conducted in hospital settings in Brazil and Italy (2 trials each) and in Iran, Sweden, Turkey and the United Kingdom (1 trial each). Sample sizes in individual trials ranged from 40 to 1087. Trials were published between 2000 and 2017. Interventions included breathing techniques, progressive muscle relaxation, and combined breathing and muscle relaxation techniques. Usual care was not clearly defined in most trials.

Maternal outcomes

Pain relief: Low-certainty evidence suggests that relaxation may reduce pain intensity during the latent phase of labour (1 trial, 40 women, MD -1.25, 95% CI -0.53 to -1.97; pain was measured on a 5-point scale). It is unclear whether pain intensity in the active phase of labour is reduced by relaxation techniques because the certainty of the evidence is very low (4 trials, 273 women). For pain throughout labour, moderate-certainty evidence suggests that relaxation probably makes little or no difference to women's perceptions of pain (1 trial, 977 women, MD 0.0, 95% CI -0.23 to 0.23). Low-certainty evidence suggests that relaxation may make little or no difference to the use of additional pharmacological pain relief (2 trials, 1036 women, RR 0.99, 95% CI 0.88–1.11). It is unclear whether relaxation has any effect on women's satisfaction with pain relief, as the certainty of the evidence is very low.

Mode of birth: It is unclear whether relaxation techniques have any effect on instrumental or caesarean birth, as the evidence is of very low certainty.

Duration of labour: It is unclear whether relaxation makes any difference to the duration of labour, as the evidence is of very low certainty.

Augmentation of labour: It is unclear whether relaxation makes any difference to labour

augmentation, as this evidence is of very low certainty.

Birth experience: Low-certainty evidence suggests that relaxation techniques may make little or no difference to women's overall satisfaction with the experience of giving birth (3 trials, 1176 women, SMD 0.03, 95% CI -0.37 to 0.31) or their anxiety scores (1 trial, 140 women, MD 0.3, 95% CI -4.15 to 4.75). No studies reported on maternal sense of control.

Adverse effects, mother–baby interaction, breastfeeding: These were not reported in any of the included trials.

Fetal and neonatal outcomes

Perinatal hypoxia-ischaemia and admission to special care: The evidence on these outcomes is of very low certainty.

Long-term infant outcomes: These were not reported in the trials.

Comparison 2: Yoga techniques compared with control (no yoga techniques)

Two trials involving 149 women, both conducted in Thailand, compared yoga techniques with a control group. The trials were published in 2007 and 2008. One trial used breathing, chanting, education and postures; the other used yoga postures only. Women in the control groups had usual care in one trial, and were encouraged to maintain a supine position in labour in the other trial.

Maternal outcomes

Pain relief: Low-certainty evidence suggests that yoga may slightly reduce pain scores in labour (1 trial, 66 women, MD -6.12, 95% CI -0.47 to -11.7) and slightly increase satisfaction with pain relief (1 trial, 66 women, MD 7.88, 95% CI 1.51–14.25). It is unclear whether yoga has any effect on the use of pharmacological pain relief because the certainty of the evidence is very low.

Mode of birth: This was not reported in the trials.

Duration of labour: Low-certainty evidence suggests that yoga may reduce the duration of labour (1 trial, 66 women, MD -139.91 minutes, 95% CI -27.32 to -252.50).

Augmentation of labour: Evidence on this outcome is of very low certainty.

Birth experience: Low-certainty evidence suggests that yoga may slightly improve women's overall childbirth satisfaction scores (1 trial, 66 women, MD 6.34, 95% CI 0.26–12.42).

Adverse effects, mother–baby interaction, breastfeeding: These were not reported in either of the included trials.

Fetal and neonatal outcomes

Perinatal hypoxia-ischaemia: The evidence on this outcome is of very low certainty.

Admission to special care and long-term adverse infant outcomes: These were not reported in the trials.

Comparison 3: Music compared with usual care (no music)

Three trials involving 241 women compared music with a control group. Trials were conducted in hospital settings in Italy, Taiwan [China] and Turkey. Sample sizes ranged from 58 to 161. The trials were published between 2010 and 2014. All three trials offered a selection of music for labour; one included a preparation booklet for the antenatal period. The comparison groups received usual care.

Maternal outcomes

Pain relief, mode of birth, birth experience: The evidence on pain relief (pain intensity, use of epidural analgesia), mode of birth (instrumental vaginal, caesarean) and birth experience (maternal anxiety) is of very low certainty.

Maternal satisfaction and sense of control: These outcomes were not reported in the trials.

Duration of labour, labour augmentation, adverse effects, mother–baby interaction, breastfeeding: These outcomes were not reported in the trials.

Fetal and neonatal outcomes

Admission to special care: The evidence on this outcome is of very low certainty.

Perinatal hypoxia-ischaemia and long-term adverse infant outcomes: These were not reported in the trials.

Comparison 4: Audio-analgesia compared with control

One trial involving 25 women compared audio analgesia with a control group. The trial was conducted in the United Kingdom in 1965. The intervention group listened to "sea noise" set at 120 decibels in labour; the control group listened to the same sound set at 90 decibels.

Maternal outcomes

Pain relief: It is unclear whether listening to the sound of waves during labour has any effect on satisfaction with pain relief because the certainty of the evidence is very low.

No other maternal outcomes were reported in the trial.

Fetal and neonatal outcomes

No fetal or neonatal outcomes were reported in the trial.

Comparison 5: Mindfulness training compared with control (no mindfulness training)

One trial involving 30 women compared mindfulness training with a control group. The trial was conducted in the USA, and published in 2017. The intervention group received a nine-week mindfulness-based labour and parenting course in the antenatal period. The comparison group received a nine-week antenatal course without the mindfulness component.

Maternal outcomes

Pain relief: It is unclear whether mindfulness training has an effect on the use of pharmacological pain relief because the certainty of the evidence is very low. Other pain outcomes were not reported in the trial.

Mode of birth: The evidence on instrumental vaginal birth and caesarean birth is of very low certainty.

Birth experience: Low-certainty evidence suggests that women's sense of control in labour may be improved with mindfulness training (1 trial, 26 women, MD 31.3, 95% CI 1.61–60.99); however, the evidence on satisfaction scores is of very low certainty. Anxiety was not reported in the trial.

Duration of labour, labour augmentation, adverse effects, mother–baby interaction, breastfeeding: These outcomes were not reported in the trial.

Fetal and neonatal outcomes

No fetal or neonatal outcomes were reported in this trial.

Values

Findings from a review of qualitative studies looking at what matters to women during intrapartum care *(23)* suggest that most women, especially those giving birth for the first time, are apprehensive about childbirth (high confidence in the evidence), and in certain contexts and/or situations may welcome interventions that provide relief from pain (low confidence in the evidence). When interventions are being considered, women would like to be informed about the nature of the interventions and, where possible, given a choice (high confidence in the evidence).

In a separate review of qualitative studies related to labour pain coping techniques *(126)*, women valued the relief provided by relaxation techniques (moderate confidence in the evidence). Women using them felt relaxed and in control during labour, able to work effectively with their labour pains, and able to have a positive labour and childbirth experience (low confidence in the evidence). These methods also had a positive influence on postnatal well-being (moderate confidence in the evidence).

Additional considerations

While findings were consistent across the studies in the qualitative review on pain relief, only eight studies were found for the women's qualitative review and only three for providers, none of which were undertaken in LMICs. It was not possible to identify, within the included studies, whether women had had augmentation, induction of labour or other forms of intervention that may have influenced their valuation of the outcomes associated with this form of pain relief.

It is likely that the care context and the type of care provision and care provider have a strong effect on the need for labour pain relief, and on the kinds of choices women make in relation to this need *(138, 139)*. For example, some of the findings related to relaxation techniques could be related to positive relationships formed with attending health care professionals and/or birth companionship.

Resources

No research evidence on the costs or cost-effectiveness of these interventions was found.

Additional considerations

Relaxation techniques are likely to be relatively low-cost interventions, as most of these techniques can be performed by the woman herself once learned, or with the support of a labour companion, while others require little staff time and effort (e.g. music interventions). Training costs would be the main cost component of some relaxation techniques (e.g. muscle relaxation and breathing techniques), and this training can be integrated into antenatal classes where these are available, or into doula/labour companion training.

Table 3.41 Main resource requirements for relaxation techniques for pain relief

Resource	Description
Staff	■ Midwife or other provider (as per usual care)
Training	■ Training in relaxation techniques (e.g. included in provider training, labour companion training and/or antenatal classes)
Supplies	■ None
Equipment and infrastructure	■ Varies, depending on the intervention: music interventions require a method of playing music (e.g. phone, CD player, MP3 player, speakers); for yoga, sufficient floor space to spread a yoga mat, etc.
Time	■ Time to train: varies, depending on the intervention ■ Time to perform: varies depending on the intervention ■ Some of these interventions can be performed by the woman herself or require little staff time/effort (e.g. music interventions), while others might require continuous support/coaching before and throughout labour
Supervision and monitoring	■ Not required

If non-pharmacological techniques reduce the use of pharmacological techniques, they might be cost-effective; however, evidence of this effect is lacking.

Equity

Within the qualitative review on women's and providers' experiences *(26)*, providers in HICs noted that equity in the delivery of complementary therapies was compromised due to a lack of resources (funds and midwives time) (very low confidence in the evidence). There is no evidence from this review on relaxation techniques and equity from LMICs.

Additional considerations

If women requesting pain relief are offered a choice of pharmacological and non-pharmacological options, including traditional and cultural preferences, this might help to address inequalities in intrapartum care.

Acceptability

In a systematic review of qualitative studies exploring women's views of labour pain relief options *(126)*, relaxation techniques were reported to be an acceptable and effective method of pain relief in HICs (moderate confidence in the evidence). Relaxation techniques facilitated a peaceful birthing environment and enhanced feelings such as safety, strength, control and connection, which contributed to a positive labour and childbirth experience (moderate confidence in the evidence). Some women also used them after the birth, to facilitate well-being (e.g. techniques to soothe the baby or to facilitate breastfeeding).

The review findings suggest that women valued having a range of taught techniques (during the antenatal period) that could be adapted according to their changing needs during labour and childbirth (low confidence in the evidence). Women also valued the techniques as a means of enhancing the participation of partners and caregivers (low confidence in the evidence).

The evidence on health care provider views on providing pain relief, from another review *(26)*, is of very low confidence; however, it suggests that some health care providers believe that relaxation techniques increase women's ability to trust their bodies and promote a positive childbirth experience. The evidence from midwife respondents suggests that midwives may consider complementary therapies to be aligned with the woman-centred philosophy of midwifery.

Additional considerations

Only eight studies were found for the qualitative review of women's experiences of pain relief options *(126)* and three for the providers' views *(26)*, none of which were undertaken in LMICs.

It is possible that of the findings on acceptability of relaxation techniques could be related to positive relationships and labour companionship and not due to the relaxation techniques themselves. Two studies have suggested that the care context and the type of care provision and care provider have a strong effect on the need for labour pain relief, and on the kinds of choices women make in relation to this need *(138, 139)*.

Feasibility

In the qualitative systematic review that included health care professionals' views on providing pain relief *(26)*, staff identified a number of barriers to the provision of relaxation techniques, including bureaucracy, lack of consensus among professionals, lack of an evidence base, and lack of regulation and training of complementary therapy practitioners (very low confidence in the evidence).

Additional considerations

Relaxation techniques that can be provided by labour companions or that can be performed by the woman herself are plausibly more feasible to implement in settings where antenatal classes are already in place to facilitate maternal education/ preparation and labour companion training.

Table 3.42 Summary of judgements: Relaxation techniques compared with usual care (no relaxation techniques)

Desirable effects	– Don't know	– Varies		– Trivial	✓ Small	– Moderate	– Large
Undesirable effects	– Don't know	– Varies		– Large	– Moderate	– Small	✓ Trivial
Certainty of the evidence	– No included studies			✓ Very low	– Low	– Moderate	– High
Values				– Important uncertainty or variability	– Possibly important uncertainty or variability	✓ Probably no important uncertainty or variability	– No important uncertainty or variability
Balance of effects	– Don't know	– Varies	– Favours usual care	– Probably favours usual care	– Does not favour relaxation techniques or usual care	✓ Probably favours relaxation techniques	– Favours relaxation techniques
Resources required	– Don't know	– Varies	– Large costs	– Moderate costs	✓ Negligible costs or savings	– Moderate savings	– Large savings
Certainty of evidence of required resources	✓ No included studies			– Very low	Low	– Moderate	– High
Cost-effectiveness	✓ Don't know	– Varies	– Favours usual care	– Probably favours usual care	– Does not favour relaxation techniques or usual care	– Probably favours relaxation techniques	– Favours relaxation techniques
Equity	– Don't know	– Varies	– Reduced	– Probably reduced	– Probably no impact	✓ Probably increased	– Increased
Acceptability	– Don't know	– Varies		– No	– Probably No	✓ Probably Yes	– Yes
Feasibility	– Don't know	– Varies		– No	– Probably No	✓ Probably Yes	– Yes

3.2.15 Manual techniques for pain management

RECOMMENDATION 22

Manual techniques, such as massage or application of warm packs, are recommended for healthy pregnant women requesting pain relief during labour, depending on a woman's preferences.
(Recommended)

Remarks

- Most women desire some form of pharmacological or non-pharmacological pain relief during labour, and qualitative evidence indicates that massage can reduce labour discomfort, relieve pain and enhance the maternal birth experience.
- While the quantitative and qualitative evidence largely relates to massage, warm packs are unlikely to be harmful and some women might find these to be soothing.
- Health care professionals should be aware that the care context and the type of care provision and care provider could have a strong effect on the need for labour pain relief, and on the kinds of choices women make in relation to this need.
- Non-pharmacological pain relief options can vary widely across settings and contexts, which might favour other techniques not considered in this guideline, such as water immersion, hypnobirthing, acupuncture, and cultural and traditional practices that women might find soothing.
- Health care professionals should communicate to women the options available for pain relief in their birth facility, and discuss the advantages and disadvantages of these options as part of antenatal care.
- Care providers should inform women that while manual techniques for managing pain are unlikely to be harmful, evidence of the beneficial effects is of very low certainty.

Summary of evidence and considerations

Effects of the intervention (EB Table 3.2.15)

This evidence is derived from a Cochrane systematic review *(141)*, which included 12 studies involving 1024 women. The trials were conducted in Australia, Brazil, Canada, Iran (6 trials), Taiwan [China], the United Kingdom and the USA. The trial reports were published between 2002 and 2016.

Comparison 1: Massage techniques compared with usual care (no massage)

Eight trials involving 671 women compared massage with usual care. Trials were conducted in antenatal clinics or hospitals in Australia, Brazil, Canada, Iran (3 trials), Taiwan and the United Kingdom. Sample sizes of individual trials ranged from 46 to 176 women; seven trials involved 100 or fewer women. Birth partners provided the massage in three trials (326 women); two of these provided antenatal training for the partners. Three trials used professionals trained in massage (185 women), one used student midwives (100 women), and one did not clearly report who provided the massage (60 women). Usual care was not well reported.

Maternal outcomes

Pain relief: Moderate-certainty evidence suggests that pain scores in the first stage of labour are probably reduced with massage compared with usual care (6 trials, 362 women, SMD -0.81, 95% CI -1.06 to -0.56). Evidence on pain scores in the second stage of labour and use of pharmacological pain relief is of very low certainty.

Mode of birth: Low-certainty evidence suggests that massage may make little or no difference to instrumental vaginal birth (4 studies, 368 women, RR 0.71, 95% CI 0.44–1.13) and caesarean section (6 studies, 514 women, RR 0.75, 95% CI 0.51–1.09).

Duration of labour: This evidence is of very low certainty.

Augmentation of labour: This evidence is of very low certainty.

Birth experience: Low-certainty evidence suggests that more women may report satisfaction with their birth experience if they have massage (1 trial, 60 women, RR 1.90, 95% CI 1.07–3.38). Evidence on satisfaction scores was of very low certainty. Sense of control was reported in two studies using different measures: moderate-certainty evidence from one trial suggests that sense of control scores

were increased for women receiving massage (1 trial, 124 women, MD 14.05, 95% CI 3.77–24.33); and low-certainty evidence from another trial also suggests that sense of control scores may be slightly better for the massage group (1 trial, 56 women, MD -6.10, 95% CI -11.68 to -0.52). Low-certainty evidence suggests that anxiety scores may be reduced in women receiving massage (1 trial, 60 women, MD -16.27, 95% CI -27.03 to -5.51).

Breastfeeding: This was not reported in the trials.

Fetal and neonatal outcomes

Perinatal hypoxia-ischaemia: Low-certainty evidence suggests that massage may make little or no difference to low Apgar scores (< 7) at 5 minutes (2 trials, 215 infants, RR 0.72, 95% CI 0.17–3.14).

Adverse effects: Low-certainty evidence suggests that fewer infants whose mothers receive massage may require resuscitation (2 trials, 231 infants, RR 0.43, 95% CI 0.23–0.79). Low-certainty evidence suggests that massage may make little or no difference to the risk of admission to the neonatal intensive care unit (2 trials, 231 infants, RR 0.71, 95% CI 0.31–1.62).

Long-term adverse infant outcomes: These are not reported in the trials.

Comparison 2: Warm packs compared with usual care (no warm packs)

Three trials involving 252 women compared warm pack application with usual care.

All three trials were conducted in hospitals in Iran and took place between 2009 and 2013. Two trials (192 women) applied the warm packs to the women's lower backs and abdomens in the first stage of labour, and to the perineum in the second stage. The other trial applied the pack to the sacral and perineal areas for at least 30 minutes; it was not clear at what stage the intervention was applied.

Maternal outcomes

Pain relief (pain scores) during labour, duration of labour: The evidence on these outcomes, with the use of warm towels or packs, is of very low certainty.

Other maternal outcomes were not reported in the trials.

Fetal and neonatal outcomes

These outcomes were not reported in the trials.

Values

Findings from a review of qualitative studies looking at what matters to women during intrapartum care *(23)* suggest that most women, especially those giving birth for the first time, are apprehensive about childbirth (high confidence in the evidence), and in certain contexts and/or situations may welcome interventions that provide relief from pain (low confidence in the evidence). When interventions are being considered, women would like to be informed about the nature of the interventions and, where possible, given a choice (high confidence in the evidence).

In a separate review of qualitative studies related to labour pain coping techniques *(126)*, women valued massage techniques as a form of pain relief when these techniques enabled them to relax and feel calm, and to retain control over childbirth (low confidence in the evidence). Benefits to women's overall well-being, such as feeling safe, reassured and less anxious, were also reported (low confidence in the evidence). However, while some women found that massage enabled them to effectively work with labour pain (low confidence in the evidence), others found it to be ineffective (very low confidence in the evidence).

Additional considerations

Findings were consistent across the studies in the qualitative review, but only four studies were found, none of which were undertaken in LMICs *(126)*.

It was not possible to identify, within the included studies, whether women had had augmentation, induction of labour or other forms of intervention that may have influenced their valuation of the outcomes associated with this form of pain relief.

Resources

No research evidence on the costs or cost-effectiveness of these interventions for labour pain was found. However, indirect evidence from a review of the cost-effectiveness of complementary therapies for a range of other (non-pregnancy-related) conditions found emerging evidence of cost-effectiveness and possible cost-savings across a number of therapies and clinical populations *(142)*. The majority of studies included in this review pertained to the use of manipulative or body-based practices for the treatment of back pain.

Additional considerations

Manual techniques could be relatively low-cost interventions if performed by a labour companion. Training costs would then be the main cost

Table 3.43 Main resource requirements for manual techniques for pain relief

Resource	Description
Staff	■ Midwife or other provider (as per usual care)
Training	■ Health care provider or labour companion training in manual techniques (for the labour companion, this could be included in antenatal classes)
Supplies	■ Lotion, massage oil, clean towels
Equipment and infrastructure	■ Access to warm water
Time	■ Time to train: varies, depending on the intervention ■ Time to perform: provided intermittently over the course of labour
Supervision and monitoring	■ Not required

component, which could be integrated into antenatal classes where these are available, or into doula/labour companion training. However, the cost of massage provided by professional massage therapists could be relatively high, depending on location and setting.

If non-pharmacological techniques reduce the use of pharmacological techniques, they might be cost-effective; however, evidence of this effect is lacking.

Equity

Within a qualitative systematic review that included health care providers' views on different pain relief options *(26)*, providers in HICs noted that equity in the delivery of complementary therapies was compromised due to a lack of resources (funds and midwives' time) (very low confidence in the evidence). The review found no evidence on manual techniques and equity from LMICs.

Additional considerations

If women requesting pain relief are offered a choice of pharmacological and non-pharmacological options, including traditional and cultural preferences, it might help to address inequalities in intrapartum care.

Acceptability

A systematic qualitative review of women's experiences of pain relief in labour found that training in massage techniques enhanced participation of the women's birth partners (low confidence in the evidence), whereas massage carried out by midwives enhanced the mother–midwife relationship and women's sense of feeling cared for (low confidence in the evidence) *(126)*.

In another systematic qualitative review that included health care professionals' views on providing pain relief, the evidence suggests that some health care professionals believe that massage techniques increase the potential for a positive childbirth experience (very low confidence in the evidence) *(26)*. Midwife respondents felt that complementary therapies were a valued alternative to pharmacological pain relief and that they were aligned with midwifery's woman-centred philosophy, which values and facilitates active participation by each woman in her own labour and childbirth process (very low confidence in the evidence).

Additional considerations

The qualitative review findings on women and providers' views *(26, 126)* were all from studies conducted in HICs.

It is possible that the findings on acceptability of massage could be related to positive relationships and labour companionship, and not due to the massage itself. Two studies have suggested that the care context and the type of care provision and care provider have a strong effect on the need for labour pain relief, and on the kinds of choices women make in relation to this need *(138, 139)*.

Feasibility

In the qualitative systematic review that explored health care professionals' views on providing pain relief *(26)*, staff indicated that barriers to the provision of massage or other manual techniques included bureaucracy, lack of consensus among professionals, lack of an evidence base, and lack of regulation and training for complementary therapy practitioners (very low confidence in the evidence).

Additional considerations

Manual techniques that can be provided by labour companions are plausibly more feasible to implement in settings where antenatal classes are already in place to facilitate maternal education/preparation and labour companion training.

Table 3.44 Summary of judgements: Manual techniques[1] compared with usual care (no manual techniques)

Desirable effects	– Don't know	– Varies		– Trivial	✓ Small	– Moderate	– Large
Undesirable effects	Don't know	– Varies		– Large	– Moderate	– Small	✓ Trivial
Certainty of the evidence	– No included studies			– Very low	✓ Low	– Moderate	– High
Values				– Important uncertainty or variability	– Possibly important uncertainty or variability	✓ Probably no important uncertainty or variability	– No important uncertainty or variability
Balance of effects	– Don't know	– Varies	– Favours usual care	– Probably favours usual care	– Does not favour manual techniques or usual care	✓ Probably favours manual techniques	– Favours manual techniques
Resources required	– Don't know	✓ Varies	– Large costs	– Moderate costs	– Negligible costs or savings	– Moderate savings	– Large savings
Certainty of evidence of required resources	✓ No included studies			– Very low	– Low	– Moderate	– High
Cost-effectiveness	– Don't know	✓ Varies	– Favours the usual care	– Probably favours the usual care	– Does not favour manual techniques or the usual care	– Probably favours manual techniques	– Favours manual techniques
Equity	– Don't know	– Varies	– Reduced	– Probably reduced	– Probably no impact	✓ Probably increased	– Increased
Acceptability	– Don't know	– Varies		– No	– Probably No	✓ Probably Yes	– Yes
Feasibility	– Don't know	✓ Varies		– No	– Probably No	– Probably Yes	– Yes

3.2.16 Pain relief for preventing labour delay

RECOMMENDATION 23

Pain relief for preventing delay and reducing the use of augmentation in labour is not recommended. *(Not recommended)*

Remarks

- This recommendation has been integrated from the *WHO recommendations for augmentation of labour (46)*, in which the GDG for that guideline determined it to be a conditional recommendation based on very low-quality evidence.
- The GDG noted that there is no clear evidence to suggest that any form of pain relief is associated with reductions in labour duration or frequency of labour augmentation.
- The GDG acknowledged that pain relief may not necessarily reduce the need for labour augmentation but it has other substantial benefits that make it an essential component of good intrapartum care.
- The evidence supporting this recommendation can be found in the source guideline document, available at: http://apps.who.int/iris/bitstream/10665/112825/1/9789241507363_eng.pdf

[1] Warm packs were also evaluated but most of the quantitative and qualitative evidence relates to massage.

3.2.17 Oral fluid and food

RECOMMENDATION 24

For women at low risk, oral fluid and food intake during labour is recommended. *(Recommended)*

Remarks

- This recommendation has been integrated from the *WHO recommendations for augmentation of labour (46)*, in which the GDG for that guideline determined it to be a conditional recommendation based on very low-quality evidence.
- Given that restriction of oral fluid and food intake has no beneficial effects on important clinical outcomes, including the use of labour augmentation, the GDG puts its emphasis on respect for the wishes of the woman and therefore made a positive recommendation.
- The GDG noted that no cases of Mendelson's Syndrome (inhalation of food and drink from the stomach into the lungs during general anaesthesia – the most important safety concern limiting oral intake during labour – were reported in over 3000 women participating in the trials included in the systematic review.
- The evidence supporting this recommendation can be found in the source guideline document, available at: http://apps.who.int/iris/bitstream/10665/112825/1/9789241507363_eng.pdf

3.2.18 Maternal mobility and position

RECOMMENDATION 25

Encouraging the adoption of mobility and an upright position during labour in women at low risk is recommended. *(Recommended)*

Remarks

- This recommendation has been integrated from the *WHO recommendations for augmentation of labour (46)*, in which the GDG for that guideline determined it to be a strong recommendation based on very low-quality evidence.
- Although the evidence does not suggest that mobility and upright position in labour reduce the use of oxytocin augmentation, the GDG placed its emphasis on the clinical benefits in terms of reducing caesarean section.
- The GDG noted that in many settings, traditional practices of enforcing bed rest for all women in labour are common, rather than allowing women's choices to be informed by their knowledge of the benefits of mobility and upright position. The GDG puts its emphasis on providing women with the choice of an intervention that is beneficial, cheap and easy to implement, and therefore made a strong recommendation for this intervention.
- This recommendation should inform and support women's choices on what position to adopt during the first stage of labour.
- The evidence supporting this recommendation can be found in the source guideline document, available at: http://apps.who.int/iris/bitstream/10665/112825/1/9789241507363_eng.pdf

3.2.19 Vaginal cleansing

RECOMMENDATION 26

Routine vaginal cleansing with chlorhexidine during labour for the purpose of preventing infectious morbidities is not recommended. *(Not recommended)*

Remarks

- This recommendation has been integrated from the *WHO recommendations for prevention and treatment of maternal peripartum infections (114)*, in which the GDG for that guideline determined it to be a strong recommendation based on moderate-quality evidence.
- This recommendation was based on the lack of clinical benefits for the neonate and not on the potential effect of the intervention on group B Streptococcus (GBS)-related maternal infectious morbidity.
- The GDG acknowledged the considerable variations in policies regarding the screening for GBS colonization in pregnant women. Therefore, the group agreed that this recommendation should be implemented within the context of local policy and guidance on screening for GBS colonization.
- The evidence supporting this recommendation can be found in the source guideline document, available at: http://apps.who.int/iris/bitstream/10665/186171/1/9789241549363_eng.pdf

3.2.20 Active management of labour

RECOMMENDATION 27

A package of care for active management of labour for prevention of delay in labour is not recommended. *(Not recommended)*

Remarks

- This recommendation has been integrated from the *WHO recommendations for augmentation of labour (46)*, in which the GDG for that guideline determined it to be a conditional recommendation based on low-quality evidence.
- The GDG agreed that this package of interventions has potential benefits in terms of reducing the duration of labour and possible caesarean section rate. However, the group did not support its recommendation as it considered the approach to be highly prescriptive and interventional and one that could undermine women's rights, choices and autonomy as recipients of care. In addition, the intervention is considered to be a complex package that exerts considerable demands on health resources, which may not be feasible in many settings. The GDG chose not to recommend the package because the reported clinical benefits do not clearly outweigh these other considerations.
- The GDG also noted that continuous one-to-one care is the only component of the package that has been shown to be beneficial, and is probably the component responsible for the benefits attributed to the package. Continuous support during labour as a separate intervention is recommended in the *WHO recommendations for augmentation of labour*.
- Evidence supporting this recommendation can be found in the source guideline document, available at: http://apps.who.int/iris/bitstream/10665/112825/1/9789241507363_eng.pdf

3.2.21 Routine amniotomy

RECOMMENDATION 28

The use of amniotomy alone for prevention of delay in labour is not recommended. *(Not recommended)*

Remarks

- This recommendation has been integrated from the *WHO recommendations for augmentation of labour (46)*, in which the GDG for that guideline determined it to be a conditional recommendation based on very low-quality evidence.
- The GDG noted that in spite of the common use of amniotomy for prevention of labour delay in clinical practice, there is no clear evidence that the potential benefits outweigh the potential harms.
- As early amniotomy may increase the risk of perinatal HIV transmission, this recommendation could be strengthened in settings where HIV infection is prevalent and women may present in labour with unknown HIV status.
- The evidence supporting this recommendation can be found in the source guideline document, available at: http://apps.who.int/iris/bitstream/10665/112825/1/9789241507363_eng.pdf

3.2.22 Early amniotomy and oxytocin

RECOMMENDATION 29

The use of early amniotomy with early oxytocin augmentation for prevention of delay in labour is not recommended. *(Not recommended)*

Remarks

- This recommendation has been integrated from the *WHO recommendations for augmentation of labour (46)*, in which the GDG for that guideline determined it to be a conditional recommendation based on very low-quality evidence.
- The GDG noted that the variable reduction in the duration of the first stage of labour itself does not justify the intervention, given that no substantive differences were found in other important clinical outcomes.
- The GDG noted the substantial overlap between this intervention and the other components of the active management of labour, and considered it as equally highly prescriptive and interventional. Like the package of active management of labour, the group placed much emphasis on its potential to undermine women's rights, choices and autonomy as recipients of care, and therefore did not recommend the intervention. Additionally, the intervention is not considered feasible in many settings, as it requires considerable health care resources to implement.
- The evidence supporting this recommendation can be found in the source guideline document, available at: http://apps.who.int/iris/bitstream/10665/112825/1/9789241507363_eng.pdf

3.2.23 Oxytocin for women with epidural analgesia

RECOMMENDATION 30

The use of oxytocin for prevention of delay in labour in women receiving epidural analgesia is not recommended. *(Not recommended)*

Remarks

- This recommendation has been integrated from the *WHO recommendations for augmentation of labour (46)*, in which the GDG for that guideline determined it to be a conditional recommendation based on low-quality evidence.
- Augmentation with oxytocin should be performed when indicated as treatment of confirmed delay of labour progress in women receiving epidural analgesia.
- The evidence supporting this recommendation can be found in the source guideline document, available at: http://apps.who.int/iris/bitstream/10665/112825/1/9789241507363_eng.pdf

3.2.24 Antispasmodic agents

RECOMMENDATION 31

The use of antispasmodic agents for prevention of delay in labour is not recommended. *(Not recommended)*

Remarks

- This recommendation has been integrated from the *WHO recommendations for augmentation of labour (46)*, in which the GDG for that guideline determined it to be a conditional recommendation based on very low-quality evidence.
- The GDG noted that the available data were too heterogeneous with respect to the participants and interventions to permit wide applicability of the results. The shortening in the length of the first stage of labour by one hour was considered clinically inconsequential, as it did not translate into improvement in the other critical maternal or infant outcomes. The GDG placed high value on safety issues, which were poorly reported, and chose not to recommend the practice until new information demonstrating clinical benefits with minimal risks becomes available.
- The GDG considers the effectiveness of the use of antispasmodic agents for the treatment of labour delay as a research priority.
- The evidence supporting this recommendation can be found in the source guideline document, available at: http://apps.who.int/iris/bitstream/10665/112825/1/9789241507363_eng.pdf

3.2.25 Intravenous fluids for preventing labour delay

RECOMMENDATION 32

The use of intravenous fluids with the aim of shortening the duration of labour is not recommended. *(Not recommended)*

Remarks

- This recommendation has been integrated from the *WHO recommendations for augmentation of labour (46)*, in which the GDG for that guideline determined it to be a strong recommendation based on very low-quality evidence.
- The GDG did not recommend this intervention on the basis of no clear evidence of benefits over harms. The group noted that the risk of maternal fluid overload, particularly when intravenous oxytocin infusion becomes indicated during the course of labour, might become accentuated.
- The GDG agreed that low-risk women should be encouraged to drink fluids during labour.
- The GDG acknowledged that intravenous (IV) fluid may become necessary for other indications and for supportive care in labour even for low-risk women.
- The GDG placed its emphasis on the widespread and unnecessary use of routine administration of IV fluids for all women in labour and many health care facilities in low-, middle- and high-income settings that increases cost, has considerable impact on the resource use and reduces women's mobility, and therefore made a strong recommendation against this intervention.
- The evidence supporting this recommendation can be found in the source guideline document, available at: http://apps.who.int/iris/bitstream/10665/112825/1/9789241507363_eng.pdf

3.3 Second stage of labour

3.3.1 Definition and duration of the second stage of labour

RECOMMENDATION 33

The use of the following definition and duration of the second stage of labour is recommended for practice.

