NHS
Greater Glasgow and Clyde

CLINICAL GUIDELINE

Intrapartum Fetal Monitoring, Obstetrics

A guideline is intended to assist healthcare professionals in the choice of disease-specific treatments.

Clinical judgement should be exercised on the applicability of any guideline, influenced by individual patient characteristics. Clinicians should be mindful of the potential for harmful polypharmacy and increased susceptibility to adverse drug reactions in patients with multiple morbidities or frailty.

If, after discussion with the patient or carer, there are good reasons for not following a guideline, it is good practice to record these and communicate them to others involved in the care of the patient.

Version Number:	1
Does this version include changes to clinical advice:	N/a
Date Approved:	4th July 2019
Date of Next Review:	1st April 2022
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Approval Group:	Obstetrics Clinical Governance Group

Important Note:

The Intranet version of this document is the only version that is maintained.
Any printed copies should therefore be viewed as 'Uncontrolled' and as such, may not necessarily contain the latest updates and amendments.

GREATER GLASGOW & CLYDE OBSTETRIC GUIDELINE

INTRAPARTUM FETAL MONITORING

Intrauterine Fetal Resuscitation

Fetal Blood sampling in Labour

Inpatient Antenatal Fetal Monitoring

Introduction

The assessment of fetal wellbeing is an important component of intrapartum care. The purpose of intra partum fetal monitoring is to detect the possibility of a hypoxic fetus and plan their delivery safely and timeously. The indications for fetal monitoring, and risk factors present, should always be discussed with the woman. Women have the right to make informed choices regarding their care or treatment. Consideration must be given to maternal preference and priorities along with potential risk factors to both mother and baby.

Aim

To provide consistent approach to fetal monitoring in labour based on clinical evidence and best practice.

Intermittent Auscultation (as per GGC guideline Intermittent Auscultation in Low Risk Labour)

For a woman who has been following the Green Pathway and has had a healthy and uncomplicated pregnancy, intermittent auscultation is recommended in labour to monitor fetal wellbeing. Current evidence does not support the use of an admission CTG in low risk pregnancies.

- Use a Pinard or handheld Doppler to auscultate fetal heart
- Auscultate fetal heart rate after a contraction for a minimum of 1 minute and record in the notes
- Auscultate fetal heart rate every 15 minutes in the first stage of labour
- Auscultate fetal heart rate every 5 minutes in the second stage of labour
- Record any accelerations or decelerations if heard.
- Record maternal pulse hourly on the partogram.

If the fetal heart rate baseline is noted to be less than 120bpm or greater than 160bpm, or if the baseline is noted to be rising or any decelerations are noted then

- Summon help
- Advise Continuous Electronic Fetal Monitoring (CTG)
- Consider transfer to Consultant-led care if safe and required to do so.
- If the CTG has no non-reassuring or abnormal features noted after 20 mins then it is safe to return to intermittent auscultation

Continuous Electronic Fetal Monitoring (CEFM)

The fetal heart must be confirmed by auscultation with a Pinard or handheld Doppler before commencing the CTG. Before commencing CTG the following should be discussed with the woman:

- Explain that continuous CTG is used to monitor the baby's heartbeat and the labour contractions.

- Explain that it may restrict her mobility.
- Give details of the types of findings that may occur.
- Explain that a normal trace indicates that the baby is coping well with labour.
- Explain that changes to the baby's heart rate pattern during labour are common and do not necessarily cause concern.
- Explain that if the trace is not normal there will be less certainty about the condition of the baby and so continuous monitoring will be advised.
- Explain that decisions about her care during labour and birth will be based on an assessment of several factors, including her preferences, her condition and that of her baby, as well as the findings from CTG.

