Best Practice & Research Clinical Obstetrics & Gynaecology 95 (2024) 102517

Contents lists available at ScienceDirect

Best Practice & Research Clinical Obstetrics & Gynaecology

journal homepage: www.elsevier.com/locate/bpobgyn

Improving management of first and second stages of labour in low- and middle-income countries

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ARTICLE INFO

Keywords:
Labor
First stage
Second stage
Partograph
Labor care guide
Positive birth experience

ABSTRACT

Labour care must balance aspirations of parents with vigilance for unanticipated calamities. The 'on-site midwife-led primary care birth unit' facilitates this.

The World Health Organization have replaced the traditional partograph with the 'Labour Care Guide'. An implementation project in Botswana included the mnemonic COPE: Companion, Oral fluids, Pain relief and Eliminate the supine position. The Parto-Ma project in Tanzania used guidelines, training and support to improve childbirth outcomes. We list labour practices supported by recent evidence, and highlight new developments. Foetal macrosomia increases risk but mistaken diagnosis increases caesarean births. Obstructed labour is a complex clinical diagnosis, and is difficult to predict. For shoulder dystocia prioritise delivery of the posterior shoulder, facilitated if needed by posterior axilla sling traction. 'Extended balloon labour induction' with two or three Foley catheters side by side, may reduce risks associated with uterine stimulants. Bedside ultrasound may facilitate the diagnosis of cephalic malpositions and malpresentations.

1. Background

The first and second stages of labour represent a period of intensified risk for both mother and baby. Preterm birth, placental abruption, uterine rupture, shoulder dystocia, congenital malformations, severe preeclampsia and foetal malpresentation are associated with intrapartum foetal death, which is extremely rare in high resource settings (e.g. 0.1% in a study in an Israeli population [1]). In contrast, a study in 12 hospitals in Kenya, Malawi, Sierra Leone and Zimbabwe, found stillbirth rates ranged from 2.0 to 11.8%, with 51% of these occurring in the intrapartum period [2].

Childbirth is a significant life event for the family. Care during labour needs to balance supportive care for a positive birth experience and avoiding unnecessary intervention, with vigilance for complications which may occur unexpectedly even in 'low-risk' pregnancies.

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https://doi.org/10.1016/j.bpobgyn.2024.102517
Received 1 October 2023; Received in revised form 1 February 2024; Accepted 12 June 2024
Available online 14 June 2024

WHO LABOUR CARE GUIDE

Name **Parity** **Labour onset** **Active labour diagnosis [Date]**

Ruptured membranes [Date Time] Risk factors

			Time	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
			Hours	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
			ALERT	← ACTIVE FIRST STAGE →												← SECOND STAGE →		
SUPPORTIVE CARE	Companion	N																
	Pain relief	N																
	Oral fluid	N																
	Posture	SP																
BABY	Baseline FHR	<110, ≥160																
	FHR deceleration	L																
	Amniotic fluid	M+++, B																
	Fetal position	P, T																
	Caput	+++																
	Moulding	+++																
WOMAN	Pulse	<60, ≥120																
	Systolic BP	<80, ≥140																
	Diastolic BP	≥90																
	Temperature °C	<35.0, ≥ 37.5																
	Urine	P++, A++																
LABOUR PROGRESS	Contractions per 10 min	≤2, >5																
	Duration of contractions	<20, >60																
	Cervix [Plot X]	10																
		9	≥ 2h															
		8	≥ 2.5h															
		7	≥ 3h															
		6	≥ 5h															
		5	≥ 6h															
	Descent [Plot O]	5																
		4																
		3																
		2																
		1																
		0																
MEDICATION	Oxytocin (U/L, drops/min)																	
	Medicine																	
	IV fluids																	
SHARED DECISION-MAKING	ASSESSMENT																	
	PLAN																	
	INITIALS																	

In active first stage, plot 'X' to record cervical dilatation. Alert triggered when lag time for current cervical dilatation is exceeded with no progress. In second stage, insert 'P' to indicate when pushing begins.

