ANTEPARTUM CARE

ANTEPARTUM PROCEDURES - FETAL

Key words: antepartum, fetal heart rate monitoring, cardiotocography, fetal surveillance, CTG

ANTEPARTUM FETAL HEART RATE MONITORING

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AIMS

- To confirm fetal well-being in the antenatal period.
- To exclude hypoxia.

KEY POINTS

1. There is no evidence to support the use of routine antenatal CTG in women with uncomplicated pregnancies.\(^{11}\)

2. Antenatal CTG is commonly used in conjunction with ultrasound assessment of fetal and placental Doppler in high risk pregnancy\(^{12}\)

3. Antenatal CTG from 24+0 weeks gestation should be commenced if:
   - Risk factors develop throughout the pregnancy
   - There is a change in the maternal condition or
   - There is any suspicion of in utero fetal compromise

   CTG may be considered at gestations below 24+0 weeks following a multidisciplinary discussion with the woman regarding birth and neonatal management

4. Manual fetal manipulation has not been shown to reduce the incidence of a non-reactive (NR) CTG.\(^{1}\) Therefore, this practice is not recommended.

5. Antenatal maternal glucose administration has not been shown to reduce non-reactive CTG.\(^{2}\)

6. Fetal vibroacoustic stimulation (FAS) offers benefit by decreasing the incidence of non-reactive CTG and reducing the testing time.\(^{3}\)

7. A non-reactive CTG trace shall be repeated within a few hours or the following day depending on the clinical picture. A decision to perform a repeat CTG the
following day should be made in liaison with the Obstetric Consultant or the Senior Registrar.

8. When midwives are reviewing and interpreting a trace, outpatient women shall not be discharged until the trace has been reviewed and interpreted by 2 appropriate clinical staff members (as outlined on page 7).

COMPETENCY REQUIREMENTS FOR KEMH STAFF CONDUCTING FHR MONITORING

1. All medical and midwifery staff providing care for antepartum and intrapartum women are required to attend and successfully complete a theoretical course “Introduction to Fetal Monitoring and Assessment” related to Fetal Surveillance, recognised by KEMH.

2. Obstetric registrars must attend and pass an ‘Advanced Fetal Assessment Course’ recognised by KEMH prior to commencing rotation through the Maternal Fetal Assessment Unit (MFAU), or Labour and Birth Suite.

3. Midwives to check competency requirements at the DNAMER website

INDICATIONS FOR PERFORMING A CTG

Note: the following list is presented as a guide only. The relevant guideline for individual conditions should be accessed to provide further information.

- Abnormal antenatal CTG
- Abnormal Doppler umbilical artery velocimetry
- Suspected or confirmed intrauterine growth restriction
- Oligohydramnios or polyhydramnios (Amniotic fluid index (AFI) < 5 or > 25cm)
- Pre and post administration of Prostaglandin
- Prolonged pregnancy > 41+0 weeks (twice weekly)
- Multiple pregnancy
- Breech presentation
- Antepartum haemorrhage
- Prolonged rupture of membranes > 24 hours
- Known fetal abnormality which requires monitoring
- Prior to and following an attempted external cephalic version
- Essential hypertension or pre eclampsia
- Diabetes where medication is indicated or poorly controlled, or with fetal macrosomia
- Other current or previous obstetric or medical conditions which constitute a significant risk of fetal compromise (e.g. cholestasis, isoimmunisation, substance abuse)
- Fetal movements reduced (within the week preceding labour)
- Morbid obesity (BMI ≥ 40)
- Maternal age > 40
- Abnormalities of maternal serum screening associated with an increased risk of poor perinatal outcome (e.g. low PAPP-A < 0.4MoM)
CLASSIFICATION OF A CTG

Normal Antenatal CTG Trace: associated with a low probability of fetal compromise and has all of the following features

- Baseline fetal heart rate (FHR) is between 110-160 bpm
- Variability to FHR is between 6-25 bpm
- Decelerations are absent
- Accelerations x 2 within 20 minutes\(^\text{13}\)

Non reassuring CTG trace: one of the following is present; these are unlikely to be associated with significant fetal compromise when occurring in isolation

- Baseline FHR between 100-109 bpm or between 161-170 bpm.
- Variability of FHR is reduced (3 – 5 bpm for more than 40 minutes).
- Decelerations are variable without complicating features

The presence of 2 or more features is considered abnormal as these may be associated with fetal compromise and require further action.

