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Review Article

Constructing evidence-based clinical intrapartum care algorithms for decision-support tools

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Aim To describe standardised iterative methods used by a multidisciplinary group to develop evidence-based clinical intrapartum care algorithms for the management of uneventful and complicated labours.

Population Singleton, term pregnancies considered to be at low risk of developing complications at admission to the birthing facility.

Setting Health facilities in low- and middle-income countries.

Search strategy Literature reviews were conducted to identify standardised methods for algorithm development and examples from other fields, and evidence and guidelines for intrapartum care. Searches for different algorithm topics were last updated between January and October 2020 and included a combination of terms such as 'labour', 'intrapartum', 'algorithms' and specific topic terms, using Cochrane Library and MEDLINE/PubMED, CINAHL, National Guidelines Clearinghouse and Google.

Case scenarios Nine algorithm topics were identified for monitoring and management of uncomplicated labour and childbirth, identification and management of abnormalities of fetal heart rate, liquor, uterine contractions, labour progress, maternal pulse and blood pressure, temperature, urine and complicated third stage of labour. Each topic included between two and four case scenarios covering most common deviations, severity of related complications or critical clinical outcomes.

Conclusions Intrapartum care algorithms provide a framework for monitoring women, and identifying and managing complications during labour and childbirth. These algorithms will support implementation of WHO recommendations and facilitate the development by stakeholders of evidence-based, up to date, paper-based or digital reminders and decision-support tools. The algorithms need to be field tested and may need to be adapted to specific contexts.

Keywords Algorithms, childbirth, first stage of labour, intrapartum care, labour complications, second stage of labour, third stage of labour.

Tweetable abstract Evidence-based intrapartum care clinical algorithms for a safe and positive childbirth experience.

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*A list of the WHO Intrapartum Care Algorithms Working Group members can be found in the Appendix.

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Introduction

The burden of maternal and perinatal deaths and severe morbidity is high around the time of childbirth, representing over a third of maternal deaths,[1,2] half of all stillbirths and a quarter of neonatal deaths,[3] particularly in low- and middle-income countries.[2,3]

Investment in high-quality care around the time of childbirth has been identified as the most impactful strategy to reduce maternal and perinatal deaths and severe morbidities.[4,5] The appropriate monitoring of women and babies throughout labour and childbirth, early identification of those at risk of labour complications, timely use of safe and effective interventions when needed and avoidance of unnecessary labour interventions would avert most of the preventable intrapartum-related adverse outcomes. High-quality intrapartum care is also key to optimising the wellbeing of women and their babies and their experience of care.[6]

In the last decade the World Health Organization (WHO) has released and continuously updated[7] several evidence-based recommendations addressing the care that all women and their babies should receive during uneventful or complicated labours and childbirth. However, it is well known that passive dissemination of recommendations is insufficient for its optimal implementation.[8,9] Different strategies have been used to ensure that high-quality, evidence-based practices are implemented in different contexts, such as the use of reminders and decision/job aids, in the form of posters, checklists, screening tools and flowcharts/algorithms to assist health workers in making diagnosis and clinical management decisions.[10–12]

More recently, digital decision-support systems have emerged as potential platforms for reminders and decision/job aids based on decision rules (prompts and alerts) developed according to clinical protocols/recommendations or using machine learning techniques and predictive analysis to extract patterns from clinical data.[13]

To support the development of evidence-based reminders and decision/job aids, WHO commissioned the development of evidence-based clinical algorithms for the management of uneventful and complicated labours, by skilled health personnel providing care during labour and childbirth in any health facility, with a focus on low-resource settings. This manuscript presents the standardised, iterative methods used to develop these intrapartum care algorithms. It is expected that these algorithms will support implementation of WHO recommendations and facilitate the development by stakeholders of evidence-based, up-to-date, paper-based or digital reminders and decision-support tools.

Methods

The intrapartum care algorithms were developed by a multidisciplinary group of experts using an iterative, standardised two-phased process including: (1) Evidence-based phase: to identify intrapartum care topics and case scenarios, identify evidence-based recommendations and practices in the literature, assess its hierarchy, and develop a first version of the algorithms; (2) Expert-based phase: to peer review the evidence identified and revise the algorithms, and validate the final versions of the algorithms.

