Intrapartum fetal surveillance

Clinical Guideline Presentation V2.0

45 minutes

Towards your CPD Hours

References:
The Queensland Clinical Guideline *Intrapartum fetal surveillance* is the primary reference for this package.

Recommended citation:
Queensland Clinical Guidelines. Intrapartum fetal surveillance clinical guideline education presentation I15.8-V2-R20 Queensland Health. 2015.

Disclaimer:
This presentation is an implementation tool and should be used in conjunction with the published guideline. This information does not supersede or replace the guideline. Consult the guideline for further information and references.

Feedback and contact details:
M: GPO Box 48 Brisbane QLD 4001 | **E:** Guidelines@health.qld.gov.au | **URL:** www.health.qld.gov.au/qcg

Funding:
Queensland Clinical Guidelines is supported by the Queensland Health, Health Systems Innovation Branch.

Learning outcomes

- **Outline best practice in relation to:**
  - Risk factors requiring CTG in labour
  - Features of normal and abnormal CTG
  - Methods of intrapartum fetal surveillance (IFS)
  - Management options for intrapartum fetal compromise

This clinical guideline aligns with the RANZCOG Intrapartum fetal surveillance clinical guideline (2014)

Intrapartum fetal surveillance

- **Aims to:**
  - Prevent adverse fetal outcomes
  - Determine if the fetus is likely to be well oxygenated
  - Determine if metabolic acidosis is present in the fetus

Fetal surveillance includes:

- **Intermittent auscultation:**
  - Pinnards (fetoscope)
  - Doppler ultrasound

- **Cardiotocograph (CTG)**
  - External/internal (fetal scalp electrode)
  - Intermittent/continuous (CEFM)

Physiology

- Biophysical parameters (heart rate pattern, level of activity, degree of muscular tone of the fetus) affected by:
  - Hypoxemia
  - Acidemia
  - Prematurity
  - Fetal sleep-wake cycle
  - Maternal medications
  - Fetal central nervous system abnormalities

Antenatal care

- **During the antenatal period:**
  - Provide information about IFS
  - Discuss advantages and disadvantages of methods of surveillance
  - Encourage decision making by the woman with her health care provider

Intermittent auscultation

Healthy low risk woman

Doppler or Pinard

Confirm maternal pulse

- Simultaneously with FHR during contraction
- With maternal observations
- If abnormal FHR by IA
- When CTG applied
- During second stage when:
  - Checking FHR
  - Fetal bradycardia or other anomaly suspected

Maternal pulse and FHR

Characteristic	Maternal	Fetal
Baseline	▪ Maternal heart rate significantly lower than baseline FHR	
‘Accelerations’	▪ Increase in rate occurs at beginning of contraction or pushing effort	▪ Occur at variable intervals ▪ Differ in duration
Shape	▪ Uniform and rounded off	▪ Irregular shape ▪ Asymmetric

Auscultate and record fetal heart

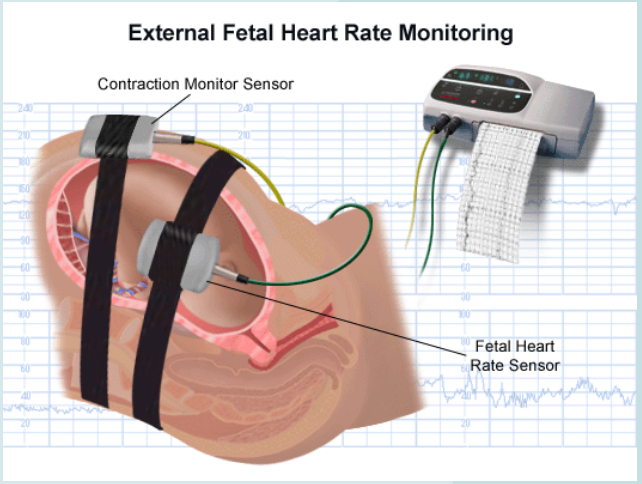
- Insufficient evidence re: frequency/duration of IA
- By consensus, perform IA:
  - Towards end of contraction for at least 30-60 seconds after contraction finished
  - In active first stage: every 15-30 minutes
  - In active second stage: towards end of and after each contraction or at least every 5 minutes

