

# BACKGROUND DOCUMENT

## PartoMa Pocket Guide 2.0

Development, Implementation and Evaluation

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**Internal reviewers:** 40 nurse-midwives, doctors and health students from Mnazi Mmoja Referral Hospital and other facilities in Zanzibar have contributed with their review of PartoMa Pocket Guide 2.0 (page 9).

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**Film:** A 7-minutes film from the PartoMa seminars is available on the homepage ('PartoMa seminars – Closing the gap between clinical guidelines and reality', by Lara Meguid).

**PartoMa homepage:** [www.publichealth.ku.dk/partoma](http://www.publichealth.ku.dk/partoma)

#### **Related scientific publications:**

Maaløe N, Housseine N, Bygbjerg IC, Meguid T, Khamis RS, Mohamed AG, et al. Stillbirths and quality of care during labour at the low resource referral hospital of Zanzibar: a case-control study. *BMC Pregnancy Childbirth*. 2016;16(351).

Maaløe N, Housseine N, van Roosmalen J, Bygbjerg IC, Tersbøl BP, Khamis RS, et al. Labour management guidelines for a Tanzanian referral hospital: The participatory development process and birth attendants' perceptions. *BMC Pregnancy Childbirth*. 2017;17(175).

Maaløe N, Housseine N, Meguid T, Nielsen BB, Jensen AKG, Khamis RS, et al. Effect of locally-tailored labour management guidelines on intrahospital stillbirths and birth asphyxia at the referral hospital of Zanzibar: A quasi-experimental pre-post-study (The PartoMa study). *BJOG*. 2017;125(2):235–45.

Maaløe N, Andersen CB, Housseine N, Meguid T, Bygbjerg IC, van Roosmalen JJM. Intrapartum management of severe hypertensive disorders and effect of locally-tailored clinical guidelines: Pre-post study from Zanzibar's referral hospital. Submitted to *International Journal of Gynecology and Obstetrics*, 2018.

#### **Disclaimer**

The PartoMa guidelines development team hereby declares editorial independence. We have no competing interests. The PartoMa Pocket Guide is for non-commercial purpose only. All reasonable precautions have been taken to verify the information contained in the guidelines, and both text and graphical presentations are internationally peer-reviewed.

The PartoMa Pocket Guide are primarily developed to guide health providers in providing best possible maternity care in the low resourced referral hospital of Zanzibar, Mnazi Mmoja Referral Hospital. The material is being distributed without warranty of any kind, and the responsibility for the interpretation and use of the material lies with the reader.

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## Acronyms and abbreviations

APH	antepartum haemorrhage
BP	blood pressure
bpm	beats per minute
FHR	foetal heart rate
MCPC	WHO integrated guidelines for managing complications in pregnancy and childbirth
PartoMa	PartoMa derives from Partogram kwa Mama (English: Partogram for Mother)
PPH	postpartum haemorrhage
PROM	pre-labour rupture of membranes
RCOG	Royal College of Obstetricians and Gynaecologists
TSPA	Tanzania's Service Provision Assessment
WHO	World Health Organization

## Scope and purpose of PartoMa

**Overall objective of PartoMa Pocket Guide 2.0:** To provide effective, specific and unambiguous clinical practice guidance on essential safe and respectful childbirth care for doctors and nurse-midwives at low-resource hospitals in Zanzibar.

**Overall objective of this Background Document:** To provide information on the development process of PartoMa Pocket Guide 2.0, its implementation and evaluation of use.

Unsafe and disrespectful care at birth is a human rights violation.<sup>1</sup> Globally, more than 300,000 women and 5 million babies die each year around birth.<sup>2-4</sup> With evidence-based and respectful care, most would survive. Particularly in sub-Saharan Africa, while facility births are increasing, quality of care often does not follow suit.<sup>5,6</sup> Generating evidence-based and respectful childbirth care is a key priority to reach the Sustainable Development Goals (SDGs) – particularly on birth-related survival and gender equality,<sup>7,8</sup> but also on societal development and poverty reduction (SDGs 1.1, 1.2, 3.1, 3.2, 5.1).<sup>9,10</sup>

In response, an expanding toolkit of reminder systems, critical care pathways, electronic partographs and algorithms for low-resource settings is emerging, which is usually based on international guidelines. However, discrepancies with contextual realities in under-resourced health systems limit implementation and may demoralize health workers.<sup>11,12</sup> Guidelines, which are not enabling health workers to improve care, may become misleading. In the low-resource and high-volume maternity unit at Mnazi Mmoja Referral Hospital of Zanzibar, adherence to international clinical guidelines is often impossible.<sup>12</sup>

As called for by the Lancet Maternal Health Series 2016, research on effectively tailored clinical guidelines in low-income countries is scarce.<sup>11,13</sup> Yet, achievable guidance is pivotal in strengthening health system accountability,<sup>14</sup> and should be a human right for health workers having lives of others in their hands. Notably, for respectful work conditions (SDGs 3c/5.1/8.8), which are paramount for delivering safe and respectful care,<sup>15-18</sup> birth attendants demand access to professional development, staff support and supervision – and in this, achievable guidance is crucial.<sup>16,19</sup>

In collaboration with birth attendants in Zanzibar, we have developed a peer-reviewed ‘PartoMa Pocket Guide’ on respectful childbirth care, which represents best possible care in such resource-constrained reality. The guidelines are practiced by case-based in-service training every three months, outside working hours. These ‘PartoMa seminars’ focus on motivation of individual providers to improve quality of care voluntarily – no per diems are paid, only free food and the guidelines booklet are provided.

The first version of PartoMa guidelines was introduced at Mnazi Mmoja Referral Hospital on 27th-28th January 2015. While few human resources and substandard care remain major challenges, an evaluation during the 9<sup>th</sup>-12<sup>th</sup> intervention month revealed improvements in quality of care and perinatal survival:<sup>20,21</sup>

- Quality of intrapartum surveillance and treatment improved in relation to foetal surveillance, progress of labour and severe hypertensive disorders
- Stillbirth rate reduced by one-third, from 59 to 39 per 1000 total births
- Neonates with Apgar score 1-5 almost halved, from 52 to 28 per 1000 live births

Demand for the PartoMa Pocket Guide and seminars remains high, also from other hospitals, the health college in Zanzibar, Ministry of Health and UNICEF. Based on this demand and health providers’ feedback to version 1, we have now developed a second version - PartoMa Pocket Guide 2.0. To provide information on the development process, implementation and evaluation of use, we include this background document, which is in line with the Appraisal of Guidelines for Research & Evaluation (AGREE) II.<sup>22</sup>

## Target context

While PartoMa Pocket Guide 2.0 has been reviewed by birth attendants from multiple facilities in Zanzibar (page 9), the guidelines are primarily tailored for the resource constraints at Mnazi Mmoja Referral Hospital. We here present key contextual indicators applied for considering achievability and relevance of the guidelines.

### Intra-hospital childbirth statistics

- Approximately 12 000 women deliver annually – an average of 36 deliveries daily.<sup>23</sup>
- Approximately 5% of women in labour are referred from other health facilities.<sup>21</sup>
- Caesarean section rate is approximately 15%.
- Vacuum extraction rate is low with approximately 1.2% of all births.<sup>20</sup>
- During a 12 months study (April 2016 – March 2017), 48/11.594 (0.4%) women died (maternal mortality ratio: 418 per 100 000 live births),<sup>23</sup> which is comparable to the previous years.
- During April 2016 – January 2018, stillbirth rate remained around 34 per 1000 total births.
- While improvements were found during the past three years at Mnazi Mmoja Referral Hospital, quality of intrapartum care is still alarmingly suboptimal.<sup>20,23–25</sup>

### Human resources and workload

*(updated February 2018)*

- At the maternity unit, 23 nurse-midwives are employed, of which three (13%) have a master in midwifery and eight (35%) have less than three months of experience with maternity care.
- At the whole department of obstetrics and gynaecology, 15 medical doctors are employed, of which two are specialists in obstetrics and gynaecology and 10 (67%) have less than three years of experience with maternity care. In addition, there are seven intern doctors, conducting their initial six weeks training in obstetrics.
- In total, there are approximately 35 birth attendants assisting 11 500 yearly deliveries. This is only half of the World Health Organization's (WHO's) 2005 benchmarks for supply-side needs, where they recommend 20 birth attendants for 3600 deliveries.<sup>26</sup> Notably, the intern doctors constitute 16% of birth attendants, and it may be questioned whether they are 'skilled birth attendants' when conducting their initial six weeks rotation in obstetrics.
- Average ratio of birth-attendants-to-labouring-women is 1:3 to 1:5, depending on whether it is day or evening/night, respectively.<sup>27</sup>
- Staff turn-over is massive. Among staff in permanent positions at the maternity unit during the initial six months of the PartoMa intervention, 40% of doctors and 25% of nurse-midwives were no longer working there when finalizing the 12th intervention month.<sup>20</sup> One year later, 80% and 60%, respectively, were no longer working at the maternity unit.
- The department has a major teaching obligation. More than 200 Tanzanian nurse-midwifery and medical students receive their training at the department each year.

### Use of the partograph and clinical guidelines

- For more than a decade, use of WHO's composite partograph has been encouraged for all labouring women.



- Before PartoMa guidelines version 1 was introduced, no intrapartum clinical practice guidelines were routinely applied.

### **Equipment**

- All comprehensive obstetric and neonatal care signal functions are usually available (parenteral antibiotics, oxytocic, magnesium sulphate, equipment for manual removal of placenta and for removal of retained products, vacuum extractor and forceps, bag and mask for neonatal resuscitation, surgical theatre with surgical staff ready for caesarean section, blood transfusion service). However, there are frequent shortages in standard supplies, or missing replenishment of the department's storage room – for instance, only one functioning Doptone; no ultrasound gel; no oxygen; no working thermometer; only one functioning blood pressure machine.<sup>21</sup>
- The maternity unit moved to a new building in March 2017, with more beds. There are now 24 beds for the first stage of active labour and four delivery beds. With approximately 11 500 annual deliveries, there are nine beds in total per 3600 deliveries. In WHO's 2005 benchmarks for supply-side needs, they recommend 60-80 beds for 3600 deliveries.<sup>26</sup> Furthermore, due to staff shortages, most deliveries occur in the beds for first stage of active labour.

### **Representativeness of Mnazi Mmoja Referral Hospital**

According to Tanzania's Service Provision Assessment (TSPA, 2015), Mnazi Mmoja Referral Hospital appears structurally comparable to other Tanzanian maternity units with more than 10 000 annual deliveries, regarding the survey's indicators: low number of maternity beds and staff shortage (though staff is only presented for the entire hospitals) – and, before implementing the PartoMa intervention, presence and use of partographs and clinical guidelines as well as post-graduation training of staff. Overall, the TSPA found that clinical care guidelines were available in only one-third of all Tanzanian maternity units, and only one-quarter had at least one provider with adequate training in application of these guidelines.<sup>28</sup>

The TSPA does not include birth outcomes. However, intra-facility maternal mortality ratio and stillbirth rate at Mnazi Mmoja Referral Hospital are comparable to data from Muhimbili National Referral Hospital, Dar es Salaam (1999-2012). Muhimbili National Referral Hospital likewise has more than 10 000 deliveries annually and is a university hospital. It has a reported maternal mortality ratio of 498-647 per 100 000 live births and stillbirth rate of 62-79 per 1000 total births.<sup>29,30</sup> According to 2007 and 2012 data, maternal and perinatal adverse outcomes appear lower at three regional hospitals in Dar es Salaam with more than 10 000 annual deliveries each (Amana Regional Referral Hospital, Mwananyamala Regional Hospital and Temeke Referral Hospital) – maternal mortality ratio 193-490 per 100 000 live births, stillbirth rate 16-28 per 1000 total births).<sup>30,31</sup> However, Muhimbili National Referral Hospital has a referral rate of 18-30%, compared to only 5% at Mnazi Mmoja Referral Hospital, and a study of maternal near miss found that Muhimbili National Referral Hospital had a lower mortality index than Temeke Referral Hospital (i.e. a lower proportion of deaths among women with life-threatening medical conditions).<sup>30</sup>

## Stakeholder involvement and external review panel

### Core development team

The group members are all medical doctors with obstetric experience in low income countries. Nanna Maaløe is primary investigator of the PartoMa study and has analysed quality of maternity care at Mnazi Mmoja Referral Hospital in-depth. Natasha Housseine and Tarek Meguid represent the target users of the guidelines. They are both working clinically at Mnazi Mmoja Referral Hospital as young doctor and chief consultant obstetrician, respectively, and are therefore also. Jos van Roosmalen and Birgitte Bruun Nielsen are both dual experts in clinical obstetrics and the methodology of systematic literature search / development of clinical guidelines:

- Nanna Maaløe (MD, Primary Investigator of the PartoMa study, Mnazi Mmoja Referral Hospital, Zanzibar and University of Copenhagen, Denmark)
- Jos van Roosmalen (MD, PhD, Professor of Safe Motherhood and Health Systems, VU University of Amsterdam)
- Tarek Meguid (MD, Chief Consultant in clinical Obstetrics and Gynaecology, Associate Professor, Mnazi Mmoja Referral Hospital and State University of Zanzibar)
- Natasha Housseine (MD, Clinician and Co-Investigator on the PartoMa study, Mnazi Mmoja Referral Hospital, Zanzibar)
- Birgitte Bruun Nielsen (MD, PhD, Senior Consultant in clinical Obstetrics and Gynaecology, Copenhagen University Hospital, Denmark).

### Involvement of target users

The primary target users are doctors and nurse-midwives at low-resource hospitals in Zanzibar. They are represented by Tarek Meguid and Natasha Housseine in the core development team, and by the PartoMa steering Committee at Mnazi Mmoja Referral Hospital:

- Alawiya Abubakar Ahmed (MD)
- Dhuria Abdallah Ahmed (Maternity Theatre Nurse)
- Fatma Mrisho Haji (MD)
- Lamlat Hassan Nondo (MD)
- Naufal Kassim (MD, Chief Medical Consultant)
- Mubina Rajhy (MD)
- Rashid Saleh Khamis (Intern Doctor)
- Saada Juma Amour (Midwife)
- Salma Abdi Mahmud (MD, PhD, MMed OBGYN)
- Zuhura Abdallah Balozi (MD, Head of Maternity Department).

Furthermore, a total of 40 nurse-midwives, doctors and health students from Mnazi Mmoja Referral Hospital, Kivunge Hospital and State University of Zanzibar participated by anonymous written questionnaires after pilot testing PartoMa Pocket Guide 2.0. The development process is further described on page 11.

### External review panel

The 12 external reviewers of PartoMa Pocket Guide 2.0 include midwives, obstetricians, neonatologists and an epidemiologist – all from or with extensive experience in low-resource settings:

- Antke Zuechner (MD, neonatologist, Tanzania)
- Barbara Kwast (Midwife, epidemiologist, PhD, Fellow of the Royal College of Obstetricians and Gynaecologists)
- Ben Mbwele (MD, PhD, epidemiologist, Tanzania)
- Bjarke Lund Sorensen (MD, PhD, OBGYN, Denmark)
- Brenda de Mello (MD, MMed OBGYN, Tanzania)
- Charles Ameh (MBBS, PhD, MPH, FWACS (OBGYN), FRCOG, United Kingdom)
- Gaynor Maclean (Midwife, PhD, United Kingdom)
- Hussein Lesio Kidanto (MD, PhD, MMed OBGYN, Tanzania)
- Josephine Obel (MD, PhD, MMed OBGYN, Yemen)
- Klaas Koop (MD, PhD, pediatrician, Netherlands)
- Mike English (MD, neonatologist, Kenya)
- Rachel Macleod (Midwife, United Kingdom)

In addition, Karen Odberg Pettersson (Midwife, PhD, Sweden) and Tom Weber (MD, PhD, OBGYN, Denmark) contributed as reviewers of PartoMa guidelines version 1.

### **Target population**

The target population is all women in labour at Mnazi Mmoja Referral Hospital, or at comparable low-resource maternity units in Zanzibar. The vast majority of the target population is of low socioeconomic status. The target population was not directly involved in the guidelines development. However, by community visits with focus group discussions, their perceptions of maternity care at the Zanzibarian maternity units have been explored (yet to be published). Their points of view are highly in line with key messages of the guidelines, and with case stories for practice-based training at the PartoMa seminars (page 31).

## Development process

### Overall development process

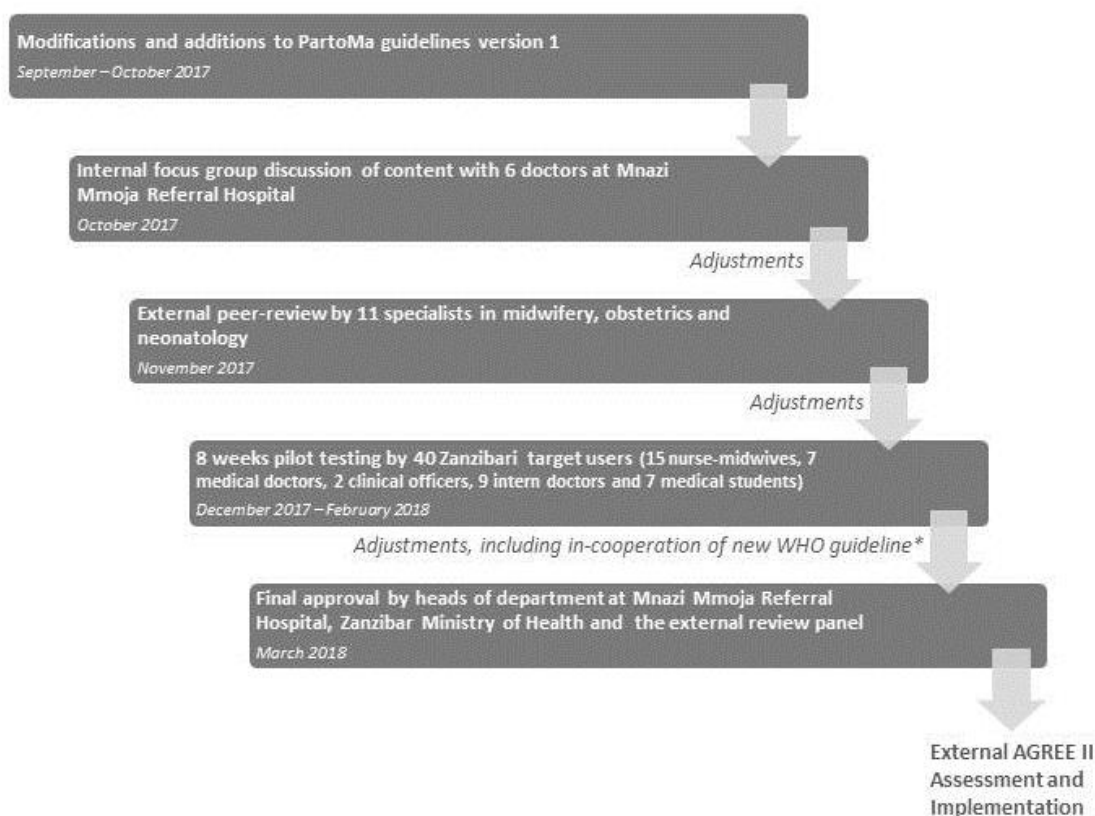
In September-October 2017, an initial draft of PartoMa Pocket Guide 2.0 was elaborated from version 1 by the core development team (page 9). Feedback from target users of version 1 and quality of care assessments at Mnazi Mmoja Referral Hospital informed the process.<sup>20,21,23</sup>

An elaborate modification process was then conducted, including testing and feedback cycles by both the target users applying the guidelines in their clinical work and the external review panel (page 9). Please see the figure below, which presents the 5-steps evaluation process.

The final second version was approved by heads of the Department of Obstetrics and Gynaecology at Mnazi Mmoja Referral Hospital, Zanzibar Ministry of Health (22<sup>nd</sup> March 2018) and by all external peer-reviewers who had time for this additional review (Antke Zuechner, Barbara Kwast, Bjarke Lund Sørensen, Brenda D’Mello, Charles Ameh, Gaynor Maclean and Klaas Koop, page 9).

As described in the sub-sections below, key parts of version 2 were adapted from version 1, but again rigorously pilot tested and externally peer-reviewed. Notably, version 1 was developed in the same way, and its development process is presented in BMC Pregnancy and Childbirth.<sup>12</sup>

*The half year development process of PartoMa Pocket Guide 2.0:*



\* WHO recommendations: Intrapartum care for a positive childbirth experience (2018)<sup>32</sup>

## Evidence sources and systematic literature searches

In accordance with terms of licence by WHO, their integrated guidelines for managing complications in pregnancy and childbirth (MCPC, 2017)<sup>33</sup> were applied as main reference for the development process, but supplemented and cross-checked by multiple other evidence-based guidelines, which is further described in the next sections. When modifications were made to well-established international recommendations, a systematic literature search was conducted in PUBMED for an overview of related scientific evidence.

The essential goal of the guidelines development process was to produce effective, specific and unambiguous clinical recommendations for over-worked birth attendants at high-volume low-resource maternity units. Evidence, however, of best possible maternity practices in such reality is scarce. Inspired by Rycroft-Malone et al., we therefore consider evidence more broadly to contain sources of knowledge as perceived by multiple stakeholders – we supplement research evidence with clinical experience, patient preferences and locally-derived data.<sup>34</sup> Contextual indicators of the target setting are presented on page 7.