INSTRUCTIONS: CIRCLE ANY OBSERVATION MEETING THE CRITERIA IN THE 'ALERT' COLUMN, ALERT THE SENIOR MIDWIFE OR DOCTOR AND RECORD THE ASSESSMENT AND ACTION TAKEN.IF LABOUR EXTENDS BEYOND 12H, PLEASE CONTINUE ON A NEW LABOUR CARE GUIDE.
Abbreviations: **Y** – Yes, **N** – No, **D** – Declined, **U** – Unknown, **SP** – Supine, **MO** – Mobile, **E** – Early, **L** – Late, **V** – Variable, **I** – Intact, **C** – Clear, **M** – Meconium, **B** – Blood, **A** – Anterior, **P** – Posterior, **T** – Transverse, **P+** – Protein, **A+** – Acetone

(caption on next page)

Fig. 1. Figure 1: WHO Labour Care Guide

2. Place of birth

The occurrence of a substantial proportion of births in primary care facilities without access to emergency obstetric care contributes to the large disparities in maternal and neonatal mortality between low- and high-income countries [3]. On the other hand, there is good evidence that midwife-led care is preferable for apparently low-risk labours [4]. In recent years there has been increasing interest in the concept of on-site, midwife-led birth units which offer the benefits of midwife-led care in close proximity to an obstetric unit [5, 6].

3. Historic overview of partographs

The concept of 'Active management of labour' including appropriate diagnosis of labour, amniotomy, oxytocin augmentation, continuous presence of a midwife and assurance to the woman of delivery within a time frame was introduced by O'Driscoll in Dublin in the 1960's [7]. The partograph designed by Philpott in 1972 [8], with a cervical dilation action line based on the work of Friedman [9], and plotting of head descent as devised by Crichton [10,11], has been recommended, with modifications, for labour monitoring for 50 years. Based on a large USA database from the Consortium on Safe Labor, Zhang proposed a partograph based on the 95th percentile of cervical dilation in normal labours [12]. A large cluster randomized trial in Norway did not demonstrate benefit of Zhang's guidelines over the WHO partograph with respect to intrapartum caesarean birth [13] or mothers' experience of childbirth [14]. Interestingly, intrapartum caesarean births decreased markedly in both groups from pre-trial levels, suggesting that attention focussed on intrapartum monitoring may improve outcomes. In 2018 the World Health Organisation (WHO) confirmed that the mean cervical dilation rate of 1 cm per hour was of limited value because of the very wide variation in dilation rates of normal labours around that mean [15], and that the rate of cervical dilation is a poor predictor of adverse perinatal outcome [16].

Active first stage of labour was usually $</= 12$ h in first labours, and $</= 10$ h in subsequent labours. In first labours, the second stage was usually $</= 3$ h, and in subsequent labours, usually $</= 2$ h.

4. The WHO labour care guide

Disrespect and abuse remain intransigent features of maternity care in many low-resource settings [17–22]. The World Health Organization (WHO) issued evidence-based guidelines on intrapartum care *for a positive childbirth experience* in 2018 [23]. The guidelines recommended, among others, 4-hourly cervical assessment in the active phase of the first stage of labour for low-risk women. The guidelines were followed by the development of the WHO Labour Care Guide [24]. The Labour Care Guide is a monitoring-to-action tool used during the active phase of labour (5+ cm cervical dilation) and the second stage of labour (Fig. 1). Clinical parameters are recorded on a vertical time scale and compared with reference values in the 'Alert' column. Steps taken to respond to abnormal recordings are agreed on the basis of shared decision-making, and recorded on the Labour Care Guide. Criticisms of the WHO guidelines include the lack of clarity on management of the latent phase of labour, particularly since the redefinition of the active phase as cervical dilation >5 cm, women will spend more time in the latent phase [25].

The WHO Labour Care Guide promotes best practice during labour by requiring explicit recording of evidence-based practices and documenting corrective steps to be taken when these best practices are not being met. These practices include:

