DESIRED OUTCOME/OBJECTIVE

The aim of antepartum fetal surveillance is to confirm fetal wellbeing in the antenatal period and exclude fetal hypoxia.

ALERT

All staff that perform or participate in fetal surveillance must have an understanding of the relevant maternal and fetal pathophysiology and demonstrate competence in the interpretation of fetal surveillance.

DEFINITION OF TERMS

Cardiotocograph (CTG): a means of recording the fetal heartbeat and uterine contractions during pregnancy and labour

Baseline fetal heart rate: (FHR) is the mean level of the FHR when this is stable, excluding accelerations and decelerations. It is a resting FHR when the fetus is not moving and in the absence of uterine activity. It is determined over a time period of 5-10 minutes, expressed as beats per minute (bpm). Preterm fetuses tend to have values towards the upper end of the normal range.

Baseline Variability: is the minor fluctuations in baseline FHR. It is assessed by estimating the difference in bpm between the highest peak and lowest trough of fluctuation in one minute segments of the trace (3-5 cycles/min).

Accelerations: are transient increases in FHR of 15bpm or more above the baseline and lasting 15 seconds. Accelerations in preterm fetuses may be of lesser amplitude and shorter duration.

Decelerations: are transient episodes of decrease of FHR below the baseline of more than 15 bpm lasting at least 15 seconds, which are:

- **Early** – uniform, repetitive decrease of FHR with slow onset early in the contraction and slow return to baseline by the end of a contraction (.ie. start and finish in the contraction). May indicate head compression.
- **Variable** – repetitive or intermittent decreasing of FHR with rapid onset and recovery. Time relationships with contraction cycle may be variable but most commonly occur simultaneously with contractions.
- **Complicated variable decelerations** – the following additional features indicate the likelihood of fetal hypoxia:
  - Rising baseline rate or fetal tachycardia
  - Reducing baseline variability
→ Slow return to baseline FHR after the end of the contraction
→ Large amplitude (by 60bpm or to 60bpm) and/or long duration (60 seconds)
→ Loss of pre and post deceleration shouldering (abrupt brief increases in FHR baseline)
→ Presence of post deceleration smooth overshoots (temporary increases in FHR above baseline)

Prolonged decelerations: a decrease of FHR below the baseline or more than 15 bpm for longer than 90 seconds but less than 5 minutes

Late decelerations: are uniform, repetitive decreasing of FHR with, usually, slow onset mid to end of the contraction and nadir more than 20 seconds after the peak of the contraction and ending after the contraction

INDICATIONS

Intermittent Auscultation
Intermittent auscultation is mandatory for all women who present for assessment in the antepartum period. When performing intermittent auscultation:
→ Use a doppler ultrasound
→ The speaker mode must be turned on
→ Each auscultation episode should be performed for at least a full minute

Continuous electronic fetal monitoring (EFM)
Continuous EFM is recommended in the antepartum period when risk factors for fetal compromise have been detected during pregnancy or have developed in the antepartum period (e.g. decreased fetal movements, antepartum haemorrhage, abdominal trauma).
When continuous EFM is undertaken the:
→ CTG should be reviewed at least every 15 minutes
→ CTG trace should be signed 15 minutely
→ CTG should be signed by the lead clinician each time the woman is reviewed and a plan of care written in the maternal notes
→ CTG trace should be reviewed by a second clinician every hour and signed to ensure critical review of the trace (if continuous antenatal EFM required).

Continuous EFM can be interrupted for periods of up to 15 minutes to allow personal care (e.g. toilet, shower) is the EFM to date is considered normal. Interruptions should be infrequent and not occur immediately after an intervention that might be expected to alter the FHR (e.g. Amniotomy, vaginal/speculum examination).

The antenatal CTG should;
→ Be undertaken for a minimum of 20 minutes
→ The episode of EFM should be discontinued if the CTG is normal
→ The inpatient antenatal CTG should be performed a minimum of once daily or more if indicated.

Fetal heart monitoring is only part of the antenatal assessment for fetal wellbeing and may be used in collaboration with ultrasound biophysical profile, amniotic fluid index and umbilical artery and Doppler studies
Indications for Antepartum EFM
The following list is a guide only. The relevant guideline for individual conditions should be accessed to provide further information. Indications include:

- Hypertensive disorders in pregnancy
- Diabetes in Pregnancy
- Prolonged pregnancy (> 41 + 3 weeks gestation)
- Intra uterine growth restriction (IUGR)
- Poor obstetric history (e.g. stillbirth, IUGR, hypertensive disorders)
- Decreased fetal movements
- Antepartum haemorrhage
- Abdominal trauma (e.g. motor vehicle accident, fall)
- Severe maternal disease (e.g. systemic lupus erythematosus, cyanotic heart disease, pulmonary disease, severe anaemia, vascular disease, renal disease, hyperthyroid)
- Multiple pregnancy
- Rhesus isoimmunisation
- Abruption
- Undiagnosed abdominal trauma
- Threatened premature labour
- Fetal heart rate abnormality noted on auscultation
- Maternal anxiety (a relative indication managed on its own merits)
- Pre term premature rupture of membranes (>24 hours)
- Suspected or confirmed Oligohydramnios/polyhydramnios
- Abnormal Doppler umbilical artery velocimetry
- Known fetal abnormality which requires monitoring

ISSUES TO CONSIDER

CTG Interpretation
The normal CTG associated with a low probability of fetal compromise has the following features:

- Baseline rate 110-160
- Baseline variability of 5-25 bpm
- Accelerations 15bpm for 15 seconds
- No decelerations

All other CTG’s are by this definition are abnormal and require further evaluation taking into account the full clinical picture.

