**NSC 404: MATERNAL HEALTH AND NORMAL MIDWIFERY 2**

USE OF PARTOGRAPH IN THE MANAGEMENT OF FIRST STAGE OF LABOUR

WHAT IS A PARTOGRAPH?

The partograph is a graphical presentation of the progress of labour, and of fetal and maternal condition during labour. It is the best tool to help detect if labour is progressing normally or abnormally, and to warn as soon as possible if there are signs of fetal distress or if the mother’s vital signs deviate from the normal range.

A partograph should be started on women in active labour, who have no complications that require immediate action, to clearly assess the progress of labour by cervical dilation. The pattern of cervical dilation can used in determining abnormal labour patterns. A partograph is started in the active phase when the cervix is at least 4 cm dilated. The dilation is marked with an X on the alert line and the corresponding time in the appropriate case or box.

In the section for cervical dilatation and fetal head descent, there are two diagonal lines labelled Alert and Action. The Alert line starts at 4 cm of cervical dilatation and it travels diagonally upwards to the point of expected full dilatation (10 cm) at the rate of 1 cm per hour. The Action line is parallel to the Alert line, and 4 hours to the right of the Alert line. These two lines are designed to notify when to take action quickly, if the labour is not progressing normally.

The partograph requires the assessment of several observations. The first set of observations relate to progress of labour: cervical dilatation, descent of the fetal head, and uterine contractions. The second set of observations focuses on the fetus: fetal heart rate, membranes and liquor, and moulding of the fetal head.

MANAGEMENT OF FIRST STAGE OF LABOUR

A normally progressing labour is characterised by at least 1 cm per hour cervical dilatation, once the labour has entered the active first stage of labour. Another important point is that (unless you detect any maternal or fetal problems), every 30 minutes you will be counting fetal heart beats for one full minute, and uterine contractions for 10 minutes.

A digital vaginal examination should be carried out initially to assess:

* The extent of cervical effacement and cervical dilatation
* The presenting part of the fetus
* The status of the fetal membranes (intact or ruptured) and amniotic fluid
* The relative size of the mother’s pelvis to check if the brim is wide enough for the baby to pass through.

Thereafter, in every 4 hours, assess change in:

* Cervical dilatation
* Development of cervical oedema (an initially thin cervix may become thicker if the woman starts to push too early, or if the labour is too prolonged with minimal change in cervical dilatation)
* Position (of the fetus, if you are able to identify it)
* Fetal head descent
* Development of moulding and caput
* Amniotic fluid colour (if the fetal membranes have already ruptured).

1. **Cervical dilatation**

The first stage of labour is divided into the latent and the active phases. The latent phase at the onset of labour lasts until cervical dilatation is 4 cm and is accompanied by effacement of the cervix. The latent phase may last up to 8 hours, although it is usually completed more quickly than this. Although regular assessments of maternal and fetal wellbeing and a record of all findings should be made, these are not plotted on the partograph until labour enters the active phase.

Vaginal examinations are carried out approximately every 4 hours from this point until the baby is born. The active phase of the first stage of labour starts when the cervix is 4 cm dilated and it is completed at full dilatation, i.e. 10 cm. In the cervical dilatation section of the partograph, down the left side, are the numbers 0–10. Each number/square represents 1 cm dilatation. Along the bottom of this section are 24 squares, each representing 1 hour. The dilatation of the cervix is estimated by vaginal examination and recorded on the partograph with an X mark every 4 hours. Cervical dilatation in multipara women may need to be checked more frequently than every 4 hours in advanced labour, because their progress is likely to be faster than that of women who are giving birth for the first time (if progress of labour is satisfactory, the recording of cervical dilatation will remain on, or to the left, of the alert line).

If the membranes have ruptured and the woman has no contractions, do not perform a digital vaginal examination, as it does not help to establish the diagnosis and there is a risk of introducing infection.

1. **Descent of the fetal head**

For labour to progress well, dilatation of the cervix should be accompanied by descent of the fetal head, which is plotted on the same section of the partograph, but using O as the symbol. The station can only be determined by examination of the woman’s vagina with your gloved fingers, and by reference to the position of the presenting part of the fetal skull relative to the ischial spines in the mother’s pelvic brim.

1. **Assessing moulding and caput formation**

The five separate bones of the fetal skull are joined together by sutures, which are quite flexible during the birth, and there are also two larger soft areas called fontanels. Movement in the sutures and fontanels allows the skull bones to overlap each other to some extent as the head is forced down the birth canal by the contractions of the uterus. The extent of overlapping of fetal skull bones is called moulding, and it can produce a pointed or flattened shape to the baby’s head when it is born.