1. *Continuous labour companionship.* This has been shown in multiple randomised control trials summarized in a Cochrane review [26] to improve labour outcomes including 25% reduction in caesarean births, 31% reduction in negative feelings about the birth experience, 38% reduction in 5 min Apgar scores <7, and shorter labours. A key component of respectful maternity care (RMC) is childbirth companionship. Despite evidence of effectiveness and global and national recommendations, implementation by healthcare providers remains problematic [27]. This situation was aggravated during the COVID pandemic due to hospital protocols prohibiting access for childbirth companions [28,29], though these barriers could be overcome with concerted quality improvement initiatives [30,31].
2. *Provision of adequate oral fluids.* Restricting oral fluids during labour is widely practised [32]. The rationale includes theoretical concern for anaesthetic complications in the event of caesarean birth. Lack of oral fluids may also be an inadvertent function of confinement of labouring women to bed in labour ward settings without bedside access to fluids. Systematic review of randomized trials has not documented any benefits of oral fluid restriction during labour [32]. On the other hand, starvation is an unpleasant experience and, particularly in hot climates, fluid restriction may result in dehydration and keto-acidosis.
3. *Offer of adequate analgesia.* Providing pain relief has been identified as a component of respectful care for women during labour in a WHO systematic review [33]. While some women prefer to avoid pharmaceutical analgesia where possible, inadequate pain relief when needed may result in a spiral of distress, anxiety and difficulty coping with the labour process.
4. *Avoidance of the supine position.* In late pregnancy the supine posture in some women reduces cardiac output [34]. The incidence of symptoms associated with the supine position is 10% [35], but haemodynamic changes may also be asymptomatic. Foetal oxygen saturation has been shown to be lower in the supine than in the lateral position during labour [36], due to aortal-caval compression by the gravid uterus and compromised placental perfusion. The supine position for the second stage of labour is also associated with

PRINCESS MARINA HOSPITAL LATENT PHASE LABOUR CARE GUIDE

Time scale 2h per column			0	2	4	6	8	10	12	14	16	18	20	22	24	
Time: even hrs eg 16|18|																
Examination time (h:min)			:	:	:	:	:	:	:	:	:	:	:	:	:	
CARE	Companion	N/↓ALERT														
	Pain relief	N														
	Oral fluid	N														
	Posture	SP														
BABY	Baseline FH	<110>160														
	FHR decel.	L														
	Amniotic fl.	M+++, B														
	Fetal posn.	P, T, BR														
	Caput	+++														
	Moulding	+++														
WOMAN	Pulse	<60 >120														
	Syst BP	<80>140														
	Diast. BP	>90														
	Temp. C	<35>37.5														
	Urine	P++, A++														
PROGRESS	Contr./10m	<2, >5														
	Dur. contr.	<20, >60														
	Cervix (cm) X Descent (fifths above brim) O	5														
		4														
		3														
		2														
		1														
		0														
MEDICATION		Oxytocin														
		Medicine														
		IV fluids														
SHARED DECISION-MAKING		Assessment														
		Plan														
		Initials														

INSTRUCTIONS: CIRCLE ANY OBSERVATION MEETING THE CRITERIA IN THE 'ALERT' COLUMN, ALERT THE SENIOR MIDWIFE OR DOCTOR AND RECORD THE ASSESSMENT AND ACTION TAKEN. IF LATENT LABOUR EXTENDS BEYOND 24H, PLEASE CONTINUE ON A NEW LATENT PHASE LABOUR CARE GUIDE.

Abbreviations: **Y:** Yes, **N:** No, **D:** Declined, **U:** Unknown, **SP:** Supine, **LA**: Lateral, **MO:** Mobile, **E:** Early, **L:** Late, **V:** Variable, **I:** Intact, **C:** Clear, **M:** Meconium, **B:** Blood, **A:** Anterior, **P:** Posterior, **T:** Transverse, **BR**: Breech, **P:** Protein, **K:** Ketones

(caption on next page)

Fig. 2. Figure 2: Latent phase labour care guide developed by the authors

increased risk of maternal anal sphincter injury [37] and urinary incontinence [38]. Evidence-based recommendations advise against the use of the supine position during second stage labour [39], nevertheless, it remains the main birthing posture globally and in over 90% of births in Sub-Saharan Africa [40], as well as still being used in the USA [41]. It remains the predominant birthing posture in health facilities in Southern Africa [42]. The practice has been ingrained in midwifery and obstetric practice for generations with attempts to change it being quite unsuccessful, especially in low resource settings.

Most research has focused on upright postures compared with recumbent postures (including supine). Upright postures appear to be associated with shorter second stage of labour, fewer abnormal foetal heart rate patterns, fewer operative births, fewer episiotomies, and possibly more second-degree perineal tears and blood loss [43].

