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FIGO GUIDELINES

Management of the second stage of labor☆

FIGO Safe Motherhood and Newborn Health (SMNH) Committee [1]

1. Introduction

The second stage of labor is regarded as the climax of the birth by the delivering woman, her partner, and the care provider. International health policy and programming have placed emphasis on the first stage of labor, including appropriate use of the partogram and identification of hypertension or sepsis, and have also focused on the third stage of labor with active management (AMTSL). More recently, a concerted effort to reduce perinatal losses has been made through dissemination of skills in neonatal resuscitation. However, the provision of skilled care and avoidance of complications during the second stage of labor have been relatively neglected. These guidelines are intended to strengthen policy and frameworks for care provision to enable providers to attend to women in the second stage of labor in line with current evidence-based recommendations for practice to optimize outcomes for mother and baby. The document is not intended as a formal systematic review of the literature, but aims to identify important clinical, programmatic, and policy issues that require attention.

The 3 stages of labor are conventionally defined as:

- First stage: from the onset of regular painful contractions associated with descent of the presenting part and progressive dilatation of the cervix until the cervix is fully dilated.
- Second stage: from full dilatation of the cervix up to the birth of the singleton baby or the last baby in a multiple pregnancy. At the start of the second stage, the fetal presenting part may or may not be fully engaged (meaning that the widest diameter has passed through the pelvic brim), and the woman may or may not have the urge to push.
- Third stage: from the birth of the baby until expulsion of the placenta and membranes.

A "fourth stage" is sometimes added in midwifery teaching, also termed "immediate postpartum care," which represents the period of a few hours after expulsion of the placenta when close observation is desirable to avoid or detect postpartum hemorrhage, signs of sepsis or hypertension, and when breast feeding is initiated.

While in most instances there is sufficient reserve to maintain oxygenation of the fetus during the second stage of labor even though the uteroplacental circulation is reduced, in some circumstances both the fetal and maternal condition can deteriorate rapidly. Deterioration can occur both in pregnancies with known complications, such as pre-eclampsia or intrauterine growth restriction, but also unpredictably in low-risk pregnancies [1]. Thus, antenatal risk assessment and the status in the first stage of labor, such as represented by a normal partogram, are not reliable predictors of normal outcomes. Important potential complications arising in the second stage of labor are fetal hypoxia and acidemia leading to "birth asphyxia," failure of the presenting part to rotate or descend appropriately leading to obstructed labor, and worsening or new manifestations of maternal hypertension leading to eclampsia. Mothers with pre-existing cardiac disease or severe anemia may be at risk of heart failure during the second stage owing to the additional circulatory demands of active pushing.

During the second stage of labor, skilled attendants should:

- Continuously provide information, support, and encouragement to the woman and her companion.
- Encourage active pushing once the urge to bear down is present, with encouragement to adopt any position for pushing preferred by the woman, except lying supine which risks aortocaval compression and reduced uteroplacental perfusion.
- Listen frequently (every 5 minutes) to the fetal heart in between contractions to detect bradycardia.
- Check the maternal pulse and blood pressure, especially where there is a pre- existing problem of hypertension, severe anemia, or cardiac disease.
- Observe progressive descent and rotation of the presenting part. This includes observing progressive distension of the perineum and visibility of the presenting part, and vaginal examination especially where progress appears to be slow.
- Conduct the delivery with support for the perineum to avoid tears, and use of episiotomy only where a tear is very likely.
- Be ready to augment contractions with an intravenous oxytocin infusion during the second stage where contractions have become infrequent and where the fetal heart rate remains normal, to avoid the need for instrumental vaginal delivery or transfer.
- Be ready to undertake instrumental vaginal delivery (vacuum or forceps) where indicated for fetal bradycardia or nonadvance of the presenting part.

☆ These guidelines were reviewed and approved in April 2012 by the FIGO Executive Board and SMNH Committee.

[1] Second Stage Guidelines Committee Members: W. Stones, Kenya; C. Hanson, Germany; A. Abdel Wahed, Jordan; S. Miller, USA; A. Bridges, Netherlands.

