

MATERNITY UNIT**GUIDELINE:****ABNORMAL LABOUR****SCOPE:**

All Midwives, obstetricians working in the Maternity Unit

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PURPOSE:

The purpose of the guideline is to aid in Management of Abnormal Labour

CONTENTS:

	Page
Definitions	1
Background	1
Assessment of progress in labour	2
Risk factors for abnormal labour	2
Management of prolonged labour	3
Prolonged first stage	3
Prolonged second stage	6
Prolonged second stage: How long is too long?	6
Summary	7
Flowchart for prolonged first stage	9
Flowchart for prolonged (protracted) second stage	10
Associated Documents	11
References	11

DEFINITIONS

Labour is the presence of uterine contractions of sufficient intensity, frequency and duration to bring about demonstrable effacement and dilation of the cervix. Prolonged labour is often described as a protraction disorder (i.e. slower than normal progress) or arrest disorder (i.e. complete cessation of progress). However the definitions are imprecise.

BACKGROUND

Prolonged labour is common. About 20% of all labours ending in a live birth involve protraction and/or arrest disorders. They are the commonest cause of unplanned caesarean deliveries and may be associated with serious complications. Assessing whether labour is progressing normally is therefore a key component of intrapartum care.

ASSESSMENT OF PROGRESS IN LABOUR

Traditionally labour has been divided into three stages.

First stage – time from onset of contractions to complete dilation. Typically this stage is separated into:

- 1) Latent phase, usually with mild and irregular contractions and;
- 2) Active phase which is more rapid and characterized by contractions which are stronger, more frequent and result in more rapid cervical dilation.

Second stage – time from complete dilation of the cervix to the birth of the fetus.

Third stage – from birth to expulsion of the placenta.

It is often difficult to know exactly the point at which latent phase has started to cause cervical change, when active stage has begun or even when full cervical dilation has been reached. Therefore determining the exact onset of labour, measuring its progress and evaluating the factors that affect its course is by no means an exact science. However various attempts have been made to establish a standard for “normal” progress in labour.

In the mid 1950’s Emanuel Friedman evaluated the course of labour of 500 primigravidas admitted to the Sloane Hospital for Women in New York and from this data derived his now classic labour curve. He proposed that normal progress for nulliparous patients in the active stage was 1.2cm/hour, 1.5cm/hour for multiparous women. However there have clearly been significant changes in patient characteristics, anaesthesia and obstetric practices since Friedman’s time and recent studies question the applicability of the Friedman Curve to contemporary practice.

Zhang et al studied data obtained from the Consortium on Safe Labour taken from the electronic medical records of 19 medical centres in the United States. Information on 62,415 singleton cephalic vaginal deliveries with spontaneous onset of labour and normal neonatal outcome was evaluated. He showed that progress in early labour was slower than Friedman had observed. Greater than 50% of patients did not dilate at a rate of > 1cm per hour until they reached 5-6cm dilation, after which more rapid cervical change (active labour) was observed. This pattern has also been noted by other observers. It has also been shown that women being induced dilate significantly more slowly than those in spontaneous labour. Zhang’s studies have suggested that regardless of parity, it may take more than 6 hours to progress from 4-5cm and more than 3 hours to progress from 5-6cm.

RISK FACTORS FOR ABNORMAL LABOUR

Abnormal labour may be associated with multiple maternal or fetal factors:

- Older maternal age
- Pregnancy complications
- Abnormal fetal heart rate
- Epidural anaesthesia
- Macrosomia

- Pelvic contraction
- Occiput posterior position
- Nulliparity
- Short stature (less than 150cm)
- High station at full dilatation
- Chorioamnionitis
- Post term pregnancy
- Obesity

Hypocontractile uterine activity:

This is the commonest cause of protraction/arrest disorders in the first stage. Uterine activity may be monitored by palpation or by electronic means.

Cephalo-pelvic disproportion (CPD):

This is a difficult diagnosis to make antepartum either clinically or radiologically. The diagnosis is usually made when labour is protracted although foetal malposition (OP position or asynclitic head) are often the cause rather than true CPD.

Occiput posterior (OP) position:

Persistent OP is associated with longer duration of both the first and second stage as well as higher risk of arrest of descent requiring operative delivery.

