Combined fetal monitoring guideline (GL964)

Approval

<table>
<thead>
<tr>
<th>Approval Group</th>
<th>Job Title, Chair of Committee</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternity &amp; Children’s Services</td>
<td>Chair, Maternity Clinical Governance Committee</td>
<td>1st November 2019</td>
</tr>
</tbody>
</table>

Change History

<table>
<thead>
<tr>
<th>Version</th>
<th>Date</th>
<th>Author, job title</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.0</td>
<td>June 2019</td>
<td>C Harding (Consultant MW) P Bose (Consultant Obstetrician &amp; Intrapartum Lead), Jo Pawlak (Clinical Skills MW)</td>
<td>Reviewed and amended to incorporate existing Fetal Blood sampling (GL839) guidance</td>
</tr>
</tbody>
</table>

To be read in conjunction with:

- Fetal blood sampling - Local safety standard for invasive procedure (GL1041) V1.1
Antenatal CTG monitoring

Prior to 26 weeks gestation a CTG should **not** be performed, auscultation of fetal heart should be undertaken with sonicaid or pinard or visualisation of FH with USS.

Women between 26 – 28 weeks who require a CTG following a consultant review must be monitored using the Dawes-Redman criteria.

CTG should NOT be undertaken prior to 28 weeks for reduced fetal movements (see guideline on Reduced Fetal Movement GL903).

**Dawes-Redman CTG analysis**

The principles of this system are to determine when there are enough data to conclude the CTG trace is normal. It has a time limit of 60 minutes.

It is valid for any gestation over 26 weeks but it is not suitable for intrapartum CTG analysis.

Criteria met: The Dawes/Redman criteria can meet the criteria as early as 10mins, if the criteria is met at this point the CTG can be considered normal and discontinued, it does not need to continue for the traditional 20 minutes. The CTG should be reviewed but the measurements and STV are insignificant as the CTG has been classified as normal.

Criteria not met: If the criteria are not met and the CTG appears to have normal features it must be continued for 60 minutes, at this point the CTG should be discontinued and an appropriate clinical review/action must be taken. If the CTG appears suspicious or pathological at any point an immediate senior obstetric review sought. There will be specific reason codes as to why the criteria have not been met (see information attached to CTG). The STV should be taken into account and the trend reviewed if previous analysis has been performed. A low STV is most commonly associated with growth retarded, chronically stressed foetuses.

**STV values:**

| ≥4 is normal | <4 is low | <3 is abnormal | <2 highly abnormal |

An antenatal CTG sticker and signature should still be applied at the end of the CTG to ensure that it has been reviewed by a qualified member of staff.
Chronic hypoxia

It is important to exclude chronic hypoxia when assessing antenatal CTGs. To do this the following questions should be asked and if answer is no this should be escalated to a senior obstetrician for appropriate plan.

**Checklist to exclude chronic hypoxia and pre-existing fetal injury**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Baseline regal heart rate appropriate for gestational age</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>2. Normal variability and cycling</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>3. Presence of accelerations (2 or more in 20 minutes)</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>4. No shallow or late decelerations</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

Also consider wider clinical picture

- Meconium
- Maternal temperature
- Fetal growth
- Reduced fetal movements

**Record keeping**

The following data should be checked documented at the beginning of every CTG

1. Correct date and time on the clocks of fetal monitor- should be hand written or print out confirmed to be correct.
2. Mother's name, and hospital number

Or use preformatted ‘start of CTG’ sticker

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Date &amp; time of start</td>
<td></td>
</tr>
<tr>
<td>Date / time / paper speed correct?</td>
<td></td>
</tr>
<tr>
<td>Name/DOB/number</td>
<td></td>
</tr>
<tr>
<td>Indication for CTG</td>
<td></td>
</tr>
<tr>
<td>FH auscultated</td>
<td>Pinard / sonicaid</td>
</tr>
<tr>
<td>Gest:</td>
<td>MP:</td>
</tr>
<tr>
<td>Sign:</td>
<td>Print:</td>
</tr>
</tbody>
</table>

**Induction of labour with propess**

There should be a minimum of 20 minute CTG prior to induction. Once contractions begin, or pain experienced a CTG should be performed however the need for on-going continuous electronic fetal monitoring should be individually assessed.
Interpretation