5. Implementing the WHO labour care guide

The usability, feasibility, and acceptability among maternity care practitioners of the WHO Labour Care Guide have been evaluated in clinical settings with doctors, midwives, and nurses in Argentina, India, Kenya, Malawi, Nigeria, and Tanzania [44] and in a global survey of practitioners [42]. An implementation study has been conducted in India. A small randomized trial in North India found reduced caesarean births with the WHO Labour Care Guide compared with the previous WHO partograph [45]. An international research prioritization exercise highlighted the need to optimize implementation strategies [46].

One of the most difficult and complex principles of the labour care guide to implement is childbirth companions. Lack of space and privacy in labour wards may be seen as a barrier to implementing this important strategy. Structural changes may not be possible. Flexible ways of promoting companionship appropriate to the local environment need to be found. For example, even when lack of privacy makes the presence of male companions inappropriate, female companions may be acceptable within the context of consultation with all patients and respect for local social norms.

As an example of strategies which may be used to customize implementation of the WHO LCG for local relevance, we describe a quality improvement project at Princess Marina Hospital in Gaborone, Botswana to improve the quality of intrapartum care in line with current, evidence-based WHO guidelines by means of structured, workshop-based educational interventions and supportive supervision, including introduction of the WHO Labour Care Guide. We provide the training materials used, which may be useful for adaptation to other settings. Prior to the intervention, childbirth companionship was not practiced (during and since the COVID pandemic), and the routine position for birth was the supine position. The evaluation of the project is in progress and will be reported separately.

During July 2022, we held meetings with medical and nursing staff to discuss the proposed project. There was considerable support for the project. One concern of staff was the lack of a monitoring tool for the latent phase of labour. We agreed to develop a local latent phase monitoring tool based on the WHO Labour Care Guide (Fig. 2). We used the same alert criteria as those agreed in the WHO consultation to develop the WHO Labour Care Guide. In the absence of evidence-based guidelines for the duration of the latent phase of labour, and of criteria to pin-point the onset of latent phase, we did not specify an alert for latent phase duration.

During August 2022 we conducted several 90-min workshops attended by the majority of obstetric medical and nursing staff members. The workshops were interactive and included: a PowerPoint presentation with slides prepared by WHO for implementation of the LCG, modified for local use, and a motivational presentation of evidence supporting childbirth companions and clinical examples of adverse effects of the supine position during labour, particularly the second stage (see supplementary files); open discussion of benefits and barriers to implementation of the LCG; and an exercise in which participants completed the local latent phase Labour Care Guide and the WHO active phase Labour Care Guide with information from a clinical case scenario presentation.

There was generally positive support for the project from the clinical staff. The main area of concern was anxiety about conducting the second stage of labour in a non-supine position. Staff were encouraged to use a position as close as possible to the supine position with which they were familiar, with thighs parted and hips flexed, but with the patient tilted to the left side so that her left knee touched the mattress and her right knee pointed towards the ceiling.

A poster with key slides from the workshop presentation was put up in the labour ward as a reminder, and smaller A3 posters with the key points of the project were placed in the labour ward and in each delivery room (Fig. 3). Posters informing patients that they were welcome to invite a companion of choice to accompany them during labour and birth were placed in patient-facing areas in the hospital (Fig. 4). The workshops were followed by supportive supervision from senior members of staff.

The WHO Labour Care Guide was generally well accepted, though problematic aspects remained. The antenatal ward staff were worried that the 5 cm cervical dilation definition of active labour would result in problems from delayed transfer to the labour ward; some staff remained anxious about the lack of alert and action lines on the partograph; childbirth companions were well accepted by staff, but many patients had no companion available due to their potential companions being at work or due to having been referred from a distance to the referral hospital, and some preferred not to have a companion; some staff found it difficult to adapt to non-supine positions for second stage of labour, though with continued support and mentoring good progress is being made. We emphasize the fact that changing practice which has been institutionalized for generations is not easy or intuitive, and requires considerable determination, commitment and mentoring. We attach the materials we developed for the intervention as figures and editable format appendices so that they can be adapted for use elsewhere.