— **The second stage is the period of time between full cervical dilatation and birth of the baby, during which the woman has an involuntary urge to bear down, as a result of expulsive uterine contractions.** *(Recommended)*

— **Women should be informed that the duration of the second stage varies from one woman to another. In first labours, birth is usually completed within 3 hours whereas in subsequent labours, birth is usually completed within 2 hours.** *(Recommended)*

Remarks

- The description of the onset of the second stage based on research is an inexact science and the onset of the second stage of labour in clinical practice is often not precisely known. A woman may feel the urge to bear down before complete dilatation or she may not yet feel this urge at the moment when complete dilatation is diagnosed. If complete dilatation is found on vaginal examination, it remains uncertain for how long this cervical status has been present.
- Transportation from the labour room to a specific delivery room at the beginning of the second stage could be unpleasant to the woman and is unnecessary when labour is progressing normally.
- Birth attendants should be aware that a woman can feel the urge to bear down at a cervical dilatation earlier than 10 cm.
- A decision about curtailing the second stage of labour should be based on surveillance of the maternal and fetal condition, and on the progress of labour. When the woman's condition is satisfactory, the fetus is in good condition, and there is evidence of progress in the descent of the fetal head, there are no grounds for intervention. However, when the second stage has extended beyond the above-mentioned standard durations, the chance of spontaneous birth within a reasonable time decreases, and intervention to expedite childbirth should be considered.

Summary of evidence and considerations

Duration of the second stage of labour

Evidence was derived from a systematic review of 37 studies evaluating the duration of labour in low-risk women with normal perinatal outcomes *(52)*. The same review provided evidence for the duration of the first stage of labour. The included studies were conducted in 17 low-, middle- and high-income countries (China, Colombia, Croatia, Egypt, Finland, Germany, Israel, Japan, Republic of Korea, Myanmar, Nigeria, Norway, Taiwan [China], Uganda, the United Kingdom, the USA and Zambia), involving over 200 000 women of different ethnic origins and socioeconomic status. The trials were published between 1960 and 2016. Twenty-one of the included studies reported data on the duration of the second stage of labour for nulliparous, and 17 reported data for parous women. Labour interventions such epidural analgesia and instrumental vaginal birth, which could impact the duration of the second stage, varied widely across studies.

In 13 of the studies reporting data for nulliparous women, no epidural analgesia was used; epidural use was not reported in five studies. One study subdivided the nulliparous population according to epidural use (groups with 0% and 100% epidural use) while three other studies reported 4.1%, 42.9% and 48.0% epidural use in the study populations. Eleven of the studies did not clearly define the starting reference point for the second stage while others defined this as starting from 10 cm of cervical dilatation. Two studies defined the reference starting point as 10 cm of cervical dilatation or the urge to bear down. These studies were not pooled due to heterogeneity in population characteristics, interventions and definitions of the onset of the second stage of labour.

Nulliparous second stage: As shown in Table 3.45, moderate-certainty evidence from four studies indicates that the median duration of the second stage was 14–66 minutes (0.2–1.1 hours), with 95th percentile thresholds of 65–138 minutes

(1.1–2.3 hours). The two studies with epidural use of 48% and 100% in this group reported longer durations (median of 53–66 minutes [0.9–1.1 hours], and 95th percentiles of 138–216 minutes [2.3–3.6 hours]).

Low-certainty evidence from 17 studies presenting duration of the second stage as mean and standard deviations reported mean durations of 20–116 minutes (0.3–1.9 hours), with estimated statistical ("maximum") limits of 78–216 minutes (1.3–3.6 hours). Two studies reported epidural use. One with 42.9% epidural use reported a mean duration of 20 minutes (0.3 hours) and a 95th percentile of 60 minutes (1 hour). The other trial, with 4.1% epidural use, reported a mean duration of 40 minutes (0.7 hours) with no statistical limits reported.

Parous second stage: Low-certainty evidence from two studies presenting data for parity of 1 and parity of more than 1 separately reported median duration of the second stage of 6–12 minutes (0.1–0.2 hours), with 95th percentile thresholds of 58–76 minutes (1.0–1.3 hours) (Table 3.45). The subpopulation of women with 100% epidural use in one of these studies had longer median durations (18–24 minutes [0.3–0.4 hours]) and 95th percentiles (96–120 minutes [1.6–2.0 hours]).

Low-certainty evidence from 15 studies reporting data as a mean suggests that the mean duration of the second stage ranged from 6 to 30 minutes (0.1–0.5 hours), and the statistical ("maximum") limits were estimated as 16–78 minutes (0.3–1.3 hours). There was no epidural use in eight of the studies, it was unreported in six studies, and epidural use was reported in 2.4%, 4.3% and 9.5% of women in three studies. Only four of these studies clearly reported the starting reference point for the second stage.

Sensitivity analysis excluding second stage interventions also reveals a similar range of values. It shows that nulliparous women are able to successfully complete the second stage within 20–78 minutes, with statistical limits ranging from 60 to 174 minutes (1.0–2.5 hours). For parous women, the duration of the second stage is shorter, ranging from 6 to 30 minutes (0.1–0.5 hours), with upper estimates ranging from 16 to 78 minutes (0.3 to 1.3 hours).

Values

Findings from a review of qualitative studies looking at what matters to women during childbirth *(23)* indicate that most women want a normal childbirth with good outcomes for mother and baby, but acknowledge that medical intervention may sometimes be necessary.

Additional considerations

Women generally place a high value on the total duration of labour, although the relative importance of how long or how short labour is may be context dependent. Evidence from other studies suggests that women are less likely (than health care providers) to recognize defined, time-bound phases of labour *(54)*, and their ability to cope is more likely to be dependent on a variety of inter-related factors, including the level of pain experienced, the nature of the environment and their perceived level of support *(55)*.

Resources

No review evidence on resource requirements relating to duration of the second stage of labour was found.

Additional considerations

Application of limits for the duration of the second stage as informed by the respective 95th percentile thresholds as the benchmark for identifying unduly prolonged second stage of labour might be cost-effective as it has the potential to reduce the use of interventions to hasten birth, especially with instrumental vaginal birth and caesarean section. However, it might increase costs associated with longer supportive care.

In certain middle- and high-income country settings where physicians attend to all women in labour, the use of limits for the duration of the second stage of labour based on 95th percentile thresholds for managing labour may likely result in an increase in health care resource use.

Equity

No evidence on the impact on equity was found.

Additional considerations

An important indication for second stage caesarean section is prolonged second stage based on the expectation that the second stage should not last longer than 1 hour. However, caesarean section is a highly inequitable intervention (especially when used without a clear medical indication) as it is unlikely to be promptly received by disadvantaged women in resource-poor settings. Application of safe upper limits to all women has the potential to reduce inequity that is associated with over-medicalization of childbirth.

Acceptability

Findings from a review of qualitative studies looking at what matters to women during labour and

Table 3.45 Duration of the second stage of labour in nulliparous and parous women

NULLIPAROUS WOMEN						
Study	N	Epidural analgesia (%)	Reference points	Median duration (minutes)	5th percentile (minutes)	95th percentile (minutes)
Paterson 1992 *(143)*	8 270	0.0	10 cm or urge to bear down	45	NR	NR
Oladapo 2018 *(62)*	2 166	0.0	10 cm to birth	14	3.0	65
Zhang 2002 *(18)*	1 162	48	10 cm to birth	53	18	138[a]
Zhang 2010 *(16)*	21 524	100	10 cm to birth	66	NR	216
Zhang 2010 *(16)*	4 100	0.0	10 cm to birth	36	NR	168
				Mean duration (minutes)	SD (minutes)	+2SD (minutes)
Abdel-Aleem 1991 *(144)*	175	0.0	Undefined	43	24	91*
Albers 1996 *(63)*	347	NR	10 cm to birth	53	47	147
Albers 1999 *(64)*	806	0.0	10 cm to birth	54	46	146
Chen 1986 *(145)*	500	0.0	Undefined	43	NR	NR
Diegmann 2000 (African-American women) *(146)*	373	0.0	10 cm to birth	32	23	78[a]
Diegmann 2000 (Puerto-Rican women) *(146)*	157	0.0	10 cm to birth	44	33	110[a]
Dior 2013 *(147)*	12 631	NR	Undefined	78	NR	NR
Duignan 1975 *(148)*	437	0.0	10 cm or urge to bear down	42	NR	NR
Jones 2003 *(65)*	120	0.0	Undefined	54	43	140[a]
Juntunen 1994 *(58)*	42	42.9	Undefined	20	20	60[a]*
Kilpatrick 1989 *(67)*	2 032	0.0	10 cm to birth	54	39	132[a]
Lee 2007 *(68)*	66	0.0	Undefined	54	34	122[a]
Schiff 1998 *(66)*	69	NR	10 cm to birth	66	36	138[a]
Schorn 1993 *(69)*	18	NR	Undefined	66	54	174
Shi 2016 *(149)*	1 091	NR	Undefined	116	50	216
Studd 1973 *(150)*	176	0.0	Undefined	46	NR	NR
Studd 1975 *(151)*	194	4.1	Undefined	40	NR	NR
Wusteman 2003 *(152)*	66	0.0	Undefined	36	5	46
PAROUS WOMEN						
Study	N	Epidural analgesia (%)	Reference points	Median duration (minutes)	5th percentile (minutes)	95th percentile (minutes)
Oladapo 2018 (P = 1) *(62)*	1 488	0.1	10 cm to birth	11	2	65
Oladapo 2018 (P = 2+) *(62)*	1 952	0.0	10 cm to birth	11	2	58
Zhang 2010 (P = 1) *(16)*	12 649	100	10 cm to birth	24	NR	120
Zhang 2010 (P = 1) *(16)*	4 106	0	10 cm to birth	12	NR	76
Zhang 2010 (P = 2+) *(16)*	12 218	100	10 cm to birth	18	NR	96
Zhang 2010 (P = 2+) *(16)*	4 001	0	10 cm to birth	6	NR	66

				Mean duration (min)	SD (min)	+2SD (min)
Abdel-Aleem 1991 *(144)*	372	0.0	Undefined	29	16	61[a]
Albers 1996 *(63)*	602	NR	10 cm to birth	17	20	57[a]
Albers 1999 *(64)*	1 705	0.0	10 cm to birth	18	23	64[a]
Dior 2013 (P = 1 to 4) *(147)*	27 252	NR	Undefined	21	NR	NR
Dior 2013 (P = 5+) *(147)*	4 112	NR	Undefined	16	NR	NR
Duignan 1975 *(148)*	869	0.0	10 cm or urge to bear down	17	NR	NR
Gibb 1982 *(153)*	749	NR	Undefined	17	NR	NR
Jones 2003 *(65)*	120	0.0	Undefined	22	28	78[a]
Juntunen 1994 (P = 2/3) *(58)*	42	2.4	Undefined	8.7	5.5	NR
Juntunen 1994 (GM) *(58)*	42	9.5	Undefined	6	5	16[a]
Kilpatrick 1989 *(67)*	3 767	0.0	10 cm to birth	19	21	61[a]
Paterson 1992 *(143)*	13 159	0.0	Undefined	19	21	61
Schiff 1998 *(66)*	94	NR	Undefined	30	24	78[a]
Schorn 1993 *(69)*	30	NR	Undefined	24	24	72
Studd 1973 *(150)*	264	0.0	Undefined	22	NR	NR
Studd 1975 *(151)*	322	4.3	Undefined	19	NR	NR
Wusteman 2003 *(152)*	71	0.0	Undefined	16	21	58[a]

GM: grand multiparity; NR: not reported; P: parity; SD: standard deviation; [a] Values estimated by systematic review authors
Source: Abalos et al., 2018 *(52)*.

Table 3.46 Main resource requirements for using 95th percentile thresholds as upper limits of duration of the second stage of labour

Resource	Description
Training	■ Practice-based training for health care providers
Supplies	■ Revised training manuals and clinical protocols for health care providers and those in pre-service training ■ Educational materials for women on what comprises "normal" labour in terms of the duration of the second stage and when birth should be expected ■ Revised paper partograph to include second stage
Infrastructure	■ Sufficient beds in the labour ward to support women whose second stage might be slower than the average for their population
Supervision and monitoring	■ Ongoing supervision and monitoring with regular audit and review of outcomes related to extending the upper limits to diagnose prolonged second stage, when fetal and maternal conditions are reassuring

childbirth *(23)* indicate that most pregnant women would prefer a shorter labour (low confidence). However, when asked after childbirth, women are more likely to report a positive labour experience if they were able to "go with the flow" where the optimal length of labour was tailored to the individual regardless of standardized time limits (moderate confidence).

Additional considerations

There is evidence to suggest that women are more likely to report both very short and very long labour in negative terms *(72, 73, 91)*.

Feasibility

In a review of qualitative evidence looking at providers' experiences of delivering intrapartum care *(26)*, the capacity to accommodate longer labours may be constrained by staff shortages and organizational time pressures (high confidence in the evidence). Local protocols and informal rules may also limit the ability of health care staff to provide personalized care *(26)*.

Additional considerations

Supporting women within the limits of the 95th percentile boundary for their parity group is unlikely to increase hospital stays or significantly increase staff workload, especially if unnecessary obstetric interventions, such as caesarean section (which could lead to longer hospital stays), can be avoided.

Table 3.47 Summary of judgements: Use of the 95th percentile thresholds as upper limits for the duration of the second stage of labour

Desirable effects	– Don't know	– Varies		– Trivial	– Small	✓ Moderate	– Large
Undesirable effects	– Don't know	– Varies		– Large	– Moderate	✓ Small	– Trivial
Certainty of the evidence	– No included studies			– Very low	✓ Low	– Moderate	– High
Values				– Important uncertainty or variability	– Possibly important uncertainty or variability	✓ Probably no important uncertainty or variability	– No important uncertainty or variability
Balance of effects	– Don't know	– Varies	– Favours average limits	– Probably favours average limits	– Favours neither upper (95th percentile) limits or average limits	✓ Probably favours upper (95th percentile) limits	– Favours upper (95th percentile) limits
Resources required	✓ Don't know	– Varies	– Large costs	– Moderate costs	– Negligible costs or savings	– Moderate savings	– Large savings
Certainty of evidence of required resources	✓ No included studies			– Very low	– Low	– Moderate	– High
Cost-effectiveness	✓ Don't know	– Varies	– Favours existing limits	– Probably favours existing limits	– Favours neither increased or existing limits	– Probably favours increased limits	– Favours increased limits
Equity	– Don't know	– Varies	– Reduced	– Probably reduced	– Probably no impact	✓ Probably increased	– Increased
Acceptability	– Don't know	– Varies		– No	– Probably No	✓ Probably Yes	– Yes
Feasibility	– Don't know	✓ Varies		– No	– Probably No	– Probably Yes	– Yes

3.3.2 Birth position for women without epidural analgesia

RECOMMENDATION 34

For women without epidural analgesia, encouraging the adoption of a birth position of the individual woman's choice, including upright positions, is recommended. *(Recommended)*

Remarks

- The evidence suggests that upright birth positions during the second stage of labour might reduce episiotomy and instrumental vaginal births but might also be associated with increased risk of postpartum haemorrhage (PPH) and second-degree tears. However, most evidence is of low certainty and the GDG agreed that the difference in benefits and harms between upright and recumbent positions might not be clinically apparent.
- It is important that any particular position is not forced on the woman and that she is encouraged and supported to adopt any position that she finds most comfortable.
- The health care professional should ensure that the well-being of the baby is adequately monitored in the woman's chosen position. Should a change in position be necessary to ensure adequate fetal monitoring, the reason should be clearly communicated to the woman.
- A practical approach to positioning in the second stage for women desiring an upright birth position might be to adapt to a semi-recumbent or all-fours position just before expulsion of the fetus, to facilitate perineal techniques to reduce perineal tears and blood loss.

Summary of evidence and considerations

Effects of the intervention (EB Table 3.3.2)

The evidence is derived from a Cochrane systematic review that included 32 individual RCTs conducted in low-, middle- and high-income countries *(154)*. Thirty trials involving 9015 women contributed data on upright compared with recumbent positions. Trial participants were nulliparous and/or parous women with uncomplicated singleton pregnancies at more than 36 weeks of gestation, except in two trials that included earlier gestations. Ten trials compared a birthing/squat stool, nine trials compared a birthing chair, and three trials compared a birth cushion with recumbent controls.

Comparison: Upright position compared with recumbent position in second stage of labour

Maternal outcomes

Duration of labour: Evidence on the duration of labour from 19 trials (5811 women) is of very low certainty due to design limitations and high inconsistency across studies in the meta-analysis. However, on sensitivity analysis, whereby studies at high risk of bias were excluded, low-certainty evidence suggests that an upright birth position may make little or no difference to the duration of the second stage in minutes (10 trials, 2499 women, MD 4.34 fewer minutes, 95% CI 9.00 fewer to 0.32 more).

Mode of birth: Low-certainty evidence suggests that an upright position may reduce instrumental vaginal birth (21 trials, 6481 women, RR 0.75, 95% CI 0.66–0.86; absolute risk difference: 32 fewer per 1000 [from 18 to 44 fewer]) but may make little or no difference to caesarean section (16 trials, 5439 women, RR 1.22, 95% CI 0.81–1.81). On sensitivity analysis, whereby studies at high risk of bias were excluded, the certainty of evidence of a reduction in instrumental vaginal birth became high (10 trials, 2534 women, RR 0.71, 95% CI 0.56–0.90) and the certainty of evidence of no effect on caesarean section became moderate (9 trials, 2544 women, RR 1.47, 95% CI 0.88–2.46).

Perineal/vaginal trauma: Low-certainty evidence suggests that an upright position may reduce episiotomy (17 trials, 6148 women, RR 0.75, 95% CI 0.61–0.92; absolute risk difference: 101 fewer [from 32 to 158 fewer]) and may increase second-degree perineal tears (18 trials, 6715 women, RR 1.20, 95% CI 1.00–1.44; absolute risk difference: 25 more per 1000 [from 0 to 56 more]). On sensitivity analysis, whereby studies at high risk of bias were excluded, the certainty of evidence of an increase in second-degree tears became high (9 trials, 2967 women, RR 1.35, 95% CI 1.10–1.67). Evidence on third- or fourth-degree perineal tears[1] is of very low certainty overall,

[1] A third-degree tear involves injury to the anal sphincter complex and a fourth-degree tear extends through the anal sphincter complex to involve the anal epithelium.

however, on sensitivity analysis, low-certainty evidence suggests that upright positions may have little or no effect on third- or fourth-degree tears (3 trials, 872 women, RR 1.46, 95% CI 0.44–4.79).

Maternal morbidity: Low-certainty evidence suggests that an upright position may increase estimated blood loss greater than 500 mL (15 trials, 5615 women, RR 1.48, 95% CI 1.10–1.98; absolute risk difference: 21 more per 1000 [from 4 to 43 more]). On sensitivity analysis, the certainty of this evidence increased to moderate.

Pain intensity: Low-certainty evidence on maternal pain suggests that there may be little or no difference in pain in the second stage of labour with an upright position, as measured with a visual analogue scale (1 trial, 155 women, MD 0.32 higher, 95% CI 0.16 lower to 0.8 higher), or postpartum pain (1 trial, 155 women, MD 0.48 lower, 95% CI 1.28 lower to 0.32 higher). Further evidence on pain intensity measured in one trial (90 women) is of very low certainty. Low-certainty evidence suggests that there may be little or no difference in analgesia requirements during the second stage (7 trials, 3093 women, RR 0.97, 95% CI 0.93–1.02).

Birth experience: The review did not report on birth experience outcomes.

Fetal and neonatal outcomes

Perinatal hypoxia-ischaemia: The review did not report 5-minute Apgar score less than 7, cord blood acidosis, or hypoxic-ischaemic encephalopathy (HIE) outcomes.

Fetal distress: Moderate-certainty evidence suggests that upright positions are probably associated with fewer abnormal FHR patterns (2 trials, 617 babies, RR 0.46, 95% CI 0.22–0.93).

Perinatal mortality: Low-certainty evidence suggests that there may be little or no difference in perinatal mortality with upright positions (4 trials, 982 babies, RR 0.79, 95% CI 0.51–1.21) *(155)*.

Additional considerations

A population-based study of 113 000 women conducted in Sweden of obstetric anal sphincter injury (OASI) and birth position found an increased risk of OASI with lithotomy position in nulliparous and parous women, a decreased OASI risk with a lateral birth position in nulliparous women, and no clear difference in risk with supine, kneeling, standing or all-fours positions *(156)*. Squatting and birth seats were associated with an increased OASI risk in parous women but not in nulliparous women. Overall, 57% of nulliparous women and 26% of parous women underwent epidural analgesia in this study and findings were not reported separately according to its use.

A 2013 Cochrane systematic review found that the duration of labour with upright and ambulant positions compared with recumbent positions and bed care for the first stage of labour is probably about 1 hour and 22 minutes shorter (15 trials, 2503 women average MD -1.36 hours, 95% CI -2.22 to -0.51) *(155)*. Findings also suggest that upright positions in the first stage probably reduce caesarean section (14 trials, 2682 women, RR 0.71, 95% CI 0.54–0.94) and epidural use (9 trials, 2107 women, RR 0.81, 95% CI 0.66–0.99). These effects did not occur in a comparison involving women with epidural analgesia.

Values

Findings from a review of qualitative studies looking at what matters to women during intrapartum care *(23)* indicate that most women want a normal childbirth with good outcomes for mother and baby (high confidence in the evidence). Findings also suggest that women are aware of the unpredictability of labour and childbirth and are fearful of potentially traumatic events (including medical interventions and maternal and fetal morbidities), so they would value any technique that reduces their potential exposure to these kinds of outcomes (high confidence in the evidence).

Findings also suggest that women expect labour and childbirth to be painful but they would like to be in control of the labour process with the support of kind, caring staff who are sensitive to their needs. Women would also like to give birth in a safe, supportive environment that may include the freedom to move around (high confidence in the evidence).

Resources

No research evidence on resources was found.

Additional considerations

Evidence on effects suggests that upright birth positions might reduce instrumental vaginal births and episiotomy but might increase second-degree tears and PPH, therefore, the cost-effectiveness is unclear. Health care professionals accustomed to supporting women to give birth in recumbent positions would require training on how to support women to give birth in an upright position. Upright positions do not necessarily require additional props (e.g. birth cushions).

Table 3.48 Main resource requirements for upright birth positions

Resource	Description
Staff	■ Midwives/nurses/doctors: same as for recumbent birth positions
Training	■ In-service training to support upright birth positions
Supplies	■ Usual supplies
Equipment	■ Bed: same as for recumbent positions ■ Birthing cushion or other options to support upright birth (optional)
Infrastructure	■ Birthing room with space to accommodate a birthing stool (optional)
Supervision and monitoring	■ Good access to medical supervision: same as for recumbent birth positions

Equity

No direct evidence was found on the impact of the different birth positions on equity. However, indirect evidence from a review of barriers and facilitators to facility-based birth indicates that many women have a "fear of cutting" by health workers (e.g. episiotomy and caesarean section) and that this is probably a significant barrier to the uptake of facility-based birth by disadvantaged women in LMICs (moderate confidence in the evidence) *(8)*. Therefore, birth practices that reduce these medical interventions might improve equity.

Additional considerations

Offering women birthing options that include those that are acceptable within their local customs and norms could positively impact on equity, through increasing facility-based births in settings where women generally avoid hospital birth because of the lack of alternative birthing options.

In addition, encouraging upright labour and birth positions in well resourced settings might have a positive impact on equity by reducing unnecessary medical interventions and associated resource use among more advantaged women.

Acceptability

A systematic review of qualitative studies exploring women's experiences of intrapartum care *(26)* found that women wanted the freedom to adopt various positions during the second stage of labour (low confidence in the evidence). In most cases, a non-supine position was perceived to be more empowering and less painful and to facilitate an easier birth, although the supine position (on a bed) was still viewed as the more traditional approach to giving birth (low confidence in the evidence).

The review also reported findings on health care professionals' experiences *(26)*, which showed that staff tried to be responsive to women's needs but tended to favour the supine position as it made monitoring, medical intervention and the childbirth process easier for them to manage (moderate confidence in the evidence).

Additional considerations

Data from cross-sectional surveys conducted in Africa (Malawi and Nigeria) showed that more than 90% of women were aware of the supine or semi-recumbent positions for labour and childbirth but less than 5% were aware of alternative positions (e.g. squatting, kneeling, and on hands and knees). Data from the study in Nigeria also showed that only 18.9% of women would have been prepared to adopt an alternative position if it had been suggested by a health care professional *(157, 158)*.

Feasibility

A systematic review of qualitative studies exploring women's experiences of intrapartum care *(26)* found that women were sometimes unaware of non-supine positions and felt that different options for birth positions should have been highlighted during antenatal care (low confidence in the findings).

Findings on health care professionals' experiences from the same systematic review showed that providers were often unaware of or inexperienced in the use of non-supine positions. Staff also raised safety concerns about women coming "off the bed" and in certain contexts (LMICs) felt that overcrowding in birth rooms prevented women from adopting an upright position (low confidence in the evidence).

Additional considerations

The adoption of upright positions will require additional training and practise as many practising doctors and midwives may not be familiar with the method. Facilities employing a younger generation of doctors and midwives may not have experienced personnel on staff, which may slow

down implementation even when a policy of offering upright birth options is in place. Safety concerns about the baby falling on the floor during an expulsive second stage would need to be addressed by appropriate training and provision of supportive birthing facilities.

Table 3.49 Summary of judgements: Upright birth positions for women without epidural analgesia compared with recumbent birth positions

Desirable effects	– Don't know	– Varies		– Trivial	– Small	✓ Moderate	– Large
Undesirable effects	– Don't know	– Varies		– Large	✓ Moderate	– Small	– Trivial
Certainty of the evidence	– No included studies			– Very low	✓ Low	– Moderate	– High
Values				– Important uncertainty or variability	✓ Possibly important uncertainty or variability	– Probably no important uncertainty or variability	– No important uncertainty or variability
Balance of effects	– Don't know	– Varies	– Favours recumbent	– Probably favours recumbent	✓ Does not favour upright or recumbent	– Probably favours upright	– Favours upright
Resources required	– Don't know	– Varies	– Large costs	– Moderate costs	✓ Negligible costs or savings	– Moderate savings	– Large savings
Certainty of evidence of required resources	✓ No included studies			– Very low	– Low	– Moderate	– High
Cost-effectiveness	– Don't know	– Varies	– Favours recumbent	– Probably favours recumbent	✓ Does not favour upright or recumbent	– Probably favours upright	– Favours upright
Equity	– Don't know	– Varies	– Reduced	– Probably reduced	– Probably no impact	✓ Probably increased	– Increased
Acceptability	– Don't know	✓ Varies		– No	– Probably No	– Probably Yes	– Yes
Feasibility	– Don't know	✓ Varies		– No	– Probably No	– Probably Yes	– Yes

3.3.3 Birth position for women with epidural analgesia

RECOMMENDATION 35

For women with epidural analgesia, encouraging the adoption of a birth position of the individual woman's choice, including upright birth positions, is recommended. *(Recommended)*

Remarks

- Evidence suggests that there might be little or no difference in most birth outcomes according to birth position among women with epidural analgesia. Having a choice of birth positions during the second stage of labour might positively impact maternal birth experience and improve equity.
- Upright positions with traditional epidural analgesia, which provides a dense neuroaxial block, might not be feasible; however, most epidural analgesia currently provided are "low dose" and "mobile" epidural analgesia, which should enable a choice of birth positions.
- It is important that any particular position is not forced on the woman and that she is encouraged and supported to adopt any position that she finds most comfortable.
- The health care professional should ensure that the well-being of the baby can be adequately monitored in the woman's chosen position. Should a change in position be necessary to ensure adequate fetal monitoring, this should be effectively communicated to the woman.