## Overall guidelines structure

PartoMa 2.0 consists of 16 infographics in a pocket-size flip-book. The aim is to present essential best possible practices in maternity care, when taking the resource constraints at Mnazi Mmoja Referral Hospital into account, such as patient load, staff numbers, supplies, knowledge and continuity of staff. Furthermore, the guidelines should assist the providers in prioritizing surveillance and procedures in the best possible way, for individual labouring women as well as across the needs in the labour ward. Compared to international guidelines, reductions have been made in frequency of assessments, information load and ambiguity. Wordings and graphical presentations are also carefully considered to make the guidelines easy-to-understand-and-use for work-overloaded birth attendants. It is the aim that all recommendations are clear and achievable algorithms without ambiguity.

Each infographic has a high information load, but we were reluctant to sub-divide information to more pages as it is interlinked. As for the one-sheet paper partograph, the possibility to be able to view all essential and connected information at a glance is valuable in busy clinical situations. Notably, users of PartoMa guidelines version 1 commented that they quickly became familiar with the infographics, and then they were easy to use.<sup>12</sup>

Throughout the development, we kept in mind that it is a pocket booklet, not a text book, and information overload may disturb simple and clear use. In the field of maternity care, examples of development or adaptation of clinical practice guidelines in low resource settings are scarce.<sup>11</sup> However, we did find a few sources of inspiration on what to include and how detailed.<sup>35-37</sup> We also learned from the evaluation of PartoMa guidelines version 1.<sup>12,20,21</sup>

As in version 1, we apply colour codes as indicators of urgency (green, yellow, red), assisting in prioritization, both within management of one woman and between women. We furthermore apply the red exclamation-symbol to emphasize key messages. The key messages represent particular clinical problems found at the target context, which need special attention.

In the sections below, content considerations and evidence sources are presented for each page of the guidelines. For a full overview of the guidelines and graphics, please see the PartoMa Pocket Guide 2.0.

## **Booklet page 1: Safe and respectful care for every woman and baby**

👉 For practice-based training, see the [PartoMa case stories](#) (page 31).

[Saada](#) (page 32) and [Halima](#) (page 50) in particular concern anxiety and caring support.

Inspired by the ‘mother-baby friendly birthing facility’, WHO and Freedman et al., we define respectful safe care at birth as a situation where every woman, every unborn baby in late pregnancy, and every newly born baby “should be protected from unnecessary interventions, practices, and procedures that are not evidence-based, and any practices that are not respectful of their culture, bodily integrity, and dignity”.<sup>32,38,39</sup> On page 1, we emphasize 12 central issues of respectful care that are crucial to address at Mnazi Mmoja Referral Hospital, and provide guidance of pain relief, which is based on MCPC and WHO 2018 guidance.<sup>32,33</sup> The guidelines include criteria for ‘a mother-baby friendly birthing facility’.<sup>39</sup> However, currently, birth companions are not encouraged at Mnazi Mmoja Referral Hospital.

## **Booklet page 2: Partograph and PartoMa use**

👉 For practice-based training, see the [PartoMa case stories](#) (page 31)

### *Three diagnostic questions*

We encourage that the partograph is always analysed by asking three diagnostic questions, which staff find to be helpful: 1. How is the mother? 2. How is the baby? 3. How is progress of labour?


### *A decision-support tool*

While effectiveness of using the WHO partograph has been questioned,<sup>40,41</sup> it is generally perceived to be central for timely intrapartum surveillance and decision-making.<sup>33,42,43</sup> It must be coupled, however, with a locally-achievable and relevant labour management protocol to assist in timely management – although often not prioritized in evaluations of partograph use, this has been proven effective.<sup>20,44,45</sup> Moreover, while the partograph’s focus is often delineated to early detection of foetal distress and prolonged labour, we see it as an integrated early warning tool for routine and emergency obstetric care in both first and second stage of labour. In combination with useful guidelines, the partograph becomes a broad decision-support tool for work-overloaded birth attendants.<sup>12</sup>

### *When to start active phase of labour*

The national composite partograph applied in Zanzibar and Tanzania mainland indicates start of the active phase of labour at a cervical dilatation of 3 cm. This is, however, inconsistent with international recommendations, and may cause unnecessary and harmful interventions.<sup>32,33</sup> A few weeks before final launching of PartoMa 2.0, new WHO guidelines were launched recommending not to start active phase before 5 cm of cervical dilatation. The certainty of the evidence is low and there are major individual differences.<sup>32</sup> As PartoMa 2.0 was pilot tested with 4 cm as cut-off point, we have decided to define the active phase of labour to start at 4-5 cm with regular painful uterine contractions. We furthermore emphasize that ‘WHO guidelines (2018) recommend not starting active phase before 5 cm’ (booklet pages 3 and 7). Further adjustments based on the WHO 2018 guidelines are described on pages 16 and 16.

### **Booklet page 3: Routine assessments during labour**

 For practice-based training, see the [PartoMa case stories](#) (page 31)

Even on less busy days, MCPC's frequencies of routine assessments are unrealistic at the study site, and the package of assessments appear too complex.<sup>12,33</sup> Therefore, reductions in both frequencies and complexity of assessments have been necessary and are here described. This section is unchanged from version 1.

#### *Foetal heart rate (FHR)*

Auscultation using a Doppler ultrasound device or Pinard foetal stethoscope is recommended – cardiotocography is not available nor recommended in low-resourced hospitals.<sup>32,46</sup> No studies exist that compare different FHR auscultation intervals.<sup>47</sup> During first stage of active labour, the international benchmark of 30 minutes intervals is often hard to achieve, and one hour is included as a minimum acceptable interval. For second stage, due to high numbers of intrapartum stillbirths and known risks of pushing on the foetus' oxygen supply, importance of continual attendance and FHR monitoring immediately after each contraction are stressed several times in the guidelines.<sup>24,48</sup>

#### *Contractions, vaginal examinations and foetal head descent*

MCPC's recommendations for vaginal examination in women with low-risk pregnancies were found achievable, and in alignment with WHO 2018 recommendations as well.<sup>32,33</sup> Assessments of contractions half hourly was, however, structurally impossible – one birth attendant would have a full time job assessing contractions on three labouring women. We found no studies comparing different frequencies of monitoring contractions. For PartoMa Pocket Guide 2.0, when progress is normal, no oxytocin administered, and maternal and foetal conditions reassuring, consensus was reached on counting contractions every four hours. Furthermore, in relation to foetal heart auscultation, we note the importance of auscultation after a contraction.

Evaluating foetal head descent was reduced from every two to every four hours, as part of vaginal examination.

#### *Temperature*

Temperature is excluded from two hourly routine assessments during labour, which MCPC recommends,<sup>33</sup> but encouraged on admission and in case of clinical signs of infection.

#### *Urine dipstick*

Due to time and budget constraints, urine dipstick is excluded from routine assessments of labouring women and saved for women with hypertensive disorders or signs of urinary tract infection.

#### *Corticosteroids for preterm birth*

It is unclear whether antenatal corticosteroids are advisable in low-resource settings.<sup>49</sup> Althabe et al. showed worrying results from a cluster-randomized trial in many hospitals in low- and middle-income countries. Compared to standard care for the reduction of neonatal mortality due to preterm birth, corticosteroids did not improve outcome, but was associated with over-use and a more than 10% relative increase in the number of perinatal deaths. Mistaken prediction of preterm birth appeared to be a central cause.<sup>50,51</sup> This has let WHO to formulate antenatal corticosteroids treatment criteria, of which the first is “gestational age assessment can be accurately undertaken”, and a multi-centre efficacy trial is now being conducted in low-income countries.<sup>49,52</sup> From our quality of care studies, gestational age assessments

appear imprecise at Mnazi Mmoja Referral Hospital – for instance, during the PartoMa study’s baseline, 41% of babies with birth weight below 2000 gram had no information on gestational age.<sup>24</sup> We therefore have excluded this from PartoMa Pocket Guide 2.0 and note: “When preterm birth is expected, it is unclear whether corticosteroids do more good than harm in low resource settings. This is due to risk of harmful over-use”.

#### **Booklet page 4: Routine post-delivery care**

👉 For practice-based training, see the [PartoMa case stories](#) (page 31)

This section is based on MCPC, but shortened considerably.<sup>33</sup> MCPC recommends assessments of pulse and blood pressure every 15 minutes during the first 2 hours postpartum. This is impossible with available resources, and we recommend every 30 minutes.

#### **Booklet page 5: Foetal heart rate (FHR), liquor, foetal distress**

👉 For practice-based training in foetal distress, see the related PartoMa case stories:

[Husna](#) (page 36), [Fatma](#) (page 44), [Halima](#) (page 50), [Asia](#) (page 53) and [Zuwena](#) (foetal death, page 63)

##### *Interval for normal FHR*

Though evidence is limited, it has internationally been suggested that FHR of 110-160 beats per minute (bpm) is normal.<sup>53</sup>

##### *Management of non-reassuring (yellow) and abnormal (red) FHR*

This section is unchanged from PartoMa guidelines version 1, and it is more specific than MCPC.<sup>33</sup> Prior to the PartoMa guidelines, there was a common understanding among staff at Mnazi Mmoja Referral Hospital that FHR less than 120 or above 160 bpm was an indication for caesarean section. Simultaneously, even for FHR less than 100 bpm, it was common to wait 30 minutes before deciding for caesarean section, which was often followed by delays in the decision-to-delivery interval.<sup>24</sup> Management in the non-reassuring zones (yellow) is specified and does not include operative delivery. For FHR less than 100 bpm, we agreed on an interval of 5 minutes before re-check and, if FHR remaining less than 100 bpm, plan for expedite delivery (preferably by vacuum extraction in the second stage of labour). Concerning FHR above 180 bpm, by a systematic literature search, no evidence or international consensus was found for when to decide on caesarean section/vacuum extraction – for PartoMa guidelines, consensus was reached on a 1-hour time frame.

##### *Intrauterine resuscitation*

For PartoMa guidelines version 1, we reached consensus for including the following: Woman lying on left side (if no improvement, then right side); stop oxytocin if administered; assess pulse, blood pressure, FHR, cervix and temperature; always ensure that it is FHR, not maternal pulse. We have not included intravenous fluid or oxygen as evidence is scarce, and we fear that it will delay reassessment of FHR.

##### *Absent FHR and intrauterine foetal death*

This section is based on MCPC.<sup>33</sup> We do not mention expectant management as our booklet primarily concerns women in labour.



## **Booklet page 6: Latent phase, pre-labour rupture of membranes (PROM), labour induction**

👉 For practice-based training in PROM and labour induction, see the related PartoMa case story:

[Rukia](#) (page 69)

### *Latent phase*

There is no strong evidence on when to diagnose prolonged latent phase and how to manage.<sup>32</sup> We find MCPC's eight hours limit for prolonged latent phase and the following immediate plan for oxytocin infusion unnecessarily risky with possible over-use of invasive procedures.<sup>33,54</sup> Meanwhile, Friedman's suggestion of 20 hours in nulliparous women and 14 hours in multiparas is still used.<sup>55</sup> At Mnazi Mmoja Referral Hospital, many women have had irregular contractions for multiple hours when admitted. It is therefore agreed for PartoMa guidelines that if latent phase lasts more than 12 hours, with painful uterine contractions and variable effacement of the cervix, poor progress of latent phase is diagnosed and labour enhancement or rest with pain-relief should be considered. For simplicity, we decided to avoid different time limits for nulli- and multiparas.

### *Pre-labour rupture of membranes*

This is new in version 2 and based on MCPC.<sup>33</sup>

### *Induction of labour*

This is new in version 2. The simplified scoring table, scoring limits and misoprostol regimen are adapted from MCPC.<sup>33</sup> Oral misoprostol in solution has the lowest risk of uterine hyperstimulation and associated foetal heart rate changes,<sup>56,57</sup> and it is currently applied at Mnazi Mmoja Referral Hospital. While MCPC recommends combined treatment with balloon catheter and oxytocin, we follow the National Institute for Health and Care Excellence on a more safe step-wise and possibly safer approach.<sup>58</sup>

## **Booklet page 7: Cervix, contractions, slow progress**

👉 For practice-based training in slow progress of active labour, see the related PartoMa case stories:

[Saada](#) (page 32), [Maryam](#) (page 40), [Tabia](#) (page 58), and [Sabra](#) (page 66)

This section is unchanged from version 1.<sup>12</sup>

### *Management of poor progress in the first stage of active labour*

This is more specific than MCPC.<sup>33</sup> For best possible decision-support, management of poor progress in the first stage of active labour is illustrated by the WHO partograph's alert and action lines. A similar diagram was successfully used in a previous Tanzanian study.<sup>59</sup> To follow the WHO partograph and keep simplicity, we refrained from including different slopes for the alert and action lines for nulli- and multiparas. Based on limited evidence, the new WHO 2018 guidelines recommend that labour progression slower than 1 cm/hour in first stage of active phase, which is depicted by the partograph's alert line, is not applied as routine indication for obstetric interventions. In alignment, Oladapo et al. call for individualized labour management algorithms instead of the averaged alert and action lines.<sup>60</sup> However, until individualized labour progression curves are developed and feasible at low-resource hospitals, we see that the PartoMa guidelines are largely in line with these latest WHO recommendations. While obstetric interventions are not clearly defined, it appears mainly to concern oxytocin augmentation and caesarean sections.<sup>32</sup> PartoMa 2.0 still applies alert and action lines, but with more in-depth, restrictive and unambiguous guidance allowing an interval of watchful expectancy before confirming delay in progress and initiating oxytocin augmentation (see the section on oxytocin below).

When the action line is crossed, we found no clear evidence for when to decide in favour of caesarean section. However, women often suffered from severe delays in management of poor progress in this facility.<sup>24</sup> For version 1 of the guidelines, consensus was reached on three clear indications: 1. Progressive signs of obstruction (no further dilatation & descent, moulding +++ and positive FHR); 2. No progress after 4 hours of a well-titrated oxytocin augmentation, 3. Foetal or maternal compromise.

### *Management of poor progress in the second stage of labour*

When to diagnose whether the second stage of labour is prolonged and optimal management remains debatable and evidence is poor.<sup>32,48,61</sup> Likewise, WHO does not provide detailed guidance.<sup>32,33</sup> For PartoMa guidelines version 1, the second stage was defined as prolonged when lasting more than one hour or when pushing for more than 30 minutes, at which time corrective actions should be initiated, including assessment of the 5 Ps and oxytocin if indicated (see below). It was additionally agreed that delivery by vacuum extraction or caesarean section was indicated when second stage had lasted two hours, or pushing for more than one hour. For simplicity, it was found relevant to apply one time frame for all labouring women, irrespective of parity. For PartoMa 2.0 we have, however, added that 'for nulliparous, a normal second stage can last up to 3 hrs'.<sup>32</sup>

Considering the high number of intrapartum stillbirths before introducing PartoMa,<sup>24</sup> and the known adverse effect of the expulsive phase on the foetus' oxygen supply,<sup>48</sup> the importance of close surveillance and monitoring when pushing were stressed several places in the guidelines booklet.

### *Augmentation of labour*

Before PartoMa guidelines' implementation in 2015, more than 20% of labouring women received oxytocin for augmentation, often on doubtful indication, and oxytocin appeared to be a predisposing factor for stillbirth.<sup>24</sup> To ensure safe administration of this potent drug in resource constrained contexts, a restrictive regimen was agreed upon for version 1, where oxytocin is saved for women crossing the action line with ruptured membranes for  $\geq 1$  hour and  $< 4$  strong contractions in 10 minutes.<sup>62</sup> Danger of uterine hyperstimulation was stressed, and a restrictive dose recommended: 2.5 units in 500 ml Ringer's Lactate / Normal Saline at 10 drops per minute, infusion increased with 5 drops per minute every 30 minutes until 4-5 strong contractions per 10 minutes. By the '5 Ps mnemonic', which was elaborated from the Advanced Life-saving Skills in Obstetrics (ALSO) course,<sup>63</sup> attention was drawn to alternative and less dangerous interventions to enhance labour between alert and action line: artificial rupture of membranes, spontaneous urination, oral fluid and food, ambulation or upright position, caring and close support.<sup>32,33</sup> Guidance on artificial rupture of membranes is adapted from MCPC.<sup>33</sup> Notably, evidence of the effect of rupturing membranes between alert and action lines is weak.<sup>32</sup> As early amniotomy may increase the risk of perinatal HIV transmission, it was recommended to delay rupturing membranes in HIV positive women after crossing action line or cervical dilatation of 7 cm. This is in line with MCPC, which, however, is less specific.<sup>33</sup>

Based on these augmentation guidelines, overall oxytocin use declined from 22% to 12% (relative risk (RR) 0.54, 0.37–0.81) – use before crossing the action line fell (RR 0.23, 0.12–0.41), whereas it increased after crossing (RR 3.57, 1.46–8.76).<sup>20</sup>

The restricted regimen is in line with Oladapo et al.'s labour progression study and the recent WHO recommendations on 'intrapartum care for a positive childbirth experience'.<sup>32,60</sup> In Oladapo et al.'s Nigerian/Ugandan study, the 95th percentiles of nulliparous women admitted at 4, 5 and 6 cm reached full dilatation four, two and one hours passed action line, respectively.<sup>60</sup> As women with adverse birth outcome were excluded, these results must be interpreted with caution. However, few women would have received oxytocin augmentation unnecessarily when applying restricted oxytocin use only after crossing action line. Due to slow labour progress before 5 cm cervical dilatation, WHO recommends that to start active phase at

5 cm cervical dilatation. In alignment, we have added 5 cm cervical dilatation to the indications for when to start oxytocin augmentation in active phase of labour.<sup>32,60</sup> If less than 5 cm dilatation, oxytocin use should follow the indications for induction or prolonged latent phase of labour.

### **Booklet page 8: High blood pressure (BP), urine protein, hypertensive disorders**

👉 For practice-based training in severe pre-eclampsia/eclampsia, see the related PartoMa case stories: [Wahida](#) (page 47) and [Zuwena](#) (page 63)

This page has only undergone minor changes since version 1.<sup>12</sup> Notably, 19% of Zanzibari women aged 25-44 years suffer from hypertension,<sup>64</sup> with risk of gestational aggravation and superimposed pre-eclampsia.<sup>65,66</sup> The prevalence of severe hypertensive disorders at Mnazi Mmoja Referral Hospital is 7%.<sup>21</sup>

#### *Diagnostic criteria*

Diagnostic criteria for pre-eclampsia are based on RCOG guidelines and in alignment with MCPC.<sup>33,67</sup> For simplicity RCOG's mild and moderate pre-eclampsia are merged and biochemical/haematological impairment excluded from the definition of severe pre-eclampsia.

#### *Management*

Management of hypertensive disorders is inspired by the LIVKAN treatment chart, which was found useful among birth attendants in Somali-land.<sup>36</sup> For simplicity, and due to the difficulties of excluding the possibility of severe pre-eclampsia in a pregnant woman with severe hypertension, management of severe hypertension and severe pre-eclampsia/eclampsia are grouped together. Notably, The American College of Obstetricians and Gynecologists likewise emphasize the minimal relationship found between quantity of urinary protein and pregnancy outcome in severe hypertensive disorders, and, furthermore, the qualitative determination of dipsticks result in many false-positive and false-negative findings.<sup>68,69</sup>

For severe hypertensive disorders, an intensive treatment protocol is recommended aiming at delivery within 12-24 hours of admission.<sup>67</sup> Notably, women are admitted with severe hypertension of unknown duration, and therefore 12 hours may be more appropriate in this setting.<sup>21</sup>

#### *Medicine*


Medical treatment is restricted to the drugs available at the study site (hydralazine for fast antihypertensive treatment; magnesium sulphate as anticonvulsant and the antidote calcium gluconate).

Our study of women with severe hypertensive disorders at Mnazi Mmoja Referral Hospital showed that while 91% of labouring women with severe pre-eclampsia/eclampsia at baseline had Magnesium Sulphate initiated, only 47% with recorded severe hypertension received antihypertensive treatment.<sup>21</sup> Yet, data suggest severe hypertension as a likewise important contributor to maternal mortality, and we emphasize its use in the guidelines.<sup>70</sup> During the 9<sup>th</sup>-12<sup>th</sup> month of using PartoMa guidelines, recorded antihypertensive treatment of severe hypertension had increased to 64%, which was a statistically significant improvement.<sup>21</sup>

Concerning hydralazine, its associations with maternal hypotension, placental abruption, and adverse perinatal outcome, and the 20-minute interval before maximum effect, were considered when deciding on a more conservative regimen than suggested by MCPC: 5mg every 20 minutes until systolic blood pressure <160 mmHg.<sup>33,35,71</sup>

Concerning magnesium sulphate, the clinical dosage regimen varies widely globally,<sup>72</sup> and there is no international consensus on the optimal regimen.<sup>73</sup> However, efficacy trials suggest 4g IV and 10g IM loading dose, and 5g IM maintenance dose every 4 hours (Pritchard regimen) to be a safe choice.<sup>73</sup> Yet, even less consensus appears concerning optimal dilution and injection time for the initial IV bolus. We agreed on 4g in 200 ml over 10 minutes.

### **Booklet page 9: Low BP, high pulse, high temperature**

 For practice-based training in intrapartum fever, see the related PartoMa case story:

[Rukia](#) (page 69)

#### *Management of low BP and high pulse*

These sections are based on MCPC, but shortened considerably.<sup>33</sup>


#### *Intrapartum fever*

This section is based on recent international guidelines from ACOG and WHO.<sup>74,75</sup> As intrapartum epidural anaesthesia is not applied at the hospital, the risk of non-infectious fever is lower than in many high-income settings. Therefore, broad spectrum antibiotics are recommended for all women with temperature of 38C° or more. Usually, temperature is measured orally at the study site.