SMNH Committee Members: A. Lalonde, Canada (Chair); P. Okong, Uganda (Co-Chair); S. Zulfigar Bhutta, Pakistan; L. Adrien, Haiti; W. Stones, Kenya; C. Fuchtner, Bolivia; A. Abdel Wahed, Jordan; C. Hanson, Germany; P. von Dadelszen, Canada.

Corresponding members: B. Carbonne, France; J. Liljestrand, Cambodia; S. Arulkumaran, UK; D. Taylor, UK; P. Delorme, UK; S. Miller, USA; C. Waite, UK.

Ex officio: G. Serour, FIGO President; H. Rushwan, FIGO Chief Executive; C. Montpetit, SMNH Committee Coordinator.

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Close monitoring and the skills and capacity to offer timely intervention are required for all births to prevent adverse outcomes. High-quality care in the second stage of labor is necessary to prevent stillbirth and newborn complications arising from undetected hypoxia and acidemia, as well as maternal mortality and morbidity from complications such as vesicovaginal fistula, genital tract lacerations, infection, hemorrhage [2], as well as worsening of hypertensive disease.

2. Guiding principles

As with all aspects of maternity care in accordance with a rights-based approach, the individual needs of the woman and her companion during the second stage of labor should be taken into consideration, tailoring care to an individual's needs while offering the highest quality, evidence-based care. A particularly important aspect is information and communication that prepares the woman and her labor companion for what to expect during labor and delivery. Special consideration is needed for culturally based birth preferences, especially where these are unusual or a minority within a particular healthcare setting. It is thought that lack of attention to humanistic care and respect for even "mainstream" cultural preferences by maternity care providers is a major barrier to the utilization of health facilities in many countries, as reflected in health surveys that show reasonable uptake of antenatal care but low rates of delivery in health facilities.

Unfortunately, many health facilities do not allow partners or companions to remain with women during labor. While outdated hospital regulations may be a factor, this is often owing to the design of delivery rooms that lack privacy, such as screens and curtains. Service planners and managers need to address such barriers as a matter of urgency, so that all women can benefit from having someone with them throughout labor and delivery. As well as providing an attractive and humanistic setting, this approach has the potential to encourage greater utilization of health facilities and there is strong evidence that it reduces the need for medical interventions.

3. Specific aspects of care in the second stage

This is the stage in labor where the contribution of a qualified and skilled attendant with midwifery skills is the most critical in ensuring a safe outcome.

While attending a delivery, the timing and process of active pushing should be guided so that this is encouraged only when the cervix is fully dilated and when the presenting part has engaged in the pelvis and the woman feels the urge to push. The skilled attendant also has the role of encouraging the mother to adopt positions for active pushing that are culturally appropriate, comfortable, and mechanically beneficial; for example, squatting or sitting up as opposed to lying flat on a bed. Unfortunately, in many hospitals in low-resource countries, lying supine while in labor has become the norm—a tendency exacerbated by a lack of available cushions or the use of nonflexible delivery beds where the upper part cannot be elevated—and the use of stirrups is common.

Assuring safety also requires the presence of a second person trained to assist [3]. In order to provide the 8 key aspects of care listed above, the presence of a second person is essential; for example, to maintain auscultation of the fetal heart and support for the mother while the midwife or doctor puts on sterile gloves in preparation for the delivery. To achieve this, health facilities providing maternity care need to structure their staff allocation and skill mix to recognize the extra care needs of mothers in the second stage. While this is very challenging in settings where budgets or shortages of skilled staff are major constraints, serious efforts to provide full and effective care at this critical stage will reduce the burden of need for "rescue" emergency interventions for asphyxiated babies and mothers with complications that could have been prevented.

The presence of a second person assisting the skilled attendant allows continuity of intermittent auscultation of the fetal heart once the attendant has donned sterile gloves. It also allows additional reassurance and support. Finally, if complications occur, the second birth attendant is able to summon help and initiate emergency care as specified in obstetric emergency skills drills, while not detracting from continuous care provided to the mother by the skilled attendant.