Summary of evidence and considerations

Effects of the intervention (EB Table 3.3.3)

The evidence is derived from a Cochrane systematic review that included five individual RCTs conducted in the United Kingdom (4 trials) and France, involving 879 women *(159)*. Participants were nulliparous and parous women with term singleton gestations and epidural analgesia for pain relief in labour. Three studies used mobile epidural analgesia, one study used traditional epidural analgesia, and the other study did not state the type of epidural used. Two studies reported that women with spontaneous and induced labour were included; however, it is unclear whether the other studies included women with induced labour.

Positions of the study groups varied between studies but all studies distinguished two groups that could be classified as upright or recumbent for the purpose of the review.

Upright positions included sitting (on a bed or a tilting bed more than 45° from the horizontal), squatting (unaided or using squatting bars or a birth cushion, semi-recumbent (with the main axis of the body 45° or more from the horizontal), and kneeling (upright, leaning on the head of the bed, or supported by a partner). Recumbent positions included lithotomy position, lateral position (left or right), Trendelenburg's position (head lower than pelvis), knee-elbow (all fours) position (with axis of the trunk horizontal), and semi-recumbent (with the main axis of the body less than 45° from the horizontal).

Comparison: Upright position compared with recumbent position in second stage of labour with epidural analgesia

Maternal outcomes

Duration of labour: Low-certainty evidence suggests there may be little or no difference in the mean duration of the second stage with upright versus recumbent positions (2 trials, 322 women, MD 22.98 minutes lower, 95% CI 99.09 lower to 53.13 higher). One study with data for 3093 women reported a median reduction in duration of the second stage of 7 minutes (interquartile range [IQR] 0–13 minutes).

Mode of birth: Low-certainty evidence from six trials (3967 women) suggests there may be little or no difference in spontaneous vaginal birth (RR 0.97, 95% CI 0.82–1.14), and moderate-certainty evidence from the same trials suggests there is probably little or no difference in operative birth (caesarean section and instrumental vaginal birth) (RR 1.04, 95% CI 0.89–1.20) or instrumental vaginal birth (RR 1.05, 95% CI 0.94–1.18). Low-certainty evidence suggests there may be little or no difference in caesarean section (6 trials, 3967 women, RR 1.05, 95% CI 0.71–1.55).

Perineal/vaginal trauma: Moderate-certainty evidence suggests there is probably little or no difference in perineal/vaginal trauma that requires

suturing (3 trials, 3266 women, RR 1.01, 95% CI 0.89–1.14).

Maternal morbidity: No studies reported PPH or other morbidity outcomes, although one study (3093 women) reported the number of women with blood loss requiring transfusion; low-certainty evidence suggests there may be little or no difference between groups for this outcome (RR 1.20, 95% CI 0.83–1.72).

Birth experience: One study (3093 women) reported on the number of women expressing satisfaction with their overall childbirth experience; moderate-certainty evidence suggests there is probably little or no difference between groups (RR 0.98, 95% CI 0.93–1.03).

Fetal and neonatal outcomes

Perinatal hypoxia-ischaemia: Low-certainty evidence from two studies (3200 infants) suggests there may be little or no difference in Apgar scores below 7 at 5 minutes (RR 0.66, 95% CI 0.11–3.94). Moderate-certainty evidence suggests that low cord pH[1] is probably reduced with an upright position (2 studies, 3159 infants, RR 0.43, 95% CI 0.20–0.90; absolute difference: 9 fewer per 1000 [from 2 to 13 fewer]). Low-certainty evidence suggests there may be little or no difference in rates of neonatal resuscitation (1 study, 3093 infants, RR 1.00, 95% CI 0.75–1.32).

Fetal distress: The evidence on abnormal FHR patterns requiring intervention is of very low certainty.

Perinatal mortality: Low-certainty evidence from one study suggests little or no difference in perinatal death (there was a single event, 3093 infants, RR 2.96, 95% CI 0.12–72.69).

Additional considerations

A population-based study of 113 000 women conducted in Sweden of obstetric anal sphincter injury (OASI) and birth position found an increased risk of OASI with lithotomy position in nulliparous and parous women, a decreased risk of OASI with a lateral birth position in nulliparous women, and no clear difference in risk with supine, kneeling, standing or all-fours positions *(156)*. Squatting and birth seats were associated with an increased risk of OASI in parous women but not in nulliparous women. Overall, 57% of nulliparous women and 26% of parous women underwent epidural analgesia in this study and findings were not reported separately according to its use.

Values

Findings from a review of qualitative studies looking at what matters to women during intrapartum care *(23)* indicate that most women want a normal childbirth with good outcomes for mother and baby (high confidence in the evidence). Findings also suggest that women are aware of the unpredictability of labour and childbirth and are fearful of potentially traumatic events (including medical interventions and maternal and fetal morbidities) so would value any technique that reduces their potential exposure to these kinds of outcomes (high confidence in the evidence).

In addition, findings suggest that women expect labour and childbirth to be painful but would like to be in control of the labour process with the support of kind, caring staff who are sensitive to their needs. Women would also like to give birth in a safe, supportive environment that may include the freedom to move around (high confidence in the evidence).

Additional considerations

Although the evidence on the effect of birth positions with epidural is limited, it suggests that birth position has little impact on outcomes for women with epidural. Therefore, based on the qualitative evidence above, women with epidurals may prefer the option of an upright birth position if it does not cause harm to them or their babies.

Resources

No research evidence was found on costs associated with birth positions.

Additional considerations

As the evidence on effects suggests there might be little or no difference in the duration of the second stage and other birth outcomes, the choice of birth position for women with epidural analgesia might plausibly have little or no resource implications with regard to staff time and beds.

Health care professionals accustomed to supporting women with epidural analgesia to give birth in recumbent positions could require additional/refresher training on how to support them to give birth in an upright position.

[1] Low cord pH was defined as a pH of < 7.05 in one study (n = 3093) and a pH < 7.20 in the other study (n = 66).

Equity

No research evidence on equity was found.

Additional considerations

Having a choice of birth positions might have a positive impact on equity if it reduces unnecessary medical interventions among more advantaged women using epidural analgesia.

Acceptability

A systematic review of qualitative studies exploring women's experiences of intrapartum care *(26)* found that women wanted the freedom to adopt various positions during the second stage of labour (low confidence in the evidence). In most cases a non-supine position was perceived to be more empowering and less painful, and to facilitate an easier birth, although the supine position (on a bed) was still viewed as the more traditional approach to giving birth (low confidence in the evidence).

Findings on health care professionals' experiences from the same review showed that staff tried to be responsive to women's needs but tended to favour the supine position as it made monitoring, medical intervention and the birth process easier for them to manage (moderate confidence in the evidence) *(26)*.

Additional considerations

Data from cross-sectional surveys conducted in Africa (Malawi and Nigeria) showed that more than 90% of women were aware of the supine or semi-recumbent positions for labour and birth but less than 5% were aware of alternative positions (e.g. squatting, kneeling, and on hands and knees). Data from the Nigerian study also showed that only 18.9% of women would have been prepared to adopt an alternative position if it had been suggested by a health care professional *(157, 158)*.

Feasibility

A systematic review of qualitative studies exploring women's experiences of intrapartum care *(26)* found that women generally wanted to move around during childbirth but the lack of space in some birth facilities prevented them from doing so (low confidence in the evidence). Findings also showed that women were sometimes unaware of non-supine positions and felt different options for birth positions should have been highlighted during antenatal care (low confidence in the findings).

Findings on health care professionals' experiences of intrapartum care *(26)* showed that providers were often unaware of or inexperienced in the use of non-supine positions. Staff also raised safety concerns about women coming "off the bed" and in certain contexts (LMICs) felt that overcrowding in delivery rooms prevented women from adopting an upright position (low confidence in the evidence).

Additional considerations

Upright birth positions might be more feasible to implement in settings where "walking" epidurals are available, as these are less restrictive than traditional epidurals. The adoption of upright positions will require additional training and practise, as many practising doctors and midwives may not be familiar with the method. Facilities employing a younger generation of doctors and midwives may not have experienced personnel on staff, which may slow down implementation even when a policy of offering upright birth options is in place. Safety concerns about the baby falling on the floor during an expulsive second stage would need to be addressed by appropriate training and provision of supportive birthing facilities.

Table 3.50 Summary of judgements: Upright birth positions compared with recumbent birth positions in women with epidural analgesia

Desirable effects	– Don't know	– Varies		✓ Trivial	– Small	– Moderate	– Large
Undesirable effects	– Don't know	– Varies		– Large	– Moderate	– Small	✓ Trivial
Certainty of the evidence	– No included studies			– Very low	✓ Low	– Moderate	– High
Values				– Important uncertainty or variability	– Possibly important uncertainty or variability	✓ Probably no important uncertainty or variability	– No important uncertainty or variability
Balance of effects	– Don't know	– Varies	– Favours the comparison	– Probably favours recumbent	✓ Does not favour upright or recumbent	– Probably favours upright	– Favours upright
Resources required	– Don't know	– Varies	– Large costs	– Moderate costs	✓ Negligible costs or savings	– Moderate savings	– Large savings
Certainty of evidence of required resources	✓ No included studies			– Very low	– Low	– Moderate	– High
Cost-effectiveness[a]	– Don't know	– Varies	– Favours the comparison	– Probably favours recumbent	– Does not favour upright or recumbent	– Probably favours upright	– Favours upright
Equity	✓ Don't know	– Varies	– Reduced	– Probably reduced	– Probably no impact	– Probably increased	– Increased
Acceptability	– Don't know	✓ Varies		– No	– Probably No	– Probably Yes	– Yes
Feasibility	– Don't know	✓ Varies		– No	– Probably No	– Probably Yes	– Yes

[a] The cost-effectiveness domain was not judged because the desirable effects of the intervention were trivial.

3.3.4 Method of pushing

RECOMMENDATION 36

Women in the expulsive phase of the second stage of labour should be encouraged and supported to follow their own urge to push. *(Recommended)*

REMARKS

- Qualitative evidence on what matters to women during intrapartum care shows that women want to feel in control of their birth process, with the support of kind, reassuring staff who are sensitive to their needs *(23)*.
- Health care providers should avoid imposing directed pushing on women in the second stage of labour, as there is no evidence of any benefit with this technique.

Summary of evidence and considerations

Effects of the intervention (EB Table 3.3.4)

This evidence is derived from a Cochrane systematic review on pushing techniques *(160)*. Eight RCTs involving 884 women compared spontaneous pushing with directed pushing. Most participants in these studies, which were conducted in Hong Kong Special Administrative Region, Iran, Turkey, the United Kingdom (1 study each) and the USA (3 studies), were nulliparous women with uncomplicated singleton vertex gestations at term. Sample sizes ranged from 32 to 320 participants. One trial (258 women) also included parous women and another comprised a proportion of women with epidural analgesia. The birth position of participants in the studies was not consistent across studies, with one study (72 women) managing the directed pushing group in a supine position, whereas women in the spontaneous group pushed in an upright position. Other aspects of the techniques differed slightly across studies but, in general, women in the spontaneous group were not given specific instructions on how to push and were encouraged, rather, to do what comes naturally.

Comparison: Spontaneous pushing compared with directed pushing

Maternal outcomes

Duration of labour: Evidence on duration of the second stage of labour and the duration of pushing is of very low certainty.

Mode of birth: High-certainty evidence shows that spontaneous pushing makes little or no difference to spontaneous vaginal birth (5 trials, 688 women, RR 1.01, 95% CI 0.97–1.05), and low-certainty evidence suggests that it may have little or no effect on instrumental vaginal birth (2 trials, 393 women, RR 0.56, 95% CI 0.06–5.10). Evidence on caesarean section is of very low certainty.

Perineal/vaginal trauma: Moderate-certainty evidence suggests there is probably little or no difference between spontaneous and directed pushing on perineal lacerations (1 trial, 320 women, RR 0.87, 95% CI 0.45–1.66). Evidence on episiotomy is of very low certainty.

Long-term morbidity: Low-certainty evidence suggests there may be little or no difference in postpartum urinary incontinence between spontaneous and directed pushing (1 trial, 128 women, RR 0.77, 95% CI 0.29–1.69). No studies reported perineal pain, dyspareunia or pelvic floor prolapse.

Birth experience: There may be little or no difference in maternal satisfaction between these techniques, measured on a visual analogue scale, however the evidence is of low certainty (1 trial, 31 women, MD 0.91 higher satisfaction score [from 1.3 lower to 3.12 higher]). Evidence on maternal fatigue after birth is of very low certainty and no studies reported on pain during the second stage.

Fetal and neonatal outcomes

Perinatal hypoxia-ischaemia: Low-certainty evidence suggests there may be little or no difference between spontaneous compared with directed pushing on 5-minute Apgar score less than 7 (1 trial, RR 0.35, 95% CI 0.01–8.43), umbilical arterial cord blood pH less than 7.2 (1 trial, 320 women, RR 0.74, 95% CI 0.24–2.29), and delivery room neonatal resuscitation (2 trials, 352 babies, RR 0.83, 95% CI 0.40–1.75).

Fetal distress: The review did not report this outcome.

Perinatal mortality: The review did not report this outcome.

Additional considerations

Evidence from other studies suggests that women are less likely (than health care providers) to recognize defined, time-bound phases of labour *(54)*, and their ability to cope is more likely to be dependent on a variety of inter-related factors, including the level of pain experienced, the nature of the environment and their perceived level of support *(55)*.

Values

Findings from a review of qualitative studies looking at what matters to women during intrapartum care *(23)* indicate that most women want a normal childbirth with good outcomes for mother and baby (high confidence in the evidence). Some women also hope for a relatively quick labour but this is often based on the perception that the longer labour lasts the more likely they are to require medical intervention (low confidence in the evidence). Findings also suggest that women are aware of the unpredictability of labour and childbirth and are fearful of potentially traumatic events (including medical interventions and maternal and fetal morbidities) so they would value any technique that reduces their potential exposure to these kinds of outcomes (high confidence in the evidence).

Findings also suggest that women would like to "go with the flow" by being aware of and trusting their own physiological signals (including the urge to push), supported by kind, reassuring staff who are sensitive to their needs (high confidence in the evidence).

Additional considerations

Evidence from other studies suggests that women are less likely (than health care providers) to recognize defined, time-bound phases of labour *(54)*, and their ability to cope is more likely to be dependent on a variety of inter-related factors, including the level of pain experienced, the nature of the environment and their perceived level of support *(55)*.

Resources

There is no review evidence on costs associated with these two pushing techniques.

Additional considerations

If a pushing technique leads to a longer duration of second stage and/or more interventions, it would have cost implications in terms of staff time and other costs. However, this does not appear to be the case with spontaneous and directed pushing techniques, which, the review found, had little or no effect on the duration of labour and other birth outcomes. Therefore, although based on low-certainty evidence overall, findings suggest that cost implications with these different techniques may be negligible.

Equity

No research evidence was found.

Additional considerations

Encouraging women to use their own natural, physiological method of pushing in the second stage might help women to feel more in control of their childbirth experience and empower them to enjoy their reproductive rights.

Acceptability

A qualitative systematic review of women's experiences of labour and childbirth *(26)* found no direct evidence relating to women's views on pushing. Indirect evidence from this review suggests that in certain LMIC contexts women are more likely to experience disrespectful or abusive care when health care professionals adopt a directive approach to labour and childbirth (low confidence in the evidence). Findings also indicate that women like to feel "in control" of labour progress but welcome support and advice from reassuring health care professionals, provided it is consistent, coherent and in accord with their perceived physiological and psychological state (low confidence in the evidence).

The qualitative systematic review found no direct evidence on health care professionals' views relating to pushing *(26)*.

Additional considerations

Evidence from a review and case analysis study indicates that women do not like the conflicting internal and external messages, when their internal desire is to push but health care professionals tell them not to, or vice versa *(161)*.

Feasibility

A qualitative systematic review of women's experiences of labour and childbirth found no direct evidence relating to women's views on pushing *(26)*. Indirect evidence would suggest that there are unlikely to be any concerns around feasibility.

The qualitative systematic review found no direct evidence on health care professionals' views relating to pushing *(26)*. Indirect evidence would suggest that organizational pressures relating to time and bed space may encourage health care professionals to favour directed pushing in certain contexts based on the perception that it shortens labour (very low confidence in the evidence).

Additional considerations

The teaching of women, by health care professionals, to follow their own instincts to push when they feel the urge is more feasible than teaching women to perform the Valsalva manoeuvre.

Table 3.51 Summary of judgements: Spontaneous pushing compared with directed pushing

Desirable effects	– Don't know	– Varies		✓ Trivial	– Small	– Moderate	– Large
Undesirable effects	– Don't know	– Varies		– Large	– Moderate	– Small	✓ Trivial
Certainty of the evidence	– No included studies			– Very low	✓ Low	– Moderate	– High
Values				– Important uncertainty or variability	– Possibly important uncertainty or variability	✓ Probably no important uncertainty or variability	– No important uncertainty or variability
Balance of effects	– Don't know	– Varies	– Favours the comparison	– Probably favours directed pushing	✓ Does not favour spontaneous or directed pushing	– Probably favours spontaneous pushing	– Favours spontaneous pushing
Resources required	– Don't know	– Varies	– Large costs	– Moderate costs	✓ Negligible costs or savings	– Moderate savings	– Large savings
Certainty of evidence of required resources	✓ No included studies			– Very low	– Low	– Moderate	– High
Cost-effectiveness[a]	– Don't know	– Varies	– Favours the comparison	– Probably favours directed pushing	– Does not favour spontaneous or directed pushing	– Probably favours spontaneous pushing	– Favours spontaneous pushing
Equity	✓ Don't know	– Varies	– Reduced	– Probably reduced	– Probably no impact	– Probably increased	– Increased
Acceptability	– Don't know	– Varies		– No	– Probably No	✓ Probably Yes	– Yes
Feasibility	– Don't know	– Varies		– No	– Probably No	✓ Probably Yes	– Yes

[a] The cost-effectiveness domain was not judged because the desirable effects of the intervention were trivial.

3.3.5 Method of pushing for women with epidural analgesia

RECOMMENDATION 37

For women with epidural analgesia in the second stage of labour, delaying pushing for one to two hours after full dilatation or until the woman regains the sensory urge to bear down is recommended in the context where resources are available for longer stay in second stage and perinatal hypoxia can be adequately assessed and managed. *(Context-specific recommendation)*

Remarks

- Evidence on effects suggests that delaying pushing probably increases the likelihood of spontaneous vaginal birth after a slightly longer labour. The evidence that delaying pushing might increase the risk of low umbilical cord pH is of low certainty and the GDG agreed that the clinical importance of this limited evidence is very uncertain.
- Health care providers should avoid imposing immediate pushing on women in the second stage of labour, as there is no evidence of any benefit with immediate pushing and the practice might lead to further medical intervention.

Summary of evidence and considerations

Effects of the intervention (EB Table 3.3.5)

The evidence is derived from a Cochrane systematic review on pushing techniques *(160)*. Twelve individual RCTs compared delaying pushing with immediate pushing in 2879 women with epidural analgesia in the second stage of labour. Sample sizes of these trials, which were conducted mainly in HICs (Canada, Ireland, Switzerland, United Kingdom [2 studies] and the USA [8 studies]) and one middle-income country (Malaysia), ranged from 37 to 1862 participants. Most participants were nulliparous women with uncomplicated singleton vertex gestations at term; however, two trials also included parous women. All participants had epidural analgesia, with dosing schemes and types of epidural analgesia (e.g. traditional or walking/mobile) varying across the trials. Birth position of participants was reported in only five trials and most trials did not report whether women were encouraged to use a closed-glottis or spontaneous pushing technique for bearing down.

In general, women in the immediate pushing group began pushing as soon as full cervical dilatation was identified, whereas in the other group, the onset of pushing was delayed until the women experienced an irresistible urge to push, or for 1, 2 or 3 hours, depending on the individual trial protocols. In the largest trial of 1862 women, pushing was delayed for 2 hours in the intervention group, unless the woman had an irresistible urge to bear down, the fetal head was visualized on routine inspection of the perineum, or there was a medical indication to shorten the duration of labour.

Comparison: Delaying pushing compared with immediate pushing in women with epidural analgesia

Maternal outcomes

Duration of labour: Low-certainty evidence suggests that the duration of labour may be about an hour longer with the delaying pushing technique (11 trials, 3049 women, MD 56.4 minutes longer, 95% CI 42–71 minutes longer) but that the duration of pushing itself may be shorter (11 trials, 2932 women, MD 19 minutes shorter, 95% CI 6–32 minutes shorter).

Mode of birth: Moderate-certainty evidence suggests that vaginal birth is probably increased with delaying pushing (12 trials, 3114 women, RR 1.07, 95% CI 1.02–1.11), with an absolute risk difference of 50 more spontaneous births per 1000 (from 14 to 78 more).

Moderate-certainty evidence suggests that delaying pushing may make little or no difference to the individual outcomes of caesarean section (9 trials, 2783 women, RR 0.83, 95% CI 0.65–1.05; moderate-certainty evidence), instrumental birth (10 trials, 3007 women, RR 0.89, 95% CI 0.74–1.07) and forceps use (5 trials, 2151 women, RR 0.82, 95% CI 0.61–1.14).

Perineal/vaginal trauma: Moderate-certainty evidence suggests that delaying pushing probably makes little or no difference to perineal lacerations (7 trials, 2775 women, RR 0.94, 95% CI 0.78–1.14) and episiotomy (5 trials, 2320 women, RR 0.95, 95% CI 0.87–1.04).

Long-term morbidity: Low-certainty evidence suggests that delaying pushing has little or no effect on postpartum dyspareunia (1 trial, 162 women, RR 1.15, 95% CI 0.63–2.10) or faecal incontinence (1 trial, 178 women, RR 1.47, 95% CI 0.94–2.29).

Birth experience: Low-certainty evidence suggests that delaying pushing may make little or no difference to maternal satisfaction (1 trial, 73 women, MD 0.4 higher, 95% CI 7.34 lower to 8.14 higher), as measured on a visual analogue scale.

Fetal and neonatal outcomes

Perinatal hypoxia-ischaemia: Low-certainty evidence suggests that delaying pushing might increase rates of low umbilical cord pH (arterial and/or venous pH as defined by trial authors) (4 trials, 2145 babies, RR 2.24, 95% CI 1.37–3.68). The absolute risk difference might be approximately 25 more events per 1000 (from 7 to 53 more) with delaying pushing. Evidence on a 5-minute Apgar score less than 7 is of very low certainty. No trials reported hypoxic-ischaemic encephalopathy (HIE).

Fetal distress: This outcome was not reported in the review.

Perinatal mortality: This outcome was not reported in the review.

Values

Findings from a review of qualitative studies looking at what matters to women during intrapartum care *(23)* indicate that most women want a normal childbirth with good outcomes for mother and baby (high confidence in the evidence). Findings also suggest that women are aware of the unpredictability of labour and childbirth and are fearful of potentially traumatic events (including medical interventions and maternal and fetal morbidities), so they would value any technique that reduces their potential exposure to these kinds of outcomes (high confidence in the evidence).

Some women also hope for a relatively quick labour, but this is often based on the perception that the longer labour lasts the more likely they are to require medical intervention (low confidence in the evidence).

Findings also suggest that women would like to "go with the flow" by being aware of and trusting their own physiological signals (including the urge to push), supported by kind, reassuring staff who are sensitive to their needs (high confidence in the evidence).

Additional considerations

The qualitative evidence above suggests that women are likely to value the increased chance of spontaneous birth with delaying pushing, but would worry about the increase in cord pH if this translated into poor birth outcomes.

Resources

The Cochrane systematic review *(160)* included evidence on costs, with one large trial (1862 women) reporting this outcome *(162)*. Delaying pushing was associated with an increase of approximately 80 Canadian dollars (Can$) (approximately US$ 60) in total hospital costs in a private health care setting, which could mostly be attributed to an increase in cost of intrapartum care for the delaying pushing group (MD 68.22 Can$, 95% CI 55.37–81.07 Can$).

Equity

No research evidence on equity was found.

Additional considerations

Epidural analgesia is a technique for pain relief that, in healthy pregnant women, is mainly employed in well resourced settings and HICs.

Higher costs associated with the technique of delaying pushing might further reduce equity if women undergoing epidural analgesia require additional resources to accommodate delaying pushing in the second stage of labour.

Acceptability

A qualitative systematic review of women's experiences of labour and childbirth found no direct evidence relating to women's views on pushing *(26)*. Indirect evidence from this review suggests that women like to feel in control of labour progress but welcome the support and advice from a reassuring health care professional, provided it is consistent, coherent and in accord with their perceived physiological and psychological state (low confidence in the evidence).

The same review also found no direct evidence on health care professionals' views relating to pushing *(26)*.

Feasibility

A qualitative systematic review of women's experiences of labour and childbirth found no direct evidence relating to women's views on pushing *(26)*. Indirect evidence would suggest there are unlikely to be any concerns around feasibility.

The qualitative systematic review also found no direct evidence on health care professionals' views relating to pushing *(26)*. Indirect evidence would suggest that a lack of training in certain contexts may have an impact on practice (very low confidence in the evidence).

Additional considerations

If delaying pushing leads to longer labour duration this might be less feasible in resource-constrained settings.

Table 3.52 Summary of judgements: Delaying pushing compared with immediate pushing in women with epidural analgesia

Desirable effects	– Don't know	– Varies		– Trivial	– Small	✓ Moderate	– Large
Undesirable effects	– Don't know	– Varies		– Large	– Moderate	✓ Small	– Trivial
Certainty of the evidence	– No included studies			– Very low	– Low	✓ Moderate	– High
Values				– Important uncertainty or variability	– Possibly important uncertainty or variability	✓ Probably no important uncertainty or variability	– No important uncertainty or variability
Balance of effects	– Don't know	– Varies	– Favours immediate pushing	– Probably favours immediate pushing	– Does not favour delaying or immediate pushing	✓ Probably favours delaying pushing	– Favours delaying pushing
Resources required	– Don't know	– Varies	– Large costs	✓ Moderate costs	– Negligible costs or savings	– Moderate savings	– Large savings
Certainty of evidence of required resources	– No included studies			– Very low	– Low	✓ Moderate	– High
Cost-effectiveness	– Don't know	– Varies	– Favours immediate pushing	– Probably favours immediate pushing	– Does not favour delaying or immediate pushing	✓ Probably favours delaying pushing	– Favours delaying pushing
Equity	– Don't know	– Varies	– Reduced	✓ Probably reduced	– Probably no impact	– Probably increased	– Increased
Acceptability	– Don't know	– Varies		– No	– Probably No	✓ Probably Yes	– Yes
Feasibility	– Don't know	– Varies		– No	– Probably No	✓ Probably Yes	– Yes

3.3.6 Techniques for preventing perineal trauma

RECOMMENDATION 38

For women in the second stage of labour, techniques to reduce perineal trauma and facilitate spontaneous birth (including perineal massage, warm compresses and a "hands on" guarding of the perineum) are recommended, based on a woman's preferences and available options. *(Recommended)*

Remarks

- Evidence suggests that perineal massage may increase the chance of the keeping the perineum intact and reduces the risk of serious perineal tears, that warm perineal compresses reduce third- and fourth-degree perineal tears, and that a "hands-on" approach (guarding) probably reduces first-degree perineal tears. Most women accept these low-cost preventative perineal techniques and highly value the outcomes that they impact.
- Evidence on Ritgen's manoeuvre (using one hand to pull the fetal chin from between the maternal anus and the coccyx, and the other hand placed on the fetal occiput to control speed of birth) is very uncertain; therefore, this technique is not recommended.

Summary of evidence and considerations

Effects of the intervention (EB Table 3.3.6)

The evidence is derived from a Cochrane systematic review that included 22 individual RCTs *(163)*. Twenty trials involving 15 181 women contributed data. The trials were conducted in Australia (2 trials), Austria (1 trial), Brazil (2 trials), Denmark (1 trial), Iran (8 trials), Israel (1 trial), Spain (1 trial), Sweden (2 trials), the United Kingdom (1 trial) and the USA (1 trial). Perineal techniques performed in the second stage of labour that are included in this framework are:

- perineal massage compared with a "hands-off" approach or usual care;
- a "hands-off" compared with a "hands-on" approach;
- a warm compress compared with a "hands-off" approach or no warm compress; and
- Ritgen's manoeuvre compared with usual practice.

Other interventions assessed in the review that were associated with very limited evidence included cold compresses, delivery of the posterior shoulder first compared with the anterior shoulder, the application of petroleum jelly, enriched oil compared with liquid wax, and a perineal protection device. These interventions are not evaluated in this framework.

Comparison 1: Perineal massage compared with control ("hands off" approach or usual care)

Seven studies (2684 participants) from Australia, Iran and the USA contributed data to this comparison. In these studies, perineal massage in the second stage of labour was performed with a lubricant. It generally involved the midwife inserting two fingers into the vagina and applying mild, downward pressure to the vagina towards the rectum, while moving the fingers with steady strokes from side to side. Massage in some studies was performed only during contractions in the second stage and in others was continued during and between pushes.

Maternal outcomes

Perineal/vaginal trauma: Low-certainty evidence suggests that perineal massage may increase the likelihood of having an intact perineum after giving birth (6 trials, 2618 women, RR 1.74, 95% CI 1.11–2.73). The absolute effect is estimated as 168 more women having an intact perineum per 1000 (from 25 to 393 more).

High-certainty evidence indicates that perineal massage reduces third- or fourth-degree perineal tears (5 trials, 2477 women, RR 0.49, 95% CI 0.25–0.94). The absolute effect is estimated as 5 fewer per 1000 (from 2 to 22 fewer). Evidence on first- and second-degree tears, episiotomy and the need for perineal suturing is of very low certainty.

Long-term morbidity: The review found no evidence on long-term outcomes.

Birth experience: The review found no evidence on maternal satisfaction or other outcomes related to birth experience.