Epidural anaesthesia:

A Cochrane review of randomised trials concluded that epidural use is not associated with increasing length of first stage of labour. There were small but statistically significant increases in the length of second stage and women were more likely to undergo operative vaginal delivery. However recent changes in technique and use of narcotics or low-dose anaesthetic's could affect those findings.

Maternal obesity:

Increased maternal body mass index (BMI) correlates with an increasing length of first stage labour and consideration may be given to allowing more time for labour to progress.

MANAGEMENT OF PROLONGED LABOUR**Prolonged First Stage:****1. Prolonged latent phase**

- Some women do not progress to active labour despite many hours of contractions. As discussed previously, the concept of a latent phase of labour is controversial as it can be difficult to precisely determine the time of onset of contractions, the time of transition to active phase and the cervical dilation when this transition occurs.

- In the case of suspected prolonged (protracted) latent phase a three way discussion among the woman, her LMC and the obstetrician may be indicated.

2. Prolonged active phase

- Zhang found that the median (95th percentile) time for the cervix to dilate from 4-10cm in nulliparous women was 5.3 hours and in multiparous women 3.8 hours. However, some women take significantly longer. He proposed that the active phase should be defined as starting when the cervix is 6cm dilated.
- If there is poor progression in labour after the active phase has been confirmed the obstetrician should be consulted as per referral guidelines and a four-way conversation held.
- If labour is protracted then it is no longer a normal uncomplicated labour so continuous monitoring is recommended.

3. Other considerations

- Amniotomy – there is evidence from randomized trials that routine amniotomy does not accelerate spontaneous labour. However, other randomised trials found that early amniotomy with Syntocinon appeared to shorten labour and resulted in a decreased caesarean section rate.
- Maternal hydration – Adequate hydration improves skeletal muscle function and may also improve smooth muscle action (myometrium). Similarly, intravenous fluids with dextrose were shown in one trial to decrease the length of both first and second stage. Consideration should therefore be given to maternal fluid status and nutrition during lengthy labours.
- Ambulation – although this may make a woman's labour more comfortable, there is no evidence that it is clinically effective for treatment of established arrest or protraction disorders.
- Maternal position – there is no strong evidence that a change in maternal position (eg upright posture, lateral or hands and knees position instead of supine) is useful in treatment of second stage arrest. Women should be encouraged to give birth in the position they find most comfortable but allowing for some degree of gravity to assist.

4. Augmentation of labour

- If uterine hypotonus is suspected administration of Syntocinon (oxytocin) is recommended unless there are contraindications.

The evidence for this recommendation is described below.

A meta-analysis of nine randomized trials (n=1983 women) found that early initiation of oxytocin as soon as progress was slower than predefined criteria appeared to modestly improve the chance of spontaneous vaginal delivery

and to reduce antibiotic use compared with conservative measures. In these trials, oxytocin was initiated without consideration of baseline uterine activity. Membrane status (ruptured or intact) was the same in both groups.

Another meta-analysis of eight randomized trials of 1338 low risk women in the first stage of labour at term compared early use of oxytocin (intervention group) versus placebo/no treatment/delayed use of oxytocin (control group) and found a significant two hour reduction in the mean duration of labour with oxytocin. There was no difference between groups in caesarean delivery or instrumental delivery rates. Although there was significant heterogeneity among the trials, results were consistent

5. Assessing progress after initiating Syntocinon

- Traditionally active phase arrest has been diagnosed when slow cervical dilation is not corrected by Syntocinon therapy that achieves regular adequate contractions for two hours. Caesarean delivery is often performed at this point. However two hours may not be adequate for some labours.

DIAGNOSING ARREST OF LABOUR IN THE FIRST STAGE

Zhang found that the median (95th percentile) time for the cervix to dilate from 4-10cm in nulliparas was 5.3 hours and in multiparas 3.8 hours. However some women take significantly longer to reach 6cm and his studies suggest that it is more reasonable to wait until cervical dilation ceases after reaching 5-6cm dilation before establishing the diagnosis.

In 2012 a workshop was convened by the U.S. National Institute of Child Health and Human Development (NICHD), Society of Maternal-Foetal Medicine (SMFM) and ACOG. One of the main purposes of the workshop was to address the rising caesarean delivery rate. Based on Zhang's work they proposed a new definition:

Arrest of labour in the first stage was defined as:

Cervical dilation ≥ 6 cm and ruptured membranes with:

- No cervical change for ≥ 4 hours despite adequate contractions
- No cervical change for ≥ 6 hours with inadequate contractions

However, since the aim is to **prevent** arrest of labour, consider intervention before that point is reached.