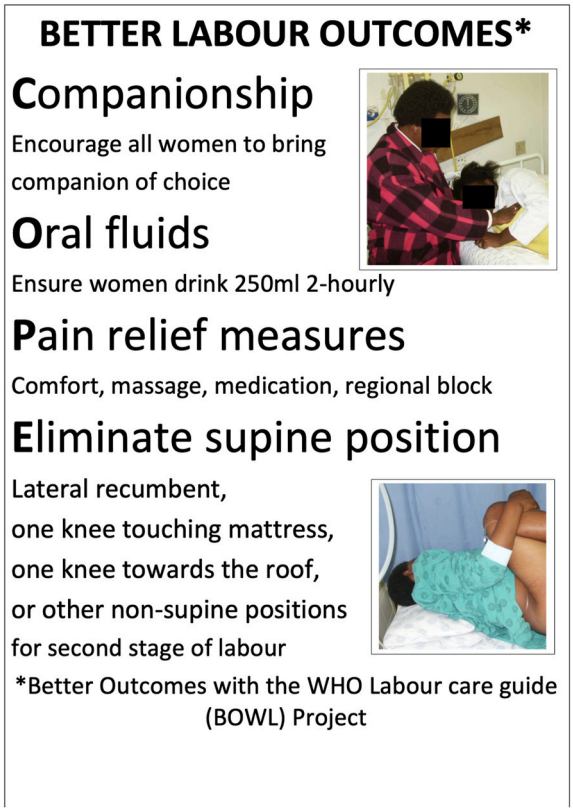

Fig. 3. Figure 3: Poster for labour wards

6. The PartoMa project

The PartoMa project in Tanzania has demonstrated that locally-relevant guidelines plus supportive skills training seminars may substantially improve childbirth outcomes. In a pre- and post-intervention study at Mnazi Mmoja Hospital in Zanzibar, Tanzania, implementation and training on locally developed labour care guidelines tailored for local conditions was associated with a 34% reduction in stillbirths (mainly intrapartum stillbirths) and 47% reduction in 5-min Apgar scores <5 [47]. After 4 years, birth attendants at the hospital continued to express high demand for the intervention [48].

7. Practices with evidence of effectiveness to improve labour outcomes

Based on a series of systematic reviews [49], the following pre-labour practices are supported by high-quality evidence: perineal massage; pelvic floor muscle exercises; sweeping of membranes weekly starting at 37 to 38 weeks' gestation; for low-risk women, midwife-led care, preferably in a unit alongside a hospital; for women with a risk factor for abnormal outcome, hospital birth; and training of birth attendants. X-ray pelvimetry is not supported.

In the first stage of labour, the following practices are supported by high-quality evidence [50]: Intrapartum antibiotic prophylaxis for group B streptococcus-positive women (highlighting the need to improve access to screening in low-resource settings); antibiotics in women with prolonged (>24 h) term prelabour rupture of membranes; intravenous fluid containing dextrose at a rate of 250 mL/h for women without indications for intravenous fluid restriction if oral fluid restriction is indicated; upright positions and ambulation; oxytocin augmentation for women with dysfunctional or slow labour; aromatherapy and immersion in water can be considered.

The following first stage practices cannot be recommended: vaginal disinfection with chlorhexidine; oral restriction of fluid or solid food; continuous bladder catheterisation; routine use of the peanut ball; antispasmodic agents; routine amniotomy in normally progressing spontaneous first stage of labour; routine use of intrauterine pressure catheter and ultrasound; caesarean delivery for arrest unless labour has arrested for a minimum of 4 h with adequate uterine activity or 6 h with inadequate uterine activity in a woman with rupture of membranes, adequate oxytocin, and ≥6 cm cervical dilation.

Practices in the second stage of labour with high quality evidence of effectiveness include [51]: birth in any upright or lateral position; pushing according to a woman's own urge to push or using the Valsalva manoeuvre; perineal massage; stretching of the perineum with a water-soluble lubricant; the use of perineal warm packs and heating pads; in foetuses with persistent occiput posterior position, manual rotation can be considered; the "hands-poised" position rather than the "hands-on" method for delivery; waiting 4 h for nulliparous women with epidural anaesthesia before diagnosing prolonged second stage of labour; and a mandatory second opinion

before caesarean birth in the second stage of labour (acknowledging that this may be difficult in settings with limited staff).