A Steering Group, composed of WHO staff and selected content experts, developed the standard operating procedures, identified a first set of intrapartum care topics and case scenarios, convened the technical working group, oversaw the development and consolidation of the various algorithms and approved the final versions of the algorithms. The WHO Intrapartum Care Algorithms Working Group is a purposefully selected international, multidisciplinary group of individuals with expertise in clinical obstetrics and midwifery, evidence-based synthesis and guideline development. The experts were assigned to work in teams of two to four experts with dual function of developing topic-specific algorithms and peer-reviewing algorithms developed by other teams, so that at least one member of a team served as an external reviewer for algorithms that they had not been involved with. Teams could invite new members or consult external content experts as appropriate and in consultation with the steering group. No representatives of pregnant women were involved in the development of the algorithms.

The standard operating procedure was developed based on previous literature on methods for clinical algorithm development, previously proposed standards and examples of algorithm development from other fields. Based on the evidence, algorithms were defined as flowcharts providing evidence-based step-by-step visual interpretation of a logical sequence of information gathering, decision-making and/or associated action for optimal monitoring and management of women and babies during labour and childbirth.[14–18]

The main components of the processes to develop clinical algorithms were also identified through literature review: description of principles, end users, target population and setting, and care period covered.

Evidence-based phase

Identification of topics and case scenarios

An initial list of intrapartum care topics and case scenarios was developed by the steering group, based on a rapid review of intrapartum care recommendations from WHO, international and national professional societies. This list was refined by the WHO Intrapartum Care Algorithms Working Group teams, based on the findings of the topic-specific literature searches conducted by each of the teams. For any given topic, the first step was to identify up to five

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scenarios. References were to be provided to support the choice of the clinical case scenarios, based on epidemiological data of most common deviations, severity of related complications or clinical outcomes, if available.

Identification of evidence

A literature review was completed by each team to identify published clinical practice guidelines, meta-analyses, systematic reviews and relevant single studies for each topic. Specific search terms were developed, including combinations of terms such as 'labour', 'intrapartum', 'algorithms' and specific topic terms. Specific search strategies are described in each manuscript included in this supplement on intrapartum care algorithms.[19–26] Briefly, searches included The Cochrane Library and MEDLINE/PubMED, CINAHL, National Guidelines Clearinghouse and Google. In addition, international and national guidance documents were identified by consulting web pages of professional societies. Searches were first completed in November 2018 and updated between January and October 2020. No language restrictions were applied when possible but this depended on the language proficiency of each of the teams. The teams screened titles and abstracts, extending manual searches through the reference lists of relevant articles and extracted the recommendations and supporting evidence into an EXCEL file (Appendix S1). Any inconsistencies were solved by consultation with another person in the teams or a member of the WHO working group, as appropriate.

The groups identified the highest level of evidence available for each scenario based on hierarchy of available evidence sources. The highest level of evidence found was used to support decisions along the algorithm using the template in Appendix S1. Priority was given to WHO recommendations and WHO guideline derivatives,[27,28] given its internationally recognised methods and standards[29] for development of recommendations. These ensure that WHO guidelines are of the highest quality, ensure transparent decision-making processes, involve geographical and gender-balanced groups of content experts and stakeholders and ensure that recommendations are universally applicable and people-centred. Where no WHO recommendations or derivates existed other international or national guidelines using Grading of Recommendations Assessment, Development and Evaluation (GRADE) methodology were prioritised, followed by recommendations developed using other methodologies. In the absence of guidelines, a combination of evidence from existing studies and expert opinion was used to determine key points for consideration in the algorithm. The highest level of evidence found was used to support the decisions along the algorithms, in the order of up-to-date systematic review with or without meta-analyses, other systematic review, validated decision rules, randomised controlled trials, non-randomised controlled trials, observational studies and consensus documents.

Prioritisation of recommendations and interventions in the algorithm

After collating the evidence, a selection process for inclusion of the evidence in the algorithm was conducted by each team. Selection was based on relevance of the evidence to the key decision points, strength of the evidence (if available from the source document), severity of the condition targeted by an intervention (interventions with the most impact on maternal and/or perinatal outcomes) and frequency (e.g. interventions that apply to a significant proportion of women). The selection also accounted for the applicability and feasibility in low-resource settings. Any lack of evidence or inconsistencies in the evidence were discussed with the working group, and decisions informed by the highest level of evidence and consensus for each of the algorithms.