For a quick reference guide to management of prolonged first stage please refer to the flow chart in appendix 1.

PROLONGED SECOND STAGE

Following their workshop, the group (above) published a consensus document in both the American Journal of Obstetrics and Gynaecology and the journal Obstetrics and Gynaecology redefining appropriate length of the second stage of labour. The consensus opinion was that “at least 3 hours of pushing in nulliparous women should be allowed before diagnosing arrest of labour” and longer with an epidural. Of note, induction does not affect the duration of the second stage.

However, type of analgesia, duration of the first stage, parity, BMI and station of the presenting part at full dilation all affect duration. For this reason ACOG recommended that assessment of labour progress in the second stage must include parity and use of regional anaesthetic. They recommended that there should be no intervention as long as the fetal heart rate pattern is normal and some degree of progress is observed. However, when second stage is prolonged, electronic fetal monitoring (EFM) may be a wise precaution to demonstrate fetal wellbeing.

Prompt operative delivery was indicated for those fetuses with abnormal fetal heart rate tracings or when cephalopelvic disproportion was likely because of macrosomia, malposition or a clinically small maternal pelvis.

Arrest of labour in the second stage was defined as:

No progress (no descent or rotation):

- Nulliparous women ≥ 3 hours or ≥ 4 hours with epidural
- Multiparous women ≥ 2 hours or ≥ 3 hours with epidural

This opinion was heavily influenced by Zhang’s findings that 95th percentile for second stage labour in nulliparous women was 3.6 hours with epidural analgesia.

It is important to note, however, that Zhang’s study included only women who achieved a vaginal birth, i.e. all women with caesarean delivery were excluded. Also he limited his analysis to those infants with normal outcomes. All compromised infants delivered > 3 hours were excluded.

PROLONGED SECOND STAGE; HOW LONG IS TOO LONG?

Recently there have been several studies which challenge the conclusion that a second stage labour > 3 hours is safe for the infant.

Allen et al in an analysis of 55,936 nulliparous women giving birth found increased adverse maternal and fetal outcomes as the second stage increased. In particular, Apgar scores ≤ 3 at 5 minutes, HIE, neonatal intensive care and sepsis all increased with increased length of second stage.

Loughon et al studied 32,124 nulliparous women who reached the second stage of labour and found that the risk of both maternal and perinatal adverse outcomes increases with increased duration of the second stage, particularly for durations of > 3 hours in nulliparous women.

Levano et al. in an important Clinical Opinion in the American Journal of Obstetrics & Gynaecology, April 2016 484-489 review 6 reports on the infant effects of the duration of second-stage labour from 2004-2014. Included are the reports (Zhang and Chen) which were pivotal in the ACOG/SMFM Obstetric Care Consensus conclusion. Their conclusion is that second stage > 3 hours was associated with serious infant complications when statistical adjustment of the data was not done for mode of delivery. Their conclusion is that the evidence for safety of prolonged labour is not robust. *“We conclude that the currently available evidence fails to support the Obstetric Care Consensus position that longer second-stage labour is safe for the unborn infant. Indeed, the evidence suggests quite the opposite.”*

Longer duration is also associated with increased maternal risks such as chorioamnionitis, postpartum haemorrhage, shoulder dystocia, operative delivery and third/fourth degree perineal lacerations or difficult caesarean births. These risks have been found to increase with increasing duration of the second stage.

Since there is no consensus currently regarding the ideal length of the second stage, the benefit of potentially avoiding a caesarean birth must be weighed against the potential risks to both mother and baby of a prolonged second stage of labour. It is recommended that the obstetrician should be consulted in all cases of poor progress in labour in the second stage. Clinical assessment of the mother, fetus and expulsive forces is indicated.

Factors such as the degree of macrosomia suspected, adequacy of the pelvis, fetal position, fetal heart rate tracing and maternal pushing efforts need to be evaluated in considering when and how to intervene.