The following features are unlikely to be associated with significant fetal compromise when occurring in isolation however the CTG is still considered abnormal and close observation should continue in addition to discussion of the features with the obstetric registrar/ lead obstetrician:

- Baseline rate 100-109
- Absence of accelerations
- Early decelerations
- Variable decelerations without complicating features

The following features may be associated with significant fetal compromise and require further action:

- Fetal tachycardia
- Reduced baseline variability
- Complicated variable decelerations
- Late decelerations
→ Prolonged decelerations

The following features are very likely to be associated with **significant fetal compromise** and require **immediate management**, which may include urgent delivery:
- Prolonged bradycardia (<100 bpm for > 5 minutes)
- Absent baseline variability
- Sinusoidal pattern
- Complicated variable decelerations with reduced baseline variability
- Late decelerations with reduced variability

**Management of the abnormal FHR pattern**
Immediate management includes:
- Identify any reversible cause and initiate appropriate action (e.g. reposition mother to relieve cord compression or maternal hypotension, correct maternal hypotension, cessation of oxytocin and/or tocolysis as per CPGU005 Uterine Hyperstimulation (Tachysystole) - management of.
- Initiation or maintenance of EFM
- Consideration of further fetal evaluation (e.g. fetal scalp blood sampling) or birth if a significant abnormality exists

**Expedite birth when**
- Significant fetal acidosis is suspected
- There is clear evidence of serious fetal compromise (fetal scalp blood sampling should not be undertaken at this time).
- CTG abnormalities are of a degree requiring further assessment and FBS is contraindicated.

**IN THE EVENT OF A PATHOLOGICAL TRACE WHERE BIRTH MUST BE EXPEDITED AN OBSTETRIC RESPONSE MUST BE CALLED ON 94444 STATING THE LOCATION OF THE RESPONSE. THE LEAD OBSTETRICIAN MAY THEN CALL A CAESEREAN RESPONSE IF INDICATED.**

**Antenatal CTG review**

**Normal CTG**
When the CTG is interpreted as normal the clinician must:
- Record the result on the trace
- Sign the trace
- Record the finding and ongoing management in the women’s medical record (*see PROCEDURE*)

**Abnormal CTG**
All abnormal CTG traces are to be reviewed by the lead obstetrician and a management plan initiated and documented.
EQUIPMENT

- Doppler ultrasound and/or Cardiotocograph (CTG)
- Transducer Gel (warmed)
- Progress notes and/or partogram

PROCEDURE

1. Determine the indication for fetal monitoring as above “Indications for EFM”.
2. Discuss fetal monitoring with the woman and obtain permission to commence. Provide the ‘Fetal Monitoring during Pregnancy and Labour’ pamphlet if appropriate.
3. Perform abdominal palpation to determine lie and presentation unless contraindicated (e.g. APH, abruption).
4. Give the woman an opportunity to empty her bladder
5. The woman should be in an upright to lateral position (not supine)
6. If performing intermittent auscultation ensure the volume is turned on and apply probe to abdomen where the anterior shoulder of the fetus is positioned. Refer to ‘Indications’ for frequency of auscultation.
7. If performing a CTG check the accurate date and time has been set on the CTG machine and the paper speed is set on 1cm per minute. Ensure the CTG is labelled with the woman’s name, UR number and date/time of commencement. Record the maternal heart rate at the commencement of the CTG in order to differentiate between maternal and fetal heart rate.
8. Place the two elastic belts around the abdomen and secure. Position the tocotransducer firmly on the abdomen over the fundus. Apply the transducer gel to the ultrasound transducer and firmly attach over the position of the anterior shoulder of the fetus.
9. Set the tocotransducer at a uterine resting tone baseline level of 20mm of mercury.
10. Record on the trace anything which may influence the fetal heart rate or uterine activity including maternal medications, movement, changes in position, fetal movements, contractions/Braxton Hicks contractions, drinks/food ingested, use of illicit drugs or cigarettes.
11. Documentation of findings must be recorded in the patient notes and if a CTG is performed all features of the CTG must be documented including:
   - Baseline heart rate
   - Variability, accelerations and decelerations
   - An assessment of the trace as normal, abnormal or pathological
12. Criteria for a normal antenatal CTG which may be discontinued include:
   - Two episodes of FHR accelerations of 15 bpm or more
   - Of at least 15 seconds duration
   - Occurring within a 20 minute period
   - With a baseline in normal limits
   - And normal variability 5-25 bpm
13. If the fetus is not active after 10 minutes an attempt to stimulate the fetus may be made including a position change or a cold drink.
14. If the criteria for a normal trace are not met within 30 minutes the obstetric team must be notified.
RELATED DOCUMENTS

Internal
CPG/F011 Fetal Surveillance – Intrapartum

External
RANZCOG Fetal Monitoring During Pregnancy and Labour Pamphlet

REFERENCES