The following second stage practices are not supported by high quality evidence: prophylactic intrapartum betamimetics; routine use of maternal stirrups; water immersion; fundal pressure; perineal hyaluronidase injection; perineal gel; routine episiotomy; and use of ultrasound.

8. Foetal surveillance

In low-resource settings, the presence of a skilled birth attendant and provision of basic emergency obstetric care is estimated to reduce intrapartum birth asphyxia by 40% [52]. Compared with cardiotocography [53] or with an admission cardiotocograph [54], intermittent auscultation in low risk labours has been found to reduce emergency caesarean births in labour without increasing adverse neonatal and maternal outcomes.

9. Macrosomia

Macrosomia may have serious consequences for mother and baby [55]. In a United Kingdom population, compared with a reference group with foetal weight between 30th to 70th percentile, term babies of non-diabetic mothers with ultrasound estimated weight >95th percentile had 2 to 2.5 times increased risk of adverse or severe adverse outcomes. Those between 90th to 95th percentile had reduced risk of adverse outcomes and no increased risk of severe adverse outcomes [56].

In an Israeli population attempting vaginal birth after prior caesarean birth, compared with babies weighing 3500 to 4000 g, those >4000 g did not have statistically significantly different success rates nor maternal or perinatal complications other than shoulder dystocia (4% versus 0.4%) [57].

Ultrasound estimation of foetal weight near term is substantially inaccurate, though accuracy may be improved with complex prediction models [58]. A false positive diagnosis of macrosomia is associated with increased risk for caesarean birth, suggesting a lowered clinical threshold for labour intervention [59].

Because of limitations to labour monitoring facilities in low-resource settings, a conservative threshold of 4000g has been suggested for Caesarean birth as opposed to labour induction [60].

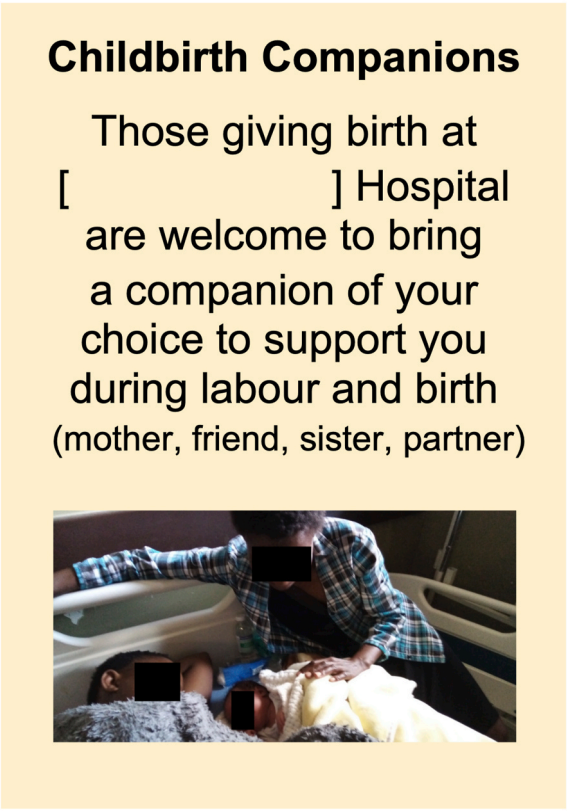

Fig. 4. Figure 4: Poster informing antenatal clients about childbirth companions

10. Obstructed labour

Obstructed labour is a complex clinical diagnosis based not only on delayed progress in terms of cervical dilation and head descent, but also clinical signs such as the presence of adequate uterine activity and increasing foetal caput succedaneum and moulding.

Magnetic resonance imaging pelvimetry has not been found to be a useful predictor of obstructed labour [61], nor is it feasible in LMICs. It has recently been suggested that the interspinous diameter is the best predictor of obstructed labour, and that this can be predicted with 99% accuracy by means of a formula using maternal height and transperineal ultrasound measurement of the pubic arch angle [62]. Another study found that clinical measurement of the bituberous diameter was a reasonable predictor of unplanned obstetrical interventions due to labour dystocia [63].

