Guideline for Fetal Heart Rate Monitoring in Labour

The purpose of fetal heart rate monitoring in labour is to detect fetal hypoxia.

The aim of monitoring should be

1. To identify a fetus in jeopardy in timely fashion so that we can intervene and prevent permanent damage or death (High Risk)

2. To identify a normal fetus so that we can safely continue expectant management (Low Risk)

Both antenatal and intrapartum events are important in the aetiology of neonatal encephalopathy; there should be clear understanding of the High and Low risk antenatal and intrapartum pathways.

There are two methods of fetal heart rate monitoring:-

(i) Intermittent auscultation.
(ii) Continuous electronic fetal heart rate monitoring (CTG)

Continuous fetal heart rate monitoring gives more information than intermittent auscultation, but is prone to over diagnose fetal hypoxia in labour.

Principles of fetal heart rate monitoring in University Hospital Wishaw

Every woman has the right to be fully informed and to share in the decision-making about the method of fetal monitoring they wish to receive whilst in labour. Women should be directed to the section "Monitoring your baby in labour" in "Ready Steady Baby" book, with an opportunity to discuss further with midwifery and/or obstetric staff.

1. Every woman in labour should undergo fetal heart rate monitoring.

2. The method of fetal heart rate monitoring should be decided by discussion between the pregnant woman and her attendant, whether this is her midwife or obstetrician and whether she is on the Low or High Risk intrapartum pathway. This guideline refers to low risk women in spontaneous labour but also covers identifying the fetus at risk as it may not be identified until fetal heart rate monitoring in labour.

3. No attendant caring for the woman in labour, whether midwife or obstetrician, should adversely criticise the method of fetal monitoring decided upon and initiated by another attendant, even if the method initiated is changed to the other method.

4. Because electronic fetal monitoring sometimes over diagnoses fetal distress, the standard method of monitoring for spontaneous labour in University Hospital Wishaw is intermittent auscultation.

We must remember the fetuses at risk of fetal heart rate abnormalities and jeopardy who may not have previously been identified as in the High risk antenatal pathway but should be on the High risk intrapartum pathway.

- **Preterm**
- **Post maturity**
- **IUGR**
- **Thick meconium with scanty fluid**
- **Intrauterine Infection**
- **Previous caesarean section and scar rupture**

In the absence of such features we assume a normal fetus and we can safely continue expectant management with intermittent monitoring (or continuous monitoring if that is the woman's informed choice), unless the situation changes.

Intermittent auscultation- LOW RISK pathway

1. On admission in labour, risk assess to confirm the woman remains low risk (green pathway, and none of the above features are present indicating a fetus at risk of jeopardy) and that she is suitable for intermittent fetal monitoring. In accordance with NICE guidelines 2017, there is currently no evidence that supports a recommendation of routine admission CTG testing in healthy women deemed to be low risk.

2. The method of intermittent auscultation is that recommended by the Royal College of Midwives:-

   a. A Pinard stethoscope or a hand-held Doppler machine is used.
   b. The fetal heart rate is counted for one minute after a contraction.
   c. The fetal heart rate is counted every fifteen minutes in the first stage of labour, and every five minutes in the second stage of labour.

3. Just after the fetal heart rate is counted, the maternal pulse rate should be counted.

4. The fetal heart rate and the maternal pulse rate should be recorded in the maternity notes every time they are taken.

   DO NOT use the CTG monitor for intermittent auscultation.

Continuous electronic fetal heart rate monitoring – LOW / HIGH RISK pathway

1. Continuous electronic fetal heart rate monitoring is recommended if the fetal heart rate is abnormal on auscultation or if this is the woman's preferred and informed choice.

2. Electronic fetal heart rate monitoring without prior intermittent auscultation is recommended where there is a high expectation that the fetal heart rate will become abnormal as labour progresses. This is a judgment of the woman's attendant in labour.

3. In deciding on the method of fetal heart rate monitoring, however, we must again remember the **Fetuses at risk:**

   - **Preterm**
   - **Post maturity**
   - **IUGR**
   - **Thick meconium with scanty fluid**
   - **Intrauterine Infection**
   - **Intrapartum bleeding**

And the

Fetus at relative risk:

- Injudicious use of oxytocin
- Epidural in a case with some compromise
- Difficult instrumental delivery
- Acute events- cord prolapse, abruption and scar rupture
- Suspicious / abnormal admission test if performed

Prematurity <37 weeks gestation

Continuous electronic fetal monitoring should be performed if the fetus is considered viable and active resuscitation is to be attempted. This can be difficult when labour may be precipitate and the fetal heart rate must be clearly documented in the notes. In some cases of extreme prematurity, monitoring cannot be performed, and in some pre-viable infants, monitoring will be misleading and the baby may be more safely delivered by caesarean section. This decision needs to be made by the consultant obstetrician and discussed with the consultant neonatologist on call.