Abnormal CTG trace: 2 or more of the features described in the non-reassuring CTG trace definition are present or one of more of the following features. These are very likely to be associated with significant fetal compromise and require further action

- Baseline FHR is < 100 bpm or > 170 bpm
- Variability is absent or < 3 bpm.
- Variability is sinusoidal
- Decelerations are prolonged for > 3 minutes / late / have complicated variables

PERFORMING A CTG

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<td>1 Preparation</td>
<td>Explain the procedure to the woman, gain verbal consent, and ensure privacy. Encourage the woman to empty her bladder.</td>
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<tr>
<td>1.1 Determine the position of the fetus by gentle abdominal palpation unless contra-indicated e.g. TPL, APH, abruption</td>
<td>To determine the fetal presentation and position and therefore locate the site where the fetal heart rate is heard at maximum intensity.</td>
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### PROCEDURE | ADDITIONAL INFORMATION
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1.2 Ensure the woman is well supported in an upright or left lateral position. Supine or recumbent maternal positioning reduces uterine blood flow and placental perfusion through compression of the vena cava and aorta. This compression produces hypoxic changes to the fetus, which are reflected in alterations to the fetal heart rate. Correct maternal positioning excludes this as a cause of hypoxia and abnormal traces.
1.3 Place two elastic belts around the abdomen securing the transducers. Prevents displacement of transducers and allows continued transmission of the clearest signals.
1.4 Position the ‘pressure transducer’ firmly on the maternal abdomen over the fundus. The fundus is the area of greatest contractility.
1.5 Set the toco transducer at a uterine resting tone baseline level of 10 to 20 mm of mercury. This level varies with the CTG machine being used:
- Corometrics 10mm Hg
- Phillips 20mm Hg
1.6 Apply the coupling gel to the ultrasound (cardiac) transducer. Attach firmly on the maternal abdomen over the location of the fetal heart. Coupling gel is used to maintain contact with the woman’s abdomen. The ultrasonic beam is directed toward the fetal heart. Firm contact is necessary to maintain a steady tracing.
1.7 Check the paper speed is set a recording time of 1cm per minute.
1.8 Place an addressograph label on the trace and record the woman’s:
- Current pulse and blood pressure.
- Gestation, gravity and parity
- Date and time of the CTG (check to validate the correct time and date is correct on the machine)
- Maternal pulse rate

Maternal pulse should be palpated simultaneously with FHR auscultation in order to differentiate between maternal and FHR, although the new Corometric machines record the same.

In the event of the maternal pulse being more than 100 beats per minute, additional means should be used to confirm that the trace is fetal and not maternal.
PROCEDURE

Procedure

Record on the trace anything which may influence the fetal heart rate or uterine activity:

- maternal medications
- maternal movement / changes in position
- fetal movements (recorded by the mother)
- use of FAS
- If the CTG is performed within 30 minutes of cigarette smoking and administration of drugs

The duration of the recording need only be 10 minutes if there are no decelerations and the features are within the normal parameters described in CTG Reporting by RANZCOG

2.1 If after monitoring for 10 minutes the fetus is not active, an attempt to stimulate the fetus may be made by changing the maternal position.

2.2 If the maternal condition is stable and there has been one period of acceleration of 15bpm lasting 15 seconds within 30 minutes, continue to monitor for another 20 minutes after this acceleration.

Consider the use of FAS.

2.3 Discontinue the trace and notify the Medical Officer if the criteria for a reactive CTG are not met after 30 minutes.

ADDITIONAL INFORMATION

Administration of glucose to antenatal women has not been shown to reduce non-reactive CTG.² There is no evidence that suggest icy drinks will lead to fetal activity.⁹

Fetuses are known to have sleep cycles lasting 20 to 40 minutes⁶ in which there is reduced fetal heart variability and reactivity.

Ensure no contra-indications to use of the FAS.
PROCEDURE | ADDITIONAL INFORMATION
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2.4 Record the maternal pulse and BP at the completion of the trace. | If a fetal bradycardia occurs the maternal pulse should be simultaneously recorded on the CTG trace.

3 Fetal Acoustic Stimulation (FAS) | The FAS is a battery operated hand device that produces a vibratory sound effect at 74 decibels. The FAS is used to interrupt the fetal sleep cycle. It reduces testing time and the incidence of non-reactive CTGs secondary to sleep cycles.