Special consideration is needed in delivery settings where only one skilled attendant is available, such as home births or small health centers. Here, birth planning needs to involve relatives, traditional birth attendants (TBAs), or nonclinical staff to assist in the role of "second birth attendant." Such assistants need to be briefed about their role and arrangements made for them to be accessible and present for the birth.

3.1. Initiation of active pushing

A woman should be encouraged to push when full cervical dilatation, the fetal condition, and engagement of the presenting part have been confirmed, and the woman feels an urge to bear down. Even when the woman feels the urge, pushing should only be encouraged during a contraction [4]. In the absence of the urge to push and in the presence of a normal fetal heart rate, care providers should wait before encouraging active pushing in primiparous women and women who have had an epidural for up to but not longer than 4 hours, and in multiparous women for up to but not longer than 1 hour [5,6]. The basis for this recommendation is that under normal circumstances at the end of the first stage of labor, uteroplacental perfusion and fetal oxygenation only start to deteriorate once active pushing commences.

3.2. Duration of active pushing in the second stage of labor

Primiparous women should not actively push for more than 2 hours and multiparous women for more than 1 hour, owing to an increased risk of birth asphyxia and maternal infection [7]. Lack of descent of the presenting part may also indicate obstructed labor.

Intervention should be considered promptly and options evaluated and acted upon before these indicative time periods if the maternal and/or fetal condition deviates from normal; for example, in the presence of fetal bradycardia or severe maternal hypertension.

3.3. Maternal and fetal monitoring during the second stage

Maternal parameters should be monitored when the second stage of labor is confirmed and thereafter, and for specific indications such as a history of high blood pressure, prolonged labor, and previously identified abnormal fetal heart rate.

Equipment in good working order and devices that simplify detection of the fetal heart should be available at the recommended frequency [8]. The frequency of fetal heart auscultation should be every 5–10 minutes or more often when bradycardia is suspected. One can get the best information about the condition of the fetus, and it is easiest to hear, by auscultating immediately after a contraction. The care provider should have the skills to interpret the fetal heart rate and take appropriate action when needed. While the traditional Pinard stethoscope (fetoscope) may be adequate in very quiet labor rooms, it is often difficult to use reliably owing to surrounding noise or maternal obesity, and especially in the second stage because of the woman's naturally vigorous movements. Wide availability of robust handheld Doppler devices with battery backup and/or wind-up recharging technology should be part of standard equipment provision for safe maternity care. Service planners and managers should prioritize procurement and regular maintenance of such devices.

Fig. 1. Supporting to provide both a good upright position and comfort (Picture courtesy of One Heart World-Wide).

3.4. Position of the woman during the second stage of labor

The delivery facility should have adequate space, equipment, and skilled care providers for the woman to deliver in a position of her choice, including upright positions (Fig. 1, Fig. 2.) [9,10]. Unfortunately, inappropriate medical and midwifery teaching and habit have meant that many women are made to deliver lying flat on their backs with their feet in stirrups (Fig. 3). This position reduces uteroplacental blood flow, can contribute to fetal distress, and provides no mechanical advantage to enhance descent.

Fig. 2. A good upright position, but not mother friendly.

Fig. 3. Inappropriate provision that will lead to the woman lying flat.

3.5. Use of oxytocin during the second stage of labor

Intramuscular oxytocin administration before delivery is contraindicated. Intravenous oxytocin should be administered only according to a health facility protocol (describing indications, dose, and intravenous route) by a trained care provider. A typical intravenous oxytocin infusion regime for labor augmentation is described by the World Health Organization (WHO) [11] (P-22, Table P-7). It should be noted that infusions based on counting drops in the intravenous giving set can result in highly inaccurate oxytocin dosing, and where an infusion pump is not available the resulting contraction frequency and strength should be observed especially carefully to avoid hyperstimulation. Where the contractions are poor and the fetal presentation, position, and heart rate have been confirmed as normal, the use of oxytocin infusion may reduce the need for instrumental vaginal delivery.