#### *Sepsis*

This section is based on guidelines developed by the 2017 Surviving Sepsis Campaign.<sup>76,77</sup>

### **Booklet pages 10-12: Obstetric manoeuvres**

 For practice-based training, see the related PartoMa case stories:

[Sabra](#) (vaginal breech delivery, page 66) and [Fatma](#) (vacuum extraction, page 44)

Only vacuum extraction was included in version 1, but the other manoeuvres were requested by birth attendants. As noted in the booklet, the described obstetric manoeuvres need hands-on training with supervision, which cannot be replaced by the notes.

#### *Vaginal breech delivery and delivery of second twin*

This section is based on MCPC and RCOG guidelines.<sup>33,78</sup>

#### *Vaginal delivery of second twin*

This section is based on MCPC.<sup>33</sup>


#### *Shoulder dystocia*

This section is based on the Advanced Life-saving Skills in Obstetrics (ALSO) course.<sup>63</sup>

#### *Vacuum extraction*

With permission from the Advanced Live Support in Obstetrics' (ALSO's) legal board, their recommendations, including illustrations, for vacuum extraction are adapted and included in the guidelines.<sup>63</sup> While still suboptimal, vacuum extractions rose from 0.3% to 1.2% during the first year of using PartoMa guidelines.<sup>20</sup>

### **Booklet page 13: Decision on caesarean section, vaginal birth after caesarean section**

 For practice-based training, see the related PartoMa case stories:

[Husna](#) (decision on caesarean section, page 36) and [Raya](#) (vaginal birth after caesarean section, page 20)


*The decision-to-delivery intervals for caesarean section*

This section is based on NICE guideline.<sup>79</sup>

*Vaginal birth after caesarean section (trial of scar)*

This was not included in PartoMa version 1, but requested by birth attendants. The recommendations are based on MCPC.<sup>33</sup>


### **Booklet page 14: Bleeding before birth (APH)**

 For practice-based training in APH, see the related PartoMa case stories:

[Zuwena](#) (placental abruption, page 63) and [Halima](#) (uterine rupture, page 50)

This page is based on MCPC, but shortened considerably.<sup>33</sup>

### **Booklet page 15: Bleeding after birth (PPH)**

 For practice-based training in PPH, see the related PartoMa case stories:

[Maryam](#) (page 40)

Regrettably, this was not included in PartoMa guidelines version 1. Since then, maternal death audits from Mnazi Mmoja Referral Hospital have indicated that strengthening postpartum haemorrhage (PPH) management is warranted. The PPH guidelines included in version 2 are primarily based on the Advanced Live Support in Obstetrics' (ALSO's) course.<sup>63</sup> In addition, for treatment of women where bleeding exceeds 500 ml, we follow the WOMAN trial's evidence for the effectiveness on maternal mortality and morbidity of administering tranexamic acid together with oxytocin and misoprostol.<sup>80,81</sup> Tranexamic acid is an inexpensive drug, which is already available at Mnazi Mmoja Referral Hospital. It is easy to administer, has no considerable side effects, and appears highly applicable and cost-effective in low resource settings.<sup>82</sup>

### **Booklet page 16: Neonatal resuscitation**

 For practice-based training in neonatal resuscitation, see the related PartoMa case stories:

[Fatma](#) (page 44) and [Asia](#) (page 53)

This is based on the Helping Babies Breathe guidelines, which are particularly developed for neonatal resuscitation in low resource settings, and with promising effects in Tanzania mainland and Zanzibar.<sup>37,83</sup>

## Implementation

At Mnazi Mmoja Referral Hospital, the PartoMa guidelines are available as personal pocket booklets for staff and on posters. It is encouraged to refer to guidelines at daily clinical meetings, as well as in clinical discussions and teaching. In addition, use of the PartoMa guidelines is strengthened by the PartoMa seminars, which are conducted every three months and voluntary to attend.

### PartoMa seminars

🎬 A 7-minutes film from the PartoMa seminars is available online: [www.publichealth.ku.dk/partoma](http://www.publichealth.ku.dk/partoma)

The seminars have now been held every three months for three years. It is a place for introducing and training in the use of the PartoMa guidelines. The seminars are conducted in a communal room at the hospital and facilitated by hospital staff and members of the PartoMa study team. Each seminar lasts 3.5 hours and commences after work. The guidelines implementation strategy focuses on being low-cost and on motivation of individual providers to improve quality of care voluntarily. Therefore, staff participates after working hours and no per diems are paid, only free food and the guidelines booklet are provided with a certificate of attendance. To enable the vast majority of staff to participate, each seminar is conducted twice. The main part of the seminar is problem-based learning at five work stations, each lasting 30 minutes and including main topics of labour management, in accordance with PartoMa guidelines.

#### Seminar agenda:

14.00-14.30:	Arrival, sign-up, PartoMa pocket guide to newcomers, distribution of group numbers (5 groups in total, snacks
14.30-14.40:	Introduction in plenary (standard slide show)
14.40-15.10:	Station 1
15.10-15.40:	Station 2
15.40-16.10:	Station 3
16.10-16.40:	Station 4
16.40-17.10:	Station 5
17.10-17.30:	Completing remark in plenary (standard slideshow), comments from participants, anonymous evaluation questionnaire and certificate of attendance

*Case-based training in groups*  
*Five case stories are selected with one facilitator each.*  
*A timekeeper helps groups to the stations.*

The overall seminar agenda is the same each time, but case stories for the stations differ. There is usually one case related to foetal distress, one to labour progress and one to hypertensive disorders, as well as a triage station. The case stories are based on real-life stories from Mnazi Mmoja Referral Hospital and include both routine and emergency care. The majority of case stories are based on partograph use. One group participant fills in the vital signs and labour progress on a white board partograph while the story is told by the facilitator. For each new time point of observations, the situation is analysed by asking three questions:



1. How is the mother? 2. How is the baby? 3. How is progress of labour?

For the neonatal resuscitation station, a baby mannequin and bag and mask are provided. Till now, additional hands-on training of obstetric manoeuvres has not been included at the seminars, as this is new in version 2.0.

An overall aim of the PartoMa seminars is to provide a positive and safe atmosphere for birth attendants to meet, learn, discuss and socialize. Therefore, while case stories may present critical situations, nearly all end with the group having saved the woman and baby. In addition, respectful care as defined on page 1 in the PartoMa Pocket Guide 2.0 is central throughout the seminars.

During the first year of the PartoMa study (2015), an average of 74% of doctors and 62% of nurse-midwives from the obstetric division participated at each seminar round. Among the 65 intern doctors at the entire hospital, attendance rate increased throughout the year from 22% to 58%. In addition, some staff from other departments at Mnazi Mmoja Referral Hospital and from other health facilities in Zanzibar participated each time. We have never turned anyone away, and therefore groups vary in size – from 4 to 10 participants at each station.

In the annex (page 31), twelve case stories and the triage station are presented. Together, they cover the vast majority of topics in the PartoMa 2.0:

 <b>PartoMa Pocket Guide 2.0</b>	 <b>Related PartoMa case story</b>
Booklet page 1: Safe and respectful care for every woman and baby	All cases - <a href="#">Saada</a> (page 32) and <a href="#">Halima</a> (page 50) in particular
Booklet page 2: Partograph and PartoMa use	All cases, and <a href="#">Triage station</a> * (page 75)
Booklet pages 3-4: Routine maternity care	All cases, and <a href="#">Triage station</a> * (page 75)
Booklet page 5: Foetal heart rate (FHR), liquor, foetal distress	<a href="#">Husna</a> (page 36), <a href="#">Fatma</a> (page 44), <a href="#">Halima</a> (page 50), <a href="#">Asia</a> (page 53), <a href="#">Zuwena</a> (page 63)
Booklet page 6: Latent phase, pre-labour rupture of membranes (PROM), labour induction	<a href="#">Rukia</a> (PROM and induction, page 69)
Booklet page 7: Cervix, contractions, slow progress	<a href="#">Saada</a> (page 32), <a href="#">Maryam</a> (page 40), <a href="#">Tabia</a> (page 58), <a href="#">Sabra</a> (page 66)
Booklet page 8: High blood pressure (BP), urine protein, hypertensive disorders	<a href="#">Wahida</a> (page 47), <a href="#">Zuwena</a> (page 63)
Booklet page 9: Low BP, high pulse, high temperature	<a href="#">Rukia</a> (intrapartum fever, page 69)
Booklet pages 10-12: Obstetric manoeuvres	<a href="#">Sabra</a> (vaginal breech delivery, page 66), <a href="#">Fatma</a> (vacuum extraction, page 44)
Booklet page 13: Decision on caesarean section, vaginal birth after caesarean section	<a href="#">Husna</a> (decision on caesarean section, page 36), <a href="#">Raya</a> (vaginal birth after caesarean, page 20)
Booklet page 14: Bleeding before birth (APH)	<a href="#">Zuwena</a> (placental abruption, page 63), <a href="#">Halima</a> (uterine rupture, page 50)
Booklet page 15: Bleeding after birth (PPH)	<a href="#">Maryam</a> (page 40)
Booklet page 16: Neonatal resuscitation	<a href="#">Fatma</a> (page 44), <a href="#">Asia</a> (page 53)

\* In addition, the triage station includes foetal distress, prolonged labour, pre-eclampsia, intrapartum fever, vacuum extraction and postpartum bleeding.

## Facilitators and barriers

Our results of evaluating the PartoMa intervention suggest that it was well tailored to the needs of staff, presenting a realistic aim for quality care. At baseline, multiple international and national evidence-based

guidelines were available, but staff rarely applied these. One might say they were not tailored to fit local customers. As reported from comparable settings, informal sharing of knowledge and experience dominated decision-making.<sup>21,84</sup> Reason for translation of PartoMa guidelines to practice appears multifactorial and concerns both guidelines content and implementation.<sup>20,21</sup>

The content was developed in close collaboration with staff to ensure that the guidelines are contextually achievable and easy to use. We find that the participatory approach for guidelines development with repeated cycles of feedback from the end-users is a major facilitator for reaching actual useful guidance. Notably, clinical guidelines for low-income countries are typically developed top-down by expert panels, with minimal – or even without – including target users.<sup>11,12,85,86</sup> However, the PartoMa development process is highly dependent on time, project funding, access to evidence, capacity to synthesize and apply evidence, skills in graphical design, and a robust coordination of partners – resources that can rarely be spared at facilities like the study site. Likewise, a review of health sector guidelines in Uganda concluded that low income countries face multiple barriers in adapting guidelines to local conditions.<sup>85</sup> It is therefore warranted that the central development process of international evidence-based guidelines targeting low resource settings involve end-users already in the initial phases and reach closer to reality.

Contrary to the passive strategy often used to disseminate guidelines,<sup>12,85</sup> PartoMa guidelines were actively applied at daily meetings and taught at seminars. It is likely that this repeated and low-dose training may have boosted guidelines use, particularly when considering the massive staff turnover (page 7). Conversely, an appropriate guidelines' curriculum appears crucial for effective training. A major strength at Mnazi Mmoja Referral Hospital was the disclosed motivation to learn and improve among many birth attendants, especially revealed by high voluntary seminar attendance outside working hours and without per diems. For two years, a local steering group at Mnazi Mmoja Referral Hospital has been in charge of continuing distribution of guidelines booklets and conducting seminars.

It is likely that the intervention would have been effective only with motivated staff. Some nurse-midwives not applying guidelines were a challenge for team work and further improvement. Non-participants may, for example, have contributed to unchanged lack of routine blood pressure and temperature surveillance. In the United Republic of Tanzania, including Zanzibar, the official work language in the health system and at health colleges is English. Yet, we expect language skills to be a barrier for guidelines use among some nurse-midwives. We are therefore currently in the process of translating PartoMa Pocket Guide 2.0 to Swahili.

We are furthermore in the process of analysing our qualitative results from interviews and focus group discussions collected throughout the PartoMa project. By an implementation science approach, we hope to achieve a better understanding of organizational and individual facilitators and barriers to PartoMa uptake and use. The results will be ready later in 2018.



## Evaluation of use and effect

Globally, lack of guidelines adherence, the know-do-gap, is a crucial health problem. As called for by the Lancet maternal health series 2016, improvements in development and dissemination of clearly written guidelines that are tailored to low-resource reality are critical, and this may help providers to overcome the double-burden of simultaneously providing care “too little, too late” and “too much, too soon”.<sup>11</sup> With this goal, it is vital that clinical guidelines are understood like other complex public health interventions, with both possible effects and side-effects.<sup>87</sup>

The embedded pre-post evaluation within the 2014-2016 PartoMa study was based on the Kirkpatrick model for training interventions, where the causal chain was explored from (1) the birth attendants’ perception of the intervention, through (2) knowledge changes and (3) behavioural changes in clinical practice, to (4) associated changes in birth outcomes.<sup>88</sup> Step 1 was primarily assessed by anonymous questionnaire evaluations,<sup>12</sup> step 2 by anonymous knowledge tests (unpublished), and step 3 and 4 by criterion-based audits of birth registers and case files.<sup>20,21</sup> This was a pragmatic and low-cost study designed to suit limitations in data and budget. The applied questionnaires, audit criteria for quality of both general intrapartum care and care for women with severe hypertensive disorders, birth outcome indicators and indicators of structural mediators and confounders are all available in our scientific publications.<sup>12,20,21,24</sup> Although there are specific restrictions for each sub-analysis, these multiple variables enabled exploration of the guidelines’ causal pathway.

Though low-cost and simple, such effectiveness study has its limitations. While no other formalized in-house training was initiated, the study design does not allow exploration of possible improvements in providers’ care without PartoMa (for instance, due to increasing clinical experience and informal training); data from case file reviews may be biased due to under- or over-recording; and data did not allow estimating frequency of organ failures, neonatal mortality, in-depth quality of surveillance and treatment, or respectful provider-patient interactions.<sup>20,21</sup> Though risking the Hawthorne effect<sup>89</sup> and being more resource-demanding, direct structural observations of care delivery would strengthen the evaluation and allow inclusion of for instance the full list of indicators from ‘the mother-baby friendly birthing facility’ initiative.<sup>39</sup>

Moreover, we are left with multiple ‘what, why, how’ questions, such as what are the more specific ‘active ingredients’ in the PartoMa intervention, and why did some staff attend seminars and use the guidelines while others neglected the intervention?<sup>87</sup> We hope to explore these questions further when analysing the study’s qualitative data.

To improve evidence-based care and accountability in maternal health in the Sustainable Development Goals’ era, it is a key priority to improve metrics for both routine and emergency care and conducting implementation research.<sup>13</sup> Notably, production of contextually tailored guidelines for low income settings may in fact be the first step for conducting comprehensive and effective clinical audits.<sup>90</sup>

## Future guidelines updating procedure

Guidelines development is a dynamic and continual process, which enables ‘Best Possible Timely and Respectful’ care and avoids ‘Too Much Too Soon’ and ‘Too Little Too Late’ care.<sup>11</sup> While unnecessary updates and changes cause pointless confusion, it is crucial ethically to ensure updates in relation to emerging scientific evidence and changes in supplies, staff numbers, and knowledge level of staff.<sup>12</sup> This version 2.0 of PartoMa guidelines was developed due to demand among staff for additional topics to be included – it furthermore seemed relevant due to new evidence and WHO guidelines.<sup>32,33,60</sup> We hope to rise funding for future versions when needed – and we hope that the reality at Mnazi Mmoja Referral Hospital will then be less resource constrained and thereby ready for guidelines modifications, such as more frequent surveillance during labour and birth companions for every woman.

There is an increasing demand for the PartoMa intervention among birth attendants in Zanzibar, also from other maternity units, and we will continue to collect feedback from the guidelines target users. Furthermore, we are currently applying for research funding to explore upscaling of the PartoMa guidelines and seminars to other East African hospitals, and possibly also to health and allied sciences colleges.

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## Appendix

# PartoMa Case Stories for problem-based learning

Related to partograph use and the PartoMa Pocket Guide 2.0




The PartoMa case stories are based on real-life stories at Mnazi Mmoja Referral Hospital in East Africa. They are modified by Nanna Maaløe, and given new names. Each case is reviewed by two internal medical doctors (Tarek Meguid and Natasha Housseine), one external specialist in midwifery (Gaynor Maclean) and two external specialists in obstetrics (Jos van Roosmalen and Birgitte Bruun Nielsen).


**PartoMa colour codes of urgency:** ◆ Uncomplicated ◆ Warning ◆ Danger



## Saada (anxiety, poor progress with poor uterine activity, oxytocin augmentation)

 *Special focus on pages 1 and 7 of the PartoMa Pocket Guide 2.0*

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 Ask one of the participants to record observations on a whiteboard-partograph


### Saada is admitted 16<sup>th</sup> June at 15:00:

Saada is 27 years old. She is gravida 3, para 0 with 2 previous spontaneous abortions. Her pregnancy has been uncomplicated. Her mother and sister followed her to the hospital. They asked a nurse assistant if they could be with her during childbirth, but this was not possible. Saada knows that they are waiting for her outside the maternity unit.


On admission, Saada appears to have painful and frequent contractions. In between contractions she seems calm. She is walking around and has recently been eating and drinking. Findings of the admission assessment are:

- Longitudinal lie, vertex presentation
- FHR 130 bpm
- Foetal head 4/5 palpable above pelvic brim
- 3 contractions in 10 minutes, each lasting 25 seconds
- Cervix dilated 4 cm, intact membranes
- The bones are separated and the sutures can be felt easily (no moulding)
- No localized scalp oedema (no caput succedaneum)
- Pulse 90 bpm, BP 120/80 mmHg
- Temperature 36,7 °C

Today, there are many women in labour and Saada is asked to lie down in a bed where another woman is already lying with painful contractions.

 What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

*Mother:  Good condition, but no continuous support is a problem*

*Baby:  Good condition*

*Labour progress:  First stage of active phase*

 What do you imagine that Saada is thinking?

*Discuss how it must feel to be Saada at the maternity ward on a busy day (neglected, alone, naked, scared...)*

 What actions do you take?

*Let the participants discuss. Their conclusion should focus on the following:*

*Supportive care and routine assessments (look in the PartoMa Pocket Guide together and mention the plan)*

*Start partograph on alert line*

### During the next 4 hours, FHR is assessed 3 times:

- FHR ranges 125-135 bpm

### It is now 19:00 in the evening:

Saada is lying in a corner of the bed. The other woman in her bed just delivered in the bed, and there was much bleeding. Saada is in pain and she is anxious and concerned whether everything is okay.

Saada can see three birth attendants in uniforms sitting and chatting at a bench in the other end of the room. She can hear that they are talking about a wedding and laughing. She has tried to get their attention several times – saying “sister please, I am in pain – is everything okay?” – but they didn’t come. She feels alone.

⌚ What are your thoughts on this situation?

*Let the participants discuss, focusing on the following topics:*

*Do you think this happens often at your maternity unit?*

*How do you imagine that it feels to be Saada?*

Then, you come into the room and hear that Saada is calling. You look at Saada’s partograph and conclude that it is time for examination:

- FHR 140 bpm
- Foetal head 4/5 palpable
- 2 contractions in 10 minutes, each lasting 20 seconds
- Cervix dilated 6 cm, intact membranes
- Pulse 85 bpm, BP 115/70 mmHg
- The bones are separated and the sutures can be felt easily (no moulding)
- No localized scalp oedema (no caput succedaneum)

⌚ What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

*Mother: ◆ Good condition*

*Baby: ◆ Good condition*

*Labour progress: ◆ First stage of active phase, slow progress, between alert and action lines*

⌚ What actions do you take?

*Let the participants discuss. Their conclusion should focus on the following:*

1. *Discuss 5 Ps to explore why the progress is poor (use the PartoMa Pocket Guide):*

*Power: Possibly suboptimal uterine activity*

*Pass urine: She has not passed urine in the last 2 hours*

*Psychology: She is anxious*

*Passenger: Assess presentation and position (cephalic presentation, occiput anterior position)*

*Pelvis: A rare problem. Other factors should be managed before considering this*

2. *It appears to be a power problem, and full bladder and anxiety might be causes. Therefore, enhance labour by artificial rupture of membranes (head is engaged), ambulation, eat and drink, pass urine, reassuring and respectful caring support*  
**REMEMBER: OXYTOCIN IS NOT INDICATED BEFORE THE ACTION LINE**
3. *Routine assessments with FHR every 30 minutes, and next vaginal examination in 2 hours (as the alert line is crossed)*

**During the next 2 hours, FHR is assessed 2 times:**

- FHR ranges 130-140 bpm

**Saada is assessed again at 21:00:**

Saada is still lying in the bed. She is complaining of painful contractions, but she doesn’t appear to have many. She is crying.

- FHR 130 bpm
- Foetal head 3/5 palpable above pelvic brim
- 2 contractions in 10 minutes, each lasting 25 seconds
- Cervix dilated 6 cm, clear amniotic fluid
- The bones are just touching each other (+ moulding)
- Slight scalp oedema (+ caput succedaneum)

⌚ What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

*Mother: ◆ Good condition*

*Baby: ◆ Good condition*

*Labour progress: ◆ First stage of active phase, poor progress, on partograph's action line*

⌚ What actions do you take?

*Let the participants discuss. Their conclusion should focus on the following:*

*Repeat the 5 Ps to explore why progress is poor.*

*The problem still appears to be poor uterine activity, and now on action line. Therefore, start oxytocin augmentation:*

*Discuss the dosage, monitoring and titration of oxytocin.*

*Remember that oxytocin is potentially dangerous. It can cause hyperstimulation and foetal distress and therefore, it must be monitored carefully: Drops per minute, contractions and FHR must be assessed every 15 minutes*

*Encourage ambulation (standing next to the bed with the IV-line)*

*Encourage eating and drinking*

*Ensure that bladder is empty*

*Provide reassuring and caring support*

You attend frequently to Saada during the next 4 hours. You are reassuring her that the baby is well (FHR between 130 and 140 bpm), and that labour is progressing well.