Fetal and neonatal outcomes

Perinatal hypoxia-ischaemia: The review found no evidence on Apgar scores less than 7 at 5 minutes.

Table 3.53 Main resource requirements of perineal massage

Resource	Description
Staff	■ Midwives/nurses/doctors
Training	■ Pre-service and in-service training on how to perform this perineal technique
Supplies	■ Gloves: similar to usual care ■ Lubricant, e.g. petroleum jelly: optional
Equipment and infrastructure	■ None
Time	■ Performed during the second stage so time is the same as for usual care
Supervision and monitoring	■ Same as for usual care

Birth trauma: The review did not include birth trauma as an outcome.

Values

Findings from a review of qualitative studies looking at what matters to women during intrapartum care *(23)* indicate that most women want a normal childbirth with good outcomes for mother and baby (high confidence in the evidence). Findings also suggest that women are aware of the unpredictability of labour and childbirth and are fearful of potentially traumatic events (including medical interventions and maternal and fetal morbidities) that can occur during the birthing process (high confidence in the evidence). It is therefore likely that women will value any technique that may limit perineal trauma, particularly if it is offered by kind, competent health care professionals who are sensitive to their needs (high confidence in the evidence).

Qualitative evidence also shows that, when interventions are being considered, women would like to be informed about the nature of the interventions and, where possible, given a choice (high confidence in the evidence) *(23)*.

Additional considerations

Findings from a meta-synthesis of women's experiences of perineal trauma suggest that women may feel devalued, dismissed, depressed and have a sense of failure when their perineum is damaged following childbirth *(164)*.

Resources

No review evidence was found.

Additional considerations

Perineal techniques are a low-cost intervention for which in-service training would be the main cost. If perineal massage increases the proportion of women with an intact perineum after childbirth and reduces third- and fourth-degree tears, it would logically be more cost-effective than usual care by reducing the costs associated with suturing supplies (e.g. suture materials, local anaesthetics, swabs) and health care professional time required to suture.

A 2002 study from Argentina reported an average provider cost saving of US$ 20.21 per birth with a change in episiotomy policy that led to fewer episiotomies being performed and a reduced need for suturing *(165)*, which gives an indirect indication of possible cost savings that might occur per birth with reduced third- and fourth-degree tears and an increase in intact perineum.

Equity

No evidence on perineal techniques and equity was found.

Additional considerations

If health care professionals could contribute to preserving the integrity of the perineum in the second stage of labour through simple perineal techniques, women in LMICs might be more inclined to use facility-based birth services, which could have a positive impact on equity.

Acceptability

A qualitative systematic review of women's experiences of labour and childbirth found no direct evidence relating to women's views on perineal massage techniques *(26)*. Indirect evidence from this review suggests that, in certain contexts, some women may appreciate techniques that limit perineal trauma, provided they are applied by kind and sensitive health care professionals (low confidence in the evidence). In other contexts, women may find these techniques painful, uncomfortable or embarrassing (very low confidence in the evidence).

The qualitative systematic review also found no direct evidence on health care professionals' views

on perineal techniques to prevent perineal trauma *(26)*.

Additional considerations

In a Canadian survey of women's views of prenatal perineal massage (n = 684), the authors found that women held positive views of the technique and would use it again in a subsequent pregnancy *(166)*.

It is likely that women would appreciate any of the perineal techniques if there was evidence to suggest they might help or limit any of the potential long-term consequences of a damaged perineum (dyspareunia, sexual dysfunction, urinary or faecal incontinence).

Feasibility

A qualitative systematic review of women's experiences of labour and childbirth found no direct evidence relating to women's views on perineal techniques *(26)*. Indirect evidence from this review would suggest that there are unlikely to be any concerns around feasibility.

The qualitative systematic review also found no direct evidence on health care professionals' views relating to perineal techniques *(26)*. Indirect evidence would suggest that health care professionals in certain contexts may lack the training and/or experience to use some or all of the perineal techniques described (very low confidence in the evidence).

Additional considerations

In a small survey of 54 Australian midwives taking part in an RCT on perineal massage during labour *(167)*, the author found that midwives did not always apply the intervention for a variety of reasons, including: (i) women found it uncomfortable; (ii) labour progressed too quickly; (iii) there was fetal distress; (iv) they didn't have time and (v) they felt it was intrusive. After the trial, the number of midwives who felt the technique was "definitely beneficial" increased from 8 to 15.

Table 3.54 Summary of judgements: Perineal massage compared with usual care (no perineal massage) (comparison 1)

Desirable effects	– Don't know	– Varies		– Trivial	– Small	✓ Moderate	– Large
Undesirable effects	– Don't know	– Varies		– Large	– Moderate	– Small	✓ Trivial
Certainty of the evidence	– No included studies			✓ Very low	– Low	– Moderate	– High
Values				– Important uncertainty or variability	– Possibly important uncertainty or variability	– Probably no important uncertainty or variability	✓ No important uncertainty or variability
Balance of effects	– Don't know	– Varies	– Favours usual care	– Probably favours usual care	– Does not favour perineal massage or usual care	– Probably favours perineal massage	✓ Favours perineal massage
Resources required	– Don't know	– Varies	– Large costs	– Moderate costs	✓ Negligible costs or savings	– Moderate savings	– Large savings
Certainty of evidence of required resources	– No included studies			✓ Very low	– Low	– Moderate	– High
Cost-effectiveness	– Don't know	– Varies	– Favours usual care	– Probably favours usual care	– Does not favour perineal massage or usual care	✓ Probably favours perineal massage	– Favours perineal massage
Equity	– Don't know	– Varies	– Reduced	– Probably reduced	– Probably no impact	✓ Probably increased	– Increased
Acceptability	– Don't know	– Varies		– No	– Probably No	✓ Probably Yes	– Yes
Feasibility	– Don't know	– Varies		– No	– Probably No	✓ Probably Yes	– Yes

Comparison 2: Warm perineal compress compared with control ("hands off" or usual care)

Four studies (1799 participants) from Australia, Iran, Spain and the USA contributed data to this comparison. In one study (717 participants), warm perineal compresses were provided as pads soaked in warm sterile water (heated to between 45° and 59 °C) and applied during contractions once the baby's head distended the perineum. The pad was re-soaked between contractions to maintain warmth. In another study (808 participants), warm compresses were applied continually, during and between contractions in the second stage. The warm compresses provided in the other two studies were not described in detail in the review.

Maternal outcomes

Perineal/vaginal trauma: High-certainty evidence suggests that warm compresses make little or no difference to having an intact perineum after giving birth (4 trials, 1799 women, RR 1.02, 95% CI 0.85–1.21). High-certainty evidence indicates that warm compresses reduce the incidence of third- or fourth-degree perineal tears (4 trials, 1799 women, RR 0.46, 95% CI 0.27–0.79). The absolute effect on third- or fourth-degree tears is estimated as 24 fewer per 1000 (from 9 to 33 fewer). Moderate-certainty evidence suggests that warm compresses probably make little or no difference to episiotomy (4 trial, 1799 women, RR 0.86, 95% CI 0.60–1.23). Evidence on first- and second-degree tears and the need for perineal suturing is of very low certainty.

Long-term morbidity: The review found no evidence on long-term outcomes.

Birth experience: The review found no evidence on maternal satisfaction or other outcomes related to birth experience.

Fetal and neonatal outcomes

Perinatal hypoxia-ischaemia: The review found no evidence on Apgar scores less than 7 at 5 minutes.

Birth trauma: The review did not include birth trauma as an outcome.

Additional considerations

The review also included a separate analysis of cold compresses compared with a control group (1 study, 64 women) for which the resulting evidence was assessed as being largely very uncertain.

Values

Findings from a review of qualitative studies looking at what matters to women during intrapartum care indicate that most women want a normal childbirth with good outcomes for mother and baby (high confidence in the evidence) *(23)*. Findings also suggest that women are aware of the unpredictability of labour and childbirth and are fearful of potentially traumatic events (including medical interventions and maternal and fetal morbidities) that can occur during the birthing process (high confidence in the evidence). It is therefore likely that women will value any technique that may limit perineal trauma, particularly if it is offered by kind, competent health care professionals who are sensitive to their needs (high confidence in the evidence).

Qualitative evidence also shows that, when interventions are being considered, women would like to be informed about the nature of the interventions and, where possible, given a choice (high confidence in the evidence).

Additional considerations

Findings from a meta-synthesis of women's experiences of perineal trauma suggest that women may feel devalued, dismissed, depressed and have a sense of failure when their perineum is damaged following childbirth *(164)*.

Resources

No review evidence was found.

Table 3.55 Main resource requirements of warm perineal compresses

Resource	Description
Staff	■ Midwives/nurses/doctors
Training	■ Pre-service and in-service training on how to perform this perineal technique
Supplies	■ Pads and warm water
Equipment and infrastructure	■ Ready access to clean warm water
Time	■ Performed during the second stage so time is the same as for usual care
Supervision and monitoring	■ Same as for usual care

Additional considerations

Warm compresses are a low-cost intervention for which supplies of pads/packs and in-service training would be the main cost. However, sterile water was used in at least one of the included trials, and this would have additional cost implications.

Health care providers would need access to clean warm water, which may not be possible in some low-resource settings. As warm compresses reduce third- and fourth-degree tears, this practice should be more cost-effective than usual care, as costs associated with suturing supplies (e.g. suture materials, local anaesthetics, swabs) and health care professional time required to suture should be reduced.

A 2002 study from Argentina reported an average provider cost saving of US$ 20.21 per birth with a change in episiotomy policy that led to fewer episiotomies being performed and a reduced need for suturing *(165)*, which gives an indirect indication of possible cost savings that might occur per birth with reduced third- and fourth-degree tears.

Equity

No evidence on perineal techniques and equity was found.

Additional considerations

If health care professionals could contribute to preserving the integrity of the perineum in the second stage of labour through simple perineal techniques, women in LMICs might be more inclined to use facility-based birth services, which could have a positive impact on equity.

Acceptability

A qualitative systematic review of women's experiences of labour and childbirth found no direct evidence relating to women's views on perineal techniques *(26)*. Indirect evidence from this review suggests that, in certain contexts, some women may appreciate techniques that limit perineal trauma, provided they are applied by kind and sensitive health care professionals (low confidence in the evidence). In other contexts, women may find these techniques painful, uncomfortable or embarrassing (very low confidence in the evidence).

The qualitative systematic review also found no direct evidence relating to health care professionals' views on perineal techniques to prevent perineal trauma *(26)*.

Additional considerations

It is likely that women would appreciate any perineal techniques if there was evidence to suggest they might help or limit any of the potential long-term consequences of a damaged perineum (dyspareunia, sexual dysfunction, urinary or faecal incontinence).

Women might plausibly perceive warm compresses as less uncomfortable and embarrassing than perineal massage, but no evidence on this was found.

Feasibility

A qualitative systematic review of women's experiences of labour and childbirth found no direct evidence relating to women's views on perineal techniques *(26)*. Indirect evidence from this review would suggest that there are unlikely to be any concerns around feasibility.

The qualitative systematic review also found no direct evidence on health care professionals' views relating to perineal techniques *(26)*.

Additional considerations

Although it is a low-cost intervention, warm compresses might be less feasible to implement in settings where resources are limited, particularly if warm running tap water is not available in delivery rooms.

Table 3.56 Summary of judgements: Warm perineal compress compared with no warm compress (comparison 2)

Desirable effects	– Don't know	– Varies		– Trivial	– Small	✓ Moderate	– Large
Undesirable effects	– Don't know	– Varies		– Large	– Moderate	– Small	✓ Trivial
Certainty of the evidence	– No included studies			✓ Very low	– Low	– Moderate	– High
Values				– Important uncertainty or variability	– Possibly important uncertainty or variability	– Probably no important uncertainty or variability	✓ No important uncertainty or variability
Balance of effects	– Don't know	– Varies	– Favours usual care	– Probably favours usual care	– Does not favour warm perineal compress or usual care	– Probably favours warm perineal compress	✓ Favours warm perineal compress
Resources required	– Don't know	– Varies	– Large costs	– Moderate costs	✓ Negligible costs or savings	– Moderate savings	– Large savings
Certainty of evidence of required resources	– No included studies			✓ Very low	– Low	– Moderate	– High
Cost-effectiveness	– Don't know	– Varies	– Favours usual care	– Probably favours usual care	– Does not favour warm perineal compress or usual care	✓ Probably favours warm perineal compress	– Favours warm perineal compress
Equity	– Don't know	– Varies	– Reduced	– Probably reduced	– Probably no impact	✓ Probably increased	– Increased
Acceptability	– Don't know	– Varies		– No	– Probably No	✓ Probably Yes	– Yes
Feasibility	– Don't know	– Varies		– No	– Probably No	✓ Probably Yes	– Yes

Comparison 3: "Hands-off" compared with "hands-on" perineum approach

Five studies (7317 participants) from Austria, Brazil, Iran and the United Kingdom contributed data to this comparison. The hands-off (or poised) approach was generally expectant and observational to the extent that light pressure could be applied to the baby's head in case of rapid expulsion, with the plan not to touch the head or perineum otherwise, and to allow spontaneous birth of the shoulders. A hands-on approach (or guarding) involved the midwife supporting the anterior and posterior perineum with both hands to protect/guard the perineum and maintain flexion of, and control, the expulsion of the fetal head.

Maternal outcomes

Perineal/vaginal trauma: Moderate-certainty evidence suggests that use of the hands-off compared with the hands-on approach probably makes little or no difference to the likelihood of having an intact perineum after giving birth (2 trials, 6547 women, RR 1.03, 95% CI 0.95–1.12). Low-certainty evidence suggests that the hands-off approach may increase first-degree tears compared with the hands-on approach (2 trials, 700 participants, RR 1.32, 95% CI 0.99–1.77), however, the estimate of effect includes the possibility of no difference. The absolute effect is estimated as 58 more per 1000 (from 2 fewer to 139 more). Evidence on third- and fourth-degree tears, second-degree tears and episiotomy is of very low certainty.

Long-term morbidity: The review found no evidence on long-term outcomes.

Birth experience: The review found no evidence on maternal satisfaction or other outcomes related to childbirth experience.

Fetal and neonatal outcomes

Perinatal hypoxia-ischaemia: The review found no evidence on Apgar scores less than 7 at 5 minutes.

Table 3.57 Main resource requirements of "hands-off" and "hands-on" perineal approaches

Resource	Description
Staff	■ Midwives/nurse/doctors
Training	■ Pre-service and in-service training on how to perform these perineal techniques
Supplies	■ Same as for usual care
Equipment	■ None
Time	■ Performed during the second stage so time is the same as for usual care
Supervision and monitoring	■ Same as for usual care

Birth trauma: The review did not include birth trauma as an outcome.

Values

Findings from a review of qualitative studies looking at what matters to women during intrapartum care *(23)* indicate that most women want a normal childbirth with good outcomes for mother and baby (high confidence in the evidence). Findings also suggest that women are aware of the unpredictability of labour and childbirth and are fearful of potentially traumatic events (including medical interventions and maternal and fetal morbidities) that can occur during the birthing process (high confidence in the evidence). It is therefore likely that women will value any technique that may limit perineal trauma, particularly if it is offered by kind, competent health care professionals who are sensitive to their needs (high confidence in the evidence).

Qualitative evidence also shows that, when interventions are being considered, women would like to be informed about the nature of the interventions and, where possible, given a choice (high confidence in the evidence).

Additional considerations

Findings from a meta-synthesis of women's experiences of perineal trauma suggest that women may feel devalued, dismissed and depressed and may have a sense of failure when their perineum is damaged following childbirth *(164)*.

The quantitative evidence suggests that there may be little difference between these approaches; however, the possibility of more first-degree tears with the hands-off approach might incline some women to prefer the hands-on approach.

Resources

No review evidence was found.

Additional considerations

Perineal techniques are low-cost interventions for which in-service training would be the main cost. Although the evidence suggests that the hands-off approach might increase first-degree perineal tears, these do not usually require suturing and are not associated with other poor outcomes, therefore this may not have cost implications.

Equity

No evidence on perineal techniques and equity was found.

Additional considerations

If health care professionals could contribute to preserving the integrity of the perineum in the second stage of labour through simple perineal techniques, women in LMICs might be more inclined to use facility-based birth services, which could have a positive impact on equity. However, from the evidence on effects, it is not clear whether these perineal techniques reduce perineal trauma.

Acceptability

A qualitative systematic review of women's experiences of labour and childbirth found no direct evidence relating to women's views on perineal techniques *(26)*. Indirect evidence from this review suggests that, in certain contexts, some women may appreciate techniques that limit perineal trauma, provided they are applied by kind and sensitive health care professionals (low confidence in the evidence). In other contexts, women may find these techniques painful, uncomfortable or embarrassing (very low confidence in the evidence).

The qualitative systematic review also found no direct evidence on health care professionals' views relating to perineal techniques to prevent perineal trauma *(26)*.

Additional considerations

It is likely that women would appreciate any of the perineal techniques if there was evidence to suggest they might help or limit any of the potential long-term consequences of a damaged perineum (dyspareunia, sexual dysfunction, urinary or faecal incontinence).

Feasibility

A qualitative systematic review of women's experiences of labour and childbirth found no direct evidence relating to women's views on perineal techniques *(26)*. Indirect evidence from this review would suggest that there are unlikely to be any concerns around feasibility.

The qualitative systematic review also found no direct evidence on health care professionals' views relating to perineal techniques *(26)*. Indirect evidence would suggest that health care professionals in certain contexts may lack the training and/or experience to use some or all of the perineal techniques described (very low confidence in the evidence).

Table 3.58 Summary of judgements: "Hands-off" approach compared with "hands-on" approach (comparison 3)

Desirable effects	– Don't know	– Varies		✓ Trivial	– Small	– Moderate	– Large
Undesirable effects	– Don't know	– Varies		– Large	– Moderate	✓ Small	– Trivial
Certainty of the evidence	– No included studies			✓ Very low	– Low	– Moderate	– High
Values				– Important uncertainty or variability	– Possibly important uncertainty or variability	✓ Probably no important uncertainty or variability	– No important uncertainty or variability
Balance of effects	– Don't know	– Varies	– Favours hands-on approach	✓ Probably favours hands-on approach	– Does not favour hands-off or hands-on approach	– Probably favours hands-off approach	– Favours hands-off approach
Resources required	– Don't know	– Varies	– Large costs	– Moderate costs	✓ Negligible costs or savings	– Moderate savings	– Large savings
Certainty of evidence of required resources	✓ No included studies			– Very low	– Low	– Moderate	– High
Cost-effectiveness	– Don't know	– Varies	– Favours hands-on approach	– Probably favours hands-on approach	✓ Does not favour hands-off or hands-on approach	– Probably favours hands-off approach	– Favours hands-off approach
Equity	– Don't know	– Varies	– Reduced	– Probably reduced	✓ Probably no impact	– Probably increased	– Increased
Acceptability	– Don't know	– Varies		– No	– Probably No	✓ Probably Yes	– Yes
Feasibility	– Don't know	– Varies		– No	– Probably No	✓ Probably Yes	– Yes

Comparison 4: Ritgen's manoeuvre compared with usual practice ("hands-on" approach)

Two studies (1489 participants) from Iran and Sweden contributed data to this comparison. A modified Ritgen's manoeuvre was performed in the second stage of labour in the largest study (1423 participants). This involved "using one hand to pull the fetal chin from between the maternal anus and the coccyx, and the other (hand placed) on the fetal occiput to control speed of birth". In this study, the manoeuvre was considered to be modified as it was used during a uterine contraction instead of between contractions. The "standard practice" arm comprised using one hand to support the perineum and the other hand to control the expulsion of the fetal head. Standard practice was also to perform selective episiotomy for certain indications not described in the review.

Maternal outcomes

Perineal/vaginal trauma: Low-certainty evidence suggests that Ritgen's manoeuvre may have little or no impact on third- and fourth-degree perineal tears (1 trial, 1423 participants, RR 1.24, 95% CI 0.78–1.96) and episiotomy (2 trials, 1489 participants, RR 0.81, 95% CI 0.63–1.03). The evidence on the likelihood of having an intact perineum and other perineal outcomes is of very low certainty.

Long-term morbidity: The review found no evidence on long-term outcomes.

Birth experience: The review found no evidence on maternal satisfaction or other outcomes related to birth experience.

Fetal and neonatal outcomes

Apgar scores: The review found no evidence on Apgar scores less than 7 at 5 minutes.

Birth trauma: The review did not include birth trauma as an outcome.

Additional considerations

The review also included a comparison of another type of guiding procedure: delivery of the posterior shoulder first compared with delivery of the anterior shoulder first; however, data for the review outcomes were limited and the resulting evidence was of very low certainty.

Values

Findings from a review of qualitative studies looking at what matters to women during intrapartum care indicate that most women want a normal childbirth with good outcomes for mother and baby (high confidence in the evidence) *(23)*. Findings also suggest that women are aware of the unpredictability of labour and childbirth and are fearful of potentially traumatic events (including medical interventions and maternal and fetal morbidities) that can occur during the birthing process (high confidence in the evidence). It is therefore likely that women will value any technique that may limit perineal trauma, particularly if it is offered by kind, competent health care professionals who are sensitive to their needs (high confidence in the evidence).

Qualitative evidence also shows that, when interventions are being considered, women would like to be informed about the nature of the interventions and, where possible, given a choice (high confidence in the evidence).

Resources

No review evidence was found.

Additional considerations

Perineal techniques are a low-cost intervention for which in-service training would be the main cost.

Equity

No evidence on perineal techniques and equity was found.

Table 3.59 Main resource requirements of Ritgen's manoeuvre

Resource	Description
Staff	■ Midwives/nurses/doctors
Training	■ Pre-service and in-service training on how to perform this perineal technique
Supplies	■ Similar to standard practice
Equipment	■ None
Time	■ Performed during the second stage so time is the same as for usual care
Supervision and monitoring	■ Probably more than with standard practice, to ensure adherence to technique and to monitor potential adverse outcomes

Additional considerations

If health care professionals could contribute to preserving the integrity of the perineum in the second stage of labour through simple perineal techniques, women in LMICs might be more inclined to use facility-based birth services, which could have a positive impact on equity. However, the effects evidence on Ritgen's manoeuvre is very uncertain.

Acceptability

A qualitative systematic review of women's experiences of labour and childbirth found no direct evidence relating to women's views on perineal massage techniques *(26)*. Indirect evidence from this review suggests that, in certain contexts, some women may appreciate techniques that limit perineal trauma provided they are applied by kind and sensitive health care professionals (low confidence in the evidence). In other contexts, women may find these techniques painful, uncomfortable or embarrassing (very low confidence in the evidence).

The qualitative systematic review also found no direct evidence relating to health care professionals' views on perineal techniques to prevent perineal trauma *(26)*.

Additional considerations

It is likely that women would appreciate any perineal technique if there was evidence to suggest they might help or limit any of the potential long-term consequences of a damaged perineum (dyspareunia, sexual dysfunction, urinary or faecal incontinence).

Ritgen's manoeuvre might plausibly be less comfortable for women than other perineal techniques, such as warm compresses.

Feasibility

A qualitative systematic review of women's experiences of labour and childbirth found no direct evidence relating to women's views on perineal techniques *(26)*.

The qualitative systematic review also found no direct evidence on health care professionals' views relating to perineal techniques *(26)*. Indirect evidence would suggest that health care professionals in certain contexts may lack the training and/or experience to use some or all of the perineal techniques described (very low confidence in the evidence).

Additional considerations

Appropriate application of the technique demands a reasonable level of midwifery or obstetric expertise to understand the anatomy of the fetal head.

Table 3.60 Summary of judgements: Ritgen's manoeuvre compared with usual practice ("hands on") (comparison 4)

Desirable effects	– Don't know	– Varies		✓ Trivial	– Small	– Moderate	– Large
Undesirable effects	✓ Don't know	– Varies		– Large	– Moderate	– Small	– Trivial
Certainty of the evidence	– No included studies			✓ Very low	– Low	– Moderate	– High
Values				– Important uncertainty or variability	✓ Possibly important uncertainty or variability	– Probably no important uncertainty or variability	– No important uncertainty or variability
Balance of effects	– Don't know	– Varies	– Favours usual practice	– Probably favours usual practice	✓ Does not favour Ritgen's manoeuvre or usual practice	– Probably favours Ritgen's manoeuvre	– Favours Ritgen's manoeuvre
Resources required	– Don't know	– Varies	– Large costs	– Moderate costs	✓ Negligible costs or savings	– Moderate savings	– Large savings
Certainty of evidence of required resources	✓ No included studies			– Very low	– Low	– Moderate	– High
Cost-effectiveness[a]	– Don't know	– Varies	– Favours usual practice	– Probably favours usual practice	– Does not favour Ritgen's manoeuvre or usual practice	– Probably favours Ritgen's manoeuvre	– Favours Ritgen's manoeuvre
Equity	– Don't know	– Varies	– Reduced	– Probably reduced	✓ Probably no impact	– Probably increased	– Increased
Acceptability	✓ Don't know	– Varies		– No	– Probably No	– Probably Yes	– Yes
Feasibility	– Don't know	– Varies		– No	✓ Probably No	– Probably Yes	– Yes

[a] The cost-effectiveness domain was not judged because the desirable effects of the intervention were trivial.

3.3.7 Episiotomy policy

RECOMMENDATION 39

Routine or liberal use of episiotomy is not recommended for women undergoing spontaneous vaginal birth. *(Not recommended)*

Remarks

- Although the review evidence on comparative effects of episiotomy policies was presented as selective/restrictive versus routine/liberal use of episiotomy, due to the beneficial effects of selective/restrictive compared with routine/liberal episiotomy policy, the lack of evidence on the effectiveness of episiotomy in general, and the need to discourage the excessive use of routine episiotomy across all settings, the GDG felt that it was important to emphasize that routine/liberal use of episiotomy is "not recommended", rather than recommending the selective/restrictive use of episiotomy.
- The GDG acknowledged that, at the present time, there is no evidence corroborating the need for any episiotomy in routine care, and an "acceptable" rate of episiotomy is difficult to determine. The role of episiotomy in obstetric emergencies, such as fetal distress requiring instrumental vaginal birth, remains to be established.
- If an episiotomy is performed, effective local anaesthesia and the woman's informed consent is essential. The preferred technique is a medio-lateral incision, as midline incisions are associated with a higher risk of complex obstetric anal sphincter injury (OASI). A continuous suturing technique is preferred to interrupted suturing *(168)*.
- Episiotomies do not warrant the routine use of prophylactic antibiotics, as general infection control measures should be respected at all times *(114)*.

Summary of evidence and considerations

Effects of the intervention (EB Table 3.3.7)

The evidence was derived from a Cochrane systematic review that included 12 RCTs *(168)*. In 11 trials, participants were women in labour for whom a vaginal birth was anticipated. One trial involved women undergoing instrumental vaginal birth; data from this trial were analysed separately in the review and were not considered for this recommendation. The 11 trials relevant to this recommendation were conducted in Argentina (2 trials), Canada, Colombia, Germany, Ireland, Malaysia, Pakistan, Saudi Arabia, Spain and the United Kingdom (1 trial each). Seven trials included nulliparous women only, and four trials included both nulliparous and parous women. Differences in episiotomy rates between the study groups in the trials varied from 21% to 91%, with three trials reporting a difference of less than 30%. In the selective episiotomy groups, episiotomy rates ranged from 8% to 59% (median 32%), and in the routine or liberal episiotomy groups they ranged from 51% to 100% (median 83%).

Comparison: Policy of selective/restrictive compared with routine or liberal use of episiotomy

Maternal outcomes

Short-term morbidity: Low-certainty evidence suggests that a policy of selective/restrictive episiotomy may reduce severe perineal/vaginal trauma (mainly third- and fourth-degree tears) compared with routine or liberal episiotomy (11 trials, 6177 women, RR 0.70, 95% CI 0.52–0.94). The impact increased when only the trials with a larger than 30% difference in episiotomy rate between study arms were included (8 trials, 4877 women, RR 0.55, 95% CI 0.38–0.81; moderate-certainty evidence). Subgroup analysis by parity suggests that the episiotomy policy might not make a difference to perineal/vaginal trauma in multigravid women, but the evidence is very uncertain. A selective/restrictive episiotomy policy may reduce the need for perineal suturing (excluding episiotomy repair) (6 trials, 4333 women, RR 0.68, 95% CI 0.58–0.78); however, the data in some trials may have included episiotomy repair, making the evidence uncertain.

Low-certainty evidence suggests that selective/restrictive episiotomy may have little or no effect on perineal infection (3 trials, 1467 women, RR 0.90, 95% CI 0.45–1.82). Evidence on relative blood loss at birth is very uncertain.

Long-term morbidity: For long-term morbidity at 6 months or more after childbirth, low-certainty evidence suggests there may be little or no effect of selective/restrictive versus routine or liberal episiotomy on dyspareunia (pain during intercourse) (3 trials, 1107 women, RR 1.14, 95% CI 0.84–1.53). Evidence on other long-term morbidity is sparse and very uncertain (urinary incontinence, genital prolapse), or lacking (faecal incontinence, sexual dysfunction).

Duration of the second stage of labour: The review did not report this outcome.

Use of pain relief options: Use of pain relief options was not reported in the review but low-certainty evidence suggests there may be little or no difference between selective/restrictive and routine or liberal episiotomy on perineal pain 10 days after birth (1 trial, 2587 women, RR 1.00, 95% CI 0.78–1.27).

Birth experience: According to the review, outcomes related to maternal birth experience, such as maternal satisfaction, were not reported in the trials.

Fetal and neonatal outcomes

Perinatal hypoxia-ischaemia: Evidence on low Apgar scores (< 7 at 5 minutes) is of very low certainty, mainly because the sample size is small (2 trials, 511 babies) and no events occurred in either comparison group.

Birth trauma: Birth trauma was not reported in the review.

Additional considerations

The evidence on severe perineal/vaginal trauma was derived mainly from trials employing a medio-lateral incision technique. Two trials involving 1143 women employed a midline episiotomy incision and statistical tests employed in the review suggest that the overall effect on perineal/vaginal trauma for this subgroup of trials is not different from medio-lateral incisions. However, the individual trials of midline incisions produced inconsistent results. In addition, severe perineal/vaginal trauma occurred more frequently in the trials of midline incisions than in trials of medio-lateral incisions (106/1143 [9%] vs 58/4834 [1%], respectively), suggesting that medio-lateral incisions are safer than midline incisions.