4. Summary of systematic review evidence on interventions to reduce the need for instrumental vaginal delivery

These nonoperative interventions have been shown to decrease the need for operative birth in systematic reviews:

- Continuous support for women during childbirth by one-to-one birth attendants especially when the care provider is not a member of staff (14 trials; n = 12 757; RR 0.89, 95% CI, 0.83–0.96) [12].
- Use of upright or lateral positions during delivery compared with supine or lithotomy (18 trials; n = 5506; RR 0.84, 95% CI, 0.73–0.98) [10].
- During the second stage, delaying pushing for 1–2 hours or until the woman has a strong urge to push reduces the need for rotational and midcavity interventions [4].

5. Instrumental vaginal delivery

In case of a prolonged second stage of labor and for fetal bradycardia, use of instrumental delivery (vacuum extractor [Ventouse] or forceps) may help shorten the second stage of labor and reduce the need for cesarean delivery [13,14].

Instrumental delivery should only be attempted by care providers who are trained and qualified to recognize the indications, and are skilled and equipped to perform the procedure safely for mother and baby [13,15].

In countries where care providers other than obstetricians (especially midwives) are required to perform instrumental vaginal deliveries, adequate training and supportive legislation should be in place [16]. In the absence thereof, there should be a written document enabling the care provider to intervene appropriately and definition of the circumstances under which this can be done. The aim of such documentation of policy is to enable providers to use their skills without fear of criticism or sanction arising from questions about professional scope of practice.

Country programs should provide obstetric instruments, which are an essential component of Basic Emergency Obstetric Care, and ensure that care providers are trained to competence to use them. Maintenance of these skills requires staffing policies that support the development of a cadre of experienced delivery practitioners. To maintain the skills necessary for safe instrumental delivery, institutions should avoid inappropriate rotation of key staff from labor wards to other clinical areas.

Extensive systematic review evidence is available regarding the relative merits of vacuum versus forceps delivery, therefore this will not be considered in detail in this guideline. Overall, vacuum delivery is associated with reduced maternal trauma compared with forceps, while the rate of failure is reduced with forceps. Handheld vacuum devices such as the Kiwi OmniCup have become popular as these are easy to use, with the attendant able to control the suction. Currently undergoing testing by WHO and global partners is a new low-cost device for assisted vaginal delivery: the Odon device (www.odondevice.org). Constructed of polyethylene film, it may be easier to use than forceps, with less risk of trauma to the mother and the fetus. It may be used by any trained healthcare provider. The device is applied using a simple inserter and works on the principle of friction reduction.

Vaginal breech delivery is undertaken where the balance of risk is considered to favor it over cesarean delivery, particularly in settings where access to cesarean delivery is limited or the facilities are such that surgical and anesthesia risks are high. All skilled attendants need to regularly practice the diagnosis of breech presentation in labor and maneuvers for vaginal breech delivery using models, as any individual will not undertake sufficient breech deliveries to maintain competency. The typical techniques for vaginal breech delivery are illustrated in the WHO manual [11] (P-37 onward).

6. Pain relief during the second stage of labor

Pain relief options must be discussed with the woman prior to the onset of labor and offered according to her wishes and using health facility protocols and norms [17]. The need for pain relief is highly variable between individuals and should be individually assessed. While psychosocial interventions such as having a birth companion and provision of supportive care may reduce the need for analgesia, there is excellent evidence from the pain literature that while pain behavior is culturally determined, for example whether crying out in pain is acceptable or not, experience of pain intensity and associated suffering are not culturally determined. Thus, care providers should not base assumptions of "coping" on visible pain behavior. Usually the second stage is relatively short and self-limiting. Local anesthesia should be used for perineal infiltration prior to cutting an episiotomy, and the practice of cutting an incision without anesthesia is to be deprecated. For instrumental delivery, a pudendal block may be indicated, especially for forceps delivery.