**At 00:00:**

Saada has a fully dilated cervix and she is starting to push.

- FHR 145 bpm
- Foetal head 0/5 palpable
- 4 contractions in 10 minutes, each lasting 45 seconds
- Clear amniotic fluid
- The bones are just touching each other (+ moulding)
- Slight scalp oedema (+ caput succedaneum)

⌚ What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

*Mother: ◆ Good condition*

*Baby: ◆ Good condition*

*Labour progress: ◆ Good response to labour augmentation and caring support, now reassuring progress*

⌚ What actions do you take?

*Let the participants discuss. Their conclusion should focus on management of second stage of labour with continual attendance and FHR assessment after every contraction (look in the PartoMa Pocket Guide together)*

👉 If time, hands-on training of vaginal delivery

**Saada delivers spontaneously at 00:40:**

- Apgar score 9 in 1 minute, 10 in 5 minutes.
- Birth weight 3580 gram


Saada and her baby are discharged 10 hours later, both in a good condition.

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**TAKE HOME MESSAGES**

1. A companion of choice throughout labour and childbirth increases spontaneous vaginal birth and reduces caesarean sections. It furthermore reduces perception of pain and anxiety.
  2. Anxiety may lead to a bad birth experience – it causes the woman to suffer more from labour pain and it may decrease the body's oxytocin production and thereby cause slow progress of labour. Respectful supportive care provides reassurance, decreases the perception of pain, and enhance labour progression
  3. Artificial rupture of membranes, ambulation, pass urine, respectful caring support, eating and drinking are often effective and safe ways to enhance labour and should be tried before starting oxytocin augmentation, because of its risks such as uterine hyperstimulation and foetal distress (save oxytocin for women with crossed action line)
  4. Oxytocin infusion can cause uterine hyperstimulation and foetal distress. Therefore, drops per minute, contractions and FHR should be monitored EVERY 15 MINUTES to assure the optimal dosage
-

## Husna (meconium, foetal distress, decision for CS or vacuum extraction)

 *Special focus on pages 5 and 13 of the PartoMa Pocket Guide 2.0*


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 Ask one of the participants to record observations on a whiteboard-partograph

### Husna is admitted 4th December at 4.10:

Husna is 22 years old and gravida 1, para 0. She has had an uncomplicated pregnancy. On admission she appears calm and in a good physical condition:

- Longitudinal lie, vertex presentation
- FHR 130 bpm
- Foetal head 5/5 palpable above pelvic brim
- 2 contractions in 10 minutes, each lasting 15 seconds
- Cervix dilated 2 cm, intact membranes
- Pulse 90 bpm, BP 120/80 mmHg
- Temperature 36,8 °C

 What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

*Mother: ◆ Good condition*

*Baby: ◆ Good condition*

*Labour progress: ◆ Latent phase*

 What actions do you take?

*Let the participants discuss. Their conclusion should focus on the following:*

*Supportive care, walking around, eating and drinking*

*New assessment in 4 hours or when changes occur (for instance, increase in contractions or spontaneous rupture of membranes)*

*Start partograph (latent phase)*

### Husna is again assessed at 8:00:

Husna is walking. Contractions seem more painful now.

- FHR 130 bpm
- Foetal head 4/5 palpable above pelvic brim
- 3 contractions in 10 minutes, each lasting 25 seconds
- Cervix dilated 5 cm, intact membranes
- The bones are separated and the sutures can be felt easily (no moulding)
- No localized scalp oedema (no caput succedaneum)
- Pulse 90 bpm, BP 115/80 mmHg


 What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

*Mother: ◆ Good condition*

*Baby: ◆ Good condition*

*Labour progress: ◆ First stage of active phase (transfer to alert line on partograph)*

 What actions do you take?

*Let the participants discuss. Their conclusion should focus on the following:*

*Respectful supportive care and routine assessments (look in the PartoMa Pocket Guide together and mention the plan)*

**During the next 4 hours, FHR is assessed 3 times:**

- FHR ranges 130-140 bpm

**Husna is again assessed at 11:05:**

Membranes have ruptured spontaneously. Therefore, Husna calls you. She is lying in the bed, and she still appears in good condition.

- FHR 140 bpm
- Foetal head 4/5 palpable above pelvic brim
- 3 contractions in 10 minutes, each lasting 25 seconds
- Cervix dilated 8 cm, thick meconium in the amniotic fluid draining
- The bones are separated and the sutures can be felt easily (no moulding)
- No localized scalp oedema (no caput succedaneum)
- Pulse 95 bpm, BP 128/85 mmHg

⌚ What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

*Mother: ◆ Good condition*

*Baby: ◆◆ Good condition (we are however a little concerned because of meconium)*

*Labour progress: ◆ First stage of active phase, normal progress*

⌚ What actions do you take?

*Let the participants discuss. Their conclusion should focus on the following:*

*Meconium might be a sign of foetal distress – check FHR every 15-30 minutes.*

*Plan for new vaginal examination in 2 hours, because we then expect full cervical dilatation.*

**FHR is reassessed at 11:30:**

- FHR 108 bpm, assessed after a contraction

⌚ What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

*Mother: ◆ Good condition, as above (no new assessments)*

*Baby: ◆ Non-reassuring FHR (meconium)*

*Labour progress: ◆ Normal progress, as above (no new assessments)*

⌚ What actions do you take?

*Let the participants discuss. Their conclusion should focus on the following:*

*Intrauterine resuscitation and FHR every 15 minutes*

**FHR is again assessed at 11:45:**

- FHR 105 bpm

⌚ What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

*Mother: ◆ Good condition, as above (no new assessments)*

Baby: ♦ Non-reassuring FHR (yellow zone in the PartoMa Pocket Guide)

Labour progress: ♦ Normal progress, as above (no new assessments)

⌚ What actions do you take?

*Let the participants discuss. Their conclusion should focus on the following:*

*Continue management with intrauterine resuscitation and FHR every 15 minutes. As long as FHR is above 100 bpm, this is not an indication for caesarean section)*

**Husna is again assessed at 12:00:**

- FHR 80 bpm
- Maternal pulse 75 bpm
- Foetal head 3/5 palpable above pelvic brim
- Cervix dilated 9 cm, thick meconium in the amniotic fluid draining
- 4 contractions in 10 minutes, each lasting 40 seconds
- The bones are touching each other (+ moulding)
- Slight scalp oedema (+ caput succedaneum)

⌚ What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

*Mother: ♦ Good condition*

*Baby: ♦ Foetal distress (FHR 80 bpm)*

*Labour progress: ♦ First stage of active phase (cervix 9 cm dilated)*

⌚ What actions do you take?

*Let the participants discuss. Their conclusion should focus on the following:*

*Intrauterine resuscitation for 5 minutes ONLY.*

*If no improvement in FHR to more than 100 bpm: RUSH for caesarean section.*

After 5 minutes, FHR is still 80 bpm.

⌚ How soon shall the baby be delivered by caesarean section?

*Let the participants discuss. Their conclusion should focus on the following:*

*As fast as possible and within 30 minutes*

**Just before starting surgery, at 12:18:**

- FHR 70 bpm (maternal pulse: 75 bpm)
- Cervix still dilated 9 cm

⌚ Would vacuum extraction be a better option?

*Let the participants discuss. Their conclusion should focus on the following:*

*No. Husna is nulliparous and the cervix is not fully dilated yet. Vacuum extraction would have been a safer and faster option if cervix had been fully dilated and foetal head had descended at or below ischial spines.*

**Husna delivers by caesarean section at 12:32:**

- Apgar score 5 in 1 minute, and 9 in 5 minutes
- Birth weight 3200 gram

- ⌚ What is particularly important when delivering this baby?  
*Let the participants discuss. Their conclusion should focus on the following:  
Immediate suction baby's mouth and nose if signs of obstruction or weak baby.*

Husna and her baby are discharged 2 days later, both in good condition.


---

### TAKE HOME MESSAGES


1. When women are admitted with FHR heard, it is our responsibility to assure that they are born alive. In addition, FHR abnormalities may also be an early sign of dangerous maternal conditions (for instance, maternal infection or impending uterine rupture).  
*The PartoMa study at Mnazi Mmoja Referral Hospital found that 40% of stillborn babies were alive when admitted to the hospital.*
  2. Meconium can be an early sign of foetal distress, and therefore FHR needs close attention.
  3. Foetal distress (FHR below 100 bpm) needs IMMEDIATE action: FHR should be reassessed within 5 minutes, and if still below 100 bpm, deliver immediately. It is NEVER indicated to wait 30 minutes and check again.
  4. Vacuum extraction is first choice in second stage when head is no more than 2/5 palpable above the pelvic brim, as it is faster and has less risks for mother and baby.
-



## Maryam (poor progress with signs of obstructed labour, postpartum bleeding)

 Special focus on pages 7 and 15 of the PartoMa Pocket Guide 2.0

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 Ask one of the participants to record observations on a whiteboard-partograph

### Maryam is admitted 24th February at 22:00:

Maryam is 25 years old, gravida 2, para 1. Both her previous and current pregnancy has been uncomplicated.

She appears to have painful contractions on admission. She is asking if her sister can be with her during labour. She appears nervous. You conduct the admission assessment:

- Longitudinal lie, vertex presentation
- FHR 130 bpm
- Foetal head 4/5 palpable above pelvic brim
- 3 contractions in 10 minutes, each lasting 25 seconds
- Cervix dilated 4 cm, intact membranes
- The bones are separated and the sutures can be felt easily (no moulding)
- No localized scalp oedema (no caput succedaneum)
- Pulse 80 bpm, BP 115/70 mmHg
- Temperature 36,9 °C

 What is your interpretation?

Let the participants discuss. Their conclusion should focus on the following:

*Mother:*  Good condition

*Baby:*  Good condition

*Labour progress:*  First stage of active phase

 What actions do you take?

Let the participants discuss. Their conclusion should focus on the following:

*Respectful supportive care and routine assessments (look in the PartoMa Pocket Guide together and mention the plan)*

*Start partograph on alert line*


### During the next 4 hours, FHR is assessed 3 times:

- FHR ranges 120-135 bpm

### Maryam is again assessed at 02:00:

She has painful contractions, but otherwise she appears in a good condition.

- FHR 140 bpm
- Foetal head 4/5 palpable above pelvic brim
- 3 contractions in 10 minutes, each lasting 25 seconds
- Cervix dilated 6 cm, intact membranes
- The bones are separated and the sutures can be felt easily (no moulding)
- No localized scalp oedema (no caput succedaneum)

 What is your interpretation?

Let the participants discuss. Their conclusion should focus on the following:

*Mother:*  Good condition

Baby: ◆ Good condition

Labour progress: ◆ First stage of active phase to the right of the alert line

⌚ What actions do you take?

*Let the participants discuss. Their conclusion should focus on the following:*

1. *Discuss 5 Ps to explore why the progress is poor (use the PartoMa Pocket Guide):*
  - Power: Poor uterine activity*
  - Pass urine: She has not passed urine in the last 2 hours*
  - Psychology: She appears anxious*
  - Passenger: Assess presentation and position (cephalic presentation, occiput anterior position)*
  - Pelvis: A rare problem. Other factors should be managed before considering this*
2. *It appears to be a power problem, and full bladder and anxiety might be causes. Therefore, artificial rupture of membranes (head is engaged), ambulation, eat and drink, pass urine, reassuring and respectful caring support*  
**REMEMBER: OXYTOCIN IS NOT INDICATED BEFORE THE ACTION LINE**
3. *Routine assessments with FHR every 30 minutes, and next vaginal examination in 2 hours (as the alert line is crossed)*

**During the next 2 hours, FHR is assessed 3 times:**

- FHR ranges 125-130 bpm

**Maryam is assessed at 04:00:**

- FHR 140 bpm
- Foetal head 4/5 palpable above pelvic brim
- 4 contractions in 10 minutes, each lasting 25 seconds
- Cervix dilated 8 cm, clear amniotic fluid draining
- The bones are just touching each other (+ moulding)
- Slight scalp oedema (+ caput succedaneum)

⌚ What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

*Mother: ◆ Good condition*

*Baby: ◆ Good condition*

*Labour progress: ◆ Progress nearly parallel to the alert line, which is reassuring (good effect of artificial rupture of membranes, ambulation etc.). No further descent of foetal head, which is a bit non-reassuring.*

⌚ What actions do you take?

*Let the participants discuss. Their conclusion should focus on the following:*

*Respectful supportive care*

*FHR every 30 minutes and next vaginal examination in 2 hours*

**During the next 2 hours, FHR is assessed 3 times:**

- FHR ranges 125-135 bpm

**Maryam is assessed again at 06:00:**

She is complaining of strong and painful contractions. She feels very tired.

- FHR 180 bpm
- Foetal head 4/5 palpable above pelvic brim
- 5 contractions in 10 minutes, each lasting more than 50 seconds
- Cervix dilated 8 cm, meconium in amniotic fluid draining
- The bones are overlapping (++ moulding)
- Scalp oedema (++ caput succedaneum)

⌚ What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

*Mother:* ◆◆ Good condition, but appears exhausted

*Baby:* ◆ Foetal distress (high FHR)

*Labour progress:* ◆ Severe poor progress in first stage active phase, on action line. Still no descent of foetal head.

⌚ What actions do you take?

*Let the participants discuss. Their conclusion should focus on the following:*

1. *Discuss 5 Ps to explore why the progress is poor (use the PartoMa Pocket Guide):*

*Power: Strong uterine contractions*

*Pass urine: She passed urine 30 minutes ago, blood-stained*

*Psychology: She appears tired and in pain*

*Passenger: Cephalic presentation, moulding ++, caput ++*

*Pelvis: A rare problem. Other factors should be managed before considering this*

2. *No progress in cervical dilatation and descent (red zone), moulding, meconium-staining and abnormally high FHR are together PROGRESSIVE SIGNS OF OBSTRUCTION. Caesarean section is indicated.*

*Oxytocin augmentation is NOT indicated.*

3. *Make sure that the high FHR is not caused by maternal infection*

4. *Consider the possibility of uterine rupture*

⌚ How soon should the baby be delivered by caesarean section?

Let the participants discuss. Their conclusion should focus on the following:

As soon as possible. If uterine rupture is suspected, it should be within 30 minutes

### **Maryam delivers by caesarean section at 06:42**

- Apgar score 6 in 1 minute and 10 in 5 minutes
- Birth weight 3400
- Maryam: Pulse 92 bpm, BP 130/85 mmHg

Maryam is transferred to the ward.

### **1 hour after delivery, you walk by Maryam's bed:**

You realise that no one has assessed Maryam since delivery. She is bleeding vaginally.

- Pulse 105 bpm, BP 90/60 mmHg
- Uterus atonic
- Estimated total blood loss is 2000 ml

⌚ What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

◆ **POST-PARTUM BLEEDING**, discovered late and with signs of shock  
(this means that she has already lost approximately 30% of her blood volume)

⌚ What actions do you take?

*Let the participants discuss the immediate management of post-partum bleeding, in accordance with PartoMa Pocket Guide.*

👏 If time, scenario training of managing postpartum bleeding, with 3 participants stationed around an imaginary patient.

After 10 minutes of urgent management of postpartum bleeding, the bleeding decreases. Maryam receives 3 units of blood.


Four days later, Maryam is discharged with her baby, both in a good condition.

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### **TAKE HOME MESSAGES**

1. No progress in cervical dilatation (action line, red zone) and no descent, moulding (+++), meconium-staining and abnormally high FHR can lead to OBSTRUCTION if you do not take action.
  2. In the first 2 hours after delivery, mother's general condition, pulse and BP, uterine consistency (fundal height), and vaginal blood loss must be checked EVERY 15-30 MINUTES.
  3. For the management of post-partum bleeding, you should be at least 3 people: one provides continual uterine massage and check the 4 Ts (tone, tissue, trauma, thrombin), while the others take care of head and arms, respectively.
  4. It is important to advise Maryam to seek advice early in any subsequent pregnancy as she now has a uterine scar.
-

## Fatma (foetal distress, vacuum extraction, Apgar score, neonatal resuscitation)

 Special focus on pages 4 and 14 of the PartoMa Pocket Guide 2.0


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 Ask one of the participants to record observations on a whiteboard-partograph

### Fatma is admitted 16th July at 20.00:


Fatma is 32 years old and gravida 4, para 2. Both previous pregnancies and current one have been uncomplicated. On admission she has strong, frequent and painful contractions. She starts to push. You immediately help her to a delivery bed and assess:


- Longitudinal lie, vertex presentation
- FHR 122 bpm
- Foetal head 2/5 palpable above pelvic brim
- 4 contractions in 10 minutes, each lasting 55 seconds
- Cervix dilated 10 cm, clear amniotic fluid
- Pulse 94 bpm, BP 135/85 mmHg
- Temperature 36,8 °C

 What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

*Mother:  Good condition*

*Baby:  Good condition*

*Labour progress:  Second stage of labour*

 What actions do you take?


*Let the participants discuss. Their conclusion should focus on the following:*

*Respectful supportive care and routine management in second stage of labour*


*Start partograph on alert line at 10 cm cervical dilatation*

### Fatma is assessed again at 20.05:

- FHR 95 bpm
- Foetal head 1/5 above pelvic brim

 What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

*Mother:  Good condition*

*Baby:  Foetal distress*

*Labour progress:  Second stage of labour (foetal head below ischial spines)*

 What actions do you take?


*Let the participants discuss. Their conclusion should focus on the following:*

*Intrauterine resuscitation (change position), check FHR again within 5 minutes*

*Call doctor*

### At 20.10:

- FHR 80 bpm
- Foetal head 1/5 above pelvic brim

 What is your interpretation?

*Let the participants discuss. Their conclusion should focus on ♦ Foetal distress*

⌚ What actions do you take?

*Let the participants discuss. Their conclusion should focus on the following:*

*IMMEDIATE DELIVERY by vacuum extraction if possible (briefly show participants the PartoMa Pocket Guide for vacuum extraction)*

👉 If time, hands-on training in vacuum extraction by mannequins and vacuum extractor

**At 20.18:**

Baby is delivered by vacuum extraction.

Mother is in good condition. No vaginal or perineal tears.

Baby is assessed immediately:

- Blue limbs and pink body, no response to stimulation, no activity, no respiration
- Heart rate 70 bpm

⌚ What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

*♦ Apgar score 2 in 1 minute*

⌚ What actions do you take?

*Let the participants discuss. Their conclusion should focus on the following:*

**IMMEDIATE NEONATAL RESUSCITATION:**

**VENTILATION BY BAG AND MASK SHOULD BE STARTED WITHIN 1 MINUTE (the golden minute)**

👉 Hands-on training of neonatal resuscitation, by mannequin-baby + bag-mask ventilation.

**5 minutes after delivery (and 4 minutes after starting resuscitation):**

- Blue limbs and pink body, grimace when stimulated, some flexion, weak respiration
- Pulse 130 bpm

⌚ What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

*♦ Apgar score 6 in 5 minutes*

⌚ What actions do you take?

*Let the participants discuss. Their conclusion should focus on continuing ventilation support*

**8 minutes after delivery, the baby starts to cry:**

The Apgar score is 9 in 10 minutes, and the baby is now monitored lying on Fatma's chest.

- Apgar score 10 in 15 minutes
- Birth weight 3250 gram

⌚ What is important to remember after delivery for all women and babies?

*Let the participants discuss routine post-delivery care for mother and baby by use of PartoMa Pocket Guide.*


The baby stays skin-to-skin with mother and starts breastfeeding within 30 minutes after delivery. Both Fatma and her baby is doing well on discharge 2 days later.

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### **TAKE HOME MESSAGES**

1. Never leave a woman alone in second stage of labour and listen to FHR after every contraction
  2. Always have delivery set and ambu-bag ready in second stage
  3. Vacuum extraction is first choice in second stage when head is no more than 2/5 palpable above the pelvic brim, as it is faster and has less risks for mother and baby.
  4. If baby is not breathing, IMMEDIATE BAG-MASK VENTILATION should be started within 1 minute (THE GOLDEN MINUTE). This can save the baby from death or life-long disabilities (for example cerebral palsy or learning difficulties).
  5. A low Apgar score might indicate minimal or bigger brain damage, which cannot be assessed fully until years later.
-

## Wahida (pre-eclampsia and eclampsia)

 Special focus on page 8 of the PartoMa Pocket Guide 2.0

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 Ask one of the participants to record observations on a whiteboard-partograph. Also have observation and treatment sheets for hypertensive disorders ready.

### Wahida is admitted 15 June at 20:00:

Wahida is gravida 1, para 0. She has attended the antenatal clinic 4 times.

Until last ANC visit, pregnancy has been uncomplicated. At the last ANC visit, BP was 145/90 mmHg. There is no other information on the antenatal card, and according to Wahida, no actions were taken.


Now Wahida has painful contractions. When you see her, she doesn't look well. She seems very tired, nervous and in pain. You ask her how she feels. She says 'okay' – but when asking kindly again, she whispers that she has a bad headache, and it has been there for some time.

 What is your interpretation and actions to consider?

*Let the participants discuss. Focus should be on history taking, assessments and information to the patient, tender loving care. Pre-eclampsia and anaemia should be considered.*

You take her patient history and assess the following:

- Oedema and dark urine
- Longitudinal lie, vertex presentation
- FHR 130 bpm
- Foetal head 5/5 palpable above pelvic brim
- 2 contractions in 10 minutes, each lasting 25 seconds
- Cervix 2 cm dilated, membranes intact
- Pulse 85 bpm, BP 165/110 mmHg
- Urine protein 3+
- Temperature 37.1 °C

 What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

*Mother: ◆ Severe pre-eclampsia*

*Baby: ◆ ◆ Good condition, but increased risk due to maternal pre-eclampsia*

*Labour progress: ◆ Latent phase*

 What actions do you take?