The CTG should be no less than 20 minutes in duration, if the CTG continues for longer there should be regular reviews of the CTG by a qualified member of staff, every 20 minutes, this should be annotated on the CTG with a signature/print name and time. A CTG should never be left unattended without review for any longer periods. A structured review of all the features of CTG (Contractions, baseline rate, variability, accelerations, and decelerations) should be performed and documented on the preformatted ‘antenatal’ CTG sticker at the end of the CTG and the notes the trace should be classified as NORMAL or ABNORMAL.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Normal</th>
<th>Abnormal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline rate</td>
<td>100-160bpm</td>
<td>&lt;100 or &gt;160bpm</td>
</tr>
<tr>
<td>Accelerations</td>
<td>At least 2 in 20 mins</td>
<td>None in &gt;40 mins</td>
</tr>
<tr>
<td>Variability</td>
<td>&gt;5 bpm</td>
<td>&lt;5 bpm</td>
</tr>
<tr>
<td>Decelerations</td>
<td>None</td>
<td>Present</td>
</tr>
<tr>
<td>CTG last normal</td>
<td>Now</td>
<td>min/hr/days</td>
</tr>
<tr>
<td>Date/time</td>
<td>Signed</td>
<td>ago</td>
</tr>
<tr>
<td>Uterine activity:</td>
<td>F/ M / S</td>
<td>Date/time</td>
</tr>
<tr>
<td>__________:10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Twins

An ultrasound examination should be performed prior to commencing any CTG in a twin pregnancy to confirm location of two individual fetal hearts. This should be undertaken by a suitably qualified person who is confident in scanning twins. The 20 beat separation of the two fetal hearts should be applied to differentiate more easily between the twins. A diagram should be drawn on the CTG to indicate where ‘twin 1’ and ‘twin 2’ are in the maternal uterus.

Storage of Antenatal CTGs

CTG’s should be stored in the brown Antenatal CTG envelope in the maternal notes and the front of the envelope signed.

Auditable standards:

1. The minimum data set that will be recorded on commencement of all CTG monitoring traces includes: woman’s name, hospital number, date & time, maternal pulse.

2. A CTG assessment will be carried out on completion of CTG recording during the antenatal period by completing a CTG assessment label and attaching it to the CTG trace and in the maternal health record.
References:


2. FIGO (1987) Guidelines for the use of fetal monitoring. IJO&G 25:159-167


5. NPSA www.npsa.nhs.uk/

Intrapartum electronic monitoring of Fetal heart rate and contractions

The objective of fetal heart rate (FHR) monitoring in labour is to reduce fetal mortality/morbidity by ensuring that any fetal hypoxic insult is identified in time to allow either:

- Removal/amelioration of the hypoxic insult
- Delivery of the fetus from the uterus before irreversible asphyxial damage occurs

The purpose of this document is to provide guidance and standardise the documentation, interpretation and management of intrapartum fetal monitoring.

Indications for CTG in labour

Please use the Trust Labour Risk Assessment Tool to identify all the pregnancies where continuous electronic fetal monitoring is clinically indicated or recommended. (GL863)

In addition, continuous electronic monitoring should be performed at:

- Maternal request
- Midwifery discretion
- Consultant request

Commencing CTG

The presence of fetal heart beat must be confirmed with auscultation using pinard, sonicaid or visualisation of FH with USS prior to commencing CTG monitoring.

Central monitoring

Every effort should be made to admit the patient onto the K2 Guardian system to allow central monitoring to take place. This is to reduce unnecessary interruptions in the room, enable the electronic storage of CTGs and facilitate teaching. The on-going review of the CTG and escalation of concerns remain the responsibility of the midwife providing care for the patient. The central station will not be constantly observed.

Quality of monitoring

The quality of monitoring of both uterine activity and FHR must allow for accurate interpretation even during the siting of an epidural. The monitoring of the FHR during the insertion of regional anaesthesia may be difficult but it is important to maintain a good quality trace even during that time. If you anticipate such a problem consider applying an FSE prior to the procedure being commenced.
Contraindications for applying an FSE

1. Maternal infection such as HIV, Hepatitis B, C
2. Suspected or confirmed bleeding disorder of the fetus
3. Prematurity <34 weeks
4. Face presentation

Refer to table 1 for problem solving solution.