Indications for Continuous External Fetal Monitoring during labour

Advise continuous CTG if any of the following risk factors are present at initial assessment or arise during labour:

Maternal Indications for CEFM

- Maternal Heart Rate > 110 beats/minute on 2 occasions 30 minutes apart
- Maternal Temperature of 38°C or above on a single reading, or 37.5°C or above on 2 consecutive occasions 1 hour apart
- Suspected chorioamnionitis or sepsis
- Pain reported by the woman that differs from the pain normally associated with contractions
- Severe hypertension: a single reading of either systolic blood pressure of 160 mmHg or more or diastolic blood pressure of 110 mmHg or more, measured between contractions
- Hypertension: either systolic blood pressure of 140 mmHg or more or diastolic blood pressure of 90 mmHg or more on 2 consecutive readings taken 30 minutes apart, measured between contractions
- 2+ of protein on urinalysis and a single reading of either raised systolic blood pressure (140 mmHg or more) or raised diastolic blood pressure (90 mmHg or more)
- Maternal request
- Maternal seizure/collapse
- Previous Caesarean section
- Pre-eclampsia
- Diabetes
- Antepartum haemorrhage in the third trimester
- Significant maternal medical disease
- Previous poor obstetric outcome (eg stillbirth, neonatal morbidity or mortality)

Fetal Indications for CEFM

- Gestation <37 weeks (as per GGC guideline Pre Term Labour)
- Gestation >42 weeks
- Fetal growth restriction
- Oligohydramnios
- Abnormal Umbilical Artery Doppler indices
- Multiple pregnancy

- Breech presentation
- Risk of haemolytic disease (women having antenatal middle cerebral artery peak systolic velocity Dopplers)

Intra-partum Indications for CEFM

- Significant meconium
- Fresh vaginal bleeding that develops in labour
- Delay in the first or second stage of labour
- Contractions that last longer than 60 seconds (hypertonus)
- More than 5 contractions in 10 minutes (tachysystole)
- Oxytocin use
- Regional analgesia
- Induction of labour **
- Prolonged rupture of Membranes >48 hours (as per GGC guideline Pre Labour Rupture of Membranes at Term)

  ** Women on the Green Pathway who are being induced post-dates (< 42 weeks) or for maternal request(and remain low risk)and labour with prostin alone (maximum 2 doses) have the option of intermittent auscultation if a CTG performed when contractions began was normal.

Amniotomy alone for delay in first stage of labour is not an indication for continuous CTG monitoring

When a woman is having continuous cardiotocography:

- Ensure that the focus of care remains on the woman rather than the CTG trace
- Remain with the woman in order to continue providing one-to-one support
- Encourage and help the woman to be as mobile as possible and to change position as often as she wishes
- Monitor the condition of the woman and the baby, and take prompt action if required
- Differentiate between the maternal and fetal heartbeats hourly, or more often if there are any concerns
- Ensure that the cardiotocograph trace is of high quality, and think about other options if this is not the case
- If it is difficult to categorise or interpret a cardiotocograph trace, obtain a review by a senior midwife or obstetrician
- A buddy system and 'Fresh eyes' approach should be used on an hourly basis and clear documentation on Badger of classification of CTG (normal/suspicious/pathological) with a clear plan for ongoing care.

Documentation relating to CTG

- Name of woman
- Hospital CHI
- Date and time

- Maternal pulse
- The printed time on the CTG should be confirmed
  All of the above should be documented on the CTG at the time of commencement

- Any member of staff reviewing the CTG should sign the trace and document in maternal records their findings and plan of care
- Following the birth the midwife should sign the CTG and note the date, time and mode of delivery
- The CTG should be stored securely in the maternal notes following delivery.

Interpretation of CTG

The interpretation of the CTG should take into consideration the stage of labour, progress in labour and any maternal or fetal conditions which would increase risk. Do not make any decisions based on the CTG alone.Take into account the woman's preferences.

Make a documented systematic assessment of the condition of the woman and unborn baby (including CTG findings) every hour, or more frequently if there are concerns

When reviewing the CTG assess and document contractions and all 4 features of fetal heart rate: fetal heart rate, variability, presence or absence of decelerations and presence of accelerations.

If a CTG is necessary it should be of a good quality. If this is not possible consider the following measures: Change position, carry out an ultrasound to locate fetal heart or apply a fetal scalp electrode.

If an interpretable CTG is unable to be obtained due to any reason including maternal habitus then senior obstetric opinion should be sought with the consideration of delivery.