The review did not evaluate any other outcomes according to the type of incision.

At the present time, there is no evidence corroborating the need for episiotomy in any situation. One small clinical trial (237 women) has published findings on the effects of selective/restrictive use of episiotomy compared with no episiotomy and reported no difference with respect to any maternal and perinatal outcomes *(169)*. There is an ongoing trial of selective/restrictive episiotomy compared with no episiotomy, with a target sample size of 6006 women.

Values

Findings from a review of qualitative studies looking at what matters to women during intrapartum care indicate that most women want a normal childbirth with good outcomes for mother and baby, but acknowledge that medical intervention may sometimes be necessary (high confidence in the evidence) *(23)*.

Women are scared of interventions like episiotomy (high confidence in the evidence), so they will invariably feel more anxious when they are introduced. However, in certain countries (e.g. Brazil) where episiotomy is liberally practised, there may be an expectation that its use will facilitate an easier birth (low confidence in the evidence).

When an episiotomy is indicated, women would like to receive relevant information about it, and for it to be performed by technically competent health care providers who are sensitive to their needs (high confidence in the evidence).

Additional considerations

Given that a policy of selective/restrictive use of episiotomy is associated with less maternal morbidity than liberal use of episiotomy, it is unlikely that there is important uncertainty or variability in how much women value the outcomes related to episiotomy policies, as it stands to reason that most women would prefer not to sustain severe perineal or vaginal trauma.

Resources

No review evidence on the relative cost and cost-effectiveness of these policies was found. However, a 2002 study from Argentina found that, for each low-risk vaginal birth, there was a potential average reduction in provider cost of US$ 20.21 and US$ 11.63, in two Argentinian provinces *(170)*. This seems plausible, based on the effects evidence,

Table 3.61 Main resource requirements for episiotomy

Resource	Description
Training	■ 1–2 weeks practice-based training in how to apply a policy of restrictive episiotomy, and how to repair an episiotomy
Supplies	■ Suture material (1–3 packets absorbable polyglycol per episiotomy, depending on extent and technique [171]) = US$ 2.25 per thread ■ Lidocaine = US$ 0.34 *(31)* ■ Syringe/needle/swabs = US$ 0.08 *(31)*
Equipment	■ Appropriate lighting, sterilizers, instruments (forceps, stitch holders, scissors) ■ Equipment maintenance
Time	■ Average time needed is 21–25 minutes for each episiotomy wound closure, depending on the type of method (continuous or interrupted sutures, respectively) *(171)* and other factors, such as extent of incision, provider skills, supplies, etc.
Supervision and monitoring	■ Regular supervision and review by ward/clinic/facility lead

as fewer procedures are performed and maternal morbidity might be reduced.

Additional considerations

Fewer procedures means less provider time associated with episiotomy repair. This might be an important cost saving. Findings from a Cochrane review evaluating different episiotomy repair methods suggest that the average time required to suture an episiotomy with continuous or interrupted sutures is 21 and 25 minutes, respectively *(171)*. Other costs, due to medical supplies (suture materials, anaesthetic agents, analgesics, etc.) and equipment for episiotomy repair, and those associated with wound complications, would logically also be lower with selective/restrictive compared with routine or liberal episiotomy policies.

Out-of-pocket costs to individual women might also be lower with selective/restrictive compared with routine or liberal episiotomy in settings where women incur additional birth costs for births in which episiotomy has been performed *(172)*.

Routine or liberal use of episiotomy may be linked to over-medicalization based on ensuring financial profits for practitioners.

Equity

No direct evidence of the impact of the different episiotomy policies on equity was found. However, indirect evidence from a review of barriers and facilitators to facility-based birth indicates that many women have a "fear of cutting" (caesarean section and episiotomy) by health workers and this is probably a significant barrier to the uptake of facility-based birth by disadvantaged women in LMICs (moderate confidence in the evidence) *(8)*.

Additional considerations

WHO's 2015 *State of inequality* report indicates that women who are poor, least educated and residing in rural areas have lower health intervention coverage and worse health outcomes than the more advantaged women *(33)*. Therefore, by reducing the "fear of cutting", with a clearly communicated policy of selective/restrictive episiotomy, the intervention might have a positive impact on health equity by increasing facility-based birth coverage among disadvantaged women.

A review of evidence-based practices suggests that some of the highest episiotomy rates occur in middle-income countries *(173)*. This overuse might be a symptom of the obstetric transition,[1] with medicalization and more interventionist birth practices increasing with obstetric transition stage *(174, 175)*. Significant within-country differences in episiotomy coverage also exist *(176)*. For example, in Brazil, public health care facilities have been reported to employ excessive use of episiotomy compared with private-sector facilities *(177)*. Therefore, employing a restrictive policy of episiotomy in these settings could differentially improve the childbirth experience of disadvantaged women relative to more advantaged women, with a positive impact on equity.

Women in LMIC settings are often not informed about the risks of and reasons for interventions and are often not asked to give informed consent *(173, 178–181)*. Non-consented, invasive procedures are prevalent in LMICs and in the treatment of

[1] Obstetric transition is the concept of a secular trend of countries as they shift from patterns of high maternal mortality to low maternal mortality through reductions in direct obstetric causes of mortality.

disadvantaged pregnant women globally. Therefore, clinical protocols and provider training on episiotomy should emphasize the need for informed consent, to ensure that women's human rights are respected.

Acceptability

In a qualitative systematic review exploring women's and providers' views and experiences of intrapartum care, women felt they were poorly informed about the reasons for performing an episiotomy and were rarely asked for their permission (high confidence in the evidence) *(26)*. Review findings suggest that women preferred to minimize the level of pain experienced from cutting and stitching, as well as the levels of discomfort experienced following episiotomy (high confidence in the evidence). In addition, they may be ill-prepared for the pain associated with the procedure or the potential short- and long-term consequences (perineal discomfort, difficulty performing normal day-to-day activities, aesthetic deformities, effect on sex life) (low confidence in the evidence). In some instances, women felt that their concerns were ignored or dismissed by staff, whom they perceived to be rude and insensitive (low confidence in the evidence).

The review findings also suggest that in certain countries (e.g. Brazil) women might hold the belief that an episiotomy facilitates a smoother birth (shorter labour, less pain) (low confidence in the evidence). This may be based on an established cultural acceptance of the procedure, largely generated by health care providers (low confidence in the evidence).

Review findings also showed that staff were generally aware of the recommendations for selective/restrictive use of episiotomy, but in some regions (South America, the Middle East, South-East Asia) they were reluctant to change established behaviour, particularly for primigravid women, where episiotomy was practised routinely (high confidence in the evidence). For primigravid women in these contexts, staff felt that an episiotomy was safer, more easily managed (by them) than a tear, and facilitated an "easier" birth (for them) (high confidence in the evidence).

Additional considerations

Reluctance to change established behaviour in some settings might be financially motivated: a study of health care provider practice in Cambodia found that providers performed episiotomies to justify charging women a higher fee *(172)*. From the above evidence, it seems that most women would find selective/restrictive episiotomy more acceptable than routine or liberal episiotomy.

Acceptability among providers, in LMIC settings where episiotomy is routinely practised, might vary.

Feasibility

Findings from a qualitative systematic review exploring women's and providers views and experiences of intrapartum care suggest that a practice of selective/restrictive episiotomy would be easier to implement, especially in settings where resources may be limited (high confidence in the evidence) *(26)*. However, in certain contexts, staff may have limited access to current research evidence (because of resource constraints) and subsequently have no clear policies or protocols to guide practice in this area (high confidence in the evidence). As a result, clinical practice is based on established, hierarchical, unwritten "rules" and/or competence in performing the procedure (high confidence in the evidence).

Additional considerations

Findings from a cluster RCT conducted in Mexico and Thailand of a multifaceted educational strategy to promote the use of the WHO Reproductive Health Library (RHL) on obstetric practices, including promotion of selective/restrictive over routine or liberal episiotomy, showed that implementing selective/restrictive episiotomy was feasible in Thailand and led to a reduction in episiotomy rates *(182)*.

Shifting from a policy of routine or liberal to selective/restrictive use of episiotomy will require a change in organization culture, training, monitoring and continuous clinical practice audit.

Table 3.62 Summary of judgements: Policy of selective/restrictive episiotomy compared with routine/liberal use of episiotomy

Desirable effects	– Don't know	– Varies		– Trivial	– Small	✓ Moderate	– Large
Undesirable effects	– Don't know	– Varies		– Large	– Moderate	– Small	✓ Trivial
Certainty of the evidence	– No included studies			– Very low	✓ Low	– Moderate	– High
Values				– Important uncertainty or variability	– Possibly important uncertainty or variability	✓ Probably no important uncertainty or variability	– No important uncertainty or variability
Balance of effects	– Don't know	– Varies	– Favours routine episiotomy	– Probably favours routine/ liberal policy	– Does not favour selective / restrictive or routine/ liberal policy	✓ Probably favours selective/ restrictive policy	– Favours selective/ restrictive policy
Resources required	– Don't know	– Varies	– Large costs	– Moderate costs	– Negligible costs or savings	✓ Moderate savings	– Large savings
Certainty of evidence of required resources	– No included studies			– Very low	✓ Low	– Moderate	– High
Cost-effectiveness	– Don't know	– Varies	– Favours routine/ liberal policy	– Probably favours routine/ liberal policy	– Does not favour selective / restrictive or routine/ liberal policy	✓ Probably favours selective/ restrictive policy	– Favours selective/ restrictive policy
Equity	– Don't know	– Varies	– Reduced	– Probably reduced	– Probably no impact	✓ Probably increased	– Increased
Acceptability	– Don't know	✓ Varies		– No	– Probably No	Probably Yes	– Yes
Feasibility	– Don't know	– Varies		– No	– Probably No	✓ Probably Yes	- Yes

3.3.8 Fundal pressure

RECOMMENDATION 40

Application of manual fundal pressure to facilitate childbirth during the second stage of labour is not recommended. *(Not recommended)*

Remarks

- The GDG had serious concerns about the potential for harm to mother and baby with this procedure.
- The panel is aware of an ongoing trial, the Gentle Assisted Pushing (GAP) trial *(183)*, which could help to provide important evidence on the effects of applying fundal pressure according to a specific protocol.

Summary of evidence and considerations

Effects of the intervention (EB Table 3.3.8)

The evidence was derived from a Cochrane systematic review that included nine trials involving 3948 women *(184)*. Five trials (3057 women) conducted in India, Iran, South Africa and Turkey (2 trials) evaluated manual fundal pressure in women with low-risk pregnancies compared with no fundal pressure. Four trials (891 women) conducted in Italy, Republic of Korea (2 trials) and the United Kingdom evaluated fundal pressure by means of an inflatable belt compared with no fundal pressure. For the purposes of this guideline, only the evidence on manual fundal pressure was considered, as the use of inflatable belt devices has not progressed beyond research settings.

Manual fundal pressure was applied according to the Kristeller manoeuvre in four trials, and as "gentle assisted pushing" (see Additional considerations) in one small trial (120 women); two of these trials recruited primigravid women only. One trial limited the application of fundal pressure to three attempts. Most of the included trials had design limitations.

Comparison: Manual fundal pressure compared with no fundal pressure

Maternal outcomes

Mode of birth: Evidence on the relative effects on caesarean section and instrumental birth rates is of very low certainty.

Duration of the second stage of labour: Evidence on the duration of the second stage of labour is of very low certainty. Low-certainty evidence on the failure of women to give birth spontaneously within a time frame specified by the authors suggests that there may be little or no difference between manual fundal pressure and no fundal pressure (1 trial, 110 women, RR 0.96, 95% CI 0.71–1.28).

Mortality: This outcome was not assessed in the studies.

Morbidity: Low-certainty evidence suggests that fundal pressure compared with no fundal pressure may have little or no effect on PPH (1 trial, 110 women, RR 1.87, 95% CI 0.58–6.06). Evidence on the effect of fundal pressure on soft tissue damage (vagina, perineum or uterus) is very uncertain, mainly due to sparse data. Low-certainty evidence suggests that applying fundal pressure may make little or no difference to episiotomy rates compared with no fundal pressure (1 trial, 317 women, RR 1.18, 95% CI 0.92–1.50). The outcome "severe maternal morbidity or death" was not reported in any of the trials.

Birth experience: The trials did not report maternal satisfaction; however, low-certainty evidence suggests that women receiving manual fundal pressure may experience more pain after birth (assessed in terms of analgesic requirements) than those not receiving fundal pressure (1 trial, 209 women, RR 4.54, 95% CI 2.21–9.34).

Fetal and neonatal outcome

Birth trauma: Evidence on birth trauma, including fractures and haematomas, is of very low certainty due to sparse data (small sample, no events).

Perinatal hypoxia-ischaemia: Evidence on low arterial cord pH and Apgar score less than 7 at 5 minutes is of very low certainty.

Perinatal mortality: No neonatal deaths occurred in the comparison groups (2 trials, 2445 neonates), therefore evidence on neonatal death is of very low certainty.

Additional considerations

Concerns relating to the practice of fundal pressure are due to the possibility that serious harm might

arise in the mother or the baby from the application of excessive uncontrolled force *(185, 186)*, including uterine and other organ rupture, and maternal and perinatal death; however, these occurrences might not often be reported in the literature.

Fundal pressure in the included trials was applied with the birth attendants' hands (i.e. not forearms or elbows); therefore, the evidence is not applicable to settings where other techniques of fundal pressure are applied.

The review also included studies on inflatable belts. The resultant moderate-certainty evidence suggests that fundal pressure by an inflatable belt probably increases anal sphincter damage (third-degree tear) compared with no fundal pressure (1 trial, 500 women, RR 15.69, 95% CI 2.10–117.02). Inflatable belt devices have not progressed beyond the research stage.

A large multicentre trial is currently under way in South Africa to evaluate a new technique of fundal pressure, which is applied with the pregnant woman in an upright posture *(183)*. The technique is called "gentle assisted pushing" whereby the health care professional applies "steady firm fundal pressure" with the palms of her hands, in the direction of the pelvis, taking care to use only the strength of her forearms and not to apply additional body weight. The health care professional is required to maintain the pressure for the full duration of each contraction or 30 seconds (whichever is shorter). The investigators hope that this trial, involving 1145 women, will establish whether or not a gentler form of fundal pressure can improve birth outcomes.

Values

Findings from a review of qualitative studies looking at what matters to women during intrapartum care *(23)* indicate that most women want a normal childbirth with good outcomes for mother and baby, but acknowledge that medical intervention may sometimes be necessary. Most women, especially those giving birth for the first time, are apprehensive about childbirth (high confidence in the evidence) and fearful of some medical interventions, although in certain contexts and/or situations women welcome interventions to shorten labour or provide relief from pain (low confidence in the evidence). When interventions are introduced, women would like to receive relevant information from technically competent health care professionals who are sensitive to their needs (high confidence in the evidence). Findings also show that women desire to be in control of their birth process and would like to be involved in decision-making around the use of interventions (high confidence in the evidence).

Resources

There is no evidence on the costs or cost-effectiveness of this practice.

Equity

No direct evidence of the impact of fundal pressure on equity was found. However, indirect evidence from a review of barriers and facilitators to facility-based birth indicates that unfamiliar and undesirable birth practices by health workers in facilities, such as unfamiliar birth positions, are an important barrier to the uptake of facility-based birth by disadvantaged women in LMICs (high confidence in the evidence) *(8)*.

Additional considerations

WHO's 2015 *State of inequality* report indicates that women who are poor, least educated and residing in rural areas have lower health intervention coverage and worse health outcomes than the more advantaged women *(33)*. Based on the research evidence above, if disadvantaged women consider fundal pressure an unfamiliar and undesirable practice, the intervention might have a negative impact on equity by contributing to low use of health care facilities by disadvantaged women. However, in the absence of specific evidence on fundal pressure,

Table 3.63 Main resource requirements for fundal pressure application

Resource	Description
Staff	■ Staff trained in how to safely apply fundal pressure
Training	■ Practice-based training on how to safely apply fundal pressure
Supplies	■ None required
Equipment	■ None required
Time	■ The time of an additional skilled birth attendant is needed and would vary depending on the duration of the procedure
Supervision and monitoring	■ Regular supervision, audit and review by ward/clinic/facility lead to ensure adherence to fundal pressure protocol and to monitor safety

the converse could also be true. Findings from a study conducted in a rural population in India suggest that fundal pressure might be a desirable part of some traditional birth practices *(187)*.

In many settings where fundal pressure is used, women might not be given adequate information about the procedure and might not be asked for their consent. If non-consented, or applied indiscriminately and with excessive force, applying fundal pressure could be considered an abuse of a woman's human rights.

Acceptability

There is no specific evidence on receiving or applying fundal pressure in a qualitative systematic review on women's and providers' views and experiences of intrapartum care *(26)*. However, general findings from this document suggest that women would rather avoid this type of procedure unless their baby is at risk (high confidence in the evidence). They would also like to be cared for by competent, skilled and sensitive health care professionals (high confidence in the evidence) and, even though they would prefer to have a quick labour (low confidence in the evidence), they would, where possible, like to remain in control of their labour and childbirth processes (high confidence in the evidence).

Additional considerations

As part of a recent global initiative looking at how women are treated during labour and childbirth, the authors of a qualitative study conducted in Guinea found that health care providers were using extreme force when pushing on the fundus *(41)*. Women found this disturbing, painful and tantamount to physical abuse.

In a study in rural India *(187)*, the authors found that fundal pressure was being used routinely, often beginning in early labour, to the extent that the practice often left providers feeling exhausted. The authors did not discuss women's experiences but noted that babies were sometimes injured as a consequence of the procedure.

Feasibility

There is no specific evidence on fundal pressure in a qualitative systematic review on women's and health care professionals' views and experiences of intrapartum care *(26)*. However, findings from the review suggest that staff in certain contexts may lack the time, the training or the resources to use fundal pressure in a competent and sensitive manner (moderate confidence in the evidence).

Additional considerations

Use of uncontrolled fundal pressure application appears to be prevalent in a variety of settings *(118, 173, 184–190)*, and it might not be feasible to ensure that health care professionals deliver fundal pressure in a consistent, standardized and controlled way. The birth attendant needs assistance from another health care professional to perform this procedure.

Table 3.64 Summary of judgements: Fundal pressure compared with no fundal pressure

Desirable effects	✓ Don't know	– Varies		– Trivial	– Small	– Moderate	– Large
Undesirable effects	– Don't know	– Varies		– Large	✓ Moderate	– Small	– Trivial
Certainty of the evidence	– No included studies			✓ Very low	– Low	– Moderate	– High
Values				– Important uncertainty or variability	✓ Possibly important uncertainty or variability	– Probably no important uncertainty or variability	– No important uncertainty or variability
Balance of effects	– Don't know	– Varies	– Favours no fundal pressure	✓ Probably favours no fundal pressure	– Does not favour fundal pressure or no fundal pressure	– Probably favours fundal pressure	– Favours fundal pressure
Resources required	– Don't know	– Varies	– Large costs	– Moderate costs	✓ Negligible costs or savings	– Moderate savings	– Large savings
Certainty of evidence of required resources	✓ No included studies			– Very low	– Low	– Moderate	– High
Cost-effectiveness	– Don't know	– Varies	– Favours no fundal pressure	✓ Probably favours no fundal pressure	– Does not favour fundal pressure or no fundal pressure	– Probably favours fundal pressure	– Favours fundal pressure
Equity	– Don't know	– Varies	– Reduced	✓ Probably reduced	– Probably no impact	– Probably increased	– Increased
Acceptability	– Don't know	– Varies		– No	✓ Probably No	– Probably Yes	– Yes
Feasibility	– Don't know	– Varies		– No	– Probably No	✓ Probably Yes	– Yes

3.4 Third stage of labour

3.4.1 Prophylactic uterotonics

RECOMMENDATION 41

The use of uterotonics for the prevention of postpartum haemorrhage (PPH) during the third stage of labour is recommended for all births. *(Recommended)*

RECOMMENDATION 42

Oxytocin (10 IU, IM/IV) is the recommended uterotonic drug for the prevention of postpartum haemorrhage (PPH). *(Recommended)*

RECOMMENDATION 43

In settings where oxytocin is unavailable, the use of other injectable uterotonics (if appropriate, ergometrine/methylergometrine, or the fixed drug combination of oxytocin and ergometrine) or oral misoprostol (600 µg) is recommended. *(Recommended)*

Remarks

- These recommendations have been integrated from the *WHO recommendations for the prevention and treatment of postpartum haemorrhage (191)*, in which the GDG for that guideline determined them to be strong recommendations based on moderate-quality evidence.
- Available comparisons are limited, but a significant difference between the benefits of oxytocin and ergometrine is unlikely. These recommendations place a high value on avoiding the adverse effects of ergometrine and assume a similar benefit from using oxytocin and ergometrine for the prevention of PPH.
- Caution should be exercised when opting for ergot derivatives for the prevention of PPH as these drugs have clear contraindications in women with hypertensive disorders. Thus, it is probably safer to avoid the use of ergot derivatives in unscreened populations.
- Oral misoprostol (600 µg) was regarded by the GDG as an effective drug for the prevention of PPH. However, the GDG considered the relative benefits of oxytocin compared to misoprostol in preventing blood loss, as well as the increased adverse effects of misoprostol compared to oxytocin. The GDG acknowledged that there is no evidence to show that a 600-µg dose of misoprostol provides greater efficacy over a 400-µg dose. Lower doses have a lower side-effect profile but the efficacy of lower doses of misoprostol has not been evaluated sufficiently.
- The recommendations concerning alternative uterotonics should not detract from the objective of making oxytocin as widely accessible as possible.
- In view of past concerns regarding the community-level distribution of misoprostol and the potential for serious consequences of administration before birth, the GDG places emphasis on training persons administering misoprostol and monitoring community distribution interventions with scientifically sound methods and appropriate indicators.
- The evidence supporting these recommendations can be found in the source guideline document, available at: http://apps.who.int/iris/bitstream/10665/75411/1/9789241548502_eng.pdf

3.4.4 Delayed umbilical cord clamping

RECOMMENDATION 44

Delayed umbilical cord clamping (not earlier than 1 minute after birth) is recommended for improved maternal and infant health and nutrition outcomes. *(Recommended)*

Remarks

- This recommendation has been integrated from the *WHO Guideline: delayed cord clamping for improved maternal and infant health and nutrition outcomes (192)*, in which the GDG for that guideline determined it to be a strong recommendation based on moderate-quality evidence.
- Delayed cord clamping should be performed during the provision of essential newborn care.
- Some health care professionals working in areas of high HIV prevalence have expressed concern regarding delayed cord clamping as part of management of the third stage of labour. These professionals are concerned that during placental separation, a partially detached placenta could be exposed to maternal blood and this could lead to a micro-transfusion of maternal blood to the baby. It has been demonstrated that the potential for mother-to-child transmission of HIV can take place at three different points in time: micro-transfusions of maternal blood to the fetus during pregnancy (intrauterine HIV transmission), exposure to maternal blood and vaginal secretions when the fetus passes through the birth canal in vaginal deliveries (intrapartum transmission), and during breastfeeding (postnatal infection). For this reason, the main intervention to reduce the maternal-to-child transmission is the reduction of maternal viral load through the use of antiretroviral drugs during pregnancy, childbirth and postnatal period. There is no evidence that delaying cord clamping increases the possibility of HIV transmission from the mother to the newborn. Maternal blood percolates through the placental intervillous space throughout pregnancy with a relatively low risk of maternal–fetal transmission before delivery. It is highly unlikely that separation of the placenta increases exposure to maternal blood, and it is highly unlikely that it disrupts the fetal placental circulation (i.e. it is unlikely that during placental separation the newborn circulation is exposed to maternal blood). Thus, the proven benefits of a 1–3 minute delay, at least, in clamping the cord outweigh the theoretical, and unproven, harms. Late cord clamping is recommended even among women living with HIV or women with unknown HIV status.
- The evidence supporting this recommendation can be found in the source guideline document, available at: http://apps.who.int/iris/bitstream/10665/148793/1/9789241508209_eng.pdf

3.4.6 Controlled cord traction (CCT)

RECOMMENDATION 45

In settings where skilled birth attendants are available, controlled cord traction (CCT) is recommended for vaginal births if the care provider and the parturient woman regard a small reduction in blood loss and a small reduction in the duration of the third stage of labour as important. *(Recommended)*

Remarks

- This recommendation has been integrated from the *WHO recommendations for the prevention and treatment of postpartum haemorrhage (191)*, in which the GDG for that guideline determined it to be a strong recommendation based on moderate quality evidence.
- This recommendation is based on a large RCT in which oxytocin 10 IU was used for the prevention of postpartum haemorrhage (PPH) in all participants. Based on this evidence, CCT was regarded as safe when applied by skilled birth attendants as it provides small beneficial effects on blood loss (average reduction in blood loss of 11 ml) and on the duration of the third stage of labour (average reduction of 6 minutes). The care provider should discuss the decision to implement CCT in the context of a prophylactic uterotonic drug with the woman.
- If ergot alkaloids are used for the prevention of PPH, then CCT to minimize placenta retention is regarded as essential.
- There is insufficient evidence to determine the benefits or risks of CCT when used in conjunction with misoprostol.
- CCT is the first intervention to treat retained placenta; therefore, the teaching of CCT in medical and midwifery curricula is essential.
- Based on the most recent evidence, understanding about the contribution of each component of the active management of the third stage of labour package has evolved. The GDG considered that this package has a primary intervention: the use of a uterotonic. In the context of oxytocin use, CCT may add a small benefit, while uterine massage may add no benefit for the prevention of PPH. Early cord clamping is generally contraindicated.
- The evidence supporting this recommendation can be found in the source guideline document, available at: http://apps.who.int/iris/bitstream/10665/75411/1/9789241548502_eng.pdf

3.4.7 Uterine massage

RECOMMENDATION 46

Sustained uterine massage is not recommended as an intervention to prevent postpartum haemorrhage (PPH) in women who have received prophylactic oxytocin. *(Not recommended)*

Remarks

- This recommendation has been integrated from the *WHO recommendations for the prevention and treatment of postpartum haemorrhage (191)*, in which the GDG for that guideline determined it to be a conditional recommendation based on low-quality evidence.
- There is a lack of evidence regarding the role of uterine massage for PPH prevention when no uterotonic drugs are used, or if a uterotonic drug other than oxytocin is used.
- Although the GDG acknowledged that one small study reported that sustained uterine massage and clot expulsion were associated with a reduction in the use of additional uterotonics, there is lack of robust evidence supporting other benefits. However, the GDG considered that routine and frequent uterine tone assessment remains a crucial part of immediate postpartum care, particularly for the optimization of early PPH diagnosis.
- Based on the most recent evidence, understanding about the contribution of each component of the active management of the third stage of labour package has evolved. The GDG considered that this package has a primary intervention: the use of a uterotonic. In the context of oxytocin use, CCT may add a small benefit, while uterine massage may add no benefit for the prevention of PPH. Early cord clamping is generally contraindicated.
- The evidence supporting this recommendation can be found in the source guideline document, available at: http://apps.who.int/iris/bitstream/10665/75411/1/9789241548502_eng.pdf

3.5 Care of the newborn

3.5.1 Routine nasal or oral suction

RECOMMENDATION 47

In neonates born through clear amniotic fluid who start breathing on their own after birth, suctioning of the mouth and nose should not be performed. *(Not recommended)*

Remarks

- This recommendation has been integrated from the *WHO Guidelines on basic newborn resuscitation (193)*, in which the GDG for that guideline determined it to be a strong recommendation based on high-quality evidence.
- No further remarks were noted.
- The evidence supporting this recommendation can be found in the source guideline document, available at: http://apps.who.int/iris/bitstream/10665/75157/1/9789241503693_eng.pdf

3.5.2 Skin-to-skin contact

RECOMMENDATION 48

Newborns without complications should be kept in skin-to-skin contact (SSC) with their mothers during the first hour after birth to prevent hypothermia and promote breastfeeding. *(Recommended)*

Remarks

- This recommendation has been integrated from the *WHO Recommendations for management of common childhood conditions: evidence for technical update of pocket book recommendations (194)*, in which the GDG for that guideline determined it to be a strong recommendation based on low-quality evidence.
- No further remarks were noted.
- The evidence supporting this recommendation can be found in the source guideline document, available at: http://apps.who.int/iris/bitstream/10665/44774/1/9789241502825_eng.pdf

3.5.3 Breastfeeding

RECOMMENDATION 49

All newborns, including low-birth-weight (LBW) babies who are able to breastfeed, should be put to the breast as soon as possible after birth when they are clinically stable, and the mother and baby are ready. *(Recommended)*

Remarks

- This recommendation has been integrated from the *WHO recommendations on newborn health (195)*. The evidence supporting this recommendation can be found in the *WHO guidelines on optimal infant feeding for low birth weight infants in low- and middle-income countries (196)*. This recommendation was determined to be a strong recommendation based on low-quality evidence.
- No further remarks were noted.
- The source and the evidence supporting this recommendation can be found in the above-mentioned guideline documents, which are available, respectively, at: http://apps.who.int/iris/bitstream/10665/259269/1/WHO-MCA-17.07-eng.pdf and http://www.who.int/maternal_child_adolescent/documents/9789241548366.pdf

3.5.4 Haemorrhagic disease prophylaxis using vitamin K

RECOMMENDATION 50

All newborns should be given 1 mg of vitamin K intramuscularly after birth (i.e. after the first hour by which the infant should be in skin-to-skin contact with the mother and breastfeeding should be initiated). *(Recommended)*

Remarks

- This recommendation has been integrated from the *WHO Recommendations for management of common childhood conditions: evidence for technical update of pocket book recommendations (194)*, in which the GDG for that guideline determined it to be a strong recommendation based on moderate-quality evidence.
- No further remarks were noted.
- The evidence supporting this recommendation can be found in the source guideline document, available at: http://apps.who.int/iris/bitstream/10665/44774/1/9789241502825_eng.pdf

3.5.5 Bathing and other postnatal care of the newborn

RECOMMENDATION 51

Bathing should be delayed until 24 hours after birth. If this is not possible due to cultural reasons, bathing should be delayed for at least six hours. Appropriate clothing of the baby for ambient temperature is recommended. This means one to two layers of clothes more than adults, and use of hats/caps. The mother and baby should not be separated and should stay in the same room 24 hours a day. *(Recommended)*