**Table 1. Solving Problems and Escalation**

<table>
<thead>
<tr>
<th>Solving problems with recording of FHR</th>
<th>Recommended action</th>
</tr>
</thead>
</table>
| No fetal heart found prior to commencing CTG | • The Registrar and delivery suite coordinator should be informed immediately  
• A portable US machine should be brought to the bedside.  
• Senior obstetrician to visualise fetal heart with ultrasound.  
• Confirm fetal life  
• Reposition US transducer or apply FSE if appropriate |

| Erratic recording, loss of contact with external US transducer | • Perform Leopold’s manoeuvres to locate fetal back  
• Reposition US transducer over fetal back  
• Readjust belt and apply enough gel over US transducer  
• If recording still suboptimal, locate fetal heart with ultrasound and reposition US transducer  
• If membranes ruptured and there are no contraindications, apply fetal scalp electrode. |

| Erratic or no recording with FSE | • Call senior obstetrician and senior midwife. Full evaluation of history and labour to this point. Confirm normal fetal heart rate with ultrasound  
• Check that FSE wire is attached to the leg plate  
• Check FSE connection to fetus, and replace it if detached  
• Check that external monitor is discontinued  
• Transcutaneous Electrical Nerve Stimulation (TENS) may interfere with the acquisition of FHR signal.  
• Consider expediting delivery if fetal wellbeing cannot be adequately confirmed |

| Artifacts with FSE | • Confirm presence of fetal heart beat with ultrasound or auscultation using pinard or sonicaid  
• Commence external monitor  
• Reposition FSE and ensure it is not attached close to cervix or vaginal walls. |
Erroneous recording of the maternal heart rate (MHR)

Inadvertent recording of the maternal heart rate should be suspected in the following situations:

1. Sudden shift in the baseline rate
2. Sudden improvement of a previously abnormal trace
3. Accelerations that coincide with the contractions especially in the second stage of labour.

In these cases one of the following options should be undertaken:

1. Check/monitor maternal pulse. This should differ from what is displayed on CTG. 
Pulse oximeter allows continuous monitoring of MHR and this can be helpful particularly in the second stage when the MHR can accelerate significantly during the pushing efforts and can be mistaken for fetal.
2. Ultrasound examination of the fetal heart and repositioning of external transducer
3. Apply a FSE only once positive FH has been confirmed with sonicaid, pinard or USS.

Uterine activity

Confirm the uterine activity pattern (frequency, strength, duration and uterine resting tone) by abdominal palpation; this should be clearly documented in the medical records.

Place the toco transducer at the level of uterine fundus. In preterm pregnancies this level is expected to be lower and closer to the umbilicus.

If monitoring of the contractions is not possible;

- Change maternal position
- Consider using the extra-large straps for women with increased BMI
- Palpate contraction and place toco on abdomen where contraction palpated at strongest
- Escalate to senior midwife

In order for the CTG to be assessed accurately the recording of the contractions is a vital element therefore every effort should be made to record on the CTG the presence of contractions. If the toco is not picking them up the midwife may use another method to ensure this is done, e.g. press the toco lightly during contraction, or mark the CTG but accuracy must be sought.

Any difficulties in monitoring the contractions should be evidenced within the maternal records including actions taken.

The midwife should monitor contractions by palpating continuously for 10 mins every 30 mins. They should document in the maternal records difficulties of monitoring contraction and how they are palpating for strength, duration via palpates.

Alternatively the woman may be asked to assist by using fetal movement button to indicate the start of a contraction. This should be documented in the woman’s medical records.
Telemetry

This should be used for all women having continuous electronic fetal monitoring to encourage mobility.

Twins

An ultrasound examination should be performed by an appropriately trained person experienced in USS in twins prior to commencing any CTG in a twin pregnancy to confirm location of two individual Fetal hearts. An FSE should be recommended for twin one if cephalic as soon as possible. The 20 beat separation of the two fetal hearts should be applied to differentiate more easily between the twins.

Interpretation

The CTG should be reviewed continuously and the FHR baseline recorded in the partogram every 15 minutes in the first stage and every 5 minutes in the second stage.

A structured review of all the features of CTG (Contractions, baseline rate, variability, accelerations, and decelerations) should be performed and documented in the notes at least every 60 minutes; the trace should be classified as NORMAL, SUSPICIOUS or PATHOLOGICAL. Assessment by a second person using the Fresh Eyes approach should take place hourly during established labour (see appendix 1 for Fresh Eyes process).

When reviewing a CTG consideration of previous CTG tracings should be made to identify when the CTG was last normal.