If the fetal heart is inaudible an ultrasound should be carried out to confirm the presence or absence of a fetal heart. This should only be carried out by a competent practitioner

DESCRIPTION	FEATURE		
	BASELINE HEART RATE (bpm)	BASELINE VARIABILITY (bpm)	DECELERATIONS
REASSURING	110-160	5 to 25	None OR Early Variable decelerations with no concerning features** for less than 90 minutes

NON-REASSURING	100-109* or 161-180	Less than 5 for 30 to 50 minutes OR More than 25 for 15 to 25 minute	Variable decelerations with no concerning features** for 90 mins or more OR Variable decelerations with any concerning features** in up to 50% of contractions for 30 minutes or more OR Variable decelerations with any concerning features** in over 50% of contractions for less than 30 minutes OR Late decelerations in over 50% of contractions for less than 30 minutes, with no maternal or fetal clinical risk factors such as vaginal bleeding or significant meconium
ABNORMAL	BELOW 100 or ABOVE 180	Less than 5 for more than 50 minutes OR More than 25 for more than 25 minutes OR Sinusoidal	Variable decelerations with any concerning features** in over 50% of contractions for 30 mins (or less if any maternal or fetal clinical risk factors) OR Late decelerations for 30 minutes (or less if any maternal or fetal clinical risk factors) OR Acute bradycardia, or a single prolonged deceleration lasting 3 minutes or more
*A fetal heart between 100-109bpm with no other non-reassuring or abnormal features may be normal but CTG should have a review by a senior midwife or obstetrician to allow normal care to continue. **The following are concerning features of variable decelerations: lasting more than 60 seconds; reduced baseline variability within the deceleration; failure to return to baseline; biphasic (W) shape; no shouldering concerns arising from intermittent auscultation and there are no ongoing risk factors)			

CATEGORY	DEFINITION	MANAGEMENT
NORMAL	All features are reassuring	Continue CTG (unless it was started because of concerns arising from intermittent auscultation and there are no longer ongoing risk factors)
SUSPICIOUS	1 non-reassuring feature AND 2 reassuring features	Correct any underlying causes such as hypertension or uterine hyperstimulation Perform a full set of maternal observations Start 1 or more conservative measures* Inform an obstetrician or a senior midwife Document a plan for reviewing the whole clinical picture and the CTG findings

PATHOLOGICAL	1 abnormal feature OR 2 non-reassuring feature	Exclude acute events (for example, cord prolapse, suspected placental abruption or suspected uterine rupture) Correct any underlying causes, such as hypotension or uterine hyperstimulation Start 1 or more conservative measures* If the CTG trace is still pathological after implementing conservative measures: – obtain a further review by an obstetrician and a senior midwife – offer digital fetal scalp stimulation and document the outcome If the CTG is still pathological after fetal scalp stimulation: consider fetal blood sampling OR consider expediting the birth
NEED FOR URGENT INTERVENTION	Acute bradycardia, OR a single prolonged deceleration for 3 minutes or more	Seek urgent obstetric help If there has been an acute event (for example, cord prolapse, suspected placental abruption or suspected uterine rupture), expedite the birth Correct any underlying causes, such as hypotension or uterine hyperstimulation Start 1 or more conservative measures* Make preparations for an urgent birth Expedite the birth if the acute bradycardia persists for 9 minutes If the fetal heart rate recovers at any time up to 9 minutes, reassess any decision to expedite the birth, in discussion with the woman
Following all CTG reviews, talk to the woman and her birth companion(s) about what is happening and take her preferences into account. * If there are any concerns about the baby's wellbeing, be aware of the possible underlying causes and start one or more of the following conservative measures based on an assessment of the most likely cause(s): encourage the woman to mobilise or adopt an alternative position (and to avoid being supine); offer intravenous fluids if the woman is hypotensive; reduce contraction frequency by reducing or stopping oxytocin if it is being used and/or offering a tocolytic drug (a suggested regimen is subcutaneous terbutaline 0.25 mg).		

Baseline Fetal Heart

Take the following into account when assessing baseline fetal heart rate:

- differentiate between fetal and maternal heartbeats
- baseline fetal heart rate will usually be between 110 and 160 beats/minute
- Although a baseline fetal heart rate between 100 and 109 beats/minute is a non-reassuring feature, continue usual care if there is normal baseline variability and no variable or late decelerations.