Abnormal FHR by IA

- Confirm FHR by CTG
- Reposition woman to improve utero-placental blood flow
- VE to check/alleviate cord compression
- Consider:
  - Transition to CEFM
  - Expediting birth

Transition to ECFM

- **Transition to continuous monitoring if:**
  - Abnormal fetal heart rate detected by IA
  - Labour augmented with oxytocin
  - Intrapartum complications develop



Source: Stanford School of Medicine [accessed 2015 June 01 http://www.stanford.edu/search

Antenatal risk factors

Abnormal AN CTG	APH
Abnormal USS	PROM
Suspected or confirmed FGR	Fetal abnormality
Oligo/polyhydramnios	Uterine scar
≥ 42 weeks gestation	Hypertension/ preeclampsia
Multiple pregnancy	Diabetes
Breech presentation	Obstetric or medical conditions
Vasa praevia	BMI > 40 kg/m^2
Reduced fetal movements	Abnormal maternal serum screening
Maternal age ≥ 42 years	

Intrapartum risk factors	
Prostaglandin induction	Meconium or blood stained liquor
Oxytocin induction/augmentation	Absent liquor following amniotomy
Abnormal IA or CTG	Prolonged first stage
Abnormal vaginal bleeding in labour	Preterm labour (> 28+0 weeks)
Maternal pyrexia (≥ 38°C)	Hyperstimulation
Regional analgesia	Tachysystole

CTG interpretation

- Review CTG trace every 15–30 minutes
- Differentiate between maternal pulse and FHR
- Systematic interpretation/intervention including:
  - Uterine contractions
  - Fetal heart-baseline, baseline variability, accelerations, decelerations
  - Category of trace
  - Other findings and relevant information
  - Plan of action
  - Documentation and communication

CEFM in preterm labour

- **Not recommended** at less than 24 weeks gestation
- Clinical utility uncertain between 24 weeks and 28 weeks gestation
- **Recommended** in labour after 28 weeks gestation

Preterm fetus

- **Physiological control of FHR differs from term baby**
  - Lower reserves
  - Reduced ability to withstand persistent intrapartum insults
  - Requires early identification and management of hypoxia

Multiple pregnancy

- Separate monitoring for each fetus
- Correctly identify cables for each
- Doppler +/- FSE
- Confirm each fetal heart and maternal pulse

Normal CTG

Low probability of fetal compromise

Baseline (bpm)	Baseline variability (bpm)	Decelerations	Accelerations
110-160 bpm	6-25 bpm	Nil	15 bpm for 15 seconds (may be absent)

During CEFM

- Review, interpret, escalate and document findings
- Short infrequent interruptions acceptable
- Minimise disturbance to woman
- Continue FHR monitoring by IA during unavoidable interruptions

Intrapartum care

- Respect wellbeing and wishes of woman
- Provide one-to-one midwifery care to women in active labour during CEFM
- Differentiate between maternal and fetal pulses
- Confirm fetal viability with USS if fetal death suspected

Abnormal CTG

- Further evaluation and management:
  - Review full clinical picture
  - Identify and manage reversible causes
  - Consider FBS
  - Escalate to senior midwifery/obstetric staff
  - Consider expediting birth

Abnormal CTG: reversible causes

- Cord compression or reduced placental perfusion
- Uterine hyperstimulation
- Maternal tachycardia/pyrexia
- Inadequate quality of CTG

Management of abnormal CTG

- Identify, review and escalate findings
- Document
- Identify reversible causes and initiate potential corrective actions
- Consider further fetal evaluation
- FBS if in first or early second stage
- Expedite birth where CTG indicates:
  - Further assessment required and FBS contraindicated
  - Clinically indicated (e.g. bradycardia < 100 bpm for > 5 minutes)