<table>
<thead>
<tr>
<th>Date and time:</th>
<th>Primary midwife’s name &amp; role:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reviewer’s name &amp; role:</td>
<td>Risk factors:</td>
</tr>
<tr>
<td>Maternal pulse:</td>
<td>Contractions in 10 mins:</td>
</tr>
<tr>
<td>Baseline rate</td>
<td></td>
</tr>
<tr>
<td>No increase in baseline rate more than 20bpm</td>
<td>Lacking at least one characteristic of normality, but with no pathological features</td>
</tr>
<tr>
<td>Variability</td>
<td></td>
</tr>
<tr>
<td>5 - 25 bpm</td>
<td>&lt;5 bpm for &lt;50 mins</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Decelerations</td>
<td></td>
</tr>
<tr>
<td>No repetitive decelerations (decelerations with &lt;50% contractions)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Impression:</td>
<td>Normal</td>
</tr>
<tr>
<td>Clinical Management</td>
<td>No intervention necessary</td>
</tr>
<tr>
<td>Positive features:</td>
<td>Comments and action:</td>
</tr>
<tr>
<td>Accelerations</td>
<td></td>
</tr>
<tr>
<td>Cycling</td>
<td></td>
</tr>
<tr>
<td>Scalp stimulation response</td>
<td></td>
</tr>
<tr>
<td>Other (specify):</td>
<td></td>
</tr>
</tbody>
</table>

Author: C Harding, P Bose
Job Title: Consultant Midwife, Consultant Obstetrician
Policy Lead: Group Director Urgent Care
Location: Policy hub/ Clinical/ Maternity/ Intrapartum/ GL964

This document is valid only on date last printed

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The above sticker or K2 wizard must be used in conjunction with the definition tool (appendix 2).

**Escalation**

- Senior review (MW or obstetrician) should be sought at any time if the person assessing the CTG has concerns.
- If there is a difference of opinion during a Fresh Eyes review the process for a safety huddle should be followed (see appendix 1).
- Prolonged deceleration

Prolonged deceleration (greater than 3 minutes) indicates a need for urgent assessment and intervention to improve fetal oxygenation.

These may be in response to a reversible cause such as hypotension, uterine activity, sustained umbilical compression or a non-reversible causes such as placental abruption, cord prolapse or uterine rupture.

- Follow the 3,6,9 rule

- **By 3 minutes**
  - Call for help and start action below.

- **By 6 minutes**
  - Reposition mother in left lateral position. Rapid maternal ABC assessment. Are there any clues such as maternal hypoxia, uterine hyperstimulation or hypotension that are reversible? If so treat with oxygen and increase IV fluids as appropriate. Turn off any oxytocin infusion, regardless of the likely cause. It is best not to stress a bradycardic fetus further with contractions prior to recovery. In cases where there has been uterine hyperstimulation with evidence of more than 5 contractions every ten minutes consider administering 250 micrograms of terbutaline S/C.
  - Check it is fetal heart against maternal pulse. If any doubt then scan to visualise fetal heart. A portable US machine should be kept charged up and switched on in the delivery suite corridor at all times to avoid delay.
  - Are there signs of a sentinel event such as a placental abruption, uterine rupture or cord prolapse? Do a rapid vaginal examination to exclude a cord prolapse and ascertain cervical dilation.

- **By 9 minutes**
  - move patient directly to theatre with no delay for a category 1 caesarean section under GA. Use the emergency call system (2222) to alert the team.
  - Once in theatre check the fetal heart again as the bradycardia may have resolved and labour may be able to continue. In this circumstance good communications with the patient and her partner are imperative as she is likely to be very frightened and concerned for her baby. If the bradycardia has resolved, remain in theatre for the next 15 minutes whilst performing continuous electronic fetal monitoring to ensure that no repetition of the fetal bradycardia occurs. If the CTG remains reassuring then the patient may be
moved back to the labour ward. She should remain on continuous monitoring for the remainder of the labour.

- **By 12 minutes**
  - If the bradycardia is persisting prepare for caesarean section under GA unless the patient is fully dilated with the fetal head low in the pelvis when an operative vaginal delivery may be attempted. Do not waste time attempting this unless you are confident of success and can execute the delivery without regional anaesthesia.

- **By 15 minutes**
  - Accomplish delivery

### Fetal Blood Sampling

FBS is not evidenced based. Two Cochrane Systematic Reviews (2008 and 2013) have concluded that FBS does not improve long-term neurological outcomes or reduce caesarean sections. National Institute of Health and Care Excellence Guideline (London: NICE; 2014) has concluded that FBS as an adjunct to CTG significantly increased operative vaginal births and caesarean sections. FBS complications include bleeding (including haemorrhagic shock), infection, scalp abscess as well as rare but potentially serious complications such as leakage of cerebrospinal fluid or fetal haemorrhagic shock (Chandraharan BJOG 2014;121:1056–60).

If FBS is to be undertaken at RBH it should be done with consent of the consultant on call.