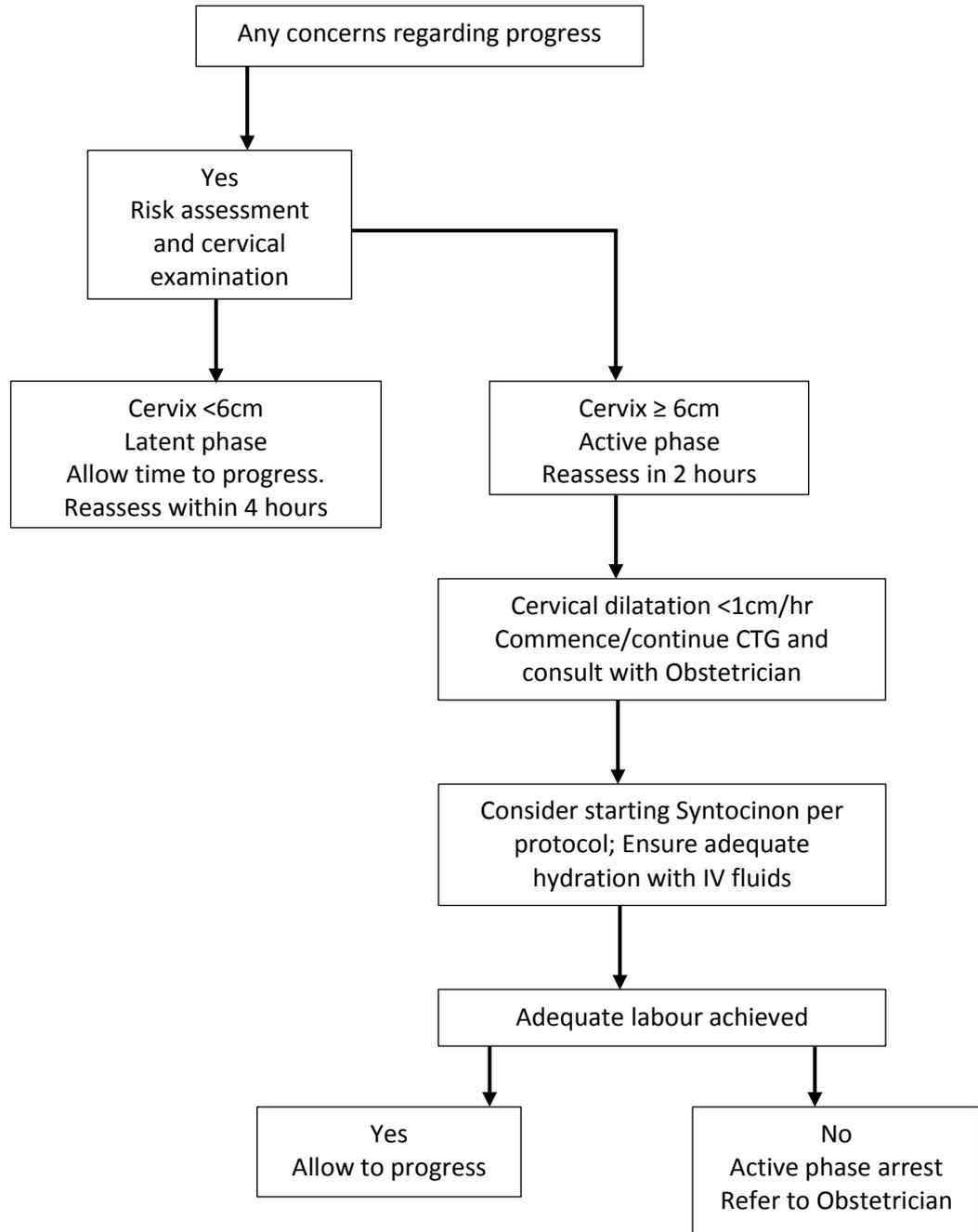
For quick reference guide to management of prolonged second stage please refer to flowchart, appendix 2.