*Let the participants discuss and facilitate development of a full plan for monitoring and treatment, supported by PartoMa Pocket Guide. The plan must include:*

- *Magnesium sulphate*
- *Antihypertensive treatment (for instance, hydralazine)*
- *Enhance labour progression (rupture of membranes if possible)*
- *Assessment plan, including observation and treatment sheets for hypertensive disorders*
- *Start partograph (latent phase)*
- *Delivery within 12 hours*

*Give additional estimates for the assessments when asked for. For example:*

- *Fluids: 100 ml orally in 1 hr.*
- *Urine output: 40 ml in 1 hr.*

**At 00:00:**



The headache has decreased and Wahida is feeling a little better. The contractions are strong and painful now. The plan that you made has been followed and you now assess the following:

- FHR 124 bpm
- Foetal head 3/5 palpable above pelvic brim
- 4 contractions in 10 minutes, each lasting 45 seconds
- Cervix 7 cm dilated, clear amniotic fluid
- The bones are just touching each other (+ moulding)
- Pulse 85 bpm, BP 155/105 mmHg

⌚ What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

*Mother: ♦ Severe pre-eclampsia, condition improved with reduced blood pressure, but still too high*

*Baby: ♦♦ Good condition, but increased risk due to maternal pre-eclampsia*

*Labour progress: ♦ Good progress, now first stage of active phase (cervix 7 cm)*

⌚ What actions do you take?

*Their discussion should focus on continuing their plan, and transferring to alert line on the partograph.*

**At 03:00:**

Wahida is crying and contractions seem painful. You now assess the following:

- FHR 124 bpm
- Foetal head 2/5 palpable above pelvic brim
- 3 contractions in 10 minutes, each lasting 35 seconds
- Cervix fully dilated, clear amniotic fluid
- The bones are just touching each other (+ moulding)
- Slight scalp oedema (+ caput succedaneum)
- Pulse 90 bpm, BP 165/115 mmHg

⌚ What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

*Mother: ♦ Severe pre-eclampsia, blood pressure increased again and crying (organ symptoms?, pain?, anxiety?)*

*Baby: ♦♦ Good condition, but increased risk due to maternal pre-eclampsia*

*Labour progress: ♦ Second stage of labour*

⌚ What actions do you take?

*Let the participants discuss. Their conclusion should focus on the following:*

*Hypertension: Hydralazine is indicated. Continue treatment plan for severe pre-eclampsia.*

*Management of second stage of labour with continual attendance and FHR assessment after every contraction (look in the PartoMa Pocket Guide together)*

**At 03:55:**

Wahida has just delivered vaginally.

- Apgar score 9 in 5 minutes
- Birth weight 2600 g

Clinically, Wahida appears very tired:

- GCS 15
- Pulse 95 bpm, BP 160/108 mmHg still too high
- Estimated blood loss: 420 ml

**7 hours post-partum, at 10:55:**

Suddenly Wahida starts convulsing.

- Pulse 85 bpm, BP 205/120 mmHg

⌚ What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

*Eclampsia.*

*Perhaps she didn't receive the maintenance dose as planned!*

⌚ What actions do you take?


*Let the participants discuss. Their conclusion should focus on managing convulsions and antihypertensive treatment (supported by the PartoMa Pocket Guide)*

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**TAKE HOME MESSAGES**

1. ASSESS BLOOD PRESSURE ON ALL WOMEN DURING ADMISSION FOR CHILDBIRTH.  
19% of Zanzibarian women aged 25-44 years have hypertension  
7% of women in childbirth at Mnazi Mmoja Referral Hospital of Zanzibar have severe hypertensive disorders
  2. Severe hypertensive disorders are extremely dangerous for both mother and baby if not monitored and treated properly
  3. Safe and respectful timely care for women with pre-eclampsia during childbirth includes close attention to clinical guidelines (as a checklist) – REMEMBER anticonvulsive, antihypertensive, strict fluid balance, strict use of observation and treatments sheets, and delivery.
-

## Halima (respectful care, foetal distress, uterine rupture)

 *Special focus on pages 5 and 14 of the PartoMa Pocket Guide 2.0*

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 Ask one of the participants to record observations on a whiteboard-partograph

### Halima is admitted June 20 at 00:15:

Halima is 28 years old. She is gravida 2, para 1 and her pregnancy has been uncomplicated. First pregnancy was also uncomplicated and ended by a spontaneously vaginal delivery.

When entering the maternity ward, Halima appears to have painful and frequent contractions. In between contractions, she seems calm. You conduct the admission assessment:

- Longitudinal lie, vertex presentation
- FHR 130 bpm
- Foetal head 3/5 palpable above pelvic brim
- 3 contractions in 10 minutes, each lasting 30 seconds
- Cervix dilated 4 cm, intact membranes
- BP 120/80 mmHg, P 72 bpm
- Temperature 37,0 °C

 What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

*Mother: ◆ Good condition*

*Baby: ◆ Good condition*

*Labour progress: ◆ First stage of active phase of labour*

 What actions do you take?

*Let the participants discuss. Their conclusion should focus on the following:*

*Respectful supportive care and routine assessments (look in the PartoMa Pocket Guide together and mention the plan)*

### Halima is again assessed at 04:00:

Halima is lying in the bed. She is in pain and no one has talked to her or examined her since admission.


 What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

*How is it to be Halima? How often should she have been examined during these hours? (FHR at least every hour etc.)*

You then examine her and find the following:

- FHR 135 bpm
- Foetal head 3/5 palpable above pelvic brim
- Cervix dilated 8 cm
- 4 contractions in 10 minutes, each lasting 50 seconds
- Membranes have ruptured spontaneously, clear amniotic fluid
- Pulse 85 bpm, BP 115/70 mmHg
- The bones are separated and the sutures can be felt easily (no moulding)
- No localized scalp oedema (no caput succedaneum)

 What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

Mother: ◆ Normal vital signs – but possibly anxiety  
Baby: ◆ Good condition  
Labour progress: ◆ First stage of active phase, good progress

⌚ What actions do you take?

*Let the participants discuss. Their conclusion should focus on the following:  
Respectful caring support and surveillance*

**At 04:30 you again go to assess FHR:**

Contractions appear very strong. Halima is in pain, she is crying.

- FHR 125 bpm

⌚ What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

*Mother: ◆ Appears normal. We would like to know how frequent and strong contractions are (5 in 10 minutes, each lasting 50 seconds)*

*Baby: ◆ Good condition*

*Labour progress: ◆ According to contractions we expect good progress*

⌚ What actions do you take?

*Let the participants discuss. Their conclusion should focus on the following:*

*Continue previously mentioned plan. Next assessment at 05:00.*

**At 05:00 you again go to assess FHR:**

Halima still has very frequent and painful contractions. She nearly does not get any time to rest in between contractions. She is vomiting on her kanga and on the floor.

- FHR 105 bpm

⌚ What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

*Mother: ◆ A bit concerned as she might have too strong contractions. We would like to know how frequent and strong contractions are (5 in 10 minutes, each lasting 50 seconds)*

*Baby: ◆ Non-reassuring FHR*

*Labour progress: ◆ According to contractions we expect good progress*

⌚ What actions do you take?

*Let the participants discuss. Their conclusion should focus on the following:*

*Intrauterine resuscitation, maternal vital signs, FHR every 15 minutes Tender, loving care (help Halima to clean up vomit).*

**At 05:10 Halima calls for you:**

Halima appears distressed and in severe and constant pain, located to the uterus. You immediately assess:

- FHR 70 bpm
- Foetal head 5/5 palpable above pelvic brim
- It is difficult to assess contractions
- Cervix dilated 5 cm
- Pulse 105 bpm, BP 115/70 mmHg

- The head cannot be reached

⌚ What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

*Mother: ♦ Constant pain and high pulse*

*Baby: ♦ Foetal distress*

*Labour progress: ♦ Not good*

*We suspect ♦ Uterine rupture*

⌚ What actions do you take?

*Let the participants discuss. Their conclusion should focus on the following:*

*LAPARATOMY NOW, to save both Halima and her baby*

### **Finally, please share this information with the participants:**

In reality, this woman was not seen between 4:30 am and 8:00.

At 8:00 she collapsed in the restroom. She complained of abdominal pain, and her vital signs were: Pulse 96 bpm, BP 60/40 mmHg, no FHR heard, dilatation 5cm.

After waiting for ultrasound examination, which caused additional unnecessary delays (ultrasound was not indicated!), laparotomy was performed at 10:00: Ruptured uterus, fresh stillbirth (3.9kg),


The woman died during surgery.

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### **TAKE HOME MESSAGES**

1. If FHR is assessed every 30-60 minutes, it will not only indicate foetal distress, but also be an early sign in case of maternal morbidities, such as maternal infection or impending uterine rupture.
  2. The typical symptoms of ruptured uterus are tender abdomen, abdominal distension, abnormal shape of uterus, loss of station (foetal head goes up), high maternal pulse, low/absent foetal heart rate, blood in urine, shock and vaginal bleeding. It is more common in women with previous scar, grand multiparous women, and when administering oxytocin/misoprostol.
  3. Always pay attention to the woman's psychological well-being (mood) and pain. Respectful supportive care provides reassurance, decreases the perception of pain, and reduces the need for oxytocin augmentation of labour.
-

## Asia (grand multiparity, meconium, foetal distress, team work, neonatal resuscitation)

 Special focus on pages 5 and 16 of the PartoMa Pocket Guide 2.0

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 Ask one of the participants to record observations on a whiteboard-partograph

### Asia is admitted October 10 at 13:00:

Asia is 37 years old. She is gravida 7, para 6 with 5 living children. She suffered from intrapartum stillbirth in her latest pregnancy. Otherwise, all pregnancies and deliveries have been uncomplicated. Her current pregnancy has been uncomplicated as well.

She seeks care because she feels labour pain is starting. On admission, she appears in good condition. You conduct the admission assessment:

- Longitudinal lie, vertex presentation
- FHR 130 bpm
- Foetal head 3/5 palpable above pelvic brim
- 2 contractions in 10 minutes, each lasting 30 seconds
- Cervix dilated 1 cm, membranes intact
- Pulse 81 bpm, BP 100/85 mmHg
- Temperature 36,8 °C

 What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

*Mother: ◆ Good condition*

*Baby: ◆ Good condition*

*Labour progress: ◆ Latent phase*

 What actions do you take?

*Let the participants discuss. Their conclusion should focus on the following:*

*Respectful supportive care (mental support is particularly important due to previous stillbirth).*

*Routine assessments (look in the PartoMa Pocket Guide together and mention the plan).*

*Start partograph (latent phase).*

*New assessment in 4 hours or when changes occur (for instance, increase in contractions or spontaneous rupture of membranes).*

 Are there any specific risks to consider in Asia's case?

*Let the participants discuss. Their conclusion should focus on the following:*

*Women who previously experienced intrapartum stillbirths or early neonatal deaths are in increased risk for this happening again, and may in addition suffer from increased anxiety.*

*Grand multiparas (parity > 5) have increased risks of maternal and perinatal complications:*

- i. Increased likelihood of malpresentations*
- ii. Increased likelihood of placenta praevia*
- iii. Increased likelihood of uterine rupture (particularly if oxytocin infusion)*
- iv. Increased prevalence of meconium-stained liquor and low Apgar score*

### Asia calls you at 16:30:

Labour pains have increased, and you assess:

- FHR 135 bpm

- Foetal head 3/5 palpable above pelvic brim
- 3 contractions in 10 minutes, each lasting 35 seconds
- Cervix dilated 6 cm, membranes ruptured, thin meconium
- The bones are separated and the sutures can be felt easily (no moulding)
- No localized scalp oedema (no caput succedaneum)
- Pulse 81 bpm, BP 110/90 mmHg

⌚ What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

*Mother: ◆ Good condition*

*Baby: ◆◆ Good condition, but meconium might be an early sign of foetal distress*

*Labour progress: ◆ First stage of active phase*

⌚ What actions do you take?

*Let the participants discuss. Their conclusion should focus on the following:*

*Transfer to alert line on the partograph.*

*Respectful supportive care and routine assessments (look in the PartoMa Pocket Guide together and mention the plan, including when to assess what). FHR at least every 30 minutes, due to meconium.*

**FHR is assessed again at 17:00:**

Asia appears fine.

- FHR 130 bpm

**FHR is assessed again at 17:30:**

Asia complains of increased labour pains.

- FHR 106
- 5 contractions in 10 minutes, each lasting 45 seconds

You decide to perform an extra vaginal examination, as you predict fast labour progress in this grand multiparous woman with frequent and strong contractions:

- Cervix dilated 8 cm, membranes ruptured, still thin meconium
- The bones are separated and the sutures can be felt easily (no moulding)

⌚ What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

*Mother: ◆ Good condition*

*Baby: ◆◆ Non-reassuring FHR*

*Labour progress: ◆ First stage of active phase of labour, good progress*

⌚ What actions do you take?

*Let the participants discuss. Their conclusion should focus on the following:*

*Intrauterine resuscitation (see the PartoMa Pocket Guide), FHR every 15 minutes.*

⌚ What could the causes be to the foetal problem?

*Let the participants discuss. Their conclusion should focus on the following:*

*Too strong contractions?*

*Placenta/uterine problem? (abruptio placenta, uterine rupture)*

*Compression of cord (presentation, position?)  
Maternal hypotension?  
Normal variations in FHR*

**At 17:45:**

Asia is worried. Otherwise, she appears fine, and she has no pain in between contractions. You assess:

- FHR 120 bpm
- Pulse 85 bpm, BP 110/70 mmHg

⌚ What actions do you take?

*Let the participants discuss. Their conclusion should focus on the following:*

*Continue FHR assessments every 15 minutes. Respectful supportive care.*

You are now called to an emergency caesarean section for another patient.

⌚ What actions do you take concerning Asia?

*Let the participants discuss the importance of passing over the patient to a fellow birth attendant.*

**At 19:30:**

You are back from surgery. You realize that your colleague misunderstood your instructions. Asia has not been assessed for nearly 2 hours. Asia has started to push without support from a birth attendant, and you immediately assess her:

- FHR 75 bpm
- Foetal head 0/5 palpable above pelvic brim, crowning
- 5 contractions in 10 minutes, each lasting 50 seconds
- Cervix dilated 10 cm, meconium
- The bones are touching (+ moulding)
- Slight scalp oedema (+ caput succedaneum)

⌚ What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

*Mother: ◆ Good condition*

*Baby: ◆ Foetal distress*

*Labour progress: ◆ Second stage of labour, foetal head is crowning*

⌚ What actions do you take?

*Let the participants discuss. Their conclusion should focus on the following:*

*Head is crowning, and we expect spontaneous delivery in next contraction. However, if not, we prepare for vacuum extraction.*

⌚ Is it a common problem at your maternity unit that patients like Asia are forgotten?

*Let the participants discuss the importance of handing over information on patients, and working as a team*

⌚ What are the risks for babies suffering from foetal distress (the short and long-term complications)?

*Let the participants discuss. Their conclusion should focus on the following:*

*Foetal/neonatal death*

*Long-term disabilities (for instance, cerebral palsy and learning difficulties)*



### **Baby is delivered spontaneously during the next contraction:**

Mother is in good condition. Baby is assessed immediately:

- Blue limbs and pink body, no response to stimulation, no activity, no respiration
- Heart rate 65 bpm

⌚ What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

- ◆ Apgar score 2 in 1 minute

⌚ What actions do you take?

*Let the participants discuss. Their conclusion should focus on the following:*

**IMMEDIATE NEONATAL RESUSCITATION:**

Gently suction mouth and nose (due to meconium)

**VENTILATION BY BAG AND MASK SHOULD BE STARTED WITHIN 1 MINUTE (the golden minute)**

👏 Hands-on training of neonatal resuscitation, by mannequin-baby + bag-mask ventilation.

### **5 minutes after delivery (and 4 minutes after starting resuscitation):**

- Blue limbs and pink body, grimace when stimulated, some flexion, weak respiration
- Heart rate 130 bpm

⌚ What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

- ◆ Apgar score 6 in 5 minutes

⌚ What actions do you take?

*Let the participants discuss. Their conclusion should focus on continuing ventilation support*

### **8 minutes after delivery, the baby starts to cry:**

The Apgar score is 9 in 10 minutes, and the baby is now monitored lying on Asia's chest.

- Apgar score 10 in 15 minutes
- Birth weight 3250 gram

The baby stays skin-to-skin with Asia and starts breastfeeding within 30 minutes after delivery. Both Asia and her baby are doing well on discharge 2 days later.


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### **TAKE HOME MESSAGES**


1. Grand multiparas (parity of more than 5) are at increased risk for malpresentation, placenta previa, meconium, and low Apgar score
2. When FHR is below 100 bpm, you reassess after only 5 minutes. If not improved, you plan for expedite delivery (caesarean section or vacuum extraction).

3. If baby is not breathing, IMMEDIATE BAG-MASK VENTILATION should be started within 1 minute (THE GOLDEN MINUTE). This can save the baby from death or life-long disabilities (for example cerebral palsy or learning difficulties)
  4. TEAM WORK is extremely important to assure surveillance of the women in labour.'
  5. A low Apgar score might indicate minimal or bigger brain damage, which cannot be assessed fully until years later.
-

## Tabia (poor progress with poor uterine activity and oxytocin titration)

 *Special focus on page 7 of the PartoMa Pocket Guide 2.0*

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 Ask one of the participants to record observations on a whiteboard-partograph


### Tabia is admitted 8<sup>th</sup> May at 15:00:

Tabia is 19 years old. She is gravida 1 para 0, and her pregnancy has been uncomplicated.

On admission, she appears to have painful and frequent contractions. She is crying and asking if her sister can be with her. The following assessments are done:


- Longitudinal lie, vertex presentation
- FHR 130 bpm
- Foetal head 4/5 palpable above pelvic brim
- 3 contractions in 10 minutes, each lasting 25 seconds
- Cervix dilated 5 cm, ruptured membranes for 2 hours, clear amniotic fluid
- The bones are separated and the sutures can be felt easily (no moulding)
- No localized scalp oedema (no caput succedaneum)
- Pulse 90 bpm, BP 115/80 mmHg
- Temperature 36,7 °C

Today, there are many women in labour, and Tabia is asked to lie down in a bed, where another woman is already lying with painful contractions.

 What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

*Mother:  Good condition*

*Baby:  Good condition*

*Labour progress:  First stage of active phase of labour*

 What actions do you take?

*Let the participants discuss. Their conclusion should focus on the following:*

*Respectful supportive care and routine assessments (look in the PartoMa Pocket Guide together and mention the plan).*

*Discuss if a relative could be invited to the maternity unit as birth companion for continual support.*

*Start partograph on alert line.*

### During the next 4 hours, FHR is assessed 3 times:

- FHR ranges 130-150 bpm

### Tabia is assessed again at 19:00:

Tabia is lying in a corner of the bed. The other woman in her bed has strong contractions. Tabia is in pain too and she is concerned whether everything is okay.

- FHR 140 bpm
- Foetal head 4/5 palpable above pelvic brim
- 3 contractions in 10 minutes, each lasting 20 seconds
- Cervix dilated 7 cm, clear amniotic fluid
- Pulse 85 bpm, BP 115/70 mmHg
- The bones are separated and the sutures can be felt easily (no moulding)

- No localized scalp oedema (no caput succedaneum)

⌚ What is your interpretation?

Let the participants discuss. Their conclusion should focus on the following:

Mother: ◆ Good condition

Baby: ◆ Good condition

Labour progress: ◆ First stage of active phase, slow progress, between alert and action lines

⌚ What actions do you take?

Let the participants discuss. Their conclusion should focus on the following:

1. Discuss 5 Ps to explore why the progress is poor (use the PartoMa Pocket Guide):

Power: Suboptimal uterine activity

Pass urine: She has not passed urine in the last 2 hours

Psychology: She is anxious

Passenger: Assess presentation and position (cephalic presentation, occiput anterior position)

Pelvis: A rare problem. Other factors should be managed before considering this

2. It appears to be a power problem, and full bladder and anxiety might be causes.

Therefore, artificial rupture of membranes (head is engaged), ambulation, eat and drink, pass urine, reassuring and respectful caring support

REMEMBER: OXYTOCIN IS NOT INDICATED BEFORE THE ACTION LINE

3. Routine assessments with FHR every 30 minutes, and next vaginal examination in 2 hours (as the alert line is crossed)

**During the next 2 hours, FHR is assessed 2 times:**

- FHR ranges 130-140 bpm

**Tabia is assessed again at 21:00:**

Tabia is still lying in the bed.

- FHR 130 bpm
- Foetal head 3/5 palpable above pelvic brim
- 2 contractions in 10 minutes, each lasting 25 seconds
- Cervix dilated 7 cm, clear amniotic fluid
- The bones are separated and the sutures can be felt easily (no moulding)
- No localized scalp oedema (no caput succedaneum)

⌚ What is your interpretation?

Let the participants discuss. Their conclusion should focus on the following:

Mother: ◆ Good condition

Baby: ◆ Good condition

Labour progress: ◆ First stage of active phase, poor progress (on the action line)

⌚ What actions do you take?

Let the participants discuss. Their conclusion should focus on the following:

1. Discuss 5 Ps to explore why the progress is poor (use the PartoMa Pocket Guide):

Power: Poor uterine activity

Pass urine: She has not passed urine in the last 2 hours (urination 2 hours ago)

Psychology: She still appears anxious

*Passenger: Assess presentation and position (cephalic presentation, occiput anterior position)*

*Pelvis: A rare problem. Other factors should be managed before considering this*

2. *It still appears to be a power problem. Therefore, empty bladder and start oxytocin augmentation: 2,5 IU in 500 ml Ringer's Lactate or Normal Saline (see the PartoMa Pocket Guide):*

*Remember the risks of oxytocin (foetal distress and uterine rupture).*

*Therefore, assessment of FHR and contractions every 15 minutes). This is extremely important!*

*Plan for oxytocin titration*

3. *Encourage the woman to stand up next to the bed with the IV infusion*
4. *Next vaginal examination after 2 hours*

### **At 21:30:**

Tabia is now standing next to the bed.