7. Episiotomy

An episiotomy is an incision made into the perineum for the purpose of enlarging the soft tissue outlet for a macrosomic or breech infant or to decrease the length of the second stage if the baby is in distress. Multiple reviews have demonstrated that a policy of restricted episiotomy (episiotomy only when necessary) has better maternal outcomes than a policy of routine episiotomy, with no adverse effects for the newborn [18,19]. There is no evidence that a policy of routine episiotomy resulted in significant reductions in laceration severity, pain, or pelvic organ prolapse compared with a policy of restricted use [19]. Furthermore, a policy of routine episiotomy is more costly [20]. Where and how an attendant is trained and the rationale for the episiotomy often dictate which of the 3 main types of episiotomy—mediolateral, median, J-shaped—is performed. In general, median episiotomy is associated with less blood loss and is easier to perform and repair than the mediolateral procedure [21]. However, median episiotomy is also associated with a higher risk of injury to the maternal anal sphincter and rectum than mediolateral episiotomies or spontaneous obstetric lacerations [22]. Mediolateral episiotomy is recommended for instrumental vaginal delivery [23]. When performed on an "as necessary" basis, episiotomies should be performed under anesthesia, whether anesthesia is already in place for labor, such as epidural, or by administering a local infiltration. Episiotomy and laceration repair should always be performed under adequate perineal anesthesia.

8. Water birth

When the woman opts for a water birth, the care provider should respect her wishes as much as possible without compromising safety. In facilities that offer water births, adequate equipment should be provided for the protection and safety of the care provider, the woman, and her baby (i.e. effective infection prevention) [24].

9. Female genital mutilation

The presence of grade 3 female genital mutilation (FGM) with obstruction of the vaginal introitus following infibulation requires staff appropriately trained in defibulation. Best practice consists of antenatal identification of women with FGM and the offer of defibulation before the onset of labor, supported by appropriate counseling. When a woman presents in labor, defibulation should be undertaken only when the tissues are stretched as the fetal head descends. Defibulation should be performed before evaluating the need for episiotomy, which may not be required. The practice of "double episiotomy" is damaging and should be avoided.

10. Human resources

In countries where midwives are also qualified nurses, health managers are encouraged to form and maintain a cadre of labor ward midwives who are experienced, enabled (with additional competencies and legislation), and motivated to provide high-quality woman-centered safe care [16,25]. Health managers should avoid frequent rotation of key labor ward staff to other areas outside the maternity section. Human resource planning should recognize the need for a second skilled person to assist during the second stage of labor. To achieve this requires careful shift planning to deal with the normal "peaks and troughs" of workload on the labor ward and maintain safe staffing provision at all times.

11. Implications for health systems in low-resource countries

Clinical interventions during the second stage of labor should not be offered or advised where labor is progressing normally and the woman and baby are well, and should only be initiated when the appropriately trained staff and equipment are in place [26]. Therefore, close attention to the maternal and the fetal condition during the second stage provides the necessary clinical reassurance that no interventions are necessary. If the conditions deviate from normal, options for immediate intervention or referral depending on the

care setting should be defined clearly in protocols and guidelines to allow timely access to emergency obstetric and neonatal care. All women require close monitoring during the second stage of labor and service planners need to recognize this in formulating shift plans. With the underpinning of a supportive regulatory framework for professional practice based on competencies, and depending on the level of the healthcare system at which care is provided, the skilled attendant and the assistant should have access to equipment for instrumental delivery and neonatal resuscitation and should have the appropriate skills to use and assist with the equipment. In settings where only one skilled attendant is available, briefing of relatives, TBAs, or nonclinical staff about their roles is required.

There are challenges with consistent provision of elements of care in labor in many settings at different levels of the health system. For example, surveys in health facilities in southern Tanzania showed limited use of blood pressure checking but frequent use of auscultation of the fetal heart during labor. Further, according to Service Provision Assessments in several African countries (see www.measuredhs.com for survey reports), assisted vaginal delivery was notably lacking in service provision despite being a defined component of Basic Emergency Obstetric Care [27,28]. This contradiction demonstrates that more rapid delivery of the infant would not be possible even if severe bradycardia were to be detected; thus, detection of bradycardia by auscultation of fetal heart in the second stage cannot lead to the appropriate life-saving intervention.

Health system funders, designers, and managers need to develop and rollout sustainable plans for ensuring that the necessary human resources, skills, and equipment are in place in a structured manner at each level of the health system. As transfer to another facility during the second stage of labor is very problematic and is likely to be associated with poor outcomes because of the additional delay, every effort should be made to provide the assisted vaginal delivery component of Basic Emergency Obstetric Care so that delivery can be effected at health center level without the need for transfer.