All recommendations and supporting evidence that were applicable to each case scenario were extracted, using standardised tools (Appendix S1) by each of the teams, focusing on specific elements of care, as described in Box 1.

Construction of clinical algorithms

Algorithms were then developed for each case scenario, based on a common structure (Figure 1), starting with the identification of the case scenario and definition of the condition, followed by initial maternal and fetal assessments and management, identification of the probable cause, differential diagnosis and additional management until spontaneous vaginal birth, need for medical review to expedite birth, formulate an individualised care plan in complex cases or referral. Algorithms could also link to other relevant algorithms in the series for identification and/or management of complications where appropriate or to normal labour algorithms in case of resolution of the complication.

In the algorithms, content was broken up into boxes presented in a logical, sequential, succinct way, with unambiguous alternatives and clear stopping points.[14,15] Each algorithm was composed of standardised, variably shaped boxes representing a decision/action point in terms of suspicion of a condition, diagnosis, monitoring or management. Boxes were colour-coded to improve readability, as follows: clinical state (grey rounded rectangle), decision point (red hexagon), action task (blue rectangle), or link to a different algorithm (pink oval) (Box 2). Different types of boxes could be linked using arrows that should not intersect depending on the clinical flow (e.g. a decision box could be linked to another decision box, an action box, a clinical state box or a link box). The preferred flow was from top to bottom, and left to right, where possible. Only arrows originating from decision boxes were labelled, using 'yes' or 'no'. Clinical state, decision and action boxes were numbered sequentially, left to right and top to bottom. Box numbers corresponded to the table of evidence, showing the evidence source for the action and decision points. Algorithms were made to fit on

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Box 1 Elements of care considered in the intrapartum care algorithms

Suspicion of the condition/initial assessment (*what observations will warrant a clinical suspicion of the case scenario?).*
Definition (confirmation) (*what observations define or are characteristic of the case scenario?*).
Differential diagnosis (*what are the various diagnoses that the observations could indicate?*).
Monitoring (*what further observations or assessments are needed to monitor clinical progression of the scenario?*).
Management (*what treatment options can be used to slow the progression, correct the deviation, or avert adverse clinical outcomes?*).
Information and integration of women's views and preferences.

Box 2 Description of different algorithm boxes

Rounded rectangle: This box was used to indicate a starting or ending point, defining the clinical state, diagnosis or final outcome (birth). At the beginning of the algorithm it has only one exit path. At the end of the algorithm it has only an entry path and no exit path.
Rectangle. This box was used to indicate specific actions, either diagnostic or therapeutic, including re-evaluation, initial management, reassessment, maintenance therapy or non-clinical interventions.
Multiple actions that do not need to be sequential in time were listed in one box. When multiple actions are presented, each action was listed in a different line. Only first-option treatments or medications were included, as appropriate and other options were described in the accompanying algorithm manuscript.
Hexagon or diamond: This box required a branching decision (i.e. contains decision-relevant questions), with a response that led to one of two alternative paths. It always has one entry path and two exit paths. This box could refer to abnormal findings, suspicion or confirmation of diagnosis, identification of the cause, clinical laboratory test or differential diagnosis. The decision points are represented with yes/no, or conditional logic like if/then. Multiple questions could be asked in one box, with criteria specified for a 'yes' response (e.g. are two of three present, any present, all present?).
Small oval: This box was used to link different algorithms or proposed to link boxes for graphic clarity at page breaks. Text should read go to algorithm X.

one page. Annotations were allowed to provide clarifications or additional information as footnotes. Draw.io (https://drawio-app.com; SEIBERT/MEDIA GmbH), an open source diagramming software, was used to construct the algorithms and facilitated remote working.

Expert-based phase

For the purpose of peer review, algorithms were swapped across teams to validate case scenarios, all algorithm boxes and choice of recommendations and evidence based. All the algorithms were then reviewed by the algorithm developing teams in an iterative process that included one 2-day face-to-face meeting of the WHO working group in December 2018, several virtual meetings between the teams and/or the steering group, and written feedback, as deemed necessary. Finally, all algorithms were reviewed for consistency in case definitions, clinical management, formatting and language by the WHO steering group, during 6 days of face-to-face meetings.