- FHR 125 bpm
- 3 contractions in 10 minutes, each lasting 35 seconds
- Urine volume: She has been to the toilet
- Oxytocin in normal saline: 10 drops per minute

⌚ What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

*Mother: ◆ Good condition*

*Baby: ◆ Good condition*

*Labour progress: ◆ First stage of active phase, poor progress, still insufficient power of contractions*

⌚ What actions do you take?

*Let the participants discuss. Their conclusion should focus on the following:*

*Oxytocin titration: increase with 5 drops per minute*

*Respectful caring support*

*Assess FHR, contractions and drops per minute every 15 minutes*

### **At 22:00:**

Tabia is still standing next to the bed.

- FHR 128 bpm
- 4 contractions in 10 minutes, each lasting 40 seconds
- Oxytocin in normal saline: 15 drops per minute

⌚ What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

*Mother: ◆ Good condition*

*Baby: ◆ Good condition*

*Labour progress: ◆ First stage of active phase, poor progress (action line), but now 4 strong contractions in 10 minutes*

⌚ What actions do you take?

*Let the participants discuss. Their conclusion should focus on the following:*

*Continue oxytocin dosage of 15 drops per minute, and assess the patient every 15 minutes (FHR, contractions).*

*Next vaginal examination at 22:30.*

**At 22:30:**

Tabia is still standing next to the bed.

- FHR 135 bpm
- 4 contractions in 10 minutes, each lasting 45 seconds
- Oxytocin in normal saline: 15 drops per minute

⌚ What actions do you take?

*Let the participants discuss. Their conclusion should focus on the following:*

*Continue oxytocin dosage of 15 drops per minute, and assess the patient every 15 minutes (FHR, contractions).*

*Next vaginal examination at 23:00.*

**At 23:00:**

Tabia is complaining of strong contractions now. You assess:

- FHR 108 bpm
- Foetal head 3/5 palpable above pelvic brim
- 5 contractions in 10 minutes, each lasting 55 seconds
- Cervix dilated 9 cm, meconium
- The bones are just touching each other (+ moulding)
- Slight scalp oedema (+ caput succedaneum)
- Oxytocin in normal saline: 15 drops per minute

⌚ What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

*Mother: ◆ ◆ Good condition, but very strong contractions*

*Baby: ◆ Non-reassuring FHR*

*Labour progress: ◆ ◆ Good progress, slope is following the action line.*

⌚ What actions do you take?

*Let the participants discuss. Their conclusion should focus on the following:*

*STOP OXYTOCIN*

*Intrauterine resuscitation (see the PartoMa Pocket Guide)*

*Assess FHR again after 15 minutes*

Tabia continues to have strong contractions without more oxytocin, and FHR stays between 105 and 120.

**At 23:35 Tabia delivers:**

- Apgar score 7 in 1 minute and 10 in 5 minutes.
- Birth weight 3800g.

Tabia and her daughter are both doing well on discharge the next morning.


⌚ What information do you give to all women on discharge after childbirth?

*Let the participants discuss, and look in the PartoMa Pocket Guide together.*


## TAKE HOME MESSAGES

1. Anxiety may lead to a bad birth experience – it causes the woman to suffer more from labour pains and it may decrease the body's oxytocin production and thereby cause poor progress of labour. Respectful supportive care provides reassurance, decreases the perception of pain, and enhance labour.
  2. Artificial rupture of membranes, ambulation, pass urine, psychological support and eat&drink are often effective and safe ways to enhance labour and should be tried prior to starting the more risk-associated oxytocin augmentation (especially in yellow zone).
  3. Oxytocin can cause uterine hyperstimulation, and drops per minute, contractions and FHR should be monitored EVERY 15 MINUTES to assure optimal dosage.
-

## Zuwena (antepartum haemorrhage, foetal death, severe pre-eclampsia)

 *Special focus on pages 5, 8 and 14 of the PartoMa Pocket Guide 2.0*

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 Ask one of the participants to record observations on a whiteboard-partograph. Also have observation and treatment sheets for hypertensive disorders ready.

### **Zuwena is admitted 2<sup>nd</sup> February at 08.00:**


Zuwena is 34 years old. She is gravida 2, para 1. According to last menstrual period, gestational age is 37 weeks.

She appears tired and pale on admission. She is complaining of vaginal bleeding.

During admission, the following is recorded by another birth attendant:

- Previous obstetric history: She doesn't remember
- Cervix soft, 2 cm dilated
- Slight contractions
- FHR not heard

Zuwena is then referred to a bed in the post-delivery room for assessment after 4 hours or if changes occur.


 What do you think of this initial management?

*Let the participants discuss – they should consider the following:*

1. *Unacceptable quality of admission assessment (for instance, no maternal vital signs) and possible reasons for that?*
2. *Vaginal bleeding (APH) – and anaemia? Discuss causes to APH (see the PartoMa Pocket Guide). Vaginal examination should not have been done, due to the risk of placenta praevia as cause to APH*
3. *The problem of having critically ill patients in a room where surveillance is little.*
4. *Foetal heart rate not heard. What action should have been initiated? (see the PartoMa Pocket Guide). The discussion should include confirmation of absent FHR.*

### **Zuwena is calling for help at 10:00:**

You hear Zuwena calling for help and you attend to her. She has abdominal pain.

 What do you assess?

*Let the participants discuss – they should consider the following:*

- *Amount of fresh vaginal bleeding (APH). Approximate blood loss since admission is at least 600ml.*
- *Pulse 88 bpm, BP 180/110 mmHg*
- *RR: 20 breaths per minute*
- *GCS: 15/15*
- *Lungs: clear*
- *Urine: protein 3+*
- *Temperature: 37.2 °C*
- *FHR not recordable*
- *Uterus: Tender in between contractions. 4 strong contractions in 10 minutes*
- *Membranes intact*
- *Urgent ultrasound to exclude placenta praevia (if time allows for it): Placenta was found in the fundus, and intrauterine foetal death confirmed. Vaginal examination was then done: Cervix 7 cm, foetal head 4/5 palpable above pelvic brim. Membranes intact.*



⌚ What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

*Mother: ♦ Severe pre-eclampsia, APH, possibly abruptio placenta. At the moment, haemodynamic stable.*

*Baby: ♦ Possibly intrauterine foetal death due to abruptio placenta.*

*Progress: ♦ First stage of active phase of labour.*

⌚ What actions do you take?

*Let the participants discuss. Their conclusion should focus on the following:*

*2 big cannulas*

*Blood sample for haemoglobin, blood grouping and X-matching (urgent)*

*Plan for monitoring and treatment of severe hypertensive disorders, supported by PartoMa Pocket Guide - including:*

- *Magnesium sulphate*
- *Antihypertensive treatment (for instance, hydralazine)*
- *Enhance labour progression (rupture of membranes if possible)*
- *Assessment plan, including observation and treatment sheets for hypertensive disorders*
- *Start partograph*
- *Delivery within 12 hours*
- 

**At 11:00:**

Zuwena's stillborn baby is delivered vaginally.

- *Pulse 88 bpm, BP 105/70 mmHg*
- *Estimated blood loss: 1500 ml (and possibly more before admission)*
- *Uterus atonic*

⌚ What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

*♦ POST-PARTUM BLEEDING*

⌚ What actions do you take?

*Let the participants discuss the immediate management of post-partum bleeding, in accordance with PartoMa Pocket Guide.*

👏 If time, scenario training of managing postpartum bleeding, with 3 participants stationed around an imaginary patient.

After 10 minutes of urgent management of postpartum bleeding, the bleeding decreases. Zuwena receives 2 units of blood.

⌚ What should the post-partum plan include?

*Let the participants discuss. Their conclusion should focus on the following:*

- 1. Control Hb and possibly additional blood transfusion*
- 2. Observation of patient every 15 minutes: Bleeding, BP, P, RR (see the PartoMa Pocket Guide)*
- 3. Continue magnesium sulphate for 24 hours (see PartoMa Pocket Guide)*


Two days later, Zuwena is discharged in a good physical condition, but in grief after losing her child.

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## TAKE HOME MESSAGES

1. Blood pressure and pulse is crucial for ALL women on admission in labour
  2. Both antepartum haemorrhage and severe pre-eclampsia need IMMEDIATE management during labour, in accordance with clinical guidelines
  3. The common dangerous causes of vaginal bleeding in late pregnancy or in labour (APH) are abruptio placenta, ruptured uterus and placenta praevia.
  4. Risks of both antepartum and postpartum haemorrhage are increased in women with hypertensive disorders
  5. For the management of post-partum bleeding, you should be at least 3 people: one provides CONTINUAL UTERINE MASSAGE and check the 4 Ts, while the others take care of head and arms, respectively. Shout for help if necessary, and never leave the woman alone.
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## Sabra (slow labour progress, vaginal breech delivery)

 *Special focus on pages 7 and 10 of the PartoMa Pocket Guide 2.0*


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 Ask one of the participants to record observations on a whiteboard-partograph

### Sabra is admitted 16<sup>th</sup> June at 15:00:

Sabra is 24 years old. She is gravida 2, para 1. Her previous pregnancy and delivery were uncomplicated, and her current pregnancy has been uncomplicated as well. On admission she seems to have painful contractions, but in between she is calm. You conduct the admission assessment:

- FHR 130 bpm
- Foetal head 4/5 palpable above pelvic brim
- 3 contractions in 10 minutes, each lasting 20 seconds
- Cervix dilated 4 cm, intact membranes
- Pulse 90 bpm, BP 120/80 mmHg
- Temperature 36,7 °C

 What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

*Mother: ◆ Good condition*

*Baby: ◆ Good condition*

*Progress: ◆ First stage of active phase of labour.*

 What actions do you take?

*Let the participants discuss. Their conclusion should focus on the following:*

*Respectful supportive care and routine assessments (look in the PartoMa Pocket Guide together and mention the plan).*

*Start partograph on alert line.*

### During the next 4 hours, FHR is not assessed.

 Is this a problem? Why is it important to assess FHR every ½-1 hour?


*Let the participants discuss. Their conclusion should focus on the following:*

*When women are admitted with a foetal heart heard, it is our responsibility to assure that they are born alive. In addition, FHR abnormalities may also be an early sign of maternal conditions (for instance, maternal infection or impending uterine rupture).*

### Sabra is assessed again at 19:00:

Sabra is lying in the bed nearly sleeping.

- FHR 140 bpm
- Foetal head 4/5 palpable above pelvic brim
- 2 contractions in 10 minutes, each lasting 20 seconds
- Cervix dilated 6 cm, intact membranes
- Pulse 85 bpm, BP 115/70 mmHg
- The foetal bones/caput and sutures cannot easily be felt

 What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

*Mother: ◆ Good condition*

*Baby: ◆ Good condition*

*Labour progress: ◆ First stage of active phase, slow progress, between alert and action lines*

⌚ What actions do you take?

*Let the participants discuss. Their conclusion should focus on the following:*

1. *Discuss 5 Ps to explore why the progress is poor (use the PartoMa Pocket Guide):*
  - Power: Slow uterine activity*
  - Pass urine: She has not passed urine in the last 2 hours*
  - Psychology: She complains of being tired. Doesn't appear anxious*
  - Passenger: Assess presentation and position: UNDISCOVERED BREECH PRESENTATION!*
  - Pelvis: A rare problem. The other factors should be managed before considering this*
2. *We need to know more about the breech presentation:*
  - It is a 'frank breech' (hips flexed, knees extended) with estimated birth weight 3000g (last pregnancy: SVD at term)*
3. *Plan for vaginal delivery*
4. *Artificial rupture of membranes (buttocks are engaged), ambulation, eat & drink, pass urine, psychological support. OXYTOCIN IS NOT INDICATED BEFORE THE ACTION LINE.*
5. *Routine assessments with FHR every 30 minutes, and next vaginal examination in 2 hours (as the alert line is crossed)*

⌚ What do we fear in vaginal breech delivery?

*Let the participants discuss. Their conclusion should focus on the following:*

*Vaginal breech delivery is a more complicated birth, because the largest part of the baby is last to be delivered and in some cases this may be difficult. Therefore, it is crucial to be familiar with how to deliver breech.*  
*Important: practice with a colleague how to assist a breech delivery, so that you are ready!*

### **The FHR is assessed 3 times within the next 2 hours:**

Sabra is walking around. She has passed urine and taken food and drinks. The contractions appear to have increased.

- FHR ranges 135-150 bpm

### **Sabra is assessed at 21:00:**

Sabra is now standing next to the bed and complains of strong contractions.

- FHR 140 bpm
- Buttocks 3/5 palpable above pelvic brim
- 4 contractions in 10 minutes, each lasting 35 seconds
- Cervix dilated 9 cm, thin meconium-stained amniotic fluid

⌚ What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

*Mother: ♦ Good condition*

*Baby: ♦ Good condition (meconium in breech delivery is normal)*

*Labour progress: ♦ First stage of active phase, now reassuring progress (slope is parallel to the alert line)*

⌚ What actions do you take?

*Let the participants discuss. Their conclusion should focus on the following:*

*Prepare for birth with an experienced attendant to assist vaginal breech delivery*

**At 22:00:**

Cervix is fully dilated, and after 30 minutes, the buttocks are on the pelvic floor.

👏 Hands-on training by mannequins of vaginal breech delivery, and following the PartoMa Pocket Guide

**At 22:45 Sabra delivers:**

- Apgar score 7 in 1 minute and 10 in 5 minutes.
- Birth weight 3350 gram


Sabra and her baby are both well on discharge the next day.

---


**TAKE HOME MESSAGES**

1. Vaginal breech delivery is a more complicated birth, as the largest part of the baby is last to be delivered. Therefore, practice how to assist the delivery on a mannequin beforehand.
  2. Particularly if previous vaginal delivery **AND** no previous caesarean section **AND** no footling breech **AND** estimated birthweight below 4 kilogram **AND** a health provider experienced with the procedure, vaginal breech delivery is preferred for the safety of mother and baby.
  3. Artificial rupture of membranes, ambulation, pass urine, respectful caring support and eat&drink are effective and safe ways to enhance labour and should be tried prior to starting the more risk-associated oxytocin augmentation.
-

## Rukia (pre-labour rupture of membranes, fever, induction of labour)

 *Special focus on pages 6 and 9 of the PartoMa Pocket Guide 2.0*

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 Ask one of the participants to record observations on a whiteboard-partograph

### **Rukia is admitted 2nd February at 10.00:**

Rukia appears tired on admission. She is Gravida 4 Para 2.

According to Rukia, she has not had any problems during pregnancy. She is at term. Previously, she has had one early miscarriage. Otherwise, her previous pregnancies were uncomplicated with uncomplicated vaginal deliveries. She seeks care as labour pain is starting.

 What do you imagine that Rukia is thinking when entering the maternity ward?

*Please Let the participants discuss. The importance of feeling noticed, accepted, and safe should be mentioned.*

During the initial examination, you find:

- Longitudinal position, vertex presentation
- FHR 165 bpm
- Cervix 1 cm dilated
- Foetal head 5/5 palpable above pelvic brim
- 2 contractions in 10 minutes, each lasting 15 seconds
- Clear amniotic fluid
- Pulse 102 bpm, BP 135/85 mmHg

 What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

*Mother: ◆ High pulse*

*Baby: ◆ Non-reassuring FHR*

*Labour progress: ◆ Latent phase of labour*

*We need more information on:*

*How long time since rupture of membranes? (leakage for 1½ day)*

*Temperature (38.8 °C)*

 What actions do you take?

*Let the participants discuss. Their conclusion should focus on the following (see PartoMa):*

*Antibiotics and paracetamol*

*Plan for delivery within 12 hours by induction of labour*

*Start partograph (latent phase)*

### **During the next 4 hours, FHR and maternal pulse is assessed twice:**

- FHR 160 and 155 bpm
- Pulse 90 and 85 bpm

### **At 14:00:**

Rukia is having strong contractions now. She is resting in between.

- You find the following:
- FHR 150 bpm
- Cervix dilated 7 cm

- Foetal head 3/5 palpable above pelvic brim
- The bones are separated and the sutures can be felt easily (no moulding)
- No localized scalp oedema (no caput succedaneum)
- 4 contractions in 10 minutes, each lasting 45 seconds
- Slight meconium
- Pulse 85 bpm, BP 120/80 mmHg
- Temperature 38,2 °C

⌚ What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

*Mother: ◆ Physical condition improved*

*Baby: ◆ Condition improved, normal FHR*

*Labour progress: ◆ First stage of active phase*

⌚ What actions do you take?

*Let the participants discuss. Their conclusion should focus on the following:*

*Continue treatment plan and monitoring closely*

*Transfer to alert line on partograph*

**At 15:40:**

Spontaneous vaginal delivery.

- Apgar score 7 in 5 min
- Birth weight 2900 g

Normal maternal vital signs and good clinical condition

⌚ What are our immediate plans for post-delivery care?

*Let the participants discuss. Their conclusion should focus on the following:*

*Standard post-partum plan (see PartoMa Pocket Guide)*

*Careful assessment of maternal vital signs (continuous infection?)*


*Careful assessment of neonatal condition (neonatal sepsis?).*

---


## TAKE HOME MESSAGES

1. PROM and fever during childbirth are highly dangerous for mother and child
  2. Remember antibiotics and paracetamol
  3. High FHR may be a sign of maternal infection
  4. PROM with infection is indication for labour induction and immediate delivery
-

## Raya (previous caesarean section, trial of scar, episiotomy)

 *Special focus on pages 4 and 13 of the PartoMa Pocket Guide 2.0*

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 Ask one of the participants to record observations on a whiteboard-partograph

### Raya is admitted 10<sup>th</sup> October at 22:00:



Raya is 30 years old. She is gravida 3 para 2 (living 2), and her pregnancy has been uncomplicated. Her last delivery was 3 years ago, where she had a caesarean section due to foetal distress

On admission, she is in a good condition. Raya seeks care due to labour pain. You assess the following:


- Longitudinal lie, vertex presentation
- FHR 135 bpm
- Foetal head 3/5 palpable above pelvic brim
- Cervix dilated 2 cm
- 3 contractions in 10 minutes, each lasting 20 seconds
- Membranes intact
- The bones are separated and the sutures can be felt easily (no moulding)
- No localized scalp oedema (no caput succedaneum)
- Pulse 78 bpm, BP 130/88 mmHg
- Temp. 36,8 °C


 What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

*Mother:   Good condition, 1 previous scar*

*Baby:  Good condition*

*Labour progress:  Latent phase*

 What actions do you take?

*Let the participants discuss. Their conclusion should focus on the following:*

*Admit for observation in latent phase*

*Special concerns for women with one previous caesarean section:*

- FHR every 15-30 min throughout active labour
- Follow labour progress closely
- Do **not** use Misoprostol or Oxytocin


*Respectful supportive care and routine assessments (look in the PartoMa Pocket Guide together and mention the plan).*

*Start partograph (latent phase)*

### At 01:00:

Raya calls you. She feels that the contractions are strong now, and she is nervous about her lower abdominal pain. You assess:

- FHR 132 bpm
- Foetal head 3/5 palpable above pelvic brim
- Cervix dilated 5 cm
- 4 contractions in 10 minutes, each lasting 30 seconds *No pain in between contractions and it seems to be normal labour pain.*
- Membranes intact
- The bones are separated and the sutures can be felt easily (no moulding)
- No localized scalp oedema (no caput succedaneum)

 What is your interpretation?



Let the participants discuss. Their conclusion should focus on the following:

Mother: ◆◆ Good condition, 1 previous scar

Baby: ◆ Good condition

Labour progress: ◆ First stage of active phase of labour, good progress

⌚ What actions do you take?

Let the participants discuss. Their conclusion should focus on the following:

Respectful supportive care and routine assessments (look in the PartoMa Pocket Guide together and mention the plan).

Transfer to alert line on the partograph.

During the next 4 hours, Raya is monitored routinely. FHR is in the interval 125-135, and contractions remains like at 01:00.

**At 05:00:**

Raya is tired. She is lying in the bed dozing between contractions. You now assess the following:

- FHR 140 bpm
- Foetal head 3/5 palpable above pelvic brim
- Cervix dilated 7 cm
- 3 contractions in 10 minutes, each lasting 30 seconds
- Membranes intact
- Pulse 80 bpm, BP 115/80 mmHg
- The bones are separated and the sutures can be felt easily (no moulding)
- No localized scalp oedema (no caput succedaneum)

⌚ What is your interpretation?

Let the participants discuss. Their conclusion should focus on the following:

Mother: ◆◆ Good condition, 1 previous scar

Baby: ◆ Good condition

Labour progress: ◆ First stage of active phase, slow progress, between alert and action lines

⌚ What actions do you take?

Let the participants discuss. Their conclusion should focus on the following:

1. Discuss 5 Ps to explore why the progress is poor (use the PartoMa Pocket Guide):

Power: suboptimal uterine activity

Pass urine: She has not passed urine in the last 2 hours

Psychology: She is anxious

Passenger: Assess presentation and position (cephalic presentation, occiput anterior position)

Pelvis: A rare problem. Other factors should be managed before considering this

2. It appears to be a power problem, and full bladder and anxiety might be causes.

Therefore, artificial rupture of membranes (head is engaged), ambulation, eat and drink, pass urine, reassuring and respectful caring support

REMEMBER: OXYTOCIN IS CONTRA-INDICATED WHEN PREVIOUS SCAR

3. Routine assessments with FHR every 30 minutes, and next vaginal examination in 2 hours (as the alert line is crossed)

**During the next 2 hours, FHR is assessed 2 times:**

- FHR ranges 130-135 bpm

**At 07:00:**

Raya is complaining of strong labour pain. She is feeling urge to push.