SUMMARY

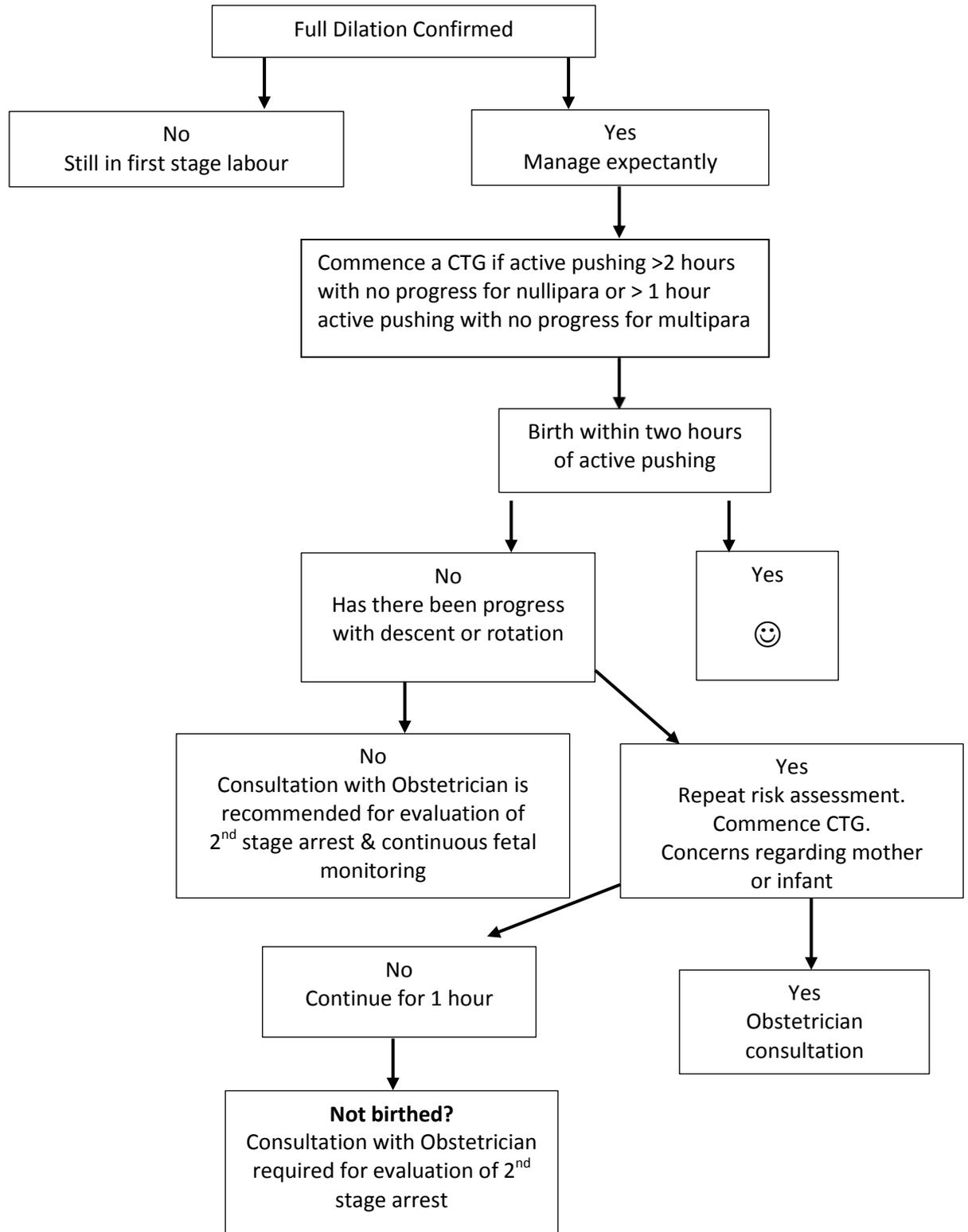
- Protraction and arrest disorders of labour are common.
- Assessing whether labour is progressing normally is a key component of intrapartum care.
- The definition of “normal” progress has been modified by recent meta-analyses. The evidence suggests that the rate of dilatation may be slower than formally believed in the early stages of labour. Over 50% of women do not dilate at a rate of > 1cm/hour until 5-6cm dilatation is reached. However, beyond a dilatation of 6cm, rates of cervical dilatation are more rapid, especially for multiparous women.

- Partograms may be a useful tool in assessing the progress of labour.
- Consultation with the obstetrician is warranted if abnormal labour is suspected.
- Risk to both mother and baby increases as the duration of second stage labour increases, particularly after three hours.

Appendix 1 Prolonged First Stage



Appendix 2 Prolonged Second Stage



ASSOCIATED DOCUMENTS:

Syntocinon intravenous infusion for induction or augmentation of labour guideline (2016)
Fetal heart rate assessment and monitoring – Antenatal & Intrapartum guideline (2016)

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Date of Approval: 03/11/2016

Next Review Date: 03/11/2019