3.1 Contra-indications
These include:
- Major placenta praevia
- APH within 7 days
- baseline FHR of >160 before FAS use
- minimal / nil liquor (i.e. amniotic fluid volume <3)
- during a contraction or tightening

3.2 Using the FAS
- The FAS should be placed on the maternal thigh and depressed for $3\frac{1}{2}$ seconds (it will automatically cut out after this time).
- Document the use of the FAS on the CTG trace.
- A maximum of 3 applications only with at least a one-minute interval between each application.
- Following a FAS response of 15bpm for a period of 15 seconds, a spontaneous acceleration of 15bpm for a period of 15 seconds must be obtained before the CTG trace
PROCEDURE

- can be classified as reactive.
- A spontaneous acceleration prior to the use of FAS may also be considered as one of the accelerations which deem a CTG reactive.
- Continue monitoring until pre FAS FHR is achieved
- If FHR accelerations only occur in response to FAS the CTG needs to be repeated as per regime following non-reactive CTG where there is satisfactory baseline variability and no abnormal features, i.e. repeat CTG within 24 hours.

4 Interpretation of the CTG Trace

CTG interpretation should follow a standardised process to ensure all features of the CTG are documented.

CTGs may only be interpreted by the categories of staff outlined on page 7 of this guideline.

Interpretation at the Point of Care

Following interpretation the CTG Reporting sticker should be completed and signed by both persons completing the review. This is then placed in the patient’s medical notes on the MR 250 progress notes for inpatients or the MR 225 Maternal Fetal Assessment Admission form for MFAU patients. If there is no room on the MR225, commence a MR225.01 continuation sheet.

If the CTG is performed on the ward but requires review in MFAU, the ward staff member should place a patient ID label on the back of the trace and on the back of the CTG Reporting sticker, complete the

When midwives are reviewing and interpreting the trace, outpatients shall not be discharged until the trace has been reviewed and interpreted by 2 appropriate clinical staff members as outlined on page 7.
PROCEDURE

‘Indication’ and UMRN section of the CTG Reporting sticker and send the trace and the reporting sticker to MFAU.

When reviewed, the MFAU staff should complete the “interpretation” and action sections of the sticker (NB the action section only requires completion if the CTG is non-reactive) and both staff members must signed it. The completed sticker is then returned to the appropriate ward for placement in the patient’s medical notes. The CTG is given to the MFAU ward clerk for filing as per WNHS policy W164.

Storage

If performed in MFAU the CTG is stored electronically. If the CTG electronic storage process should fail at any time, revert to the paper CTG process (WNHS policy W164).

If performed on the wards the CTG should be stored as per WNHS policy W164.

If performed on the wards but reviewed by MFAU, the CTG should be given to the MFAU ward clerk for filing as per policy W164.

4.1 Reactive Antenatal CTG

4.2 Non-Reactive CTG
PROCEDURE

Senior Registrar (SR) as follows:

Traces performed **during the day**:
- The Labour and Birth Suite traces are to be reviewed by the Labour and Birth Suite Obstetric Consultant / SR as appropriate.
- The MFAU or the obstetric wards traces are to be reviewed by the Team Obstetric Consultant / SR or the Labour and Birth Suite Obstetric Consultant / SR as appropriate.

Traces performed **after-hours** (regardless of the department) are to be reviewed by the highest level obstetric doctor (consultant, SR or registrar) present in the hospital.

**4.3 Management of a non reactive CTG**

A non-reactive CTG must not be ignored.

If there are no adverse features on the non-reactive trace another CTG should be repeated within a few hours or the next day depending on the clinical picture.

If the woman has a trace with abnormal features or has persistent non-reactive CTGs ultrasound assessment of fetal wellbeing should be considered including:
- biophysical profile
- amniotic fluid index
- umbilical artery and Doppler studies

Kleihauer should be performed **urgently** in this situation if the ultrasound shows a quiet fetus.

Persistent non-reactive CTGs refer to two or more non-reactive traces.

The significance of a non-reactive CTG should be further evaluated because the CTG has a high false positive rate.10

With additional testing using the biophysical profile, most fetuses will show reassuring signs and then a repeat CTG can be scheduled when appropriate for the clinical situation.10
REVIEW, INTERPRETATION, AND SIGNING OF TRACES

Antenatal CTG traces may only be reviewed, interpreted and signed off by the following categories of staff:

- two midwives who have passed an ‘Advanced Fetal Assessment Course’ recognised at KEMH

OR

- an Obstetric registrar who has passed the ‘Advanced Fetal Assessment Course’ recognised at KEMH

OR

- an Obstetric resident and midwife who have passed the ‘Advanced Fetal Assessment Course’ recognised at KEMH

OR

- a Consultant Obstetrician

Note: all private patients or overseas visitors must have their CTG interpreted and signed by the Consultant Obstetrician.
REFERENCES (STANDARDS)


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National Standards – 3 Preventing and Controlling Health Care Associated Infections
Legislation - NIL
Related Policies - NIL
Other related documents –

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