### Contraindications:

- Where there is clear evidence of acute fetal compromise (for example, prolonged deceleration greater than 3 minutes with no sign of recovery), FBS should not be undertaken and urgent preparations to expedite birth should be made.
- Mother known to have HIV or Hepatitis B or C, active Herpes simplex
- Suspected or confirmed Sepsis
- Meconium stained liquor
- Fetal bleeding disorder (known or suspected from family history)
- <34 weeks gestation
- Face presentation

### 1. Procedure:

- Explanation to patient, obtain verbal consent and document in records
- Set up trolley with FBS pack, good light source and other equipment as required
- Midwife in attendance
• Mother placed in left or right lateral position (never in lithotomy), good light, assistant, equipment
• Amnioscope passed into vagina to rest on fetal scalp.
• Sufficient contact on scalp to exclude amniotic fluid contamination
• Clean fetal scalp with swab from FBS pack
• Spray with ethyl chloride
• Smear skin with silicone jelly
• Stab scalp with guarded blade (do not twist, slice or carve with blade)
• Droplet of blood collected by capillary action into heparinised tube (no bubbles)
• On capillary samples insert a flea immediately the sample has been taken and agitate with the magnet to disperse heparin into the sample to prevent clots forming
• Blood gas analysis immediately
• Apply gentle pressure on the incision with a swab to secure haemostasis.

In the event of the blood gas analyser on delivery suite being out of action samples can be processed on Buscot.

N.B. The registrar on call should be informed if vaginal bleeding is noted or started after FBS. In case of new onset vaginal bleeding after FBS, bleeding from the fetal scalp should be excluded by direct vision of the fetal scalp with an amnioscope.

2. Interpretation:

<table>
<thead>
<tr>
<th>FBS result pH</th>
<th>Interpretation</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥7.25</td>
<td>Normal</td>
<td>Repeat FBS within an hour if CTG pathological or it does not improve. Consider sooner if CTG deteriorates</td>
</tr>
<tr>
<td>7.21-7.24</td>
<td>Borderline</td>
<td>Repeat FBS within 30 minutes if CTG pathological. Consider sooner if added risk factor i.e. IUGR present or CTG deteriorates</td>
</tr>
<tr>
<td>≤ 7.20</td>
<td>Abnormal</td>
<td>Expedite delivery Discuss case with Consultant on call</td>
</tr>
</tbody>
</table>

Any previous pH measurement, the rate of progress in labour and the clinical features of the woman and baby should all be considered when interpreting the scalp pH result and planning on-going care.

The obstetrician should document a plan of action in the maternal records detailing when the case will be reviewed, which may include the interval to the time when a second sample should be obtained.
If the FHR trace pattern remains unchanged and the FBS result is stable after a second test, further sampling may be deferred unless additional abnormalities develop on the CTG trace.

Where a third FBS is considered necessary, a consultant obstetric opinion should be sought.

If FBS is not feasible or there are no FBS results the case must be discussed with the Consultant on call.

Record keeping

The following data should be checked documented at the beginning of every CTG

1. Correct date and time on the clocks of fetal monitor- should be hand written or print out confirmed to be correct.
2. Mother’s name, and hospital number, and DOB
4. Signature and Printed name of person commencing CTG
5. Reviews of CTG (Hourly Fresh Eyes review of the FHR to a maximum of 90 mins or more frequently if clinically indicated). If using paper records pre-formatted ‘intrapartum’ CTG stickers should be used for every CTG review and placed in the medical notes. The findings should also be documented in the woman’s medical records with a written plan for on-going care. In the event of twins two sticky labels should be used in the same way indicating which sticker applies to which twin.
6. If using paper records only record intrapartum events that may affect FHR (VE, FBS, epidural sited/top up, Oxytocin adjustments) on the CTG.

On completion of the CTG the tracing should be stored securely within the manila envelope marked ‘Intrapartum CTG’ which should have the woman’s name and hospital number on the front. This is located within the intrapartum section in the woman’s medical records.

COMMUNICATION

With the woman

- Maternal wishes and concerns should be discussed.
- The benefits, risks and limitations of the intrapartum fetal monitoring should be explained.
- Consent should be sought for the aforementioned interventions.
- The woman should be included in the decision making process regarding her care.

Interdisciplinary

A structured transfer of information among healthcare professionals in labour ward can optimise communication, elicit appropriate response and help the prioritisation of workload.
TRAINING

Health professionals performing, interpreting and managing CTGs should attend the fetal monitoring study day annually and be successful in passing the EFM assessment

Auditable standards:

1. The minimum data set that will be recorded on commencement of all CTG monitoring traces includes: woman’s name, hospital number, date & time and maternal pulse.