Results

Principles

The algorithms developed would, as far as possible, reflect most up-to-date evidence-based recommendations and therefore reflect interventions and clinical practices that comply with the characteristics of good-quality maternity care: safe, effective, timely, efficient, equitable and people-centred,[6] and promote a positive childbirth experience.[30] The use of interventions to accelerate, terminate, regulate or monitor labour will be limited to when clinically indicated. In this sense, the algorithms will maximise opportunities for spontaneous vaginal birth, or instrumental vaginal births where clinically appropriate and resources are available, and limit indications for caesarean section. The algorithms developed should never override the healthcare provider's and woman's best judgement.

End users

The target users are skilled health personnel providing care during labour and childbirth, working alone or as part of clinical teams, particularly midwives, non-specialised clinicians (i.e. clinicians without specialist training in obstetrics but who also provide care for women in labour), as well as obstetric specialists.

Target population and setting

The target population is pregnant women with singleton, term pregnancies considered to be at low risk of developing complications at admission to the birthing facility, in active first stage of labour or beyond. This in line with the definition of term 'healthy pregnant women' as per the WHO

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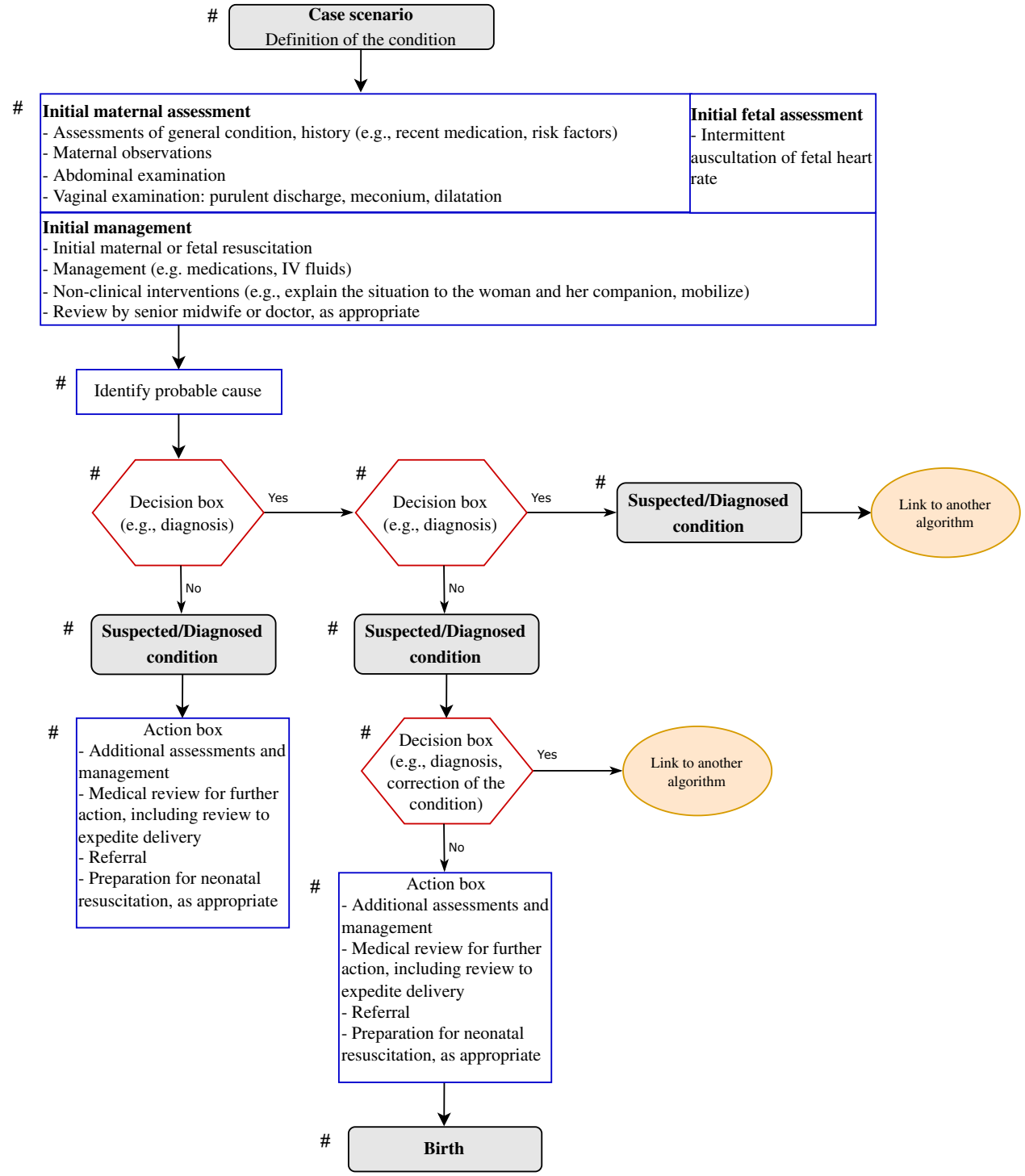