11. Shoulder dystocia

Shoulder dystocia is more dangerous and urgent than obstructed labour prior to birth of the foetal head. Strategies to prevent shoulder dystocia by a policy of elective caesarean birth in high-risk cases based on foetal size have not been effective. A case can be made for caesarean birth for babies estimated to weigh more than 4.5 kg, or 4 kg for diabetic women. However, prediction of foetal size is inaccurate and shoulder dystocia may also occur unpredictably in normally sized babies. It is therefore essential that all birth attendants be skilled in the management of shoulder dystocia, preferably including regular simulated skills training using mannikins [64].

The traditional teaching has been to first attempt to deliver the anterior shoulder with the McRobert's position (flexed thighs), suprapubic pressure and gentle posterior traction on the baby's head. Because of the risk of brachial plexus injury inherent in this approach, recent literature supports prioritising delivery of the posterior shoulder first [65]. This may be done by sweeping the posterior arm in front of the chest and out, bidigital traction in the posterior axilla, or rotation of the posterior shoulder to anterior. Recent case reports [66,67], have documented success with the posterior axilla sling traction (PAST) method developed by Hofmeyr and Cluver [68,69], when all standard methods have failed. A video recording of the procedure is available at https://www.youtube.com/user/WHOrhl. A loop of a non-elastic plastic catheter such as an infant suction catheter is passed under the posterior axilla with one or two fingers and the loop retrieved with a finger of the other hand. The catheter is clamped with an artery forceps as a handle and used to deliver the posterior shoulder directly, or preferably by rotation in the direction of the foetal back toward the anterior position. Reported modifications include use of a swab holding forceps to assist passing the catheter loop under the axilla [70], and use of a double ribbon gauze with a knot at the end - the knot is passed under the axilla with two fingers and retrieved with a long right angled forceps [71]. It is most important to avoid use of an elastic rubber or silastic catheter which may cause skin lacerations from friction during stretching.

12. Uterine rupture

Uterine rupture is sometimes surprisingly difficult to diagnose during labour. Classical signs such as continuous abdominal pain, maternal and foetal tachycardia and vaginal bleeding may not be evident. The risk of uterine rupture is increased with the use of uterine stimulants, particularly misoprostol. Small doses of misoprostol may be administered by dissolving 200 μg misoprostol in 200 mL tap water and administering 25 mL orally 2-hourly [72]. Recently we have attempted to minimize the use of uterine stimulants for labour induction by implementing 'extended balloon labour induction' with two or three Foley catheters side by side, when the cervix is too dilated to retain a single balloon [73,74].

13. Bedside ultrasound for monitoring foetal position and progress of labour

Studies in high-resource settings have found trans abdominal and trans perineal ultrasound examination to be more accurate than clinical examination in diagnosing cephalic malpositions and malpresentations such as occipitoposterior position, sinciput, face or brow presentation and asynclitism [75]. With increasing availability of bedside ultrasound even in relatively low-resources settings, ultrasound may have a role to play, particularly prior to assisted vaginal birth attempt. However, further research is needed to show whether improved diagnostic precision will translate to improved outcomes.

14. Caesarean birth

In some low-resource settings timely and lifesaving caesarean delivery is still unavailable to many women. Improved access with the support of government and non-governmental organizations is required. On the other hand, a prominent feature of birth in many LMIC's is inexorably rising caesarean birth rates. Driving factors include misguided litigation patterns, attrition of obstetric skills such as breech birth and assisted vaginal birth and patients' aversion to labour, possibly aggravated by institutionalized abuse and disrespect during labour. Overuse of caesarean birth has not shown benefits and can create harm [76]. Use of external cephalic version for breech presentation at term, vaginal breech delivery in appropriately selected women, vaginal birth after caesarean birth, assisted vaginal birth in appropriate cases, and labour companionship and midwife-led care could reduce caesarean birth use and improve maternal experiences [17].

15. Conclusions

Giving birth is a life-changing and potentially positive and empowering experience, but is not easy. Institutionalization of childbirth has improved the physical safety for mothers and babies, particularly in low-resource settings, at the expense of denying women the supportive companionship inherent in home birth. It is the responsibility of birth attendants to do everything possible to promote a positive birth experience despite the limitations of the clinical setting, while remaining vigilant for, and skilled in, the management of complications which may arise unexpectedly and change what should be an important and joyous life event to a calamity.