- If the baseline fetal heart rate is greater than 160 bpm with no other non-reassuring features then think about other underlying causes such as infection. Check the maternal heart rate and temperature and offer fluids and paracetamol if required.
- If the baseline fetal heart rate is greater than 180bpm with no other non-reassuring or abnormal features then correct any underlying causes such as infection, maternal tachycardia, with IV fluids, paracetamol. If the fetal heart rate remains above 180 bpm despite conservative measures then consider fetal blood sampling

Decelerations

When describing decelerations in fetal heart rate, specify:

- their timing in relation to the peaks of the contractions
- the duration of the individual decelerations
- whether or not the fetal heart rate returns to baseline
- how long they have been present for
- whether they occur with over 50% of contractions
- the presence or absence of a biphasic (W) shape
- the presence or absence of shouldering
- the presence or absence of reduced variability within the deceleration

Regard the following as concerning characteristics of variable decelerations:

- Lasting more than 60 seconds
- Reduced baseline variability within the deceleration
- Failure to return to baseline
- Biphasic (W) shape
- No shouldering.
- The longer and later the individual decelerations, the higher the risk of fetal acidosis (particularly if the decelerations are accompanied by tachycardia or reduced baseline variability)

Accelerations

The presence of fetal heart rate accelerations, even with reduced baseline variability, is generally a sign that the baby is healthy

The absence of accelerations on an otherwise normal CTG does not indicate fetal acidosis

Acute fetal bradycardia

If an acute fetal bradycardia or prolonged deceleration (lasting longer than 3mins) occurs:

- Call for help
- Assess for acute events such as cord prolapse/placental abruption/uterine rupture
- Correct underlying causes such as hypotension/uterine hyperstimulation
- Stop Syntocinon infusion
- Consider administration of Terbutaline 0.25mg s/c
  DO NOT USE IN PATIENTS WITH:
    1. MODERATE/ SEVERE MATERNAL CARDIAC DISEASE AS IT INCREASES MATERNAL HEART RATE AND CAN CAUSE PULMONARY OEDEMA.
    2. MATERNAL HYPOVOLAEMIA OR HYPOTENSION.
    3. SUSPECTED OR CONFIRMED PLACENTAL ABRUPTION
    4. USE WITH CAUTION IN DIABETES AND HYPERTHYROID PATIENTS
- Make preparations for urgent birth
- If bradycardia persists for 9 mins then transfer to theatre for immediate delivery. If the fetal heart rate recovers at any time up to 9 minutes, reassess any decision to expedite the birth, in discussion with the woman.
- Do not use maternal facial oxygen as this may be harmful to the fetus. Only use if there is associated maternal hypoxia, or as part of pre-oxygenation for general anaesthesia.
- Keep the patient informed at all times and take her preferences into account

Fetal scalp stimulation

If digital fetal scalp stimulation during a vaginal examination causes a fetal acceleration in heart rate then regard this as a reassuring sign. Take this into account when reviewing the whole clinical picture

If the CTG is pathological and a digital fetal scalp stimulation elicits an acceleration in fetal heart rate then only continue with fetal blood sampling if the CTG remains pathological (see Fetal Blood Sampling guideline)

Overall care

- Do not make any decisions about a patients' care based solely on the CTG
- Take into account antenatal and intra partum risk factors and progress of labour when interpreting the CTG
- Remain with the woman to offer one-to-one support
- Ensure the woman and her baby are the focus of care not the CTG.
- Make a documented systematic assessment of the condition of the woman and fetus hourly, or more frequently if any concern

Principles for intrapartum CTG interpretation

- When reviewing a CTG assess and document all 4 features (baseline fetal heart rate, baseline variability, presence or absence of decelerations, presence of accelerations
- Classify CTGs as normal, suspicious or pathological.
- Document presence and frequency of uterine activity
- If it is not possible to interpret CTG **Senior obstetric input is required**
- If a fetal blood sample is attempted and cannot be obtained or the sample cannot be processed but the scalp stimulation during the process causes an acceleration decide whether to continue with the labour or expedite delivery, taking into account the clinical circumstances and the wishes of the patient**. (see Fetal Blood Sample guideline)**

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Implementation Date: July 2019