- FHR 108 bpm
- Foetal head 1/5 palpable above pelvic brim
- Cervix fully dilated
- 4 contractions in 10 minutes, each lasting 45 seconds
- Clear amniotic fluid
- The bones are separated and the sutures can be felt easily (no moulding)

⌚ What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

*Mother: ◆◆ Good condition, 1 previous scar*

*Baby: ◆ Non-reassuring FHR*

*Labour progress: ◆ Good progress, second stage of labour*

⌚ What actions do you take?

*Let the participants discuss. Their conclusion should focus on the following:*

*Referral to delivery room*

*Continual attendance of the patient with FHR assessment after each contraction*

*As the FHR is non-reassuring, change position and start IV Ringers Lactate*

*Make sure to have delivery set and ambu-bag ready for all deliveries*

**At 07:15:**

You are attending Raya continually in the delivery room, and she is now pushing. Now you assess the following:

- FHR 104 bpm
- Foetal head 0/5 palpable above pelvic brim
- Cervix dilated 10 cm
- 4 contractions in 10 minutes, each lasting 45 seconds

⌚ What is your interpretation?

*Let the participants discuss. Their conclusion should focus on the following:*

*Mother: ◆◆ Good condition, 1 previous scar*

*Baby: ◆ Non-reassuring FHR*

*Labour progress: ◆ Second stage, pushing*

⌚ What actions do you take?

*Let the participants discuss. Their conclusion should focus on the following:*

*Call assistance, and ask to make vacuum extractor ready (just in case)*

*Change position of the mother*

*Assess FHR again after next contraction*

After next contraction:

- The head is crowning
- FHR 90 bpm

⌚ Should we now do episiotomy?

*Let the participants discuss. Their conclusion should focus on the following:*

*No, episiotomy IS NOT routinely indicated.*

**Raya now delivers:**

- Apgar score 5 in 1 minute, 9 in 5 minutes and 10 in 10 minutes
- Birth weight 3400 g

Raya and her baby are discharged after 8 hours, both in a good condition

---

**TAKE HOME MESSAGES**

1. Special management of women with one previous caesarean section include: FHR every 15-30 min throughout active labour; follow labour progress closely; do **not** use Misoprostol or Oxytocin; carefully monitor contractions; be alert to constant pain, which could point towards rupture of the scar
  2. Episiotomy should not be practiced routinely.
-

## Triage station

These seven partograph cases should be laminated in A3 size, for reuse at reoccurring seminars. They each represent a bed in the maternity ward.



Four cases are needed for the triage station, which may be freely selected among the 8 cases.

The story telling begins: *"It is night at the maternity ward, and you are 1 nurse-midwife and 1 doctor taking care of these 4 labouring women. At 3 o'clock, you assess each of them..."*

Diagnosis and treatment are then discussed for each case by asking the three questions:

1. How is the mother? 2. How is the baby? 3. How is progress of labour?

Each case is then given an overall colour, for instance by colored post-its, which summarizes the level of urgency (◆ Uncomplicated; ◆ Warning; ◆ Danger).

Afterwards, management is prioritized among the four cases. This is done at both time points: 3:00 and 5:00 hours.

### The topics are here presented:

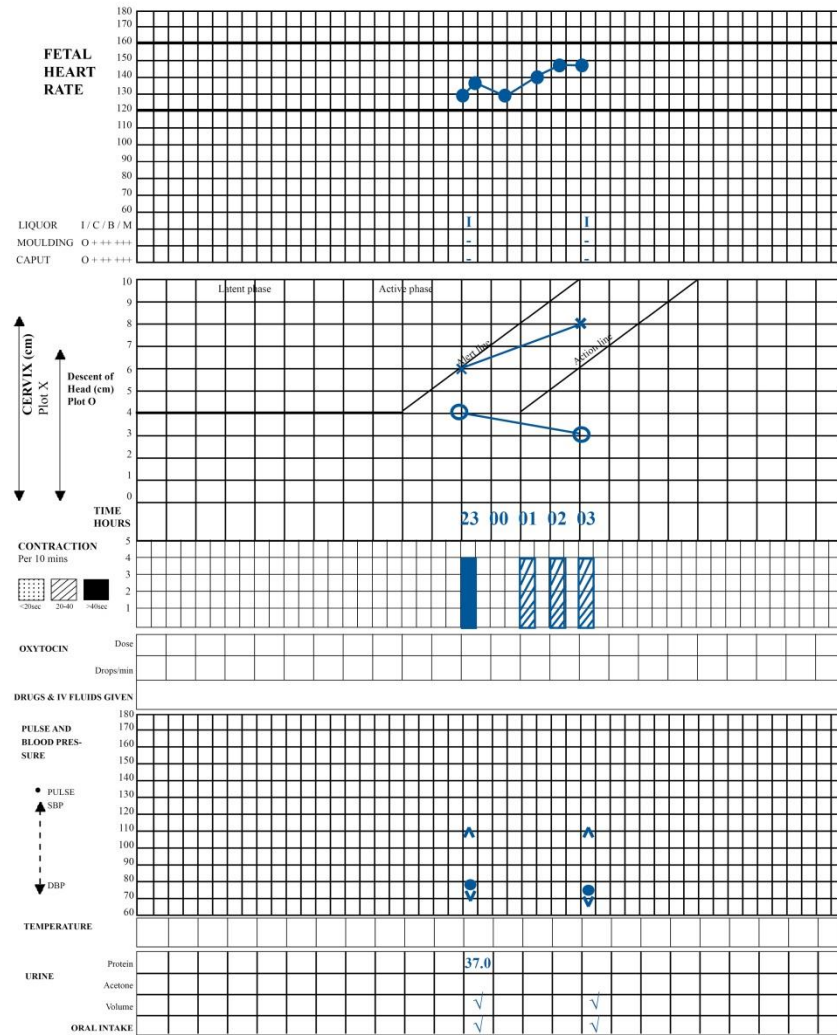
- Zainab:
- At 3:00: ◆ Slow progress in first stage active phase  
*Discuss management in accordance with page 7 of PartoMa Pocket Guide 2.0.*
  - At 5:00: ◆ Normal second stage of labour  
*Discuss management in accordance with page 3 of PartoMa Pocket Guide 2.0.*
- Aisha (page):
- At 3:00: ◆ Prolonged labour in first stage active phase (crossed action line with ruptured membranes)  
*Discuss management in accordance with page 7 of PartoMa Pocket Guide 2.0.*
  - At 5:00: ◆ Foetal distress  
*Discuss management in accordance with page 5 of PartoMa Pocket Guide 2.0.*
- Zuhura (page):
- At 3:00: ◆ Mild-moderate pre-eclampsia  
*Discuss management in accordance with page 8 of PartoMa Pocket Guide 2.0.*
  - At 5:00: ◆ Severe pre-eclampsia  
*Discuss management in accordance with page 8 of PartoMa Pocket Guide 2.0.*

- Catherine (page):  
At 3:00: ◆ Postpartum, 10 minutes after birth  
*Discuss management in accordance with page 4 of PartoMa Pocket Guide 2.0.*  
At 5:00: ◆ Postpartum bleeding (PPH)  
*Discuss management in accordance with page 15 of PartoMa Pocket Guide 2.0.*
- Alyona (page):  
At 3:00: ◆ Foetal distress  
*Discuss management in accordance with page 5 of PartoMa Pocket Guide 2.0.*  
As Alyona's FHR is 80 bpm after 5 minutes, she goes for caesarean section. Therefore, Salma is the new patient in the bed.
- Salma (page):  
At 5:00: ◆ Intrapartum fever  
*Discuss management in accordance with page 9 of PartoMa Pocket Guide 2.0.*
- Barbara (page):  
At 3:00: ◆ Slow progress in first stage active phase  
*Discuss management in accordance with page 7 of PartoMa Pocket Guide 2.0.*  
At 5:00: ◆ Prolonged labour in first stage active phase (crossed action line with signs of obstruction)  
*Discuss management in accordance with page 7 of PartoMa Pocket Guide 2.0.*
- Diana (page):  
At 3:00: ◆ Normal second stage of labour  
*Discuss management in accordance with page 3 of PartoMa Pocket Guide 2.0.*  
At 5:00: ◆ Prolonged second stage with foetal distress  
*Discuss management in accordance with pages 7 and 12 (vacuum extraction) of PartoMa Pocket Guide 2.0.*

Zainab, 23 years  
Gravida 1, para 0



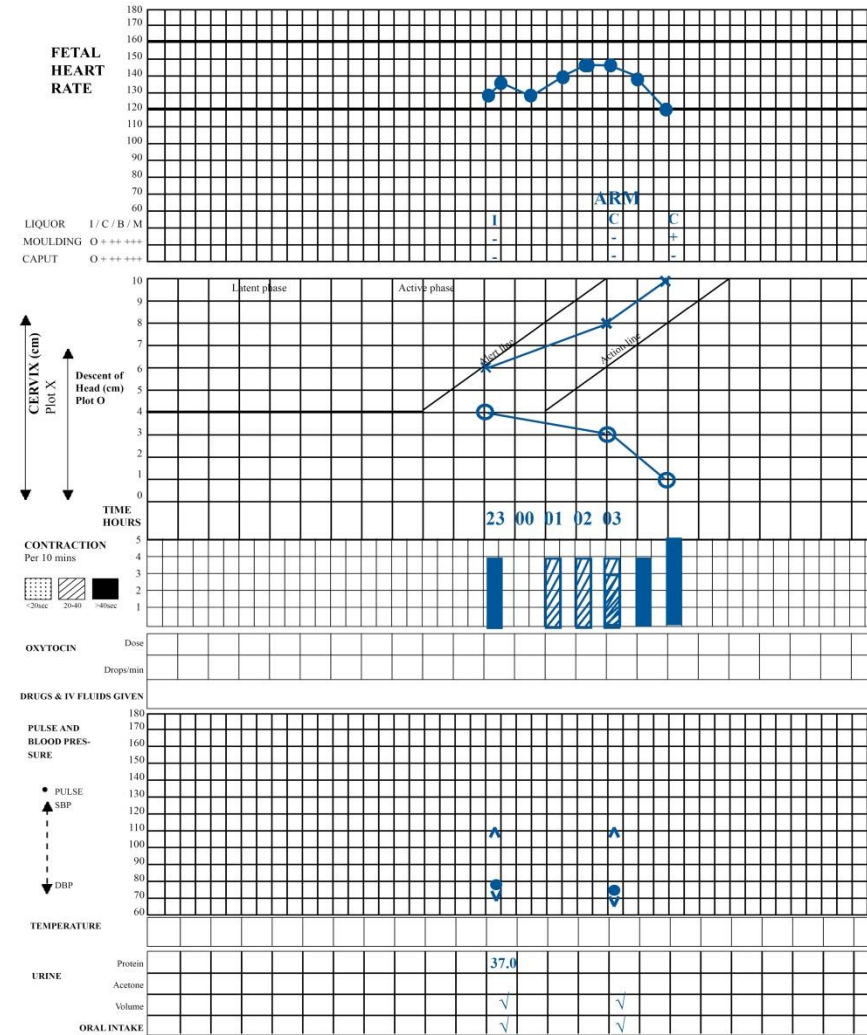
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Zainab, 23 years  
Gravida 1, para 0



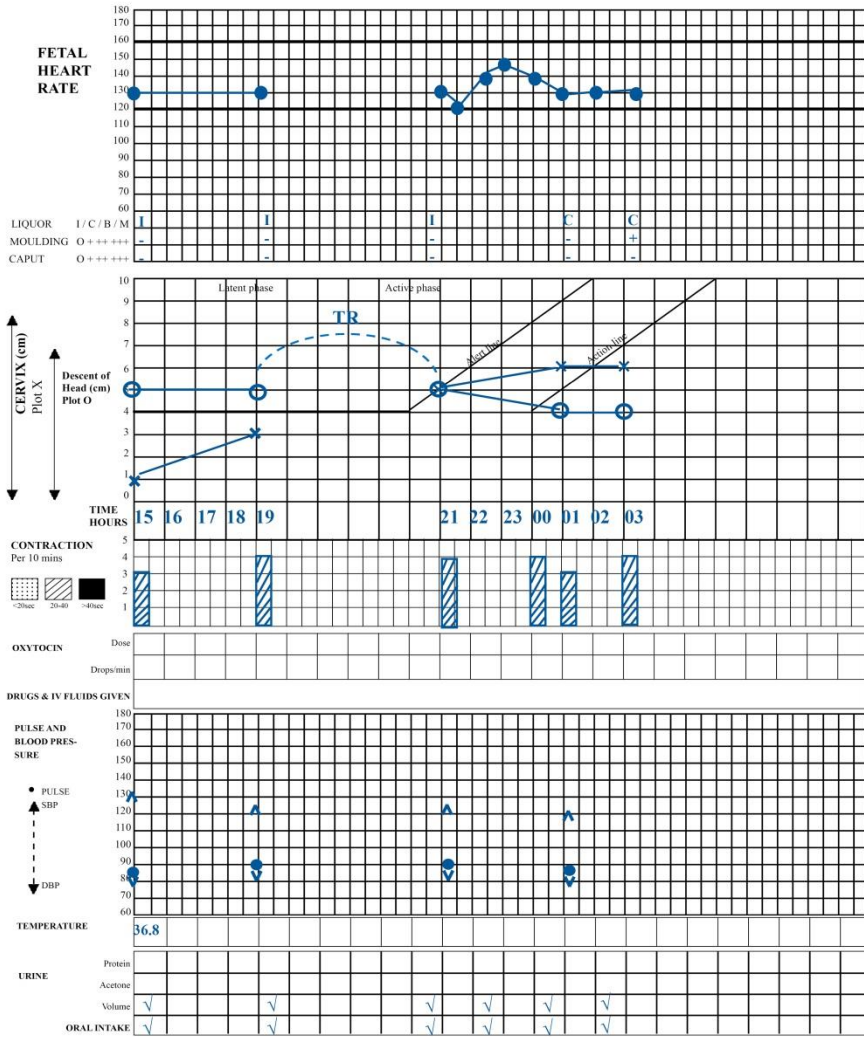
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Aisha, 25 years  
Gravida 1, para 0



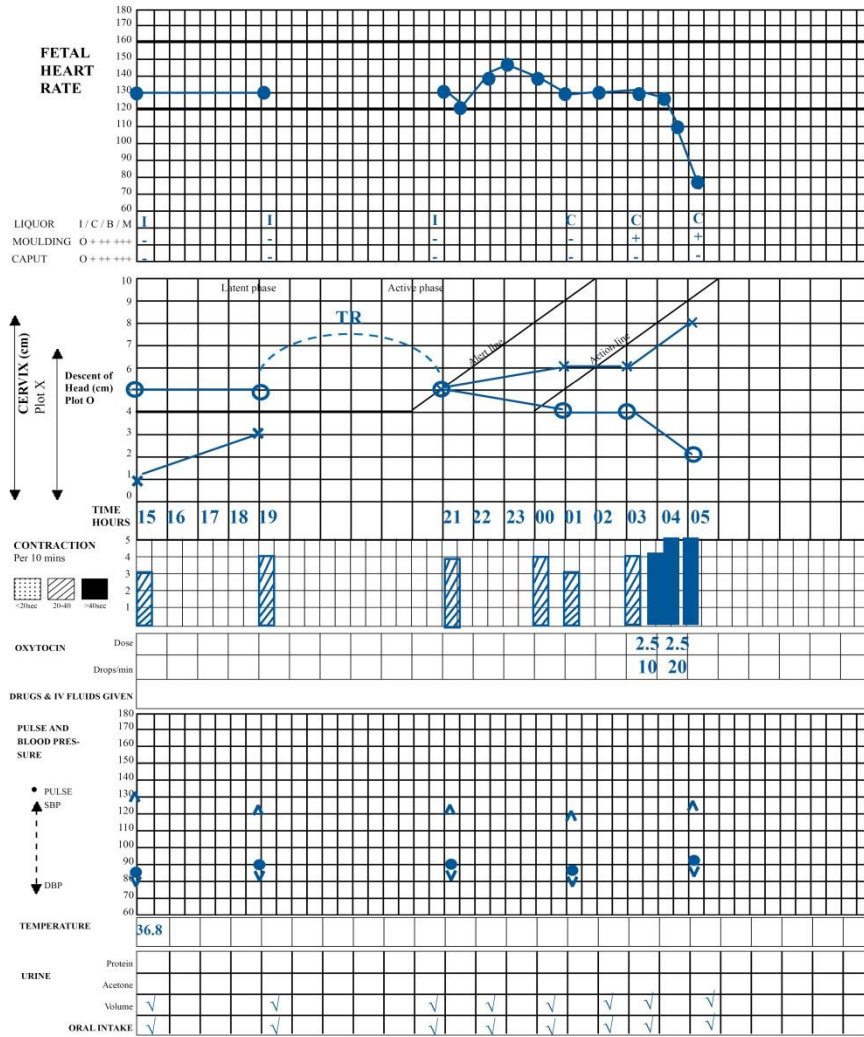
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Aisha, 25 years  
Gravida 1, para 0



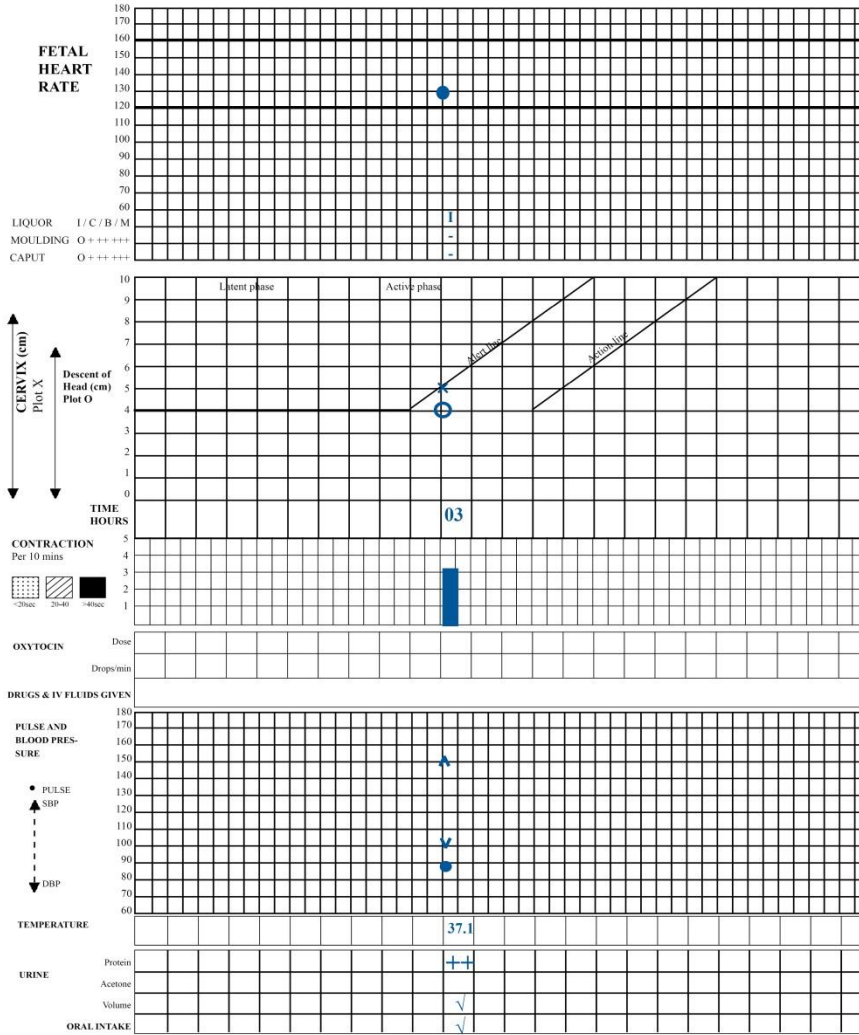
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Zuhura, 20 years  
Gravida 1, para 0



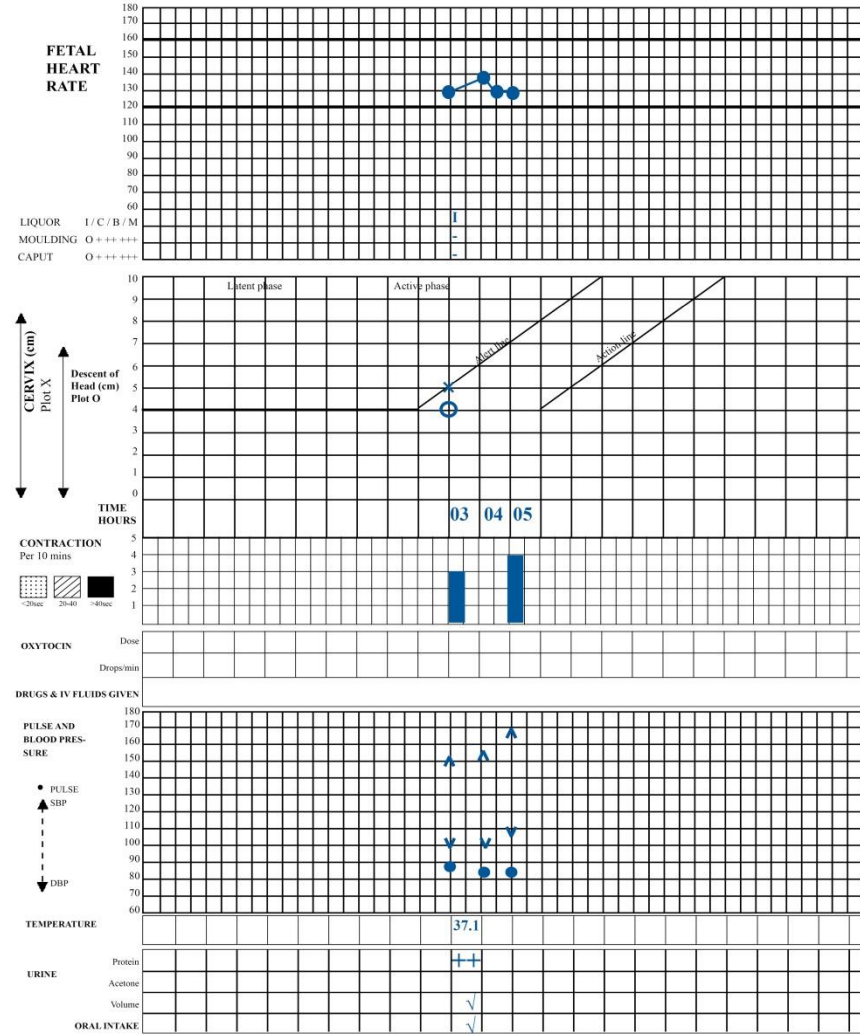
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Zuhura, 20 years  
Gravida 1, para 0