Post 42 weeks gestation

If the admission CTG is normal, intermittent auscultation is acceptable but we must not forget these fetuses are likely to have lower physiological reserves and are more prone to placental insufficiency and be alert to any change in the fetal heart rate pattern as labour progresses. This needs to be discussed with the maternity coordinator and consultant obstetrician.

Suspected intrauterine growth restriction

Continuous electronic fetal monitoring should be performed.

Meconium-stained amniotic fluid.

If the meconium staining of the amniotic fluid is light (non-significant) and the admission CTG is normal, intermittent auscultation is acceptable. This should depend on a risk assessment which should include stage of labour, volume of liquor, parity and the fetal heart rate. If the meconium is thick or contains thick lumps, (significant) scanty or apparently absent as behind presenting part we advise continuous electronic fetal monitoring in accordance with NICE2017 guidelines.

Suspected Sepsis

Both mother and baby are at risk with sepsis. Continuous electronic fetal monitoring should be performed. Midwives should always be aware of signs and symptoms of sepsis:-

- Temperature below 36 or above 38degrees Celsius
- A respiratory rate of > 20
- Tachycardia of > 100 beats per minute
- Poor urine output <30mls per hour
- Mottling of skin, general malaise, tachycardia, possible offensive odour from liquor

Septic patients are prone to a sudden drop in BP which can cause fetal hypoxia. All observations should be documented on the MEWS chart. Such patients need 1:1 high dependency care and the maternity coordinator, anesthetist and obstetric consultant involved in their care (refer to sepsis guideline)

Intrapartum bleeding

Continuous CTG is required with review by obstetrician to look for cause of bleeding and decide whether immediate delivery indicated

Fetus at relative risk

Injudicious use of oxytocin- covered in oxytocin guideline

Pharmaceutical intervention in Labour

Epidural Analgesia

Many women have been Low risk until they request an epidural therefore if intermittent auscultation has been reassuring until this point, a CTG is not necessary prior to siting. However during establishment of an epidural and following each bolus of 10mls or more it is recommended that at least 30 minutes of continuous fetal monitoring is carried out.

For Low risk women an epidural does not indicate the need for continuous monitoring but in practice we advise this, as both mother and fetus can be affected by the analgesic and anaesthetic drugs which can cause hypotension. If the mother and care giver make an informed choice that intermittent monitoring is satisfactory. This should be clearly documented.

If the woman is high risk the CTG should be continued throughout labour and epidural analgesia.

Ramifentanyl

Continuous fetal heart rate monitoring is recommended.

RED INTRAPARTUM PATHWAY

Induction of Labour- this is covered in the induction of labour guideline and synthetic oxytocin infusion guideline

A CTG should be performed before and after administration of prostin. Following administration of vaginal prostin, when contractions begin, fetal wellbeing should be assessed with continuous electronic fetal monitoring. Once the CTG is confirmed as normal, intermittent auscultation should be used unless there are clear indications for continuous CTG.

If a woman is assessed as contracting 5 or more in 10 minutes, then continuous electronic fetal monitoring should be used.

Continuous fetal monitoring should be performed during oxytocin infusions (see oxytocin guideline)

For induction by amniotomy alone, intermittent auscultation is acceptable.

High Risk ANTENATAL and INTRAPARTUM pathway – known fetus at risk

Pre-eclampsia

Continuous electronic fetal monitoring should be offered.

Previous Caesarean Section and spontaneous labour- see VBAC guideline

The preference for monitoring should be clearly documented in the antenatal record as a discussion between the woman and obstetrician as an informed choice; the risk of uterine scar rupture is small in spontaneous labour and most cases are secondary to injudicious use of synthetic oxytocin. An admission CTG is required. If the admission CTG is normal, intermittent auscultation is acceptable. If there are no complications, waterbirth is acceptable if previously discussed with woman and her care giver. The maternity coordinator and obstetrician should be informed.

Twins at term

Continuous electronic fetal heart monitoring should be performed. In all cases it would be preferred if a twin monitor was used. If one is not available, then it is acceptable practice to use two monitors. These monitors should be placed side by side and not at opposite ends of the woman.

1. Before applying the external fetal heart rate monitor the location of the fetal heart should be identified either by the Pinard stethoscope or the hand-held Doppler machine. The maternal pulse should also be identified at this time and recorded.

2. The cardiotocograph should be labelled with the date, time and the woman's details. The date and time clocks should be set correctly and the paper speed checked (1cm/min). Intrapartum events should be recorded contemporaneously on the trace. Following delivery the midwife should sign the trace, detailing the date, time, mode of delivery and APGAR score. The trace should be secured in the mother's notes.

3. Throughout the duration of the CTG the care giver should ensure there are hourly (peer reviews) carried out using intrapartum interpretation guidance (NICE 2017) which should be recorded within the notes along with a peer review sticker applied to the underside of the CTG.

In addition to the hourly CTG peer review being carried out we recommend a formal description should be carried out:

- At the beginning of the trace
- With any significant event during labour (eg administration of synthetic oxytocin)
- If fetal heart rate abnormalities occur.

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