2. A minimum of hourly assessments on the CTG trace will be carried out during the intrapartum period by completing a CTG assessment label, signed and timed and attaching it in the maternal health record or electronic assessment tool. Assessments will be aimed to be done hourly and within a maximum of 90 minutes of previous assessment.

3. “Fresh eye” reviews will be carried out hourly and within a maximum of 90 minutes from previous fresh eyes assessment by a midwife or an obstetrician.

4. In all cases when the CTG trace is assessed as suspicious or pathological an action plan will be documented in the maternal health care record.

5. All intrapartum CTG traces will be stored in the intrapartum CTG envelope securely attached to the maternal health record.

References


6. Chandraharan E. Fetal scalp blood sampling during labour: is it a useful diagnostic test or a historical test that no longer has a place in modern clinical obstetrics?. BJOG 2014; 121:1056–1062.

of electronic fetal monitoring (EFM) for fetal assessment during labour. Alfirevic Z1, Devane D2, Gyte GM3, Cuthbert A3.
Monitoring fetal wellbeing by Intermittent Auscultation of the fetal heart in labour

Overview:
Intermittent auscultation (IA) of the fetal heart (FH) in labour with a sonicaid or Pinard should be recommended for all women who are healthy and have uncomplicated pregnancies. In low risk women routine continuous electronic fetal monitoring (CEFM) is associated with more caesarean sections and assisted vaginal births.

This guideline aims to highlight best practice and minimum standards when carrying out intermittent auscultation of the fetal heart in labour. Increased fetal surveillance through prolonged auscultation (i.e. >one minute) with a sonicaid (or Pinard) may be indicated in certain situations.

Antenatal:
Women can make an informed decision by discussing this form of monitoring. If this discussion has not occurred by the time of labour, it should form part of the initial birth plan.

On assessment of labour/pre-labour rupture of membranes:
Intermittent auscultation should be the first line option for fetal monitoring in pregnancies at low risk of fetal compromise – see labour risk assessment proforma for care in labour or intrapartum CEFM guidance.

- Carry out a risk assessment to determine the woman’s suitability for IA in labour, Refer to the risk assessment tool.
- Offer auscultation of the fetal heart rate at the first contact with a woman in suspected or established labour, and at each further assessment.
- Using either a Pinard stethoscope or Doppler ultrasound auscultate the fetal heart rate (between contractions) to determine the baseline counting the rate over a period of one minute.
- Palpate the woman’s pulse to differentiate between the heartbeats of the woman and the baby.
- In the presence of contractions auscultate again immediately following a contraction to exclude decelerations.
- Question the woman on fetal movements (reduction in movements may indicate fetal compromise). For further confirmation of fetal wellbeing, when the opportunity arises, auscultate the FH during a period of fetal movements to ensure acceleration in the heart rate.
Document all findings in your records ensuring the fetal heart rate is written as 130bpm (e.g.), not as range, the length of time auscultated, presence of accelerations and decelerations if heard.

Ensure you document what equipment you are using for IA i.e. Pinard/sonicaid

**In established labour the minimum standards are:**

- Intermittent auscultation consists of listening and counting the heart rate immediately after a contraction for a minimum of 60 seconds
  
  - every 15 mins in the first stage
  
  - every 5 minutes or after every contraction in active/passive second stage of labour in the presence of expulsive contractions

  The rationale for listening immediately after a contraction is to exclude decelerations

- Continue to record the baseline rate as an average on the partogram to enable scrutiny for a rising baseline HR and/or tachycardia which may indicate fetal hypoxia

- As a minimum, palpate and document maternal pulse hourly on the partogram or on detection of FH anomalies to enable comparison between the 2 rates

- If at any time the FH is not auscultated at the recommended intervals, document reason on partogram (e.g. in transit to DS/theatre, or epidural )

- If at any time you are unable to listen to the fetal heart as frequently as required you must seek help in order to continue to do so

- The routine use of an admission CTG is not recommended in low risk women with otherwise normal observations

**Perform CEFM if the FH gives cause for concern or further risk factors develop (SEE Intrapartum CEFM guideline):**

**These may include the following maternal concerns:**

- Maternal pulse over 120 beats/minute on 2 occasions 30 minutes apart

- A single reading of either raised diastolic blood pressure of 110 mmHg or more or raised systolic blood pressure of 160 mmHg or more

- Either raised diastolic blood pressure of 90 mmHg or more or raised systolic blood pressure of 140 mmHg or more on 2 consecutive readings taken 30 minutes apart

- A reading of 2+ of protein on urinalysis and a single reading of either raised diastolic blood pressure (90 mmHg or more) or raised systolic blood pressure (140 mmHg or more)