Some baby’s skulls have a swelling called a caput in the area that was pressed against the cervix during labour and delivery; this is common even in a labour that is progressing normally. Whenever moulding or caput formation in the fetal skull is detected as the baby is moving down the birth canal, care should be emphasized in evaluating the mother for possible disproportion between her pelvic opening and the size of the baby’s head. The pelvic opening should be large enough for the baby to pass through. A small pelvis is common in women who were malnourished as children, and is a frequent cause of prolonged and obstructed labour.

When documenting the degree of moulding on the partograph, a scale from 0 (no moulding) to +3, is used to write them in the row of boxes provided:

1. Bones are separated and the sutures can be felt easily.

+1- Bones are just touching each other.

+2- Bones are overlapping but can be separated easily with pressure by your finger.

+3- Bones are overlapping but cannot be separated easily with pressure by your finger.

In the partograph, there is no specific space to document caput formation. However, caput detection should be part of your assessment during each vaginal examination. Like moulding, you grade the degree of caput as 0, +1, +2 or +3. Because of its subjective nature, grading the caput as +1 or +3 simply indicates a ‘small’ and a ‘large’ caput respectively. You can document the degree of caput either on the back of the partograph or on the mother’s health record (if you have it).

1. **Uterine contractions**

Normally, contractions become more frequent and last longer as labour progresses. Contractions are recorded every 30 minutes on the partograph in their own section, which is below the hour/time rows. At the left hand side is written ‘Contractions per 10 mins’ and the scale is numbered from 1–5. Each square represents one contraction, so that if two contractions are felt in 10 minutes, you should shade two squares.

On each shaded square, indicate the duration of each contraction by using the symbols;

* Dots represent mild contractions of less than 20 seconds duration
* Diagonal lines indicate moderate contractions of 20-40 seconds duration
* Solid shading represent strong contractions of longer than 40 seconds duration

1. **Assessment and recording of fetal wellbeing**

To assess that the fetus is in good health during labour and delivery, assess fetal condition by;

* counting the fetal heart beat every 30 minutes
* checking the colour of the amniotic fluid if the fetal membranes have ruptured

Fetal heart rate as an indicator of fetal distress

The normal fetal heart rate at term (37 weeks and more) is in the range of 120–160 beats/minute. If the fetal heart rate counted at any time in labour is either below 120 beats/minute or above 160 beats/minute, it should be counted more frequently until it has stabilized within the normal range. It is common for the fetal heart rate to be a bit out of the normal range for a short while and then return to normal. However, fetal distress during labour and delivery can be expressed as:

* Fetal heart beat persistently (for 10 minutes or more) remains below 120 beats/minute (persistent fetal bradycardia).
* Fetal heart beat persistently (for 10 minutes or more) remains above 160 beats/minute (persistent fetal tachycardia).

Recording fetal heart rate on the partograph

The fetal heart rate is recorded at the top of the partograph every half hour in the first stage of labour (if every count is within the normal range), and every 5 minutes in the second stage. Count the fetal heart rate:

* As frequently as possible for about 10 minutes and decide what to do thereafter.
* Every five minutes if the amniotic fluid (called liquor on the partograph) contains thick green or black meconium.
* Whenever the fetal membranes rupture, because occasionally there may be cord prolapse and compression, or placental abruption as the amniotic fluid gushes out.

Each square for the fetal heart on the partograph represents 30 minutes. When the fetal heart rate is in the normal range and the amniotic fluid is clear or only lightly blood-stained, the results on the partograph can be recorded. When counting the fetal heart rate at less than 30 minute intervals, use the back of the partograph to record each measurement. Prepare a column for the time and fetal heart rate.

Amniotic fluid as an indicator of fetal distress

Another indicator of fetal distress is meconium-stained amniotic fluid (greenish or blackish liquor). Lightly stained amniotic fluid may not necessarily indicate fetal distress, unless it is accompanied by persistent fetal heart rate deviations outside the normal range. The following observations are made at each vaginal examination and recorded on the partograph, immediately below the fetal heart rate recordings.

If the fetal membranes are intact, write the letter ‘I’ (for ‘intact’).

If the membranes are ruptured and:

* liquor is absent, write ‘A’ (for ‘absent’)
* liquor is clear, write ‘C’ (for ‘clear’)
* liquor is blood-stained, record ‘B’
* liquor is meconium-stained, record ‘M1’ for lightly stained, ‘M2’ for a little bit thick and ‘M3’ for very thick liquor which is like soup

1. **Assessment of maternal wellbeing**

During labour and delivery, after thorough initial evaluation, maternal wellbeing is followed by measuring the mother’s vital signs: blood pressure, pulse, temperature, and urine output. Blood pressure is measured every four hours. Pulse is recorded every 30 minutes. Temperature is recorded every 2 hours. Urine output is recorded every time urine is passed. If any persistent deviations from the normal range of any of these measurements is identified, refer the mother to a higher health facility.