16th June  
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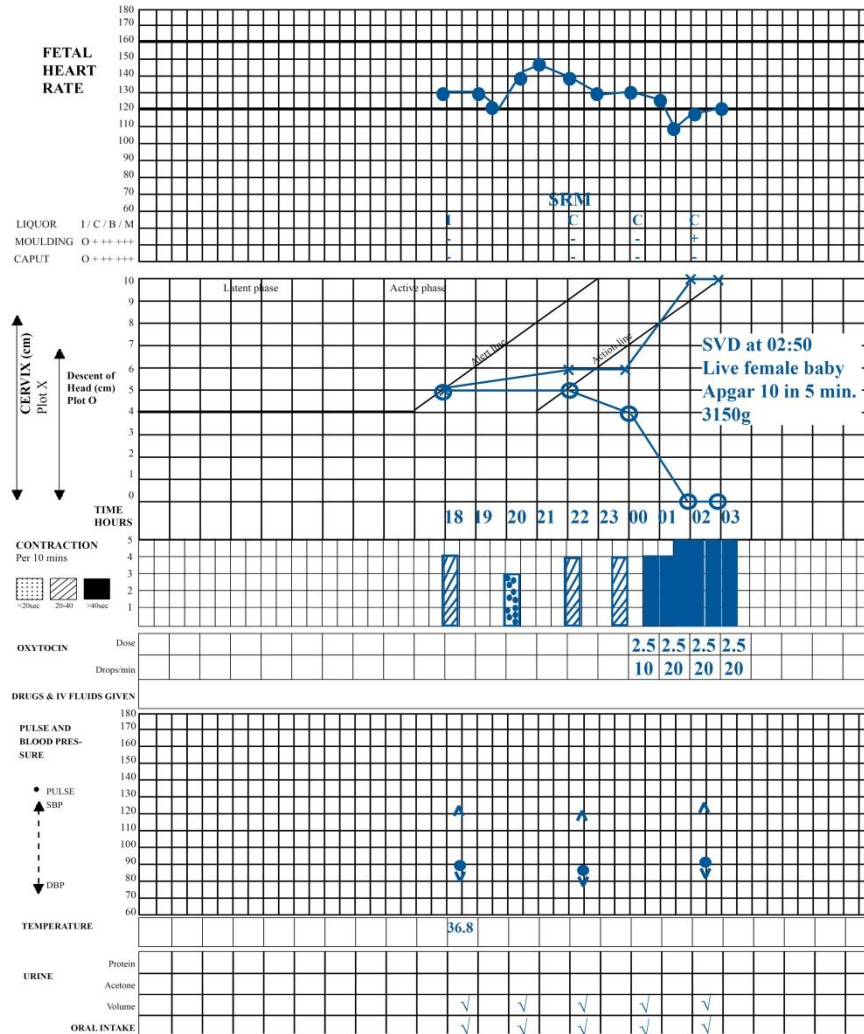




Catherine, 28 years  
Gravida 2, para 0



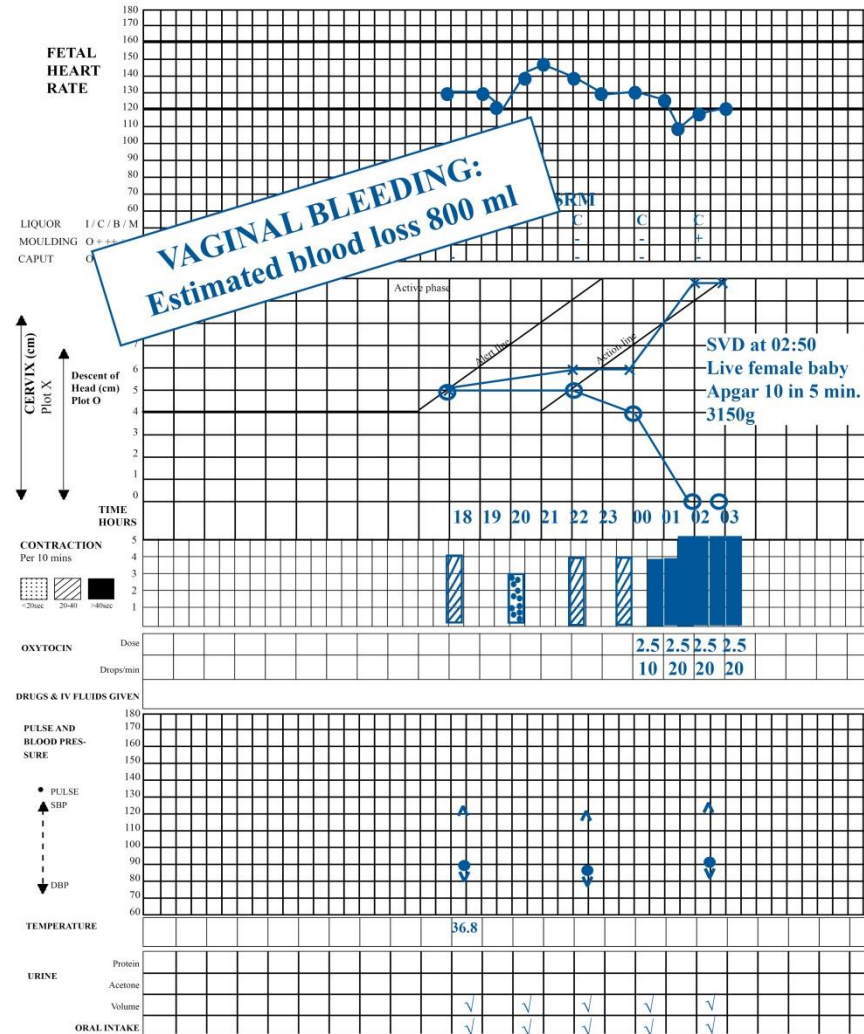
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Catherine, 28 years  
Gravida 2, para 0



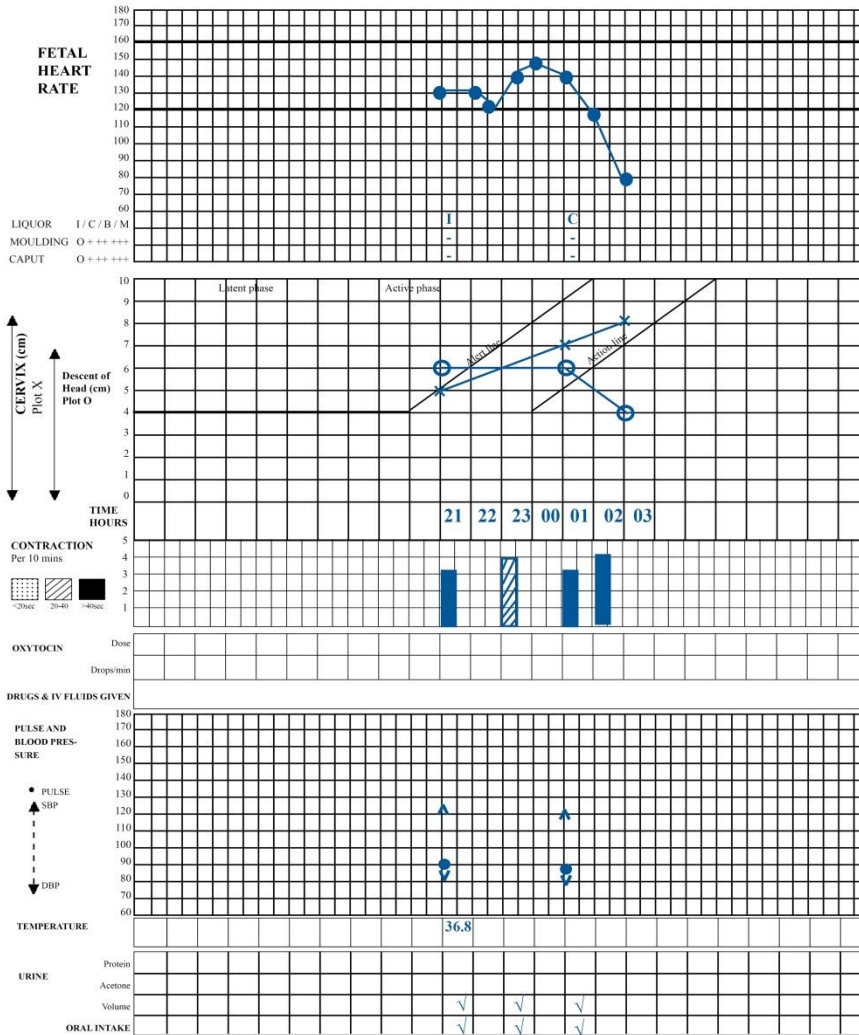
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Alyona, 21 years  
Gravida 1, para 0



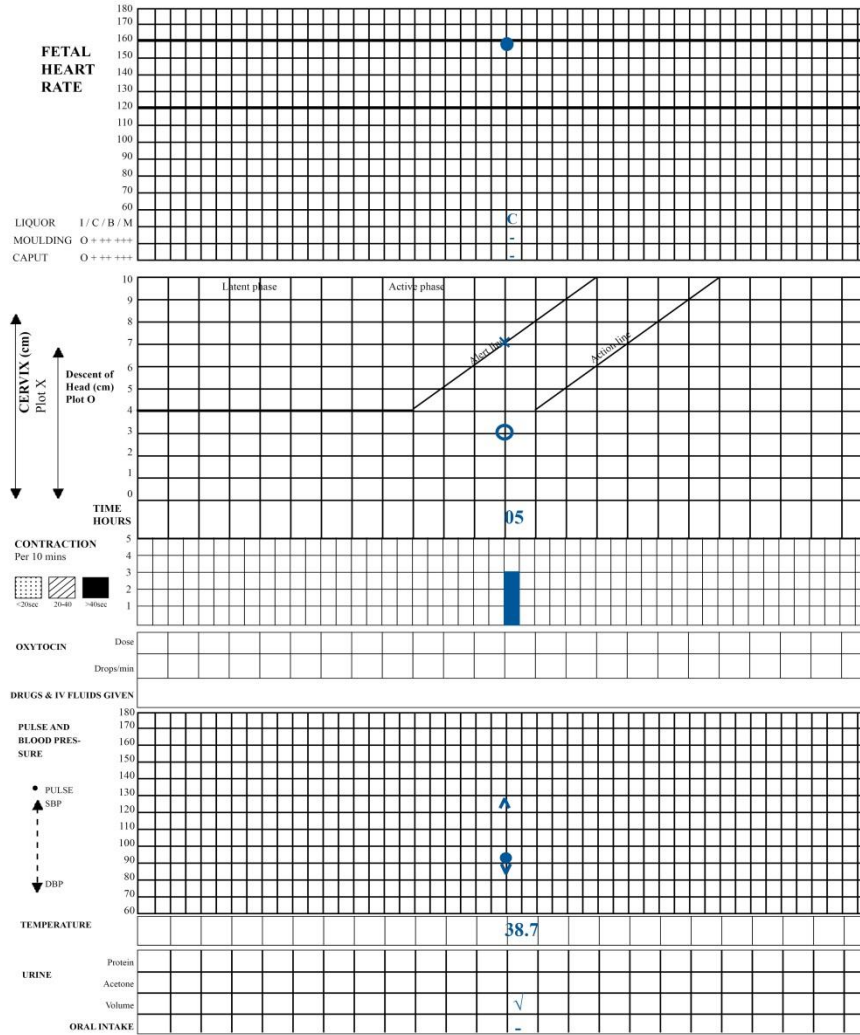
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03:00



Salma (new patient), 35 years  
Gravida 5, para 4



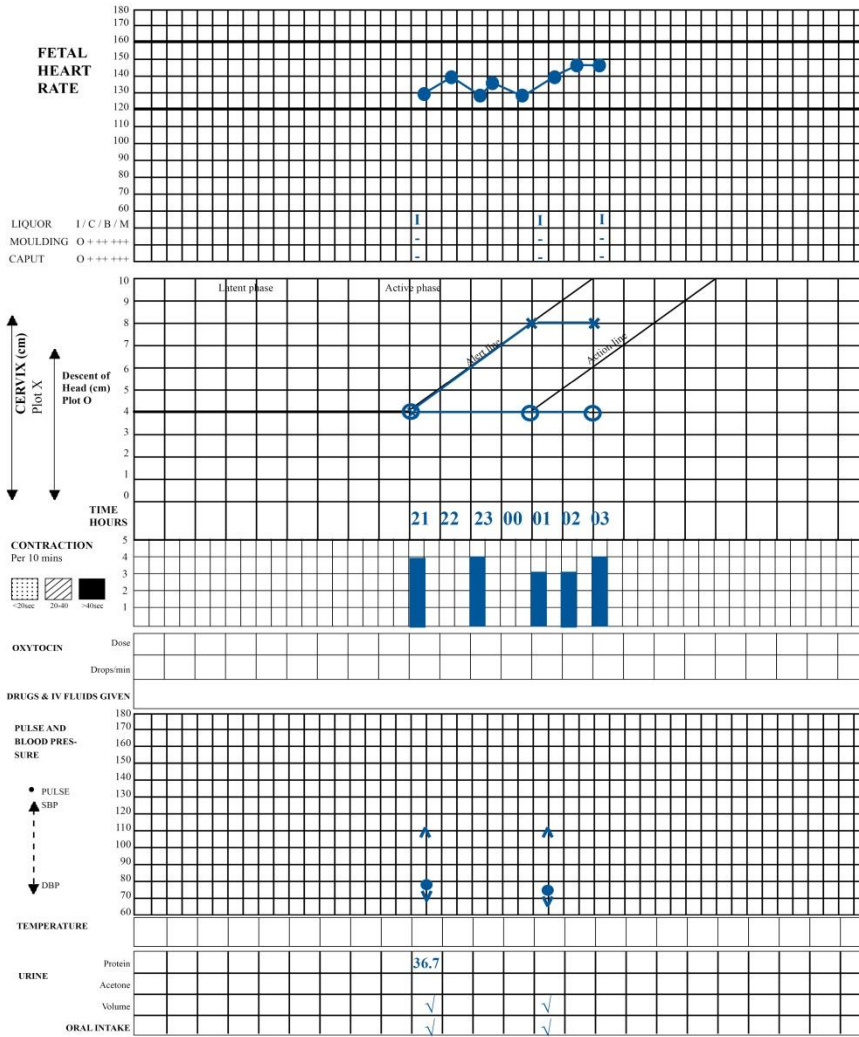
16th June  
05:00



Barbara, 31 years  
Gravida 3, para 2



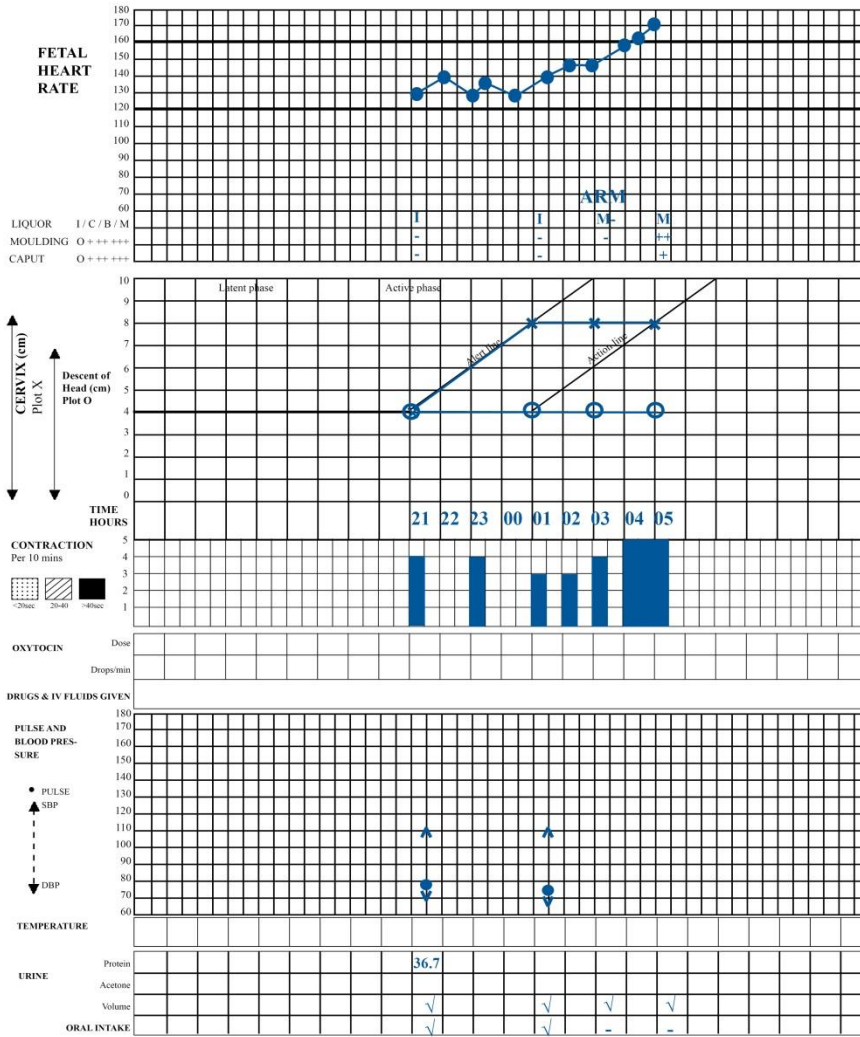
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Barbara, 31 years  
Gravida 3, para 2



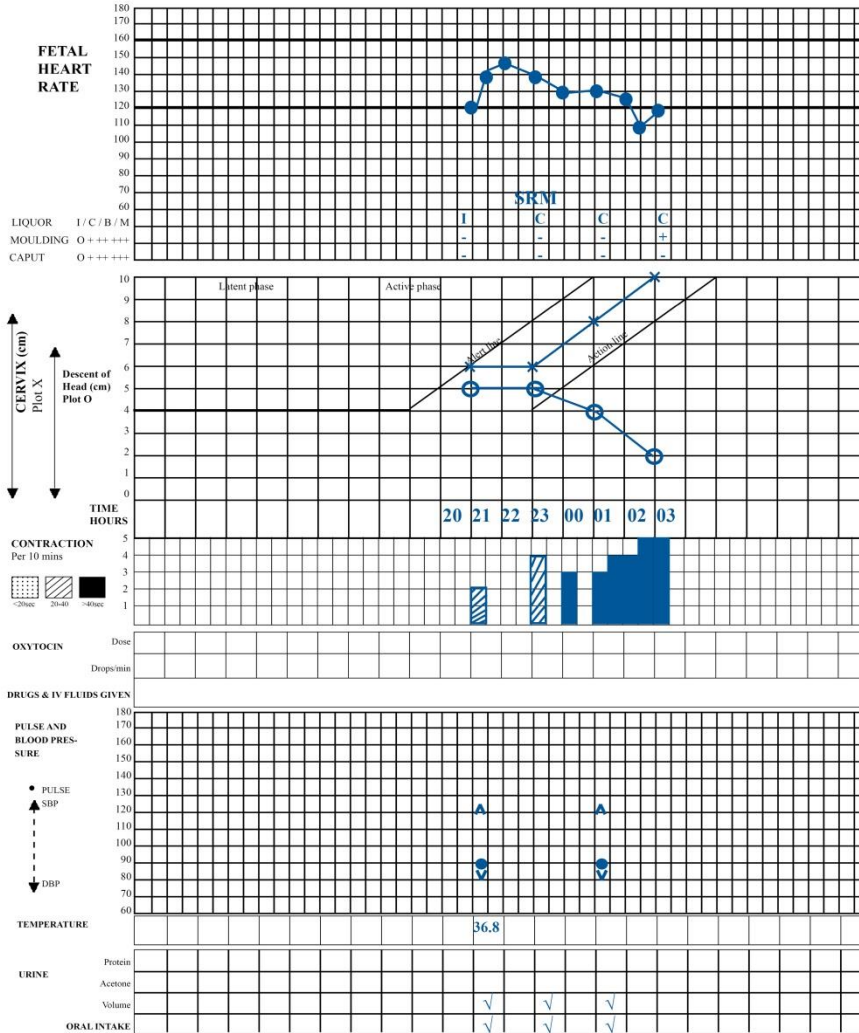
16th June  
05:00



Diana, 29 years  
Gravida 1, para 0



16th June  
03:00



Diana, 29 years  
Gravida 1, para 0



16th June  
05:00