- Temperature of 38°C or above on a single reading, or 37.5°C or above on two consecutive readings 1 hour apart

- Any vaginal blood loss other than a show
- Rupture of membranes more than 24 hours before the onset of established labour
- The presence of significant meconium
- Pain reported by the woman that differs from the pain normally associated with

**Contractions:**
- Presence of contractions that last longer than 60 seconds or more than 5 in 10 minutes
- Diagnosed delay in labour

**Fetal concerns:**
- Any abnormal fetal presentation, including cord presentation
- Transverse or oblique lie
- High (4/5–5/5 palpable) or free-floating head in a nulliparous woman
- Suspected fetal growth restriction or Macrosomia
- Suspected an hydramnios or polyhydramnios
- Fetal heart rate below 110 or above 160 beats/minute
- A deceleration in fetal heart rate heard on intermittent auscultation
- Reduced fetal movements in the last 24 hours reported by the woman.
- Persistent accelerations heard immediately after a contraction as this could be an overshoot from a deceleration of the FH.

For any FH anomaly, palpate the maternal pulse to enable comparison

If the CEFM is normal, the trace can be discontinued after 20 minutes, providing all clinical/risk assessments are within normal parameters. A full systematic assessment must be undertaken prior to discontinuing the CTG using the Fresh Eyes approach (second person)

Clearly document the reason for commencing CEFM in your records with a plan of care and whether referral to medical aid is required.

**TRAINING**

Health professionals performing IA during labour should attend the fetal monitoring study day annually and be successful in passing the IA assessment
Auditable standards:

1. All women with a live fetus will have the fetal heart rate (FHR) monitored and documented in the maternal health record as a minimum every 15 minutes during the first stage of labour and every 5 minutes or after every contraction during the second stage of labour. When using intermittent auscultation the FHR will be auscultated for at least a minute after a contraction, and the rate will be recorded as an average.

2. The equipment used for intermittent auscultation of the FHR will be in line with guideline. This will be documented in the maternal health care record.

3. In all cases when a transfer from intermittent auscultation to continuous electronic fetal monitoring occurs, the timing and reason for transfer will be documented in the maternal health record. The indication for transfer will be in accordance with the listed indications for continuous electronic fetal monitoring stated in the guideline.

4. The maternal pulse will be palpated and documented at the beginning of the intrapartum auscultation and hourly thereafter.

References


**Fresh Eyes Process**

**When?**
- In established labour only
- Every 60 minutes
- Must be complete by 90 minutes

**Who?**
- A midwife or obstetrician who has successfully completed their fetal monitoring training (plus assessment) within the previous 15 months
- A midwife or obstetrician who has completed the actions required following being unsuccessful at their fetal monitoring assessment within the previous 15 months
- Not the same person for more than two successive FE reviews

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The midwife providing one to one care completes the CTG review using either the sticker or K2 wizard. On K2 mark this as “no” to the question “is this fresh eyes?”

A second person is invited into the room following explanation of the process to the couple, and a verbal hand over is given using SBAR format.

The second person assesses the CTG using either K2 or FIGO sticker (depending on which the MW has used) without looking at the first midwife’s assessment and records this in the patient records. On K2 mark this as “yes” to the question “is this fresh eyes?”

The first midwife and reviewer compare their assessments.
APPENDIX 1b – FRESH EYES PROCESS

Policy Lead: Group Director Urgent Care
Location: Policy hub/ Clinical/ Maternity/ Intrapartum/ GL964

Version: V3.0 ratified 1/11/19

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Location: Policy hub/ Clinical/ Maternity/ Intrapartum/ GL964

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Outcome

- Findings the same and normal
  - Reviewer records in notes "FE agreed" (or similar)
    - Findings explained to couple

- Findings the same and suspicious or pathological
  - Reviewer records in notes "FE agreed" (or similar)
    - Findings explained to couple

- Findings differ
  - Explain to couple that CTG requires further discussion and senior review
    - Escalate to senior MW who will organise safety huddle at the central station
      - Following safety huddle most appropriate person explains findings to couple and documents safety huddle and outcome in records

Both agree plan for actions or escalation and these are documented within the CTG assessment

Safety Huddle
- Senior MW, Case MW, FE reviewer, Obstetric registrar and/or consultant
- Recorded in safety huddle book by senior MW
- Discuss case and CTG at central station
- Tool 2 used for prompt and therefore ensures physiology is considered
- Findings agreed
- Plan agreed

NB any ongoing agreement must be escalated to obstetric consultant (second consultant if appropriate)
### APPENDIX 2 – CTG DEFINITION TOOL

**Oxford Academic Health Science Network**

**Oxford AHSN Cardiotocograph (CTG) Interpretation Tool Definitions.**

**Acute:**
The highest point / peak of a contraction.

**Nodal:**
The lowest point, i.e. in deceleration, this is the slowest fetal heart rate recorded.

**Positive features:**
Evidence of cycling of variability, accelerations and positive fetal response to scalp stimulation all denote a healthy response by the fetus.