Figure 1. Common structure of evidence-based, clinical intrapartum care algorithms.

recommendation on intrapartum care for a positive childbirth experience.[30] Management of complications first identified or arising after admission to the birthing facilities are covered in the algorithms.

Health facilities in low- and middle-income countries were the priority setting. The algorithms will mainly be used in the place where labour and childbirth are intended to take place, e.g. labour wards, delivery rooms and

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Table 1. Clinical intrapartum care algorithm topics and corresponding case scenarios

Topic	Case scenarios	Differential diagnosis
Spontaneous labour resulting in normal vaginal birth	First stage of labour without complications Second stage of labour without complications Third stage of labour without complications	Latent first stage of labour
Fetal heart rate abnormalities[19]	Fetal bradycardia or late decelerations	Uterine rupture Placental abruption Cord prolapse Maternal hypotension Uterine hyperstimulation Unexplained
	Fetal tachycardia	Maternal hyperthermia Maternal infection Maternal dehydration Unexplained
Liquor abnormalities[20]	Oligohydramnios	Uteroplacental insufficiency Fetal growth restriction Preterm prelabour rupture of membranes
	Meconium-stained amniotic fluid	Fetal distress
	Bloody amniotic fluid or vaginal bleeding	Placental abruption Placenta or vasa praevia Uterine rupture
	Foul-smelling or purulent amniotic fluid	Intra-amniotic infection
Uterine contractions abnormalities[21]	Uterine hypoactivity	Inadequate uterine activity Suspected uterine rupture
	Excessive uterine contractions	Placental abruption Obstructed labour Uterine tachysystole during augmentation
Labour progress abnormalities[22]	Slow progress of active first stage	Malpresentation Cephalopelvic disproportion/ Obstructed labour Delay in progress of labour Inadequate uterine activity
	Slow progress of second stage of labour	Malpresentation Cephalopelvic disproportion Obstructed labour
Maternal pulse and blood pressure abnormalities[23]	Maternal tachycardia	Postpartum haemorrhage Intrapartum bleeding Maternal infection Suspected chorioamnionitis Suspected dehydration
	Maternal bradycardia	Supine hypotension Hypotension
	Hypertension	Eclampsia Severe pre-eclampsia Mild pre-eclampsia
	Hypotension	Postpartum haemorrhage Intrapartum bleeding Maternal infection Suspected chorioamnionitis Suspected amniotic fluid embolism Suspected dehydration
Maternal temperature abnormalities[24]	Hyperthermia Hypothermia	Chorioamnionitis Pyelonephritis Lower urinary tract infection Pneumonia

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Table 1. (Continued)

Topic	Case scenarios	Differential diagnosis
		Other suspected source of infection
		Cold exposure
Maternal urine abnormalities[25]	Glycosuria	Previously undiagnosed diabetes
		Low renal glucose excretion threshold during pregnancy
	Oliguria	Urinary retention
		Maternal dehydration
		Pre-eclampsia
		Shock
		Underlying maternal cardiac or renal problems
	Proteinuria	Pre-eclampsia
		Maternal urinary tract infection
		Maternal dehydration
	Ketonuria	Obstructed labour
		Maternal diabetes
		Physiological ketonuria in labour
Third stage of labour abnormalities[26]	Postpartum haemorrhage after vaginal birth	Uterine atony
		Genital tract trauma
		Retained placenta/placental products
		Coagulopathy
		Suspected amniotic fluid embolism
		Inverted uterus
	Uterine atony	
	Genital tract trauma	1st or 2nd degree tear
		3rd or 4th degree tear
		Cervical tear
		High vaginal tear
		Vulval or vaginal haematoma
		Uterine rupture
	Retained placenta/placental products	

The algorithms are based on best evidence available to date. Responsibility for the interpretation and use of the algorithms lies with the reader. In no event shall the authors be liable for damages arising from its use.

operating theatres. However, the algorithms are applicable to any healthcare setting or other places in the healthcare facilities (e.g. emergency rooms). Possible adaptations that may be required to different settings were acknowledged in each of the manuscripts in this supplement.