16. Summary

The innovative concept of 'on-site midwife-led primary care birth unit' ensures comprehensive care during childbirth by balancing the provision of unwavering support with quick access to emergency care for unforeseen complications during labour.

Even though the partograph has served as a tool for labour monitoring for decades, the WHO designed the Labour Care Guide as a dynamic replacement for it. It initiates monitoring during the active phase of the first stage of labour and includes second stage of labour. Early implementation studies of it show promising benefits, particularly in the reduction of caesarean births. The 'Better Outcomes with the WHO Labour Care Guide' implementation project in Botswana uses the acronym COPE, recommending four essential supportive functions to ensure holistic care: Companion, Oral fluids, Pain relief, and Elimination of the supine position.

Meanwhile, the Parto-Ma project in Tanzania highlights how locally-tailored guidelines and supportive skills training seminars improve childbirth outcomes.

The presence of skilled birth attendants and the provision of basic emergency obstetric care have been shown to significantly reduce intrapartum birth asphyxia. Foetal macrosomia has increased adverse outcomes risk, with challenging diagnosis, and mistaken diagnosis increases caesarean births. Prioritising delivery of the posterior shoulder first, including posterior axilla sling traction, may improve outcomes in shoulder dystocia. 'Extended balloon labour induction' with Foley catheters side by side may reduce the need for uterine stimulants. Bedside ultrasound may facilitate the diagnosis of cephalic malpositions and malpresentations.

These insights pave the way towards safer, more compassionate childbirth experiences.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Declaration of competing interest

The authors have no conflicts of interest.

Practice points

Care during labour needs to balance supportive care with vigilance for complications.

The 'on-site midwife led primary care birth unit' combines the benefits of midwife-led care with access to emergency obstetric care.

The partograph has been recommended for labour monitoring for 50 years.

The WHO Labour Care Guide was designed as a monitoring to action tool in place of the partograph.

Recording begins in the active phase of the first stage of labour (5 cm cervical dilation) and includes the second stage of labour.

Expected rate of cervical dilation is set at the 95th percentile for normal labours.

Early implementation studies have shown some evidence of benefit.

We describe the 'Better Outcomes with the WHO Labour care guide' implementation project in Botswana.

We use the mnemonic COPE for the four supportive functions on the WHO labour care guide: Companion, Oral fluids, Pain relief and Eliminate the supine position.

The training materials are available for adaptation and use elsewhere.

The Parto-Ma project in Tanzania, showed benefit from locally-relevant guidelines plus supportive skills training seminars.

The presence of a skilled birth attendant and provision of basic emergency obstetric care reduces intrapartum birth asphyxia.

Foetal macrosomia is associated with increased risk of adverse outcomes, but accurate diagnosis is difficult, and mistaken diagnosis increases caesarean births.

Prioritising delivery of the posterior rather than the anterior shoulder first, including posterior axilla sling traction, may improve outcomes in shoulder dystocia.

'Extended balloon labour induction' with two or three Foley catheters side by side may reduce the need for uterine stimulants.

Bedside trans abdominal and trans perineal ultrasound examination may facilitate the diagnosis of cephalic malpositions and malpresentations.

Research agenda

Further research is needed to:

- •Confirm effectiveness and acceptability of the WHO labour care guide
- •Optimise implementation, particularly of difficult aspects such as labour companions and non-supine second stage of labour
- •Improve foetal monitoring methods
- •Evaluate the place of bedside ultrasound examination in low-resource settings

CRediT authorship contribution statement

G Justus Hofmeyr: Writing – original draft, Writing – review & editing. **Badani Moreri-Ntshabele:** Writing – original draft. **Zahida Qureshi:** Writing – original draft. **Ndiwo Memo:** Writing – original draft. **Sarah Hanson:** Writing – original draft. **Elani Muller:** Writing – original draft, Writing – review & editing. **Mandisa Singata-Madliki:** Writing – original draft.

Acknowledgements

We thank the staff of Princess Marina Hospital, Gaborone, Botswana, who contributed to the implementation of the WHO Labour Care Guide.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.bpobgyn.2024.102517.

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