Remarks

- This recommendation has been integrated from the *WHO recommendations on postnatal care of the mother and newborn (197)*, in which the GDG for that guideline determined it to be a strong situational recommendation based on GDG consensus.
- No further remarks were noted.
- The evidence supporting this recommendation can be found in the source guideline document, available at: http://apps.who.int/iris/bitstream/10665/97603/1/9789241506649_eng.pdf

3.6 Care of the woman after birth

3.6.1 Uterine tonus assessment

RECOMMENDATION 52

Postpartum abdominal uterine tonus assessment for early identification of uterine atony is recommended for all women. *(Recommended)*

Remarks

- This recommendation has been integrated from the *WHO recommendations for the prevention and treatment of postpartum haemorrhage (191)*, in which the GDG for that guideline determined it to be a strong recommendation based on very low-quality evidence.
- The GDG considered that routine and frequent uterine tone assessment remains a crucial part of immediate postpartum care, particularly for the optimization of early PPH diagnosis.
- The evidence supporting this recommendation can be found in the source guideline document, available at: http://apps.who.int/iris/bitstream/10665/75411/1/9789241548502_eng.pdf

3.6.2 Antibiotics for uncomplicated vaginal birth

RECOMMENDATION 53

Routine antibiotic prophylaxis is not recommended for women with uncomplicated vaginal birth. *(Not recommended)*

Remarks

- This recommendation has been integrated from the *WHO recommendations for prevention and treatment of maternal peripartum infections (114)*, in which the GDG for that guideline determined it to be a strong recommendation based on very low-quality evidence.
- The GDG was concerned about the potential public health implications of the high rate of routine use of antibiotics following vaginal birth without any specific risk factors in some settings. The group places emphasis on the negative impact of such routine use on the global efforts to contain antimicrobial resistance and, therefore, made a strong recommendation against routine antibiotic prophylaxis.
- "Uncomplicated vaginal birth" in this context connotes vaginal birth in the absence of any specific risk factor for, or clinical signs of, maternal peripartum infection.
- Careful monitoring of all women after birth is essential to promptly identify any sign of endometritis and institute appropriate antibiotic treatment.
- Recommendations on antibiotic use for common intrapartum conditions or interventions that often raise concerns about increased risk of infection are available in the original WHO guideline.
- The evidence supporting this recommendation can be found in the source guideline document, available at: http://apps.who.int/iris/bitstream/10665/186171/1/9789241549363_eng.pdf

3.6.3 Routine antibiotic prophylaxis for episiotomy

RECOMMENDATION 54

Routine antibiotic prophylaxis is not recommended for women with episiotomy. *(Not recommended)*

Remarks

- This recommendation has been integrated from the *WHO recommendations for prevention and treatment of maternal peripartum infections (114)*, in which the GDG for this guideline determined it to be a strong recommendation based on GDG consensus.
- This recommendation was based on a consensus of the GDG in view of a high rate of episiotomy and the potential impact of antibiotics, in the absence of clinical benefits for public health. The GDG places emphasis on avoidance of emerging antimicrobial resistance at the global level and, therefore, made a strong recommendation.
- This recommendation applies to the use of antibiotics before or immediately after episiotomy repair following vaginal birth. Antibiotics should only be administered when there are clinical signs of infection of an episiotomy wound.
- The GDG emphasized the need for health systems to adopt a policy of restrictive rather than routine use of episiotomy to reduce its potential complications and the use of additional resources for its treatment.
- Second-degree perineal tear is anatomically similar to an episiotomy and does not warrant the use of prophylactic antibiotics.
- In a situation where an episiotomy wound extends to become a third- or fourth-degree perineal tear, prophylactic antibiotics should be administered as recommended in the source guideline document *(114)*.
- The evidence supporting this recommendation can be found in the source guideline document, available at: http://apps.who.int/iris/bitstream/10665/186171/1/9789241549363_eng.pdf

3.6.4 Routine postpartum maternal assessment

RECOMMENDATION 55

All postpartum women should have regular assessment of vaginal bleeding, uterine contraction, fundal height, temperature and heart rate (pulse) routinely during the first 24 hours starting from the first hour after birth. Blood pressure should be measured shortly after birth. If normal, the second blood pressure measurement should be taken within six hours. Urine void should be documented within six hours. *(Recommended)*

Remarks

- This recommendation has been integrated from the *WHO recommendations on postnatal care of the mother and newborn (197)*, in which the GDG for that guideline reached consensus based on existing WHO guidelines.
- No further remarks were noted.
- The evidence supporting this recommendation can be found in the source guideline document, available at: http://apps.who.int/iris/bitstream/10665/97603/1/9789241506649_eng.pdf

3.6.5 Postnatal discharge following uncomplicated vaginal birth

RECOMMENDATION 56

After an uncomplicated vaginal birth in a health care facility, healthy mothers and newborns should receive care in the facility for at least 24 hours after birth. *(Recommended)*

Remarks

- This recommendation has been integrated from the WHO recommendations on postnatal care of the mother and newborn *(197)*, in which the GDG for that guideline determined it to be a conditional recommendation based on low-quality evidence.
- An appropriate standard of care for mothers and newborns should be provided in health care facilities, in accordance with other existing WHO guidelines. For the newborn this includes an immediate assessment at birth, and a full clinical examination around one hour after birth and again before discharge.
- "Healthy mothers and newborns" are defined in the safe childbirth checklist that is to be used to assess mothers and newborns at the time of discharge *(198)*. Before discharge, bleeding in the mother should be controlled, mother and baby should not have signs of infection, and baby should be breastfeeding well.
- The evidence supporting this recommendation can be found in the source guideline document, available at: http://apps.who.int/iris/bitstream/10665/97603/1/9789241506649_eng.pdf

4. Implementation of this guideline: introducing the WHO intrapartum care model

The aim of this guideline is to improve the quality of essential intrapartum care with the ultimate goal of improving maternal, fetal and newborn outcomes. The recommended practices need to be deliverable within an appropriate model of care that can be adapted to different countries, local contexts and the individual woman. With the contributions of the members of the Guideline Development Group (GDG), WHO reviewed existing models of delivering intrapartum care with full consideration of the range of recommended practices within this guideline (Section 3) and through a human rights lens.

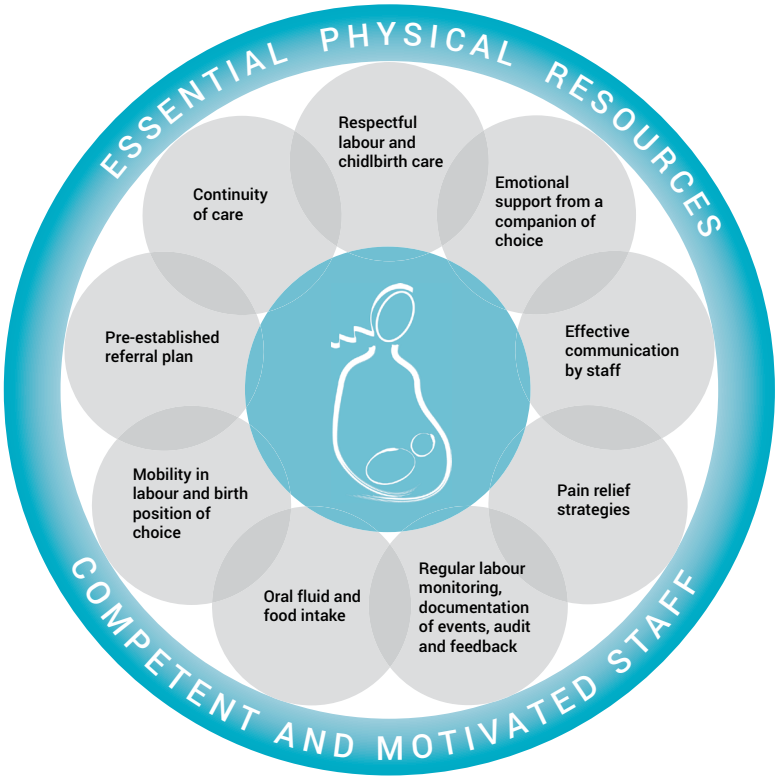
First, the GDG emphasized the urgent need to improve the quality of care around labour and childbirth in all settings. Acknowledging the substantial variations that exist in the philosophies driving the organization and provision of labour and childbirth care in contemporary practice, and the fact that clinical outcomes and experience of care for the woman and her baby are largely determined by the prevailing model of care, the GDG reviewed how intrapartum care for healthy pregnant women should be delivered in terms of cross-cutting clinical and non-clinical interventions that should be received by all women irrespective of context. To achieve the much-needed improvements to the quality of intrapartum care, the GDG recognized that a key shift is required in the practical ways that intrapartum care is delivered globally. This key shift is informed by the importance of achieving the best possible physical, emotional and psychological outcomes for the woman and her baby, irrespective of the influence of generic policies that may exist within and across health systems and countries. The group agreed that attainment of these outcomes requires a model of care in which health care providers give priority to the implementation of critical components that have been shown to be effective in improving both clinically relevant outcomes and childbirth experience for the woman and her family.

To this end, WHO proposes a global model of intrapartum care that subscribes to all domains of the WHO quality of care framework for maternal and newborn health *(12)* and places the woman and her baby at the centre of care provision (Fig. 4.1). It is based on the premise that care during labour can only be supportive of a woman's own capability to give birth without unnecessary interventions when synergistic evidence-based components are not fragmented but delivered together, giving her freedom to experience the birth of her baby, while at the same time ensuring timely and appropriate identification and management of complications if they arise. The model acknowledges the differences across settings in terms of existing models of care, and is flexible enough for adoption without disrupting the current organization of care.

The WHO intrapartum care model is founded on the 56 evidence-based recommendations included in this guideline. To optimize the potential of the new model and ensure that all women receive evidence-based, equitable and good-quality intrapartum care in health care facilities, these recommendations should be implemented as a package of care in all facility-based settings, by kind, competent and motivated health care professionals who have access to the essential physical resources. Health systems should aim to implement this model of care to empower all women to access the type of individualized care that they want and need, and to provide a sound foundation for such care, in accordance with a human rights-based approach. Implementation considerations for the WHO model can be found below in Box 4.1.

The WHO intrapartum care model has the potential to positively transform the lives of women, families and communities worldwide. It sets goals beyond the level of merely surviving, but at the level of thriving, in all country settings. The implementation of the WHO intrapartum care model should lead to cost savings through reductions in unnecessary medical interventions, with consequent improvements in equity for disadvantaged populations. Thus, addressing the shortage of skilled maternity care providers and improving the infrastructure required to successfully implement this model of evidence-based intrapartum care should be a top priority for all stakeholders.

Fig. 4.1 Schematic representation of the WHO intrapartum care model



BOX 4.1

Considerations for the implementation of the WHO intrapartum care model

Health policy considerations

- A firm government commitment to increasing coverage of maternity care for all pregnant women giving birth in health care facilities is needed, irrespective of social, economic, ethnic, racial or other factors. National support must be secured for the whole package of recommendations, not just for specific components.
- To set the policy agenda, to secure broad anchoring and to ensure progress in policy formulation and decision-making, representatives of training facilities and professional societies should be included in participatory processes at all stages.
- To facilitate negotiations and planning, situation-specific information on the expected impact of the new intrapartum care model on service users, providers and costs should be compiled and disseminated.
- To be able to adequately ensure access for all women to quality maternity care, in the context of universal health coverage (UHC), strategies for raising public funding for health care will need revision. In low-income countries, donors could play a significant role in scaling up implementation.

Organizational or health-system-level considerations

- Long-term planning is needed for resource generation and budget allocation to address the shortage of skilled midwives, to improve facility infrastructure and referral pathways, and to strengthen and sustain good-quality maternity services.
- Introduction of the model should involve training institutions and professional bodies so that pre-service and in-service training curricula can be updated as quickly and smoothly as possible.
- Standardized labour monitoring tools, including a revised partograph, will need to be developed to ensure that all health care providers (i) understand the key concepts around what constitutes normal and abnormal labour and labour progress, and the appropriate support required, and (ii) apply the standardized tools.

- The national Essential Medicines Lists will need to be updated (e.g. to include medicines to be available for pain relief during labour).
- Development or revision of national guidelines and/or facility-based protocols based on the WHO intrapartum care model is needed. For health care facilities without availability of caesarean section, context- or situation-specific guidance will need to be developed (e.g. taking into account travel time to the higher-level facility) to ensure timely and appropriate referral and transfer to a higher level of care if intrapartum complications develop.
- Good-quality supervision, communication and transport links between primary and higher-level facilities need to be established to ensure that referral pathways are efficient.
- Strategies will need to be devised to improve supply chain management according to local requirements, such as developing protocols for obtaining and maintaining stock of supplies.
- Consideration should be given to care provision at alternative maternity care facilities (e.g. on-site midwife-led birthing units) to facilitate the WHO intrapartum care model and reduce exposure of healthy pregnant women to unnecessary interventions prevalent in higher-level facilities.
- Behaviour change strategies aimed at health care providers and other stakeholders could be required in settings where non-evidence-based intrapartum care practices are entrenched.
- Successful implementation strategies should be documented and shared as examples of best practice for other implementers.

User-level considerations

- Community-level sensitization activities should be undertaken to disseminate information about:
  - respectful maternity care (RMC) as a fundamental human right of pregnant women and babies in facilities;
  - facility-based practices that lead to improvements in women's childbirth experience (e.g. RMC, labour and birth companionship, effective communication, choice of birth position, choice of pain relief method); and
  - unnecessary birth practices that are not recommended for healthy pregnant women and that are no longer practised in facilities (e.g. liberal use of episiotomy, fundal pressure, routine amniotomy).

5. Research implications

During the guideline development process, the Guideline Development Group (GDG) identified important knowledge gaps that need to be addressed through primary research. Where the certainty of available evidence was rated as "low" or "very low", the GDG considered whether further research should be prioritized, based on whether such research would contribute to improvements in the childbirth experience of women, be likely to promote equity, and be feasible to implement. GDG-prioritized research gaps are listed below.

Care throughout labour and birth

Respectful maternity care (RMC)

- What are the effects of a policy of RMC on substantive maternal and perinatal outcomes, and on longer-term health and well-being?
- Which components/sets of components are the most effective and in which contexts?
- What are the best RMC indicators, in terms of validity and responsiveness in clinical settings?
- What are the effective strategies for implementing RMC in different LMIC and HIC settings?
- What are the innovative approaches that need to be further developed and tested to integrate RMC into quality improvement initiatives?

Effective communication

- What are the effects of communication skills training on women's and providers' experiences of facility-based childbirth?
- What level, type and other characteristics of communication are effective in allaying anxiety and empowering women to take control of their birth process?
- What level, type and other characteristics of communication are effective in keeping labour companions well informed?
- What is the optimal skilled birth attendant-to-woman ratio for delivery of effective communication?

Companionship during labour and childbirth

- What are the best health system models to guarantee companionship for women in different facility settings and cultures? Are there other models of companionship (e.g. where a doula supports more than one woman at a time) that can be effective?
- What is the best model for doula/companion training that will improve birth outcomes?
- What types of birth spaces and other facilities are needed at health care facilities that provide maternity services, to optimally accommodate companions during labour without impacting negatively on maternity care provided by staff?
- What are the costs related to training and infrastructure that are associated with different companionship models?

First stage of labour

Progress of labour

- What is the ideal paper-based or digital tool for labour monitoring and for guiding decision-making to reduce unnecessary interventions and improve birth outcomes?
- What is the effectiveness of a reference line (such as the "alert line") as a tool for triaging women for referral from peripheral to higher-level settings, in terms of improved birth outcomes?
- What is the impact of facilitating longer labour on health outcomes and health service utilization?

Labour ward admission policy

- For healthy pregnant women in early labour, does delayed labour ward admission compared with direct labour ward admission improve birth outcomes?

Clinical pelvimetry on admission

- In remote or rural facilities without caesarean section availability, is routine clinical pelvimetry at labour admission a useful assessment for triaging women at risk of cephalo-pelvic disproportion?

Routine cardiotocography (CTG) on admission

- For women classified to be low risk in LMICs and any setting with inadequate antenatal care provision, can routine CTG on labour admission improve birth outcomes?

Continuous CTG during labour

- What are the effects of mobile continuous CTG on birth outcomes for women without risk factors?

- Is this intervention cost-effective, equitable, acceptable and feasible to implement?
- Can women giving birth in settings with high quality of maternity care benefit from improved CTG technology?

Method of intermittent auscultation (IA) during labour

- For healthy women in labour in LMICs, what are the effects of IA performed with CTG (with and without a paper record) compared with IA performed with a Doppler ultrasound device on birth outcomes?
- Is intermittent CTG feasible and cost-effective in LMICs?
- What are the comparative effects (benefits and harms) of different IA protocols (duration, interval and timing) in terms of birth outcomes?

Opioid analgesia

- What are women's values and experiences of opioid use for pain relief in labour?
- Is there an association between intrapartum opioid use and subsequent opioid dependency in offspring?

Second stage of labour

Episiotomy policy

- For pregnant women in the second stage of labour, does selective episiotomy based upon clearly defined clinical indications compared with no episiotomy improve birth outcomes?

Fundal pressure

- What implementation strategies are effective in discouraging the practice of fundal pressure?

6. Dissemination

This guideline will be available online for download and also as a printed publication. Online versions will be available via the websites of the WHO Departments of Reproductive Health and Research (RHR) and Maternal, Newborn, Child and Adolescent Health (MCA), and through the WHO Reproductive Health Library (RHL).[1] Print versions will be distributed to WHO regional and country offices, ministries of health, WHO collaborating centres, NGO partners and professional associations, using the same distribution list that was developed for the antenatal care guideline: *WHO recommendations on antenatal care for a positive pregnancy experience (35)*. This guideline will be accompanied by an independent critical appraisal based on the AGREE instrument (Appraisal of Guidelines for Research & Evaluation) *(199)*. Technical meetings will be held within the WHO RHR and MCA Departments to share the recommendations and derivative products, which will include a practical manual for implementation of the new WHO intrapartum care model, with the teams responsible for policy and programme implementation.

Two sets of evidence briefs will be developed: one set for policy-makers and programme managers and the other set for health care professionals. These evidence briefs, which will highlight the recommendations and implementation-related contextual issues, will be developed and disseminated in collaboration with USAID, FIGO and ICM.

The executive summary and recommendations from this publication will be translated into the six UN languages for dissemination through the WHO regional and country offices and during meetings organized by, or attended by, staff of the WHO RHR and MCA Departments.

In addition to online and print versions of this guideline, an interactive web-based version is planned, which will be developed by a professional content communication and design firm that specializes in infographics. This will facilitate the dissemination and uptake of the guideline recommendations by making them available online in a user-friendly format, and will allow a platform for cross-referenced recommendations to be updated or added on an ongoing basis to ensure that the recommendations are up to date and comprehensive. Furthermore, this would allow for focused activities and products to be developed. English, French, Portuguese and Spanish (the latter in collaboration with the WHO Regional Office for the Americas/Pan American Health Organization [PAHO]) web-based versions are planned and have been budgeted for.

The guideline will also be launched on the WHO RHR departmental website as part of the monthly *HRP News*. This site currently has over 4500 subscribers including clinicians, programme managers, policy-makers and health service users from all around the world. In addition, a number of articles presenting the recommendations and key implementation considerations will be published, in compliance with WHO's open access and copyright policies. Relevant WHO clusters, departments and partnerships, such as the Partnership for Maternal, Newborn & Child Health (PMNCH), will also be part of this dissemination process.

In an effort to increase dissemination of WHO guidelines on sexual and reproductive health and rights, a search function with the ability to search the database of WHO guidelines and recommendations has been created and recently launched by the RHR Department.[2] The intrapartum care guideline recommendations will be made available via this search function.

The Maternal and Perinatal Health and Preventing Unsafe Abortion team of the RHR Department, in collaboration with the MCA Department and other partners, will support national and subnational working groups to adapt and implement the guideline. This process will include the development or revision of existing national guidelines or protocols in line with the WHO guideline. The GREAT Network (Guideline-driven, Research priorities, Evidence synthesis, Application of evidence, and Transfer of knowledge) will be used to bring together relevant stakeholders to identify and assess the priorities, barriers and facilitators to guideline implementation, and to support the efforts of stakeholders to develop adaptations and guideline implementation strategies tailored to the local context *(200)*. This includes technical support for local guideline implementers in the development of training manuals, flow charts and quality indicators, as well as participation in stakeholder meetings.

[1] RHL is available at: http://apps.who.int/rhl/en/

[2] This can be accessed at: search.optimizemnh.org

7. Applicability issues

7.1 Anticipated impact of the guideline on the organization of intrapartum care

Effective implementation of the recommendations in this guideline may require reorganization of care and redistribution of health care resources. The potential barriers to implementation include:

- lack of human resources with the necessary expertise and skills to implement, supervise and support recommended practices;
- lack of understanding of the value of newly recommended interventions among health care providers and system managers;
- resistance of health care providers to change from non-evidence-based to evidence-based practices;
- lack of infrastructure to support interventions (e.g. comfortable maternity waiting rooms for women in early labour, warm water for warm perineal compresses, toilet facilities for labour companions);
- lack of physical space for certain non-pharmacological methods of pain management (e.g. space to accommodate labour companions);
- lack of essential equipment, supplies and medicines (e.g. Doppler ultrasound device and Pinard fetal stethoscope);
- lack of effective referral mechanisms and care pathways for women identified as needing additional care; and
- lack of health information management systems designed to document and monitor recommended practices (e.g. patient records, registers).

Various strategies for addressing these barriers and facilitating implementation are provided in the lists of implementation considerations in Section 4 and Annex 4.

7.2 Monitoring and evaluating the impact of the guideline

The implementation and impact of these recommendations will be monitored at the health-service, regional and country levels. The WHO publication *Standards for improving quality of maternal and newborn care in health facilities (201)* provides lists of prioritized input, output and outcome measures, which can be used to define quality of care criteria and indicators with locally agreed targets. In collaboration with the monitoring and evaluation teams of the WHO Departments of Reproductive Health and Research (RHR) and Maternal, Newborn, Child and Adolescent Health (MCA), data on country- and regional-level implementation of the recommendations will be collected and evaluated in the short to medium term to evaluate their impact on national policies of individual WHO Member States. Interrupted time series, clinical audits or criterion-based audits could be used to obtain the relevant data on the practices contained in this guideline.

8. Updating of the guideline

In accordance with the process for updating WHO maternal and perinatal health guidelines, a systematic and continuous process of identifying and bridging evidence gaps following guideline implementation will be employed. An Executive Guideline Steering Group (GSG) for maternal and perinatal health recommendations will convene annually to review WHO's current portfolio of maternal and perinatal health recommendations, and to prioritize new and existing questions for recommendation development and updating. Accordingly, the recommendations included in this guideline will be regularly reviewed and prioritized as needed by the Executive GSG. In the event that new evidence (that could potentially impact the current evidence base for any of the recommendations) is identified, the recommendation will be updated. If no new reports or information are identified for a particular recommendation, the recommendation will be revalidated.

The WHO Steering Group will continue to monitor the research developments in the area of intrapartum care, particularly for those questions for which no evidence was found and those that are supported by low-quality evidence, where new recommendations or a change in the published recommendations may be warranted, respectively. Any concern about the validity of any recommendation will be promptly communicated via the website for the guideline,[1] and plans will be made to update the recommendation, as needed. WHO welcomes suggestions regarding additional questions for inclusion in future updates of this guideline; suggestions can be addressed to the WHO Department of Reproductive Health and Research by email (reproductivehealth@who.int).

[1] Available at: www.who.int/reproductivehealth/publications/intrapartum-care-guidelines/en/index.html

9. References[1]

1. The state of the world's children 2016: a fair chance for every child. New York (NY): United Nations Children's Fund; 2016 (https://www.unicef.org/publications/files/UNICEF_SOWC_2016.pdf, accessed 20 October 2017).
2. Danilack VA, Nunes AP, Phipps MG. Unexpected complications of low-risk pregnancies in the United States. Am J Obstet Gynecol. 2015;212(6):809.e1-6.
3. Intrapartum care for healthy women and babies. NICE clinical guideline 190. London: National Institute for Health and Care Excellence; 2014 (http://www.geburtshaus.ch/documents/upload/NICE_clinical_guideline_190_dec2014.pdf, accessed 20 October 2017).
4. Kassebaum NJ, Bertozzi-Villa A, Coggeshall MS, Shackelford KA, Steiner C, Heuton KR, et al. Global, regional, and national levels and causes of maternal mortality during 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. Lancet. 2014;384(9947):980–1004.
5. Say L, Chou D, Gemmill A, Tunçalp Ö, Moller AB, Daniels J, et al. Global causes of maternal death: a WHO systematic analysis. Lancet Glob Health. 2014;2(6):e323–33.
6. Lawn JE, Blencowe H, Waiswa P, Amouzou A, Mathers C, Hogan D, et al. Stillbirths: rates, risk factors, and acceleration towards 2030. Lancet. 2016;387(10018):587–603.
7. Bhutta ZA, Das JK, Bahl R, Lawn JE, Salam RA, Paul VK, et al. Can available interventions end preventable deaths in mothers, newborn babies, and stillbirths, and at what cost? Lancet. 2014;384(9940):347–70.
8. Bohren MA, Hunter EC, Munthe-Kaas HM, Souza JP, Vogel JP, Gülmezoglu AM. Facilitators and barriers to facility-based delivery in low- and middle-income countries: a qualitative evidence synthesis. Reprod Health. 2014;11(1):71.
9. Coulm B, Le Ray C, Lelong N, Drewniak N, Zeitlin J, Blondel B. Obstetric interventions for low-risk pregnant women in France: do maternity unit characteristics make a difference? Birth. 2012;39(3):183–91.
10. The health and care of pregnant women and babies in Europe in 2010. European Perinatal Health Report. Euro-Peristat Project; 2013 (http://www.europeristat.com/images/doc/Peristat%202013%20V2.pdf, accessed 12 December 2017).
11. Renfrew MJ, McFadden A, Bastos MH, Campbell J, Channon AA, Cheung NF, et al. Midwifery and quality care: findings from a new evidence-informed framework for maternal and newborn care. Lancet. 2014;384(9948):1129–45.
12. Tunçalp Ö, Were WM, MacLennan C, Oladapo OT, Gülmezoglu AM, Bahl R, et al. Quality of care for pregnant women and newborns – the WHO vision. BJOG. 2015;122(8):1045–9.
13. Hofmeyr GJ. Evidence-based intrapartum care. Best Pract Res Clin Obstet Gynaecol. 2005;19(1):103–15.
14. Hanley GE, Munro S, Greyson D, Gross MM, Hundley V, Spiby H, et al. Diagnosing onset of labor: a systematic review of definitions in the research literature. BMC Pregnancy Childbirth. 2016;16:71.
15. Neal JL, Lowe NK, Patrick TE, Cabbage LA, Corwin EJ. What is the slowest-yet-normal cervical dilation rate among nulliparous women with spontaneous labor onset? J Obstet Gynecol Neonatal Nurs. 2010;39(4):361–9.
16. Zhang J, Landy HJ, Branch DW, Burkman R, Haberman S, Gregory KD, et al. Contemporary patterns of spontaneous labor with normal neonatal outcomes. Obstet Gynecol. 2010;116(6):1281–7.
17. Zhang J, Troendle J, Mikolajczyk R, Sundaram R, Beaver J, Fraser W. The natural history of the normal first stage of labor. Obstet Gynecol. 2010;115(4):705–10.
18. Zhang J, Troendle JF, Yancey MK. Reassessing the labor curve in nulliparous women. Am J Obstet Gynecol. 2002;187(4):824–8.
19. Managing complications in pregnancy and childbirth: a guide for midwives and doctors, second edition. Geneva: World Health Organization; 2017 (http://www.who.int/maternal_child_adolescent/documents/managing-complications-pregnancy-childbirth/en/, accessed 7 December 2017).
20. WHO handbook for guideline development. Geneva: World Health Organization; 2014 (http://www.who.int/publications/guidelines/handbook_2nd_ed.pdf, accessed 10 October 2017).
21. The GRADE working group; 2017 (http://gradeworkinggroup.org/, accessed 12 December 2017).
22. Bohren MA, Hofmeyr GJ, Sakala C, Fukuzawa RK, Cuthbert A. Continuous support for women during childbirth. Cochrane Database Syst Rev. 2017;(7):CD003766.
23. Downe S, Finlayson K, Lawrie TA, Oladapo OT, Bonet M, Gülmezoglu AM. What matters to women during childbirth: a systematic qualitative review. PLoS One. 2018 (in press).
24. DECIDE (2011–2015). In: DECIDE [website]. DECIDE; 2017 (http://www.decide-collaboration.eu, accessed 12 December 2017).
25. The GRADE-CERQual Project Group. In: GRADE-CERQual [website]; 2016 (http://www.cerqual.org/, accessed 26 January 2018).

[1] Cochrane reviews with citations beginning with the annotation "†" were updated or completed for the purpose of this guideline.