Health system planning requires consideration of the resources needed for acquisition and maintenance of clinical skills for conduct of deliveries. There may be a minimum number of births below which skill maintenance cannot be assured; however, simply undertaking deliveries does not guarantee that skills are being maintained or developed, as inappropriate practice may simply be repeated. In Indonesia, it was noted that many deliveries were at home, with no ability to respond to emergencies, and that the number of deliveries conducted by each midwife was low at around 10 per midwife during 3 months [29]. Thus, in many countries the emphasis in clinical licensure and recertification has shifted from specifying a particular number of births to be conducted, to participation in educational activities and structured supervision that are more likely to assure the maintenance of competencies. For midwives and doctors practicing in smaller units, life-threatening emergencies will be encountered infrequently so that skills are best taught and maintained through the use of simulation, as taught in the various obstetric skills programs. There is evidence that skills gained through such courses can be maintained in a public health system context although there are challenges in maintaining continuity and overcoming practical hurdles, such as procurement of supplies even when funds are available [30]. Program managers need to undertake periodic district level skills audits to ensure ongoing compliance with such skills training in the service setting.

In conclusion, planning and management of health facilities offering maternity care should always include participation from community members, who can help to guide health professionals toward meeting cultural and social expectations and needs during labor and delivery, and thus contribute to maximizing utilization and quality of care. This might include agreement with health managers about allowing partners or other relatives into delivery rooms, decoration or furnishing of delivery rooms, and arrangements to assure privacy such as screens and curtains. At rural health center level the community may also have a key role in assuring provision of the second attendant to assist at the time of delivery, for example by supporting community health volunteer workers or traditional birth attendants in this role where a second trained midwife is not available. Community mobilization is also important in providing security and support for trained staff deployed in remote locations so that they are encouraged to remain in post and able to fulfill their role.

12. Recommendations

- Delivery facilities must offer every woman privacy and allow her to be accompanied by her choice of a supportive person (husband, friend, mother, relative, TBA); all women must be treated with respect.
- Psychosocial support, education, communication, choice of position, and pharmacological methods appropriately used during the first stage are all useful in relieving pain and distress in the second stage of labor.
- There should be at least 2 people assisting at every birth, whether it is another health professional, family member, TBA, or village health worker. Arrangements for having another person besides the primary skilled attendant should be planned during the pregnancy.
- Monitoring of the fetal heart beat must be continued during the second stage to allow early detection of bradycardia.
- Routine episiotomy is harmful and should not be practiced.
- Women should not be forced or encouraged to push until they feel an urge to push.
- Health facilities and skilled attendants should be provided with handheld battery powered or hand-cranked Dopplers for fetal heart auscultation after every contraction. These should be added to lists of essential commodities.
- Local anesthetic should always be given for any episiotomy, episiotomy/laceration repair, or forceps delivery.
- Provision of critical skills for second stage management needs to be supported by policies as well as training, simulations (drills), and linkage with a functioning referral system.
- Lack of access to instrumental delivery is a major deficit in obstetric care in many facilities; skills necessary for safe instrumental delivery must be emphasized in preservice and in-service education for all skilled attendants.

13. Recommended research questions for second stage management

- What are the health benefits for mothers and infants of an appropriate women-centered package of second stage care? The study design could be preintervention/intervention or cluster randomized trial.
- What is the risk of short duration of ruptured membranes for transmission of HIV from mother to child? There is a lack of evidence to support or refute the hypothesis that a woman who is HIV positive and whose cervix is fully dilated has a reduced chance of transmitting HIV to her infant if she has a cesarean delivery versus artificial rupturing of membranes to support vaginal delivery. Since a randomized controlled trial would not be ethical or feasible, a retrospective, case–control study or observational study would be the preferred study design.
- Is there an association between vacuum delivery and mother-to-child transmission of HIV? Since a randomized controlled trial would not be ethical or feasible, a retrospective, case–control study or observational study would be the preferred study design.

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