Care period covered

The algorithms cover assessments and management from the time of admission of pregnant women to the health facility with the diagnosis of active first stage of labour, or beyond, until immediate postnatal care (including the first hour after childbirth) for women and their babies.

Topic of algorithms and case scenarios

Nine topics were identified for development of clinical algorithms for uneventful and complicated labours. Each topic includes from two to four case scenarios, as shown in Table 1.

The iterative process to develop the algorithms yields around four to seven versions of the algorithms before final validation. In this process, statements were edited, redundant boxes and arrows were collapsed or removed, or additional boxes were added, ensuring that the algorithms used common definitions and homogeneous language. All events and decisions in the algorithm depend on the answers to the questions and observations that precede them. Linkages between algorithms were made in cases where multiple complications could have been identified and to avoid repetition across different algorithms. In the case of multiple complications, it was clearly highlighted where medical review was indicated to refer women with complicated labour for specialist care.

All algorithms include considerations or interventions to ensure people-centred, respectful care, including for example action points on effective communication (e.g. discussion with woman and companion about complication identified, request for consent for certain interventions) or relief of labour pain.

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Discussion

The evidence-based, clinical intrapartum care algorithms developed using the methodology described in this manuscript will provide guidance on how to manage uneventful and complicated labours, particularly for less specialised birth attendants. These algorithms form the backbone upon which paper-based tools or digital decision-support systems could be built. They could also be employed to support training of healthcare providers.

To the best of our knowledge, this is the first series of intrapartum care algorithms designed using a robust, standardised approach for the management of uncomplicated and complicated labours, applicable in a variety of settings (including low-resource settings), independent of the models of intrapartum care (midwifery-led or other models). Our literature searches allowed us to identify other intrapartum care algorithms developed either for uncomplicated labours only and/or with a focus on high-resource settings.[31,32] Although, existing algorithms were useful during the prioritisation of recommendations and interventions, our algorithms may differ given considerations to different models of care or resources available. Many pre-existing algorithms were often boxes and lines or arrows without guidance for when or whether to go from one box to the next; our algorithms incorporated a clear flow and decision boxes to aid in these decisions. Discrepancies between existing and current algorithms are described in each of the manuscripts in this supplement, where appropriate.

Strengths and limitations

The intrapartum clinical algorithms were developed using standardised procedures including identification of key case scenarios, review of the evidence and robust peer-review. They were derived from a comprehensive, up-to-date review of the literature and existing guidelines covering assessments, differential diagnosis and management of uncomplicated births or those presenting with a wide range of complications. Our approach facilitated linkage between relevant algorithms for the management of other conditions, or pointed to escalation for specialist input where needed.

Some of the challenges in developing the algorithms overlap across the different topics and case scenarios, and included the lack of or insufficient evidence for some topics or specific components of the algorithms, including how to prioritise use or sequence of use of certain interventions when multiple treatment choices are available, or when availability may vary according to the setting (e.g. for management of postpartum haemorrhage). Another common limitation was inconsistency among guidelines and recommendation on terminology and definitions used, thresholds to identify deviations from normality (e.g. fetal heart rate abnormalities[19]), frequency of assessment (e.g. temperature[24]) or management (e.g. recommended dosage for regimens for oxytocin augmentation[21]). These challenges where relatively easily overcome when WHO guideline derivate documents[27,28] provided some guidance, but it was more difficult when this was not the case, and therefore necessitated reliance on expert opinion, including expert consensus of the WHO Intrapartum Care Algorithms Working Group, in consultation with external experts if deemed necessary. Justifications to those decisions are provided in each of the manuscripts included in this supplement, but in general, this included selection of lower thresholds to detect complications or reference to the more commonly used definition or practice among guidelines to allow wider acceptability and use. The algorithms focus on intrapartum care for women who are at low risk of complications at the time of admission to health facilities for childbirth, and therefore they do not cover management of labour in high-risk pregnant women, those who may present with multiple intrapartum complications where clinical decision-making becomes complex, or home births. Management may need to deviate from recommendations in cases where multiple conditions that impact on each other are present in the same woman, e.g. fluid management if pre-eclampsia and sepsis are both present. Although the algorithms point to timely referrals to higher-level facilities where appropriate, they do not provide details on how safe referrals should be organised. It was sometimes challenging to reflect all aspects of people-centred, respectful care in the algorithms, but additional considerations are provided in the manuscripts. Finally, no representatives of the women were involved in the development of these algorithms, but they are represented in WHO and some national guideline development panels.