26. Downe S, Finlayson K, Thomson G, Hall-Moran V, Feeley C, Oladapo OT. WHO recommendations for interventions during labour and birth: qualitative evidence synthesis of the views and experiences of service users and providers. 2018 (unpublished).
27. †Bohren MA, Munthe-Kaas H, Berger BO, Allanson EE, Tunçalp Ö. Perceptions and experiences of labour companionship: a qualitative evidence synthesis (Protocol). Cochrane Database Syst Rev. 2016;(12):CD012449.
28. Shakibazadeh E, Namadian M, Bohren MA, Vogel JP, Rashidian A, Pileggi VN, et al. Respectful care during childbirth in health facilities globally: a qualitative evidence synthesis. BJOG. 2017. doi:10.1111/1471-0528.15015.
29. Higgins JPT, Green S, editors. Cochrane handbook for systematic reviews of interventions, version 5.1.0. The Cochrane Collaboration; 2011 (http://handbook-5-1.cochrane.org/, accessed 12 December 2017).
30. Walsh D, Downe S. Appraising the quality of qualitative research. Midwifery. 2006;22(2):108–19.
31. OneHealth Model: intervention treatment assumptions. Geneva and Glastonbury (CT): United Nations InterAgency Working Group on Costing and the Futures Institute; 2013 (http://avenirhealth.org/Download/Spectrum/Manuals/Intervention%20Assumptions%202013%209%2028.pdf, accessed 18 December 2017).
32. WHO compendium of innovative health technologies for low-resource settings. Geneva: World Health Organization; 2015 (http://www.who.int/medical_devices/innovation/compendium/en/, accessed 18 December 2017).
33. State of inequality: reproductive, maternal, newborn and child health. Geneva: World Health Organization; 2015 (http://www.who.int/gender-equity-rights/knowledge/state-of-inequality/en/, accessed 18 December 2017).
34. WHO recommendations: optimizing health worker roles to improve access to key maternal and newborn health interventions through task shifting. Geneva: World Health Organization; 2012 (http://apps.who.int/iris/bitstream/10665/77764/1/9789241504843_eng.pdf, accessed 17 January 2018).
35. WHO recommendations on antenatal care for a positive pregnancy experience. Geneva: World Health Organization; 2016 (http://www.who.int/reproductivehealth/publications/maternal_perinatal_health/anc-positive-pregnancy-experience/en/, accessed 10 October 2017).
36. Health worker roles in providing safe abortion care and post abortion contraception. Geneva: WHO; 2015 (http://www.who.int/reproductivehealth/publications/unsafe_abortion/abortion-task-shifting/en/, accessed 19 October 2017).
37. EPOC resources for review authors. In: Cochrane Effective Practice and Organisation of Care (EPOC) [website]. The Cochrane Collaboration; 2018 (http://epoc.cochrane.org/epoc-specific-resources-review-authors, accessed 22 January 2018).
38. Downe S, Lawrie TA, Finlayson K, Oladapo OT. Effectiveness of respectful care policies for women using intrapartum care services. Reprod Health. 2018 (in press).
39. United Nations Human Rights Council. Technical guidance on the application of a human rights-based approach to the implementation of policies and programmes to reduce preventable maternal morbidity and mortality. United Nations; 2012 (A/HRC/21/22; http://www2.ohchr.org/english/issues/women/docs/A.HRC.21.22_en.pdf, accessed 17 January 2018).
40. Bohren MA, Vogel JP, Tunçalp Ö, Fawole B, Titiloye MA, Olutayo AO, et al. "By slapping their laps, the patient will know that you truly care for her": a qualitative study on social norms and acceptability of the mistreatment of women during childbirth in Abuja, Nigeria. SSM Popul Health. 2016;2:640–55.
41. Balde MD, Diallo BA, Bangoura A, Sall O, Soumah AM, Vogel JP, et al. Perceptions and experiences of the mistreatment of women during childbirth in health facilities in Guinea: a qualitative study with women and service providers. Reprod Health. 2017;14:3.
42. Balde MD, Bangoura A, Diallo BA, Sall O, Balde H, Niakate AS, et al. A qualitative study of women's and health providers' attitudes and acceptability of mistreatment during childbirth in health facilities in Guinea. Reprod Health. 2017;14(1):4.
43. Chang YS, Coxon K, Portela AG, Furuta M, Bick D. Interventions to support effective communication between maternity care staff and women in labour: a mixed methods systematic review. Midwifery. 2017;59:4–16.
44. Bashour H, Kanaan M, Kharouf M, Abdulsalam A, Tabbaa M, Cheika S. The effect of training doctors in communications skills on women's satisfaction with doctor–woman relationship during labour and delivery: a stepped wedge cluster randomized controlled trial in Damascus. BMJ Open. 2013;3(8):1–11.
45. Crofts J, Barlett C, Ellis D, Winter C, Donald F, Hunt L, et al. Patient-actor perception of care: a comparison of obstetric emergency training using manikins and patient-actors. Qual Saf Health Care. 2008;17:20–4.
46. WHO recommendations for augmentation of labour. Geneva: World Health Organization; 2014 (http://apps.who.int/iris/bitstream/10665/112825/1/9789241507363_eng.pdf, accessed 17 January 2018).
47. WHO recommendations on health promotion interventions for maternal and newborn health. Geneva: World Health Organization; 2015 (http://apps.who.int/iris/bitstream/10665/172427/1/9789241508742_report_eng.pdf, accessed 17 January 2018).
48. Spiby H, Green JM, Darwin Z, Willmot H, Knox D, McLeish J, et al. Multisite implementation of trained volunteer doula support for disadvantaged childbearing women: a mixed-methods evaluation. Health Services and Delivery Research. 2015;3.8.

49. Munoz EG, Collins M. Establishing a volunteer doula program within a nurse-midwifery education program: a winning situation for both clients and students. J Midwifery Womens Health. 2015;60:274–7.
50. Campbell DA, Lake MF, Falk M, Backstrand JR. A randomized control trial of continuous support in labor by a lay doula. J Obstet Gynecol Neonatal Nurs. 2006;35:456–64.
51. Darwin Z, Green J, McLeish J, Willmot H, Spiby H. Evaluation of trained volunteer doula services for disadvantaged women in five areas in England: women's experiences. Health Soc Care Community. 2017;25(2):466–77.
52. Abalos E, Oladapo OT, Chamillard M, Díaz V, Pasquale J, Bonet M, et al. Duration of spontaneous labour in "low-risk" women with "normal" perinatal outcomes: a systematic review. Eur J Obstet Gynecol Reprod Biol. 2018 (in press).
53. Oladapo OT, Diaz V, Bonet M, Abalos E, Thwin SS, Souza H, et al. Cervical dilatation patterns of "low-risk" women with spontaneous labour and normal perinatal outcomes: a systematic review. BJOG. 2017. doi:10.1111/1471-0528.14930.
54. Dixon L, Skinner J, Foureur M. Women's perspectives of the stages and phases of labour. Midwifery. 2013;29:10–7.
55. Eri T, Bondas T, Mechtild M, Janssen P, Green J. A balancing act in an unknown territory: a meta-synthesis of mothers' first time experiences in early labour. Midwifery. 2015;31(3):e58–e67.
56. Peisner DB, Rosen MG. Latent phase of labor in normal patients: a reassessment. Obstet Gynecol. 1985;66(5):644–8.
57. Ijaiya MA, Aboyeji AP, Fakeye OO, Balogun OR, Nwachukwu DC, Abiodun MO. Pattern of cervical dilatation among parturients in Ilorin, Nigeria. Ann Afr Med. 2009;8(3):181–4.
58. Juntunen K, Kirkinen P. Partogram of a grand multipara: different descent slope compared with an ordinary parturient. J Perinat Med. 1994;22(3):213–8.
59. Velasco A, Franco A, Reyes F. Nomograma de la dilatación del cervix en el parto [Nomogram of the dilatation of the cervix in childbirth]. Rev Colomb Obstet Ginecol. 1985;36(5):323–7.
60. Friedman E. Primigravid labor; a graphicostatistical analysis. Obstet Gynecol. 1955;6(6):567–89.
61. Friedman E. Labor in multiparas; a graphicostatistical analysis. Obstet Gynecol. 1956;8(6):691–703.
62. Oladapo OT, Souza JP, Fawole B, Mugerwa K, Perdoná G, Alves D, et al. Progression of the first stage of spontaneous labour: a prospective cohort study in two sub-Saharan African countries. PLoS Med. 2018. doi: 10.1371/journal.pmed.1002492.
63. Albers LL, Schiff M, Gorwoda JG. The length of active labor in normal pregnancies. Obstet Gynecol. 1996;87(3):355–9.
64. Albers LL. The duration of labor in healthy women. J Perinatol. 1999;19(2):114–9.
65. Jones M, Larson E. Length of normal labor in women of Hispanic origin. J Midwifery Womens Health. 2003;48(1):2–9.
66. Schiff E, Cohen SB, Dulitzky M, Novikov I, Friedman SA, Mashiach S, et al. Progression of labor in twin versus singleton gestations. Am J Obstet Gynecol. 1998;179(5):1181–5.
67. Kilpatrick SJ, Laros RK, Jr. Characteristics of normal labor. Obstet Gynecol. 1989;74(1):85–7.
68. Lee SW, Yang JH, Cho HJ, Hong DS, Kim MY, Ryu HM, et al. The effects of epidural analgesia on labor progress and perinatal outcomes. Korean J Obstet Gynecol. 2007;50(10):1330–5.
69. Schorn MN, McAllister JL, Blanco JD. Water immersion and the effect on labor. J Nurse Midwifery. 1993;38(6):336–42.
70. WHO-CHOICE unit cost estimates for service delivery – estimation file. World Health Organization; 2011 (http://www.who.int/choice/cost-effectiveness/inputs/health_service/en/, accessed 29 March 2017).
71. Lowe NK. A review of factors associated with dystocia and cesarean section in nulliparous women. J Midwifery Womens Health. 2007;52(3):216–28.
72. Nystedt A, Högberg U, Lundman B. The negative birth experience of prolonged labour: a case-referent study. J Clin Nurs. 2005;14(5):579–86.
73. Nystedt A, Högberg U, Lundman B. Some Swedish women's experiences of prolonged labour. Midwifery. 2006;22:56–65.
74. Souza JP, Oladapo OT, Bonet M, Gülmezoglu AM. Diagnostic accuracy of the partograph alert line: a systematic review. 2018 (unpublished).
75. Wei S, Wo BL, Qi H-P, Xu H, Luo Z-C, Roy C, et al. Early amniotomy and early oxytocin for prevention of, or therapy for, delay in first stage spontaneous labour compared with routine care. Cochrane Database Syst Rev. 2013;(8):CD006794.
76. Bedwell C, Levin K, Pett C, Lavender DT. A realist review of the partograph: when and how does it work for labour monitoring? BMC Pregnancy Childbirth. 2017;17(1):31.
77. Ollerhead E, Osrin D. Barriers to and incentives for achieving partograph use in obstetric practice in low- and middle-income countries: a systematic review. BMC Pregnancy Childbirth. 2014;14:281.
78. Dujardin B, De Schampheleire I, Sene H, Ndiaye F. Value of the alert and action lines on the partogram. Lancet. 1992;339(8805):1336–8.
79. World Health Organization (WHO), Maternal Health and Safe Motherhood Programme. The partograph: the application of the WHO partograph in the management of labour. Report of a WHO multicentre study 1990–1991. Geneva: WHO; 1994 (http://apps.who.int/iris/bitstream/10665/58589/1/WHO_FHE_MSM_94.4.pdf, accessed 17 January 2018).
80. Van Bogaert L. The partogram's result and neonatal outcome. J Obstet Gynaecol. 2006;26(4):321–4.

81. López C AF. Estudio comparativo entre el partograma del clap y el partograma de la oms en embarazadas del hospital Vicente Corral Moscoso de Cuenca, Ecuador [Comparative study between the CLAP partogram and the WHO partogram in pregnant women of the Vicente Corral Moscoso hospital in Cuenca, Ecuador][thesis]. University of Cuenca; 2008.
82. Orji E. Evaluating progress of labor in nulliparas and multiparas using the modified WHO partograph. Int J Gynecol Obstet. 2008;102(3):249–52.
83. Rocha IM, de Oliveira SM, Schneck CA, Riesco ML, da Costa AS. The partogram as an instrument to analyze care during labor and delivery. Rev Esc Enferm USP. 2009;43(4):880–8.
84. Diarra I, Camara S, Maiga M. Evaluation de l'utilisation du partogramme à la maternité du centre de santé de référence de la commune V du district de Bamako [Assessment of the use of partogram at the district maternity hospital of commune V in Bamako area]. Mali Med. 2009;24(2):10–3.
85. Sanyal U, Goswami S, Mukhopadhyay P. The role of partograph in the outcome of spontaneous labor. NJOG. 2014;17(1):52–7.
86. Bolbol-Haghighi N, Ebrahimi N, Delvarian Zade M, Hasani MR. Evaluation of WHO's partogram alert line for prediction of the APGAR score at the first minute after birth. J Shahrekord Univ Med Sci. 2006;8(1):50–7.
87. Rani U, Laxmi B. Effect of partographic monitoring on outcomes for women in spontaneous labour at term. IAIM. 2016;3(7):314–20.
88. Souza J, Oladapo OT, Fawole B, Mugerwa K, Reis R, Barbosa-Junior F, et al. Cervical dilatation over time is a poor predictor of severe adverse birth outcomes: a diagnostic accuracy study. BJOG. 2018 (in press).
89. Fahy M, Doyle O, Denny K, McAuliffe FM, Robson M. Economics of childbirth. Acta Obstet Gynecol Scand. 2013;92(5):508–16.
90. Khan A, Zaman S. Costs of vaginal delivery and caesarean section at a tertiary level public hospital in Islamabad, Pakistan. BMC Pregnancy Childbirth. 2010;10:2.
91. Armstrong N, Kenyon S. When choice becomes limited: women's experiences of delay in labour. Health (London). 2017;21(2):223–38.
92. Kobayashi S, Hanada N, Matsuzaki M, Takehara K, Ota E, Sasaki H, et al. Assessment and support during early labour for improving birth outcomes. Cochrane Database Syst Rev. 2017;(4):CD011516.
93. McNiven PS, Williams JI, Hodnett E, Kaufman K, Hannah ME. An early labor assessment program: a randomized, controlled trial. Birth. 1998;25(1):5–10.
94. Hofmeyr GJ, Mancotywa T, Silwana-Kwadjo N, Mgudlwa B, Lawrie TA, Gülmezoglu AM. Audit of a new model of birth care for women with low risk pregnancies in South Africa: the primary care onsite midwife-led birth unit (OMBU). BMC Pregnancy Childbirth. 2014;14:417.
95. Neal JL, Lamp JM, Buck JS, Lowe NK, Gillespie SL, Ryan SL. Outcomes of nulliparous women with spontaneous labor onset admitted to hospitals in preactive versus active labor. J Midwifery Womens Health. 2014;59(1):28–34.
96. Bailit JL, Dierker L, Blanchard MH, Mercer BM. Outcomes of women presenting in active versus latent phase of spontaneous labor. Obstet Gynecol. 2005;105(1):77–9.
97. Mikolajczyk RT, Zhang J, Grewal J, Chan LC, Petersen A, Gross MM. Early versus late admission to labor affects labor progression and risk of cesarean section in nulliparous women. Front Med. 2016;3:26.
98. Chuma C, Kihunrwa A, Matovelo D, Mahendeka M. Labour management and obstetric outcomes among pregnant women admitted in latent phase compared to active phase of labour at Bugando Medical Centre in Tanzania. BMC Pregnancy Childbirth. 2014;14:68.
99. Holmes P, Oppenheimer LW, Wen SW. The relationship between cervical dilatation at initial presentation in labour and subsequent intervention. BJOG. 2001;108(11):1120–4.
100. Tilden EL, Lee VR, Allen AJ, Griffin EE, Caughey AB. Cost-effectiveness analysis of latent versus active labor hospital admission for medically low-risk, term women. Birth. 2015;42(3):219–26.
101. Mekonnen MG, Yalew KN, Umer JY, Melese M. Determinants of delivery practices among Afar pastoralists of Ethiopia. Pan Afr Med J. 2012;13(suppl 1):17.
102. Dhakal S, van Teijlingen E, Raja EA, Dhakal KB. Skilled care at birth among rural women in Nepal: practice and challenges. J Health, Popul Nutr. 2011;29(4):371–8.
103. Kumbani L, Bjune G, Chirwa E, Malata A, Odland JO. Why some women fail to give birth at health facilities: a qualitative study of women's perceptions of perinatal care from rural southern Malawi. Reprod Health. 2013;10:9.
104. Atuoye KN, Dixon J, Rishworth A, Galaa SZ, Boamah SA, Luginaah I. Can she make it? Transportation barriers to accessing maternal and child health care services in rural Ghana. BMC Health Serv Res. 2015;15:333.
105. Kowalewski M, Mujinja P, Jahn A. Can mothers afford maternal health care costs? User costs of maternity services in rural Tanzania. Afr J Reprod Health. 2002;6(1):65–73.
106. Choulagai B, Onta S, Subedi N, Mehata S, Bhandari GP, Poudyal A, et al. Barriers to using skilled birth attendants' services in mid- and far-western Nepal: a cross-sectional study. BMC Int Health Hum Rights. 2013;13:49.
107. Chandhiok N, Shrotri A, Joglekar N, Chaudhury N, Chaudhury P, Singh S. Feasibility of using partograph by practitioners of Indian system of medicine (AYUSH): an exploratory observation. Midwifery. 2015;31:702–7.

108. Pattinson R, Cuthbert A, Vanneval V. Pelvimetry for fetal cephalic presentations at term. Cochrane Database Syst Rev. 2017;(3):CD000161.
109. Rozenholc AT, Ako SN, Leke RJ, Boulvain M. The diagnostic accuracy of external pelvimetry and maternal height to predict dystocia in nulliparous women: a study in Cameroon. BJOG. 2007;114:630–5.
110. Liselele HB, Boulvain M, Tshibangu KC, Meuris S. Maternal height and external pelvimetry to predict cephalopelvic disproportion in nulliparous African women: a cohort study. BJOG. 2000;107:947–52.
111. Devane D, Lalor JG, Daly S, McGuire W, Cuthbert A, Smith V. Cardiotocography versus intermittent auscultation of fetal heart on admission to labour ward for assessment of fetal wellbeing. Cochrane Database Syst Rev. 2017;(1):CD005122.
112. Supply catalogue [website]. United Nations Children's Fund (UNICEF); 2017 (https://supply.unicef.org/, accessed 10 October 2017).
113. Lewis D, Downe S, FIGO Intrapartum Fetal Monitoring Expert Consensus Panel. FIGO consensus guidelines on intrapartum fetal monitoring: Intermittent auscultation. Int J Gynecol Obstet. 2015;131(1):9–12.
114. WHO recommendations for prevention and treatment of maternal peri-partum infections. Geneva: World Health Organization; 2015 (http://apps.who.int/iris/bitstream/10665/186171/1/9789241549363_eng.pdf, accessed 17 January 2018).
115. Alfirevic Z, Devane D, Gyte GM, Cuthbert A. Continuous cardiotocography (CTG) as a form of electronic fetal monitoring (EFM) for fetal assessment during labour. Cochrane Database Syst Rev. 2017;(2):CD006066.
116. Herbst A, Ingemarsson I. Intermittent versus continuous electronic monitoring in labour: a randomised study. BJOG. 1994;101(8):663–8.
117. Vijgen SM, Westerhuis ME, Opmeer C, Visser GH, Moons KG, Porath MM, et al. Cost-effectiveness of cardiotocography plus ST analysis of the fetal electrocardiogram compared with cardiotocography only. Acta Obstet Gynecol Scand. 2011;90:772–8.
118. Chaturvedi S, De Costa A, Raven J. Does the Janani Suraksha Yojana cash transfer programme to promote facility births in India ensure skilled birth attendance? A qualitative study of intrapartum care in Madhya Pradesh. Glob Health Action. 2015;8:27427.
119. Maimbolwa MC, Ransjo-Arvidson AB, Ng'andu N, Sikazwe N, Diwan VK. Routine care of women experiencing normal deliveries in Zambian maternity wards: a pilot study. Midwifery. 1997;13(3):125–31.
120. Delvaux T, Ake-Tano O, Gohou-Kouassi V, Bosso P, Collin S, Ronsmans C. Quality of normal delivery care in Côte d'Ivoire. Afr J Reprod Health. 2007;11(1):22–32.
121. Walker DS, Shunkwiler S, Supanich J, Willamsen J, Yensch A. Labour and delivery nurses attitudes towards intermittent fetal monitoring. J Midwifery Womens Health. 2001;46(6):374–80.
122. Martis R, Emilia O, Nurdiati DS, Brown J. Intermittent auscultation (IA) of fetal heart rate in labour for fetal well-being. Cochrane Database Syst Rev. 2017;(2):CD008680.
123. Mugyenyi GR, Atukunda EC, Ngonzi J, Boatin A, Wylie BJ, Haberer JE. Functionality and acceptability of a wireless fetal heart rate monitoring device in term pregnant women in rural southwestern Uganda. BMC Pregnancy Childbirth. 2017;17:178.
124. Best practice in the management of epidural analgesia in the hospital setting. London: Faculty of Pain Medicine of the Royal College of Anaesthetists; 2010 (https://www.aagbi.org/sites/default/files/epidural_analgesia_2011.pdf, accessed 17 January 2018).
125. †Anim-Somuah M, Smyth RM, Jones L. Epidural versus non-epidural or no analgesia in labour. Cochrane Database Syst Rev. 2011;(12):CD000331.
126. Thomson G, Feeley C, Hall Moran V, Oladapo OT. Women's experiences of pharmacological and non-pharmacological pain relief methods for childbirth: a review and qualitative comparative analysis. 2018 (unpublished).
127. Huang C, Macario A. Economic considerations related to providing adequate pain relief for women in labour: comparison of epidural and intravenous analgesia. Pharmaeconomics. 2002;20(5):305–18.
128. Bernitz S, Aas E, Øian P. Economic evaluation of birth care in low-risk women. A comparison between a midwife-led birth unit and a standard obstetric unit within the same hospital in Norway. A randomised controlled trial. Midwifery. 2012;28(5):591–9.
129. Tracy SK, Tracy MB. Costing the cascade: estimating the cost of increased obstetric intervention in childbirth using population data. BJOG. 2003;110(8):717–24.
130. Bonouvrie K, van den Bosch A, Roumen FJ, van Kuijk SM, Nijhuis JG, Evers SM, et al. Epidural analgesia during labour, routinely or on request: a cost-effectiveness analysis. Eur J Obstet Gynecol Reprod Biol. 2016;207:23–31.
131. Dillaway H, Brubaker SJ. Intersectionality and childbirth: how women from different social locations discuss epidural use. Race Gender Class. 2006;13(3–4):16–41.
132. Sanders R. Functional discomfort and a shift in midwifery paradigm. Women Birth. 2015;28:e87–e91.
133. †Ullman R, Smith LA, Burns E, Mori R, Dowswell T. Parenteral opioids for maternal pain management in labour. Cochrane Database Syst Rev. 2010;(9):CD007396.
134. Lamvu G, Feranec J, Blanton E. Perioperative pain management: an update for obstetrician-gynecologists. Am J Obstet Gynecol. 2017. pii: S0002-9378(17)30790-1.

135. Dyer O. Ontario plans to stop funding high dose opioids. BMJ. 2016;354:i4300.
136. Linge-Dahl L, Vranken M, Juenger S, North K, Scholten W, Payne S, et al. Identification of challenges to the availability and accessibility of opioids in twelve European countries: conclusions from two ATOME six-country workshops. J Palliat Med. 2015;18(12):1033–9.
137. De Lima L, Pastrana T, Radbruch L, Wenk R. Cross-sectional pilot study to monitor the availability, dispensed prices, and affordability of opioids around the globe. J Pain Symptom Manage. 2014;48(4):649–59e1.
138. Lally JE, Murtagh MJ, Macphail S, Thomson R. More in hope than expectation: a systematic review of women's expectations and experience of pain relief in labour. BMC Med. 2008;6:7.
139. Gibson E. Women's expectations and experiences with labour pain in medical and midwifery models of birth in the United States. Women Birth. 2014;27(3):185–9.
140. †Smith CA, Levett KM, Collins CT, Crowther CA. Relaxation techniques for pain management in labour. Cochrane Database Syst Rev. 2011;(12):CD009514.
141. Smith CA, Levett KM, Collins CT, Dahlen HG, Ee CC, Suganuma M. Massage, reflexology and other manual methods for pain management in labour. Cochrane Database Syst Rev. 2018:CD009290 (in press).
142. Herman P, Poindexter B, Witt C, Eisenberg D. Are complementary therapies and integrative care cost-effective? A systematic review of economic evaluations. BMJ Open. 2012;2:e001046.
143. Paterson CM, Saunders NS, Wadsworth J. The characteristics of the second stage of labour in 25,069 singleton deliveries in the North West Thames Health Region, 1988. Br J Obstet Gynaecol. 1992;99(5):377–80.
144. Abdel Aleem H. Nomograms of cervical dilatation and characteristics of normal labor in Upper Egypt. Assiut Med J. 1991;15(4):19–30.
145. Chen HF, Chu KK. Double-lined nomogram of cervical dilatation in Chinese primigravidas. Acta Obstet Gynecol Scand. 1986;65(6):573–5.
146. Diegmann EK, Andrews CM, Niemczura CA. The length of the second stage of labor in uncomplicated, nulliparous African American and Puerto Rican women. J Midwifery Womens Health. 2000;45(1):67–71.
147. Dior U, Kogan L, Ezra Y, Calderon-Margalit R. Population based labor curves. Am J Obstet Gynecol. 2013;208(1):S150.
148. Duignan NM, Studd JW, Hughes AO. Characteristics of normal labour in different racial groups. Br J Obstet Gynaecol. 1975;82(8):593–601.
149. Shi Q, Tan XQ, Liu XR, Tian XB, Qi HB. Labour patterns in Chinese women in Chongqing. BJOG. 2016;123(suppl 3):57–63.
150. Studd J. Partograms and nomograms of cervical dilatation in management of primigravid labour. Br Med J. 1973;4(5890):451–5.
151. Studd J, Clegg DR, Sanders RR, Hughes AO. Identification of high risk labours by labour nomogram. Br Med J. 1975;2(5970):545–7.
152. Wüstemann M, Gremm B, Scharf A, Sohn C. Influence of the "walking epidural" on duration of labour in primi- and multiparae with vaginal delivery and comparison of vaginal operative delivery rates. Gynakologische Praxis. 2003;27(3):433–9.
153. Gibb DM, Cardozo LD, Studd JW, Magos AL, Cooper DJ. Outcome of spontaneous labour in multigravidae. Br J Obstet Gynaecol. 1982;89(9):708–11.
154. Gupta J, Sood A, Hofmeyr G, Vogel J. Position in the second stage of labour for women without epidural anaesthesia. Cochrane Database Syst Rev. 2017;(5):CD002006.
155. Lawrence A, Lewis L, Hofmeyr GJ, Styles C. Maternal positions and mobility during first stage labour. Cochrane Database Syst Rev. 2013;(10):CD003934.
156. Elvander C, Ahlberg M, Thies-Lagergren L, Cnattingius S, Stephansson O. Birth position and obstetric anal sphincter injury: a population-based study of 113 000 spontaneous births. BMC Pregnancy Childbirth. 2015;15:252.
157. Zileni BD, Glover P, Jones M, Teoh KK, Zileni CW, Muller A. Malawi women's knowledge and use of labour and birthing positions: a cross-sectional descriptive survey. Women Birth. 2017;30(1):e1–e8.
158. Okonta P. Birthing positions: awareness and preferences of pregnant women in a developing country. Internet J Gynecol Obstet. 2012;16(1).
159. Kibuka M, Thornton JG. Position in the second stage of labour for women with epidural anaesthesia. Cochrane Database Syst Rev. 2017;(2):CD008070.
160. Lemos A, Amorim MM, Dornelas de Andrade A, de Souza AI, Cabral Filho JE, Correia JB. Pushing/bearing down methods for the second stage of labour. Cochrane Database Syst Rev. 2017;(3):CD009124.
161. Bergstrom L, Seidel L, Skillman-Hull L, Roberts J. "I gotta push. Please let me push!" Social interactions during the change from first to second stage labor. Birth. 1997;24(3):173–80.
162. Fraser W, Marcoux S, Krauss I, Douglas J, Goulet C, Boulvain M, et al. Multicenter randomized, controlled trial of delayed pushing for nulliparous women in the second stage of labor with continuous epidural analgesia. Am J Gynecol Obstet. 2000;182(5):1165–72.
163. Aasheim V, Nilsen ABV, Reinar LM, Lukasse M. Perineal techniques during the second stage of labour for reducing perineal trauma. Cochrane Database Syst Rev. 2017;(6):CD006672.
164. Priddis H, Schmied V, Dahlen H. Women's experiences following severe perineal trauma: a qualitative study. BMC Womens Health. 2014;14(1):32.