MANAGEMENT OF SECOND STAGE OF LABOUR

Second stage of labour is initiated from full dilatation of the cervix up to the birth of the 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.

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 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.

Assuring safety also requires the presence of a second person trained to assist. In order to provide the key aspects of care, 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. 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. Also, 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. Specific aspects of care in this stage includes;

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. 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. 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.

1. **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. 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.

1. **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.

The frequency of fetal heart auscultation should be every 5–10 minutes or more often when bradycardia is suspected. The best information about the condition of the fetus, and it is easiest to hear, is gotten 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.

1. **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. 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; this position reduces uteroplacental blood flow, can contribute to fetal distress, and provides no mechanical advantage to enhance descent.

1. **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. 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.

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 no advancement of the presenting part.

MANAGEMENT OF THIRD STAGE OF LABOUR

This stage involves all activities from the birth of the baby until expulsion of the placenta and membranes. Active management of the third stage of labour is only with respect to the following outcomes:

* Severe postpartum hemorrhage (PPH)
* Need for blood transfusion
* Need for the use of uterotonics

The active management of the third stage is not mandatory but should be offered to all women in the antenatal period. In active management, placental expulsion is not dependent solely upon the natural contractility of the uterus, but must be ensured by prophylactic uterotonics, which will not only produce uterine contraction with separation of the placenta, but also prevent PPH. Three basic techniques are used to achieve rapid placental expulsion, which will be followed, by proper uterine contraction and retraction:

* Prophylactic uterotonics
* Cord clamping and cutting
* Controlled cord traction (CCT)

1. **Prophylactic uterotonics**

These drugs cause powerful contractions of the uterus and therefore the presence of another fetus should always be ruled out before administering them. They are always given after the clamping and cutting of the cord, and within a minute of delivery.

In the active management of the third stage, all low-risk vaginal deliveries are followed by the administration of oxytocin by one of the following routes:

* intramuscular oxytocin 10 IU administered immediately after the anterior shoulder is born
* intravenous infusion containing 20-40 IU oxytocin is substituted for the injection, at 150 mL/hr
* intravenous oxytocin bolus may also be used at 5-10 IU over 1-2 minutes, but is proscribed after an elective C-section.

Other uterotonins include:

* Ergonovine 0.2 mg intramuscularly, but it may precipitate hypertension in the mother as well as rarely cause retention of the placenta. Its action is a little slower (within 6-7 minutes following intramuscular use) but lasts for up to 4 hours.
* Carbetocin 100 mcg intramuscularly or as an intravenous bolus over 1 minute in vaginal deliveries with a single risk factor for PPH, and in elective C-sections respectively
* Misoprostol 600-800 mcg given orally, sublingually or rectally in the absence of oxytocin

All these are normally combined with uterine massage to promote uterine contraction, except when carbetocin is used following a vaginal delivery. Ergonovine and misoprostol are often used in developing countries and remote locations where oxytocin storage is not possible. However, only the latter, Misoprostol is recommended in this situation, due to the risk of:

* Closing off the cervix even before the placenta is expelled
* Un-physiological uterine contractions
* Sudden spiking of the maternal blood pressure and other complications, following ergonovine administration.

1. **Clamping and cutting the cord**

Cord clamping is delayed by 1 minute or more in preterm neonates, to reduce complications such as intraventricular hemorrhage and need for transfusions. However, it is performed within a minute of delivery in term babies as a part of active management.

The pretext for the lack of delay in clamping is the risk of physiological jaundice as more blood is retained in the fetal circulation with delayed clamping, but on the other hand such babies have a higher iron content and lower chances of anemia. The other reason is that it enables CCT to be performed almost at once by promoting placental separation.

1. **Controlled cord traction (CCT)**

CCT should be performed only when the uterus is well contracted. The delivery of the placenta is facilitated by applying traction on the part of the cord outside the vulva, first downwards with one hand supporting the fundus of the uterus to prevent uterine inversion, and then guiding it upwards and out of the birth canal once separation has occurred.

This is usually done following signs of placental separation from the uterine wall, such as contraction of the uterus and fresh bleeding, but may be done as an initial measure as well. If there is any resistance to the separation and emergence of the placenta, further traction should be stopped for a minute and the uterus allowed to contract, before resuming the attempt. Once the placenta appears at the vulva, both hands are used to hold and twist it gently to ensure that all the membranes are delivered intact. It should be inspected after it is completely delivered to rule out retention of any part.

Once the placenta has been delivered, uterine massage is given to ensure it retracts and contracts forcefully. This reduces the odds of PPH, and should be repeated at intervals for two hours to confirm and maintain this state. Following this, the vulva and vagina are carefully inspected and repaired if necessary to reduce the bleeding from large or deep lacerations of the birth canal and neighboring areas.