Interpretation of CTG

Refer to next slide

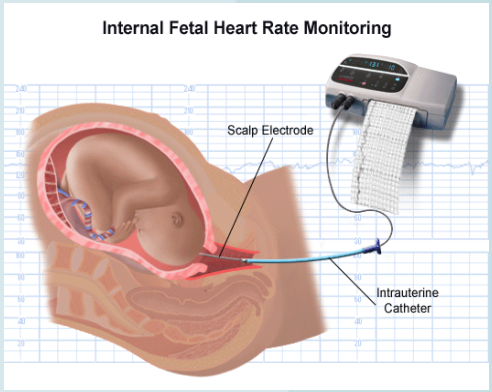
- Normal (all features are green)
- *Unlikely* fetal compromise (worst feature is blue in table) – continue CTG
- *May* be fetal compromise (worst feature is yellow) – correct reversible cause
- *Likely* fetal compromise – (worst feature is red or 2 features are yellow) – FBS or expedite birth

Interpretation of CTG

<table>
<tr><th colspan="3">Classification</th><th>Baseline</th><th>Variability</th><th>Decelerations</th><th>Accelerations</th><th>Actions</th></tr>
<tr><td rowspan="1">Normal</td><td>Low probability fetal compromise</td><td>GREEN</td><td>110–160 bpm</td><td>6–25 bpm</td><td>Nil</td><td>15 bpm* for 15 seconds</td><td>Nil</td></tr>
<tr><td rowspan="4">Abnormal</td><td>Unlikely fetal compromise</td><td>BLUE</td><td>100–109 bpm</td><td></td><td>Early OR Variable</td><td>Absent*</td><td>Continue CTG</td></tr>
<tr><td>May be fetal compromise</td><td>YELLOW</td><td>> 160 bpm OR Rising</td><td>3–5 bpm for > 30 minutes</td><td>Complicated variable** OR Late</td><td></td><td>Correct reversible causes</td></tr>
<tr><td rowspan="2">Likely fetal compromise</td><td rowspan="2">RED</td><td colspan="3">≥ 2 YELLOW features = RED</td><td rowspan="2"></td><td>Persistent YELLOW = RED</td></tr>
<tr><td>< 100 bpm for > 5 minutes</td><td>< 3 bpm for > 30 minutes OR Sinusoidal</td><td></td><td>FBS OR Expedite birth</td></tr>
</table>

Fetal scalp electrode

- **Use when:**
  - External monitoring is unable to be used
  - Signal quality is poor
- **Requires:**
  - Rupture of membranes
  - Cervical dilation 2–3 cm
  - Cephalic or breech presentation
  - Relative certainty of fetal head position to avoid placement in fontanelles, eyes, sutures or other structures



Source: Stanford School of Medicine [accessed 2015 June 01 http://www.stanford.edu/search

Intrapartum fetal blood sampling

- Provides physiological information:
  - Adjunct to CTG
  - Excludes suspicion of fetal compromise
  - Provide the reassurance to continue labour
- May reduce the caesarean section rate

Contraindications to FSE/FBS

- Gestation less than 34 weeks
- Sustained serious fetal compromise
- Fetal bleeding disorders
- Breech face or brow presentation
- Maternal infection

Interpretation of FBS

Interpretation	pH	Lactate
Normal	≥ 7.25	< 4.2
Borderline **Repeat in 30/60**	7.21–7.24	4.2–4.8
Abnormal **Expedite birth**	≤ 7.2	> 4.8

Communication

- Provide information to woman antenatally
- Keep woman informed throughout labour
- Protocols :
  - CTG interpretation, plan of action, documentation
  - Bedside clinical handover
  - Escalation to senior midwife or obstetrician

CTG labelling & documentation

- Woman's name
- Hospital number
- Date and time of commencement
- Maternal observations including heart rate
- Intrapartum events
- Interpretation of trace
- Date, time and signatures

Paired cord blood sampling

- Collection and analysis of paired cord blood samples allows the detection of respiratory and metabolic acidosis if present at birth
- Cord blood gas values may vary according to:
  - Gestation
  - Type of birth
  - Time after birth
  - Prior pH and lactate