165. Borghi J, Bastus S, Belizan M, Carroli G, Hutton G, Fox-Rushby J. Costs of publicly provided maternity services in Rosario, Argentina. Salud Publica Mex. 2003;45(1):27–34.
166. Labrecque M, Eason E, Marcoux S. Women's views on the practice of prenatal perineal massage. Brit J Obstet Gynaecol. 2001;108:499–504.
167. Stamp G, Kruzins GS. A survey of midwives who participated in a randomised trial of perineal massage in labour. Austral J Midwifery. 2001;14(1):15–21.
168. Jiang H, Qian X, Carroli G, Garner P. Selective versus routine use of episiotomy for vaginal birth. Cochrane Database Syst Rev. 2017;(2):CD000081.
169. Amorim MM, Coutinho IC, Melo I, Katz L. Selective episiotomy vs. implementation of a non-episiotomy protocol: a randomized clinical trial. Reprod Health. 2017;14:55.
170. Borghi J, Fox-Rushby J, Bergel E, Abalos E, Hutton G, Carroli G. The cost-effectiveness of routine versus restrictive episiotomy in Argentina. Am J Obstet Gynecol. 2002;186(2):221–8.
171. Kettle C, Dowswell T, Ismail KM. Continuous and interrupted suturing techniques for repair of episiotomy or second-degree tears. Cochrane Database Syst Rev. 2017;(11):CD000947.
172. Ith P, Dawson A, Homer CS, Klinken Whelan A. Practices of skilled birth attendants during labour, birth and the immediate postpartum period in Cambodia. Midwifery. 2013;29(4):300–7.
173. Miller S, Abalos E, Chamillard M, Ciapponi A, Colaci D, Comande D, et al. Beyond too little, too late and too much, too soon: a pathway towards evidence-based, respectful maternity care worldwide. Lancet. 2016;388(10056):2176–92.
174. Chaves Sda C, Cecatti JG, Carroli G, Lumbiganon P, Hogue CJ, Mori R, et al. Obstetric transition in the World Health Organization Multicountry Survey on Maternal and Newborn Health: exploring pathways for maternal mortality reduction. Rev Panam Salud Publica. 2015;37(4–5):203–10.
175. Souza JP, Tunçalp Ö, Vogel JP, Bohren M, Widmer M, Oladapo OT, et al. Obstetric transition: the pathway towards ending preventable maternal deaths. BJOG. 2014;121(suppl 1):1–4.
176. Graham ID, Carroli G, Davies C, Medves JM. Episiotomy rates around the world: an update. Birth. 2005;32(3):219–23.
177. Diniz SG, d'Oliveira AF, Lansky S. Equity and women's health services for contraception, abortion and childbirth in Brazil. Reprod Health Matters. 2012;20(40):94–101.
178. Okafor I, Ugwu EO, Obi SN. Disrespect and abuse during facility-based childbirth in a low-income country. Int J Gynaecol Obstet. 2015;128(2):110–3.
179. Bohren MA, Vogel JP, Tunçalp Ö, Fawole B, Titiloye MA, Olutayo AO, et al. Mistreatment of women during childbirth in Abuja, Nigeria: a qualitative study on perceptions and experiences of women and healthcare providers. Reprod Health. 2017;14:9.
180. Bohren MA, Vogel JP, Hunter EC, Lutsiv O, Makh SK, Souza JP, et al. The mistreatment of women during childbirth in health facilities globally: a mixed-methods systematic review. PLoS Med. 2015;12(6):e1001847.
181. Sando D, Ratcliffe H, McDonald K, Spiegelman D, Lyatuu G, Mwanyika-Sando M, et al. The prevalence of disrespect and abuse during facility-based childbirth in urban Tanzania. BMC Pregnancy Childbirth. 2016;16:236.
182. Gülmezoglu AM, Langer A, Piaggio G, Lumbiganon P, Villar J, Grimshaw J. Cluster randomised trial of an active, multifaceted educational intervention based on the WHO Reproductive Health Library to improve obstetric practices. BJOG. 2007;114(1):16–23.
183. Hofmeyr GJ, Singata M, Lawrie TA, Vogel JP, Landoulsi S, Seuc AH, et al. A multicentre randomized controlled trial of gentle assisted pushing in the upright posture (GAP) or upright posture alone compared with routine practice to reduce prolonged second stage of labour (the Gentle Assisted Pushing study): study protocol. Reprod Health. 2015;12:114.
184. Hofmeyr G, Vogel J, Cuthbert A. Fundal pressure during the second stage of labour. Cochrane Database Syst Rev. 2017;(3):CD006067.
185. Habek D, Vuković Bobić M, Hrgović Z. Possible feto-maternal clinical risk of the Kristeller's expression. Cent Eur J Med. 2008;3(2):183–6.
186. Zanconato G, Cavaliere E, Cherubini G, Bortolami O, Mantovani E, Iacovella C, et al. Fundal pressure (Kristeller maneuver) during labor in current obstetric practice: assessment of prevalence and feto-maternal effects. Minerva Ginecol. 2014;66(2):239–41.
187. Iyengar SD, Iyengar K, Martines JC, Dashora K, Deora KK. Childbirth practices in rural Rajasthan, India: implications for neonatal health and survival. J Perinatol. 2008;28(suppl 2):S23–30.
188. De Leeuw JW, Vierhout ME, Struijk PC, Hop WC, Wallenburg HC. Anal sphincter damage after vaginal delivery: functional outcome and risk factors for fecal incontinence. Acta Obstet Gynecol Scand. 2001;80(9):830–4.
189. Declercq ER, Sakala C, Corry MP, Applebaum S. Listening to mothers II: Report of the Second National U.S. Survey of Women's Childbearing Experiences: conducted January–February 2006 for Childbirth Connection by Harris Interactive® in partnership with Lamaze International. J Perinat Educ. 2007;16(4):15–7.
190. Goldman N, Glei DA. Evaluation of midwifery care: results from a survey in rural Guatemala. Soc Sci Med. 2003;56(4):685–700.
191. WHO recommendations for the prevention and treatment of postpartum haemorrhage. Geneva: World Health Organization; 2012 (http://apps.who.int/iris/bitstream/10665/75411/1/9789241548502_eng.pdf, accessed 12 December 2017).

192. Guideline: delayed umbilical cord clamping for improved maternal and infant health and nutrition outcomes. Geneva: World Health Organization; 2014 (http://apps.who.int/iris/bitstream/10665/148793/1/9789241508209_eng.pdf, accessed 12 December 2017).
193. Guidelines on basic newborn resuscitation. Geneva: World Health Organization; 2012 (http://apps.who.int/iris/bitstream/10665/75157/1/9789241503693_eng.pdf, accessed 12 December 2017).
194. Recommendations for management of common childhood conditions: evidence for technical update of pocketbook recommendations: newborn conditions, dysentery, pneumonia, oxygen use and delivery, common causes of fever, severe acute malnutrition and supportive care. Geneva: World Health Organization; 2012 (http://apps.who.int/iris/bitstream/10665/44774/1/9789241502825_eng.pdf, accessed 12 December 2017).
195. WHO recommendations on newborn health: guidelines approved by the WHO Guidelines Review Committee. Geneva: World Health Organization; 2017 (http://apps.who.int/iris/bitstream/10665/259269/1/WHO-MCA-17.07-eng.pdf, accessed 17 January 2018).
196. Guidelines on optimal feeding of low birth-weight infants in low- and middle-income countries. Geneva: World Health Organization; 2011 (http://wwwwhoint/maternal_child_adolescent/documents/9789241548366pdf, accessed 17 January 2018).
197. WHO recommendations on postnatal care of the mother and newborn 2013. Geneva: World Health Organization; 2014 (http://apps.who.int/iris/bitstream/10665/97603/1/9789241506649_eng.pdf, accessed 12 December 2017).
198. Spector JM, Agrawal P, Kodkany B, Lipsitz S, Lashoher A, Dziekan G, et al. Improving quality of care for maternal and newborn health: prospective pilot study of the WHO Safe Childbirth Checklist program. PLoS One. 2012;7(5):e35151.
199. Brouwers M, Kho M, Browman G, Burgers J, Cluzeau F, Feder G, et al. AGREE II: advancing guideline development, reporting and evaluation in healthcare. CMAJ. 2010;182(18):E839–42.
200. GREAT Network [website]. The Guideline-driven Research Priorities Evidence Synthesis Application of Evidence Transfer of Knowledge (GREAT) Network; 2016 (http://greatnetworkglobal.org/, accessed 19 October 2017).
201. Standards for improving quality of maternal and newborn care in health facilities. Geneva: World Health Organization; 2016 (http://apps.who.int/iris/bitstream/10665/249155/1/9789241511216-eng.pdf, accessed 12 December 2017).

Annex 1. Priority guideline questions and outcomes

Priority guideline questions P=Population; I=Intervention; C=Comparator; O=Outcomes	Priority outcomes
For women in labour (P), does a policy that promotes respectful, dignified, women-centred maternity practice (I), compared with usual practice (C), improve birth outcomes (O)?	Maternal birth experience Mode of birth Duration of labour Use of pain relief methods Perineal/vaginal trauma Perinatal hypoxia-ischaemia
For women in labour (P), does effective communication by health care staff (I), compared with usual practice (C), improve birth outcomes (O)?	Maternal birth experience Mode of birth Duration of labour Use of pain relief methods Perineal/vaginal trauma Perinatal hypoxia-ischaemia
For women in labour (P), does continuous labour support and companionship (I), compared with usual practice (C), improve birth outcomes (O)? Is the use of a particular type of provider of continuous support (e.g. a doula, family member or hospital staff) more effective and safer than another, for improving birth outcomes (O)?	Mode of birth Perineal/vaginal trauma Duration of labour Augmentation of labour Use of pain relief Maternal birth experience Perinatal hypoxia-ischaemia Long-term infant outcomes
What are the appropriate definitions of first (latent and active phases) and second stages of spontaneous labour that are associated with good birth outcomes?	Duration of latent phase Duration of active phase Duration of first stage Definition of onset of latent phase Definition of onset of active phase Duration of second stage
Should a cervical dilatation rate threshold of 1 cm per hour (as depicted by the partograph alert line) be used to identify women at risk of adverse birth outcomes among healthy pregnant women with a spontaneous labour onset?	True positive (TP) True negative (TN) False positive (FP) False negative (FN) Sensitivity Specificity
For pregnant women without risk factors at the onset of spontaneous labour, what are the cervical dilatation patterns associated with normal birth outcomes?	Time for cervical dilatation to advance by 1 cm from one level of cervical dilatation to the next Rate of change from one level of cervical dilatation to the next
For healthy pregnant women presenting in spontaneous labour at term (P), does a policy of delayed labour ward admission until active phase (I), compared with a policy of direct labour ward admission (C), improve birth outcomes (O)?	Mode of birth Duration of labour Augmentation of labour Use of pain relief Maternal morbidity Maternal birth experience Perinatal hypoxia-ischaemia Perinatal/neonatal death Born before arrival at facility

Priority guideline questions P=Population; I=Intervention; C=Comparator; O=Outcomes	Priority outcomes
For healthy pregnant women presenting in labour (P), does clinical pelvimetry routinely performed on admission (I), compared with no clinical pelvimetry (C), improve birth outcomes (O)?	Mode of birth Maternal morbidity Perineal/vaginal trauma Maternal birth experience Birth trauma Perinatal hypoxia-ischaemia Perinatal/neonatal death
For healthy pregnant women presenting in spontaneous labour (P), does routine cardiotocography for assessment of fetal status on labour admission (I), compared with intermittent auscultation (C), improve birth outcomes (O)?	Mode of birth Maternal birth experience Fetal distress Perinatal hypoxia-ischaemia Perinatal/neonatal death Long-term infant outcomes
For healthy pregnant women in labour (P), does continuous cardiotocography for assessment of fetal status (I), compared with intermittent auscultation (C), improve birth outcomes (O)?	Mode of birth Use of pain relief Maternal birth experience Fetal distress Perinatal hypoxia-ischaemia Perinatal/neonatal death Long-term infant outcomes
For healthy pregnant women in labour (P), is the use of a particular method of intermittent auscultation for monitoring of fetal heart rate (I), compared with other methods intermittent auscultation (C), more effective and safe for improving birth outcomes (O)?	Mode of birth Maternal birth experience Fetal distress Perinatal hypoxia-ischaemia Perinatal/neonatal death Long-term infant outcomes
For healthy pregnant women requesting pain relief during labour (P), should epidural analgesia (I), compared with no pain relief or other forms of pain relief (C), be offered to relieve labour pain and improve birth outcomes (O)?	Mode of birth Pain relief Maternal birth experience Augmentation of labour Duration of labour Adverse effects Perinatal hypoxia-ischaemia Long-term infant outcomes
For healthy pregnant women requesting for pain relief during labour (P), should relaxation techniques for pain management (I), compared with no pain relief or other forms of pain relief (C), be offered to relieve labour pain and improve birth outcomes (O)?	Mode of birth Pain relief Maternal birth experience Augmentation of labour Duration of labour Adverse effects Perinatal hypoxia-ischaemia Long-term infant outcomes
For healthy pregnant women requesting pain relief during labour (P), should parenteral opioid(s) (I), compared with no pain relief or other forms of pain relief (C), be administered to relieve labour pain and improve birth outcomes (O)? If so, which parenteral opioid(s) should be offered to eligible women?	Mode of birth Pain relief Maternal birth experience Augmentation of labour Duration of labour Adverse effects Perinatal hypoxia-ischaemia Long-term infant outcomes

Priority guideline questions P=Population; I=Intervention; C=Comparator; O=Outcomes	Priority outcomes
For healthy pregnant women requesting pain relief during labour (P), should massage and other manual techniques for pain management (I), compared with no pain relief or other forms of pain relief (C), be offered to relieve labour pain and improve birth outcomes (O)?	Mode of birth Pain relief Maternal birth experience Augmentation of labour Duration of labour Adverse effects Perinatal hypoxia-ischaemia Long-term infant outcomes
For women without epidural analgesia in the second stage of labour (P), does the adoption of an upright birthing position (e.g. sitting, standing or squatting) (I), compared with a recumbent position (C), improve birth outcomes (O)?	Duration of labour Mode of birth Pain relief/intensity Perineal/vaginal trauma Maternal birth experience Fetal distress Perinatal hypoxia-ischaemia Perinatal/neonatal death
For women with epidural analgesia in the second stage of labour (P), does the adoption of an upright birthing position (e.g. sitting, standing or squatting) (I), compared with a recumbent position (C), improve birth outcomes (O)?	Duration of labour Mode of birth Pain relief/intensity Perineal/vaginal trauma Maternal birth experience Fetal distress Perinatal hypoxia-ischaemia Perinatal/neonatal death
For women in the second stage of labour (P), does spontaneous pushing (I), compared with directed pushing (e.g. with Valsalva/closed glottis) (C), improve birth outcomes (O)?	Duration of labour Mode of birth Perineal/vaginal trauma Long-term maternal morbidity Maternal birth experience Fetal distress Perinatal hypoxia-ischaemia Perinatal/neonatal death
For women with epidural analgesia in the second stage of labour (P), does delayed pushing (I), compared with immediate pushing after full cervical dilatation (C), improve birth outcomes (O)?	Duration of labour Mode of birth Perineal/vaginal trauma Long-term maternal morbidity Maternal birth experience Fetal distress Perinatal hypoxia-ischaemia Perinatal/neonatal death
For women in the second stage of labour (P), does any perineal technique (e.g. massage, warm compress or guiding) used for preventing perineal trauma (I), compared with no perineal technique or usual practice (C), improve birth outcomes (O)?	Perineal/vaginal trauma Long-term maternal morbidity Maternal birth experience Birth trauma Perinatal hypoxia-ischaemia

Priority guideline questions P=Population; I=Intervention; C=Comparator; O=Outcomes	Priority outcomes
For women in the second stage of labour (P), does a policy of selective/restrictive use of episiotomy (I), compared with a policy of routine or liberal use of episiotomy (C), improve birth outcomes (O)?	Duration of labour Maternal morbidity Long-term maternal morbidity Perineal/vaginal trauma Use of pain relief Maternal birth experience Birth trauma Perinatal hypoxia-ischaemia
For women in the second stage of labour (P), does the application of fundal pressure (I), compared to no fundal pressure (C), improve birth outcomes (O)?	Mode of birth Duration of labour Maternal mortality Serious maternal morbidity Perineal/vaginal trauma Maternal birth experience Birth trauma Perinatal hypoxia-ischaemia Perinatal/neonatal death

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Annex 3. Summary of declarations of interest from Guideline Development Group and Technical Working Group members, and how they were managed

Name and expertise contributed to the guideline development	Declared interest(s)	Management of conflict(s) of interest
Guideline Development Group (GDG)		
Professor Hany Abdel-Aleem Expertise: Obstetrics, content expert and end-user	None declared	None
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Ms Silke Mader Expertise: Women's representative	None declared	None
Professor Suellen Miller Expertise: Midwifery, content expert and end-user	Consultancy for BlueFuzion, which produces the LifeWrap brand of non-pneumatic anti-shock garment. Received US$ 2600 and coverage for travel to conduct workshops and training.	This declared conflict of interest was not considered significant enough to pose any risk to the guideline development process or to reduce its credibility. The guideline development process did not include any new questions related to postpartum haemorrhage or non-pneumatic anti-shock garments.
Dr Rintaro Mori Expertise: Neonatology, content expert and end-user	None declared	None
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Professor Soo Downe Expertise: Midwifery, content expert, systematic review, and guideline methodology	Research grants from the National Institute for Health Research (NIHR) and the Royal College of Midwives in the United Kingdom to conduct research on self-hypnosis for labour pain and survey on interventions in normal birth (completed in 2013 and 2014, respectively); and a European Union (EU) grant for European Cooperation in Science & Technology (COST) Action on Building Intrapartum Research Through Health (BIRTH), 2014–2018.	The declared academic conflict of interest was not considered significant enough to pose a substantial risk to Professor Downe's participation as a member of the TWG, nor does it reduce the credibility of the systematic reviews that she led.

Name and expertise contributed to the guideline development	Declared interest(s)	Management of conflict(s) of interest
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Annex 4. Implementation considerations specific to individual recommendations[a]

3.1 CARE THROUGHOUT LABOUR AND BIRTH	
3.1.1 Respectful maternity care (RMC)	■ Multifaceted RMC interventions are most likely to be effective, and policy-makers should ensure that key stakeholders are engaged in RMC programmes, including facility administrators, training institutions, professional societies, providers and communities; this will ensure shared responsibility. ■ As the drivers and types of mistreatment and abuse will vary across settings, stakeholders should ensure that these factors are clearly identified through communication with women and women's groups in each different setting. RMC interventions should then be tailored to addressing these factors, to optimize implementation and impact. ■ Implementers should ensure the development and integration of up-to-date, written standards and benchmarks for RMC that clearly define goals, operational plans and monitoring mechanisms. ■ Protocols for RMC, accountability mechanisms for redress in the event of mistreatment or violations, and informed consent procedures, should all be reviewed continuously. ■ Mechanisms should be put in place to ensure that all women, and particularly those from disadvantaged backgrounds, are made aware of (i) their right to RMC and (ii) the existence of a mechanism for raising and addressing complaints (e.g. an audit and feedback mechanism that integrates women's complaints and ensures that responses are provided). ■ RMC policies should be tailored to the context of each different setting to ensure that subgroups of women at particular risk of mistreatment and those with special needs (e.g. poor awareness of their rights, language difficulties) are targeted for more intensive efforts to promote RMC, especially where maternity care experiences among these subgroups are very poor. ■ Implementers should be aware that shifts in health system infrastructure (e.g. reorganization of staffing, increasing workload) could disrupt implementation; therefore, any infrastructural changes need close monitoring to ensure and evaluate the feasibility and sustainability of RMC practices. ■ Implementers should be aware that a commitment to providing the necessary physical and staff resources and supporting staff well-being/morale is needed for successful implementation and sustainability of RMC. In addition, ensuring a visible, sustained and participatory intervention process, with committed facility leadership, management support and staff engagement, is important.[b] ■ Implementers should be aware of the general principals of the Human Rights Council's *Technical guidance on the application of a human rights-based approach to the implementation of policies and programmes to reduce preventable maternal morbidity and mortality.*[c]

[a] This annex refers only to implementation considerations for the new recommendations. Implementation considerations related to integrated recommendations can be found in the original guideline documents and accessed via the links provided in the respective "remarks" sections.

[b] Ratcliffe HL, Sando D, Mwanyika-Sando M, Chalamilla G, Langer A, McDonald KP. Applying a participatory approach to the promotion of a culture of respect during childbirth. 2016;13:80.

[c] United Nations Human Rights Council. Technical guidance on the application of a human rights-based approach to the implementation of policies and programmes to reduce preventable maternal morbidity and mortality. New York (NY): United Nations; 2012.

	■ Successful RMC programmes should be documented to inform the development of guidelines and protocols for better quality maternity care in different settings. ■ Policy-makers should ensure compliance with the 2017 Joint WHO/United Nations statement on ending discrimination in health care settings.[d]
3.1.2 Effective communication	■ Including effective communication training routinely in all pre-service and in-service professional training interventions could be the most feasible way to implement effective communication interventions. ■ Health care facilities should ensure there is an up-to-date, written policy that outlines clear goals, operational plans and monitoring mechanisms to promote the interpersonal communication and counselling skills of health care staff. ■ Potential barriers to implementation at individual, health care facility and health system levels will need to be identified and addressed. Some barriers (e.g. high workload) may be common across settings, while other barriers (e.g. cultural attitudes to disadvantaged women) might be setting-specific. ■ Changes to system infrastructure (e.g. increased staff, reorganization of staffing, skill mix, workload capacity, promotion of multidisciplinary team working, clinical leadership) could facilitate effective communication interventions and make them more sustainable. ■ Easily understood health education materials, in an accessible written or pictorial format, should be made available in the languages of the communities served by the health care facility. ■ Culturally appropriate mechanisms should be put in place to ensure that all women, and particularly those from disadvantaged backgrounds, are made aware of (i) their right to effective communication and (ii) the existence of a mechanism for raising and addressing complaints related to their maternity care.
3.1.3 Companionship during labour and childbirth	■ Policy-makers should consider how to provide a companionship service for women during labour and birth that meets the needs of the population. One approach could be to encourage women to bring their own companion wherever possible, but if a woman does not bring/have a companion, the health service would offer to provide someone to support her. ■ In settings where women are unfamiliar with the concept or the benefits of companionship during labour and childbirth, the organization of community-based groups of volunteer companions, antenatal care education and counselling groups, women's groups, hospital open days, and other promotional activities could help to promote demand for and use of companionship. ■ Policy-makers should develop culturally sensitive training programmes for companions, and consider ways of registering, retaining and incentivizing them. ■ Prior to implementation, to reduce resistance to change among health care providers, implementers might want to consider training them on the benefits of companionship during labour and childbirth, as well as how companions can be integrated into the woman's support team. ■ Labour companions should have clearly designated roles and responsibilities, to ensure that their presence is beneficial to both the woman and her health care providers, and to reduce the risk of being "in the way". ■ Infection control measures should be considered for companions, such as access to sanitation, hygiene measures and protective clothing as necessary.

[d] Joint United Nations statement on ending discrimination in health care settings. Joint WHO/UN statement. 27 June 2017 (http://www.who.int/mediacentre/news/statements/2017/discrimination-in-health-care/en/).

	■ Integration of the lay companion (including male partners/husbands and female relatives) into antenatal care visits, childbirth education classes, etc., might empower companions with knowledge about the process of labour, familiarity with the health care facility structure, and the skills and confidence to better support the woman, while additionally providing the woman herself with information about how the companion will be able to support her throughout labour and birth.
3.2 FIRST STAGE OF LABOUR	
3.2.1 Definitions of the latent and active first stages of labour	■ Guidance and protocols for health care facilities without availability of caesarean section will need to be developed that are context- and situation-specific. ■ Introduction of these new definitions and concepts should involve pre-service training institutions and professional bodies, so that training curricula for intrapartum care can be updated as quickly and smoothly as possible. ■ Labour monitoring tools will need to be updated and/or developed to facilitate the new approach. ■ Practice manuals and labour ward protocols will need to be updated and disseminated.
3.2.2 Duration of the first stage of labour	
3.2.3 Progress of the first stage of labour	
3.2.4 Labour ward admission policy	■ This recommendation requires a well functioning health system with a sufficient number of trained health care professionals. ■ It is important that health care professionals clearly communicate the reason for delaying admission to women in latent labour, and provide them with encouragement, support and advice on how to manage uncomfortable contractions, how to recognize active labour and, if a woman chooses to go home, when to return to the hospital.
3.2.5 Clinical pelvimetry on admission	■ In settings where clinical pelvimetry is routinely performed among healthy pregnant women on admission in labour, health care providers need to be aware that there is insufficient evidence to support this practice.
3.2.6 Routine assessment of fetal well-being on labour admission	■ In settings where cardiotocography (CTG) is performed routinely on admission for labouring women with no risk factors for adverse outcomes, it is important to inform health care professionals and other stakeholders that this practice is not evidence-based and increases the risk of unnecessary medical interventions. ■ Policy-makers and relevant stakeholders need to consider how records from auscultation can be validated for use in the defence against potential litigation claims, instead of reliance on admission CTG for this purpose.
3.2.10 Continuous cardiotocography during labour	■ The GDG panel is aware that in some countries and settings, continuous CTG is used to protect against litigation. In such settings, health care professionals and women should be advised that this practice is not evidence-based and does not lead to better outcomes. Clinicians might be better protected against litigation by keeping good medical notes and records, which clearly indicate findings of intermittent auscultation (IA), than by relying on continuous CTG tracings.

3.2.11 Intermittent fetal heart rate auscultation during labour	■ Policy-makers should consider what method(s) is/are most feasible in their settings. In low-resource settings, Pinard fetal stethoscope would be the most feasible method for intermittent auscultation (IA) as it is not associated with ongoing costs related to supplies and equipment maintenance, and has no infrastructural requirements (e.g. power supply). ■ A practical approach in low-resource settings might be to firstly ensure widespread availability and competence of health care providers to conduct IA with the Pinard fetal stethoscope. Then, as resources become available, the Doppler ultrasound device could be introduced with appropriate pre-service and in-service training. ■ In settings with a high prevalence of litigation, policy-makers and relevant stakeholders need to consider whether records from non-electronic fetal monitoring (and IA in general) would be valid in the defence against potential litigation claims.
3.2.12 Epidural analgesia for pain relief	■ Policy-makers need to determine which pain relief measures are most feasible and acceptable in their settings. ■ Facilities offering epidural analgesia need to have staff with the appropriate specialist skills (anaesthetists, obstetricians) as well as equipment and systems in place to monitor, detect and manage any undesirable effects of the procedure during and after labour to ensure the safety of mother and baby. Epidural analgesia should not be introduced in settings where these resources are not consistently available. ■ Systems should be in place to ensure adherence to standardized protocols for epidural analgesia, including correct drugs, doses, techniques, staffing levels and other resource requirements. ■ Oxygen, resuscitation equipment and appropriate drugs for resuscitation should be readily available in labour and postnatal wards where women who have undergone epidural analgesia are cared for. ■ Health care providers and women should be aware that epidural analgesia is a significant procedure that can lead to serious complications. The benefits and risks associated with epidural analgesia should be clearly explained to women considering this method of pain relief. ■ Signed informed consent is necessary for all women undergoing epidural analgesia. ■ Setting-specific protocols for assessing a woman's need for pain relief and for providing a range of pharmacological and non-pharmacological options should be developed to guide clinical management, to support women's decision-making, and to ensure safe and equitable provision of pain relief. ■ Health care professionals should communicate to women the pain relief options available for labour and birth at their facility, and should discuss the advantages and disadvantages of these options, as part of antenatal care education and counselling. A woman's choice of pain relief during labour, if pain relief is required, should be confirmed on admission in labour. In addition, she should be free to change her mind about the type of pain relief she would like if she feels the need to do so. ■ Health care facilities providing pharmacological options for pain relief, including epidural analgesia, should ensure that they have adequately trained staff, clear protocols and the necessary equipment to manage complications, should they arise. ■ Mechanisms should be in place at facilities offering pharmacological pain relief options to ensure that the necessary drugs are kept in stock and can be dispensed when needed. ■ Health care facilities offering epidural analgesia during labour should conduct regular audit and feedback procedures to ensure adherence to clinical protocols and to monitor complications.

3.2.13 Opioid analgesia for pain relief	■ Policy-makers need to determine which pain relief measures are most appropriate (feasible and acceptable) in their settings, in consultation with health care professionals and the women using their facilities. ■ Opioid analgesia is not suitable in settings where women and babies cannot be adequately monitored due to staff shortages, or where resuscitation skills, equipment and supplies (oxygen, appropriate drugs) are lacking. ■ Setting-specific protocols for assessing a woman's need for pain relief and for providing a range of pharmacological and non-pharmacological options should be developed to guide clinical management, to support women's decision-making, and to ensure safe and equitable provision of pain relief. ■ Health care facilities providing opioid analgesia should ensure that personnel skilled in performing resuscitation are among the staff on duty at all times. ■ Health care facilities should monitor adherence to clinical protocols and complications related to opioid use (particularly maternal and neonatal respiratory depression) to reduce iatrogenic outcomes. ■ Health care professionals should communicate to women the pain relief options for labour and birth available at their facility, and should discuss the advantages and disadvantages of these options, as part of antenatal care education and counselling. ■ Health care facilities providing pharmacological options for pain relief, including opioid analgesia, should ensure that they have adequately trained staff, clear protocols and the necessary equipment to manage complications, should they arise. ■ Mechanisms should be in place at facilities offering pharmacological pain relief options to ensure that the drugs are kept in stock and can be dispensed when needed. ■ Opioid medication needs to be securely stored and a register kept of its dispensing, to reduce the risk of abuse.
3.2.14 Relaxation techniques for pain management **3.2.15 Manual techniques for pain management**	■ Health care professionals should communicate to women the pain relief options for labour and birth available at their facility, and should discuss the advantages and disadvantages of these options as early as possible in labour, and ideally as part of antenatal care education and counselling. ■ Training institutions could cover these techniques in health care professionals' pre-service and in-service training. For lay companions, basic training in these techniques could be facilitated during the antenatal period.
3.3 SECOND STAGE OF LABOUR	
3.3.1 Definition and duration of the second stage of labour	■ Same as considerations for 3.2.1–3.2.3.
3.3.2 Birth position (for women without epidural analgesia)	■ In settings where women usually give birth in recumbent positions, policy-makers should ensure that (i) health care professionals receive in-service training on how to support women to give birth in upright positions and (ii) the necessary facilities that can be used to support alternative upright positions for women are provided. ■ Health care professionals should advise women about their options with regard to choice of birth positions; this should be done during antenatal care contacts as part of antenatal education and counselling.

3.3.3 Birth position (for women with epidural analgesia)	■ Same implementation considerations as for item 3.3.2 (previous row).
3.3.4 Method of pushing	■ In settings where health care professionals are accustomed to using directed pushing techniques, clinical protocols, pre-service and in-service training content should be updated to support spontaneous pushing.
3.3.5 Method of pushing (for women with epidural analgesia)	■ Clinical protocols, pre-service and in-service training content should be updated to support delayed pushing in the second stage of labour for women with epidural analgesia.
3.3.6 Techniques for preventing perineal trauma	■ Policy-makers should liaise with professional bodies, societies and training institutions to ensure that pre-service training of health care professionals includes training in techniques for preventing perineal trauma. ■ Professional bodies, societies and health care facilities should update their training and guidance on supporting women in the second stage of labour to include these different options for preventing perineal trauma: perineal massage, warm compresses and a "hands-on" guarding approach. ■ Stakeholders can consider which techniques are most feasible in their settings. ■ Health care professionals should communicate to women the different options available for preventing perineal trauma; this should be done during antenatal care contacts as part of BPCR counselling, and the woman's preferences for her care during the second stage of labour should be noted.
3.3.7 Episiotomy policy	■ To secure broad support and to ensure that health workers receive appropriate training and support, policy-makers should include representatives of training facilities and professional bodies in participatory processes. ■ Guidelines of professional societies and health care facility protocols should be updated to reflect the recommendation that episiotomy is not to be used liberally and that only selective use of episiotomy is permissible. ■ In settings where routine or liberal use of episiotomy has been employed, and in settings with low utilization of health care facilities for childbirth, women and health care providers should be informed that the use of episiotomy is now restricted. ■ All stakeholders should be aware of the need for a woman to give informed consent for episiotomy. ■ Episiotomy indications and protocols should be clearly displayed in maternity facilities. ■ Policy-makers, health care managers and administrators for both public and private health care facilities should ensure that any financial and other incentives to perform episiotomy are removed.
3.3.8 Fundal pressure	■ Health care providers should be made aware that this practice is not recommended and can lead to adverse birth outcomes. ■ Stakeholders could consider undertaking implementation research to determine how best to reduce unnecessary childbirth practices in their settings.

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