**Fetal Heart Rate (FHR) Baseline:**
The approximate mean fetal heart rate assessed over a period of 10 minutes, rounded to increments of 5 bpm. It can fluctuate between 100-150 beats over an hour. Preterm fetuses often display values towards the upper end of the scale and post-term fetuses towards the lower end.

- **Rising Baseline:** An increase in baseline heart rate by more than 20 bpm over an hour can be a sign of fetal compromise.

- **Tachycardia:** a baseline rate above 160 bpm for more than 10 minutes, often associated with maternal pyrexia or infection.

- **Brady cardia:** a baseline rate below 110 lasting more than 10 minutes. Baseline rate of 100 – 110 may occur in normal fetuses especially if postdates.

**Accelerations:**

An abrupt increase of at least 15 bpm in fetal heart rate (FHR) above the baseline. Time from the onset to the peak is less than 30s and duration is equal to or more than 15s and less than two minutes from onset to return to baseline. Accelerations lasting 10 mins or more are considered a baseline change.

In pregnancies ≥32 weeks gestations, accelerations may be an increase of 10 bpm or more above baseline which lasts 10 seconds or more. Persistent accelerations coinciding with uterine contractions in the second stage of labour may indicate that the maternal heart rate is being recorded as fetal accelerations are unlikely to occur.

**Decelerations:**
A drop in heart rate of more than 15 beats, lasting for more than 15 seconds. Most decelerations are variable (V-shape).

- **Early deceleration:** shallow, short lasting with normal variability within the deceleration and coincide with the contractions.

- **Variable Deceleration:** an abrupt decrease in fetal heart rate below the baseline (onset to beginning of nadir is less than 30s); good variability within deceleration, rapid recovery to baseline; varying size, shape and relationship to uterine contractions.

- **Late Deceleration:** (U-shaped and/or with reduced variability) gradual onset and/or gradual return to the baseline and/or reduced variability within the deceleration. Gradual onset and return occurs when more than 30s elapses between the beginning / end of a deceleration and its nadir. Start more than 20s after the onset of contraction, have a nadir after the acme and a return to the baseline after the end of the contraction.

- **Repetitive Decelerations:** occur with more than 50% of contractions. Decelerations that occur less frequently have less clinical significance (unless they are decelerations classified as pathological).

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<th>Oxford AHSN Maternity Network</th>
<th>CTG Interpretation Tool Definitions</th>
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**Prolonged Deceleration:** a decrease in fetal heart rate below the baseline lasting more than 3 mins.

**Single Deceleration:** decelerations exceeding 5 min with fetal heart rate maintained at less than 80 bpm and reduced variability within the deceleration are frequently associated with acute fetal hypoxia / acidosis and require emergent intervention.

**Variability:**
Fluctuations in the fetal heart rate (FHR) baseline that are irregular in amplitude and frequency. This can be assessed by selecting a one minute segment of trace, without accelerations or decelerations and measuring the difference between the highest and lowest rate. The difference is the amplitude of variability.

**Sinusoidal Pattern:**
A regular, smooth, undulating signal, resembling a sine wave, with an amplitude of 5-15 bpm, and a frequency cycle of 3-5 cycles per minute. This pattern lasts more than 30 minutes and occurs with absent accelerations.

**Pseudosinusoidal Pattern:**
Pattern resembling the sinusoidal pattern but with a more jagged "saw tooth" appearance rather than the smooth sine-wave form. Its duration seldom exceeds 30 min and it’s characterised by normal patterns before and afterwards.

**Contractions:**

45-120 second duration, up to 5 in 10 minutes but resting tone of the uterus in between contractions is significant.

- **Tachysystole:** more than 5 contractions in 10 minutes over two successive 10 minute periods or averaged over a 30 minute period with no evidence of fetal compromise.

- **Hyperstimulation:** more than 5 contractions in 10 minutes over two successive 10 minute periods or averaged over a 30 minute period with evidence of fetal compromise.

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**Policy Lead:** Group Director Urgent Care

**Location:** Policy hub/ Clinical/ Maternity/ Intrapartum/ GL964

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