Interpretation

Introducing intrapartum care clinical algorithms in facilities with less specialised health personnel may improve maternal and perinatal outcomes. Indeed, evidence-based, easy-to-use, decision-support labour tools could foster optimal labour management and optimise task shifting by supporting decision-making by less specialised health personnel.[33] These intrapartum care algorithms could serve as a prompt to consider a range of differential diagnoses, and as guidance towards appropriate monitoring, investigations and management, with timely referral for specialist care. These would also require functioning referral systems, and competent human resources in sufficient quantities with access to essential services and physical resources (infrastructure, medicines, supplies and equipment).

Implementation of standardised, evidence-based algorithms may improve adherence to guidelines and reduce unnecessary variation in practice.[18,34] However, algorithms

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by their static nature and focus on certain conditions cannot consider the whole complexity of labour and childbirth. The algorithms may provide general guidance on a logical sequence of decision-making, but in all cases evaluation of each individual situation, including women's preferences, should take precedence. The tensions between providing standardised pathway management and exercising clinical judgement to offer individualised care has been highlighted by others.[34] Our intrapartum care algorithms may need to be adapted to local context, taking into consideration the availability of skilled personnel and resources.

Over the last decade, WHO has issued and updated multiple guidelines with the overall aim of improving health outcomes and experience of care.[7] These guidelines include recommendations on clinical and non-clinical interventions for the care of healthy women and babies, and for the management of maternal and neonatal complications around the time of childbirth. The close collaboration with WHO ensured that the algorithms are in line with current WHO recommendations. However, keeping these algorithms up to date will be challenging, and ways to allow them to become more responsive to recommendation updates need to be explored. Digital platforms that can connect guideline development, dissemination and implementation tools could facilitate this task, enhancing knowledge transfer and uptake by end users.[7,13]

These intrapartum care algorithms, by translating narrative guideline recommendations and other evidence-based information into flowcharts, should facilitate understanding of the evidence by programmers and non-specialists for the development of evidence-based, accurate digital decision-support systems. In future, incorporation of these intrapartum algorithms into interactive software or mobile applications may facilitate end users' application and implementation for management in labour. Data-driven artificial intelligence, including machine learning and statistical predictive techniques, could be used to complement these digital tools.[13,33]

The intrapartum care algorithms still need to be evaluated prospectively, especially in resource-limited settings, to identify any problems in their implementation, and whether they do in fact improve clinical care and maternal and perinatal outcomes. This will require field testing with feedback from users, to identify problems of interpretation, feasibility and other logistical barriers to implementation, such as skill and resource constraints, and revisions and updates based on field testing results. The implementation of algorithms in clinical practice merits an evaluation of its effects not only on clinical outcomes but unanticipated effects on communication and collaboration between healthcare providers, occupational divisions and satisfaction of women with care.

Conclusions

These intrapartum care algorithms provide a framework for monitoring women during labour and childbirth, identifying and managing complications. It is expected that these algorithms will support the implementation of WHO recommendations and facilitate the development by stakeholders of evidence-based, up-to-date, paper-based or digital reminders and decision-support tools. The algorithms need to be field tested and may need to be adapted to specific contexts.

Disclosure of interests

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Contribution to authorship

MB and OTO conceived the methodology for the development of intrapartum care algorithms and developed the standard operating procedures. MB wrote the first draft of the paper. All authors implemented the methods described in this manuscript, contributed to revising the final version and approved the manuscript for publication.

Details of ethics approval

Ethical approval was not required for this work.

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Data availability

Data sharing not applicable to this article as no data sets were generated or analysed during the current study.

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Supporting Information

Additional supporting information may be found online in the Supporting Information section at the end of the article.

Appendix S1. Template for reporting algorithms. ■

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Appendix

WHO Intrapartum Care Algorithms Working Group

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