Review Date: 01/04/2022

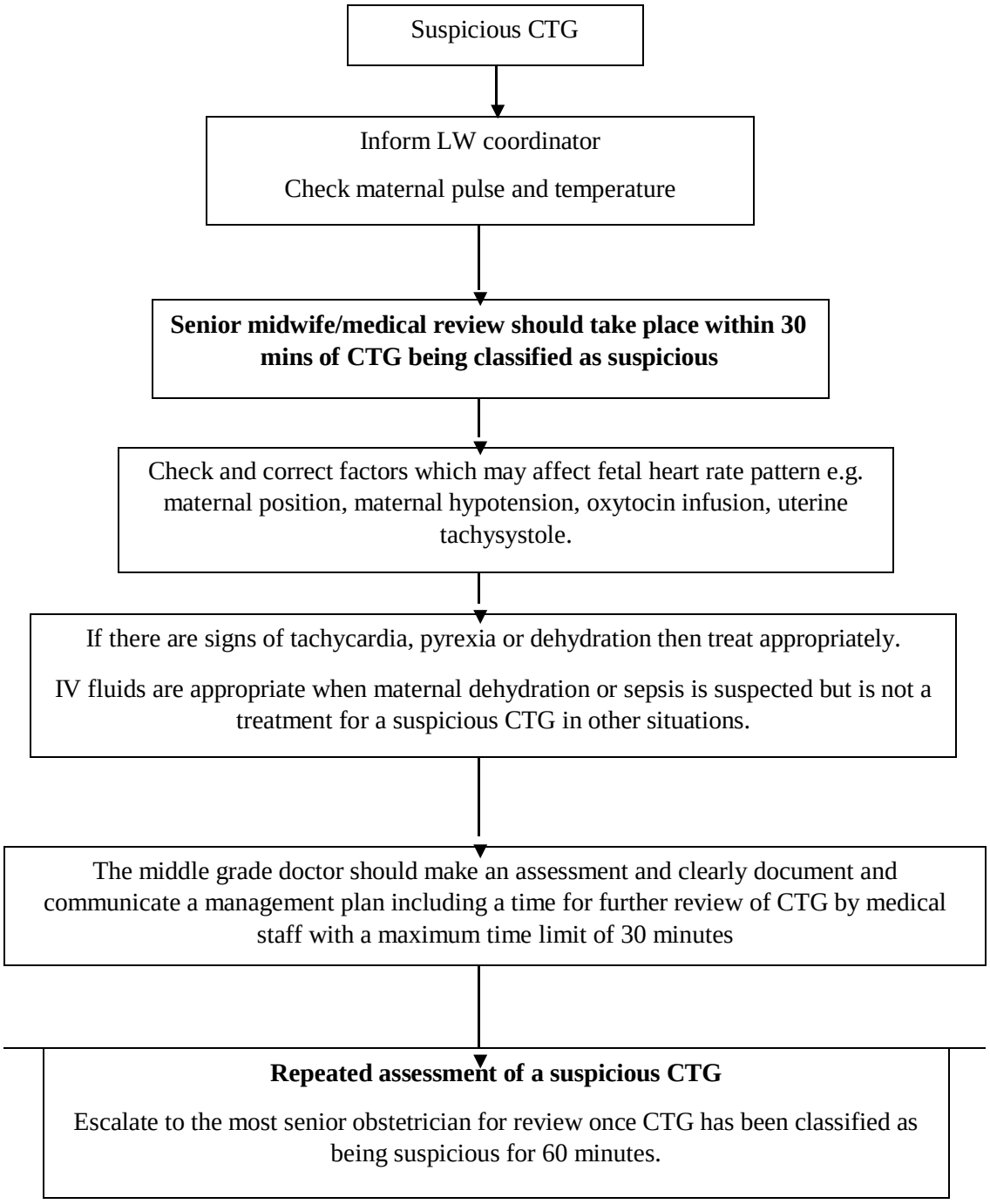
INTERPRETATION INTRAPARTUM CTG

1. REVIEW CLINICAL PICTURE – MATERNAL		FETAL RISK FACTORS:			CONTRACTIONS:
2. REVIEW CTG FEATURES	**Reassuring**	**Non-reassuring**			**Abnormal**
Baseline rate	100 – 160	100 – 109 or 161 - 180			<100 or >180
Variability	5 – 25	<5 for 30 – 50 minutes Or >25 for 15 – 25 minutes			<5 for >50 minutes Or >25 for >25 minutes Or Sinusoidal
Accelerations	If present are generally a sign that the baby is healthy				
Decelerations ***Concerning features:*** • ***Last>60 seconds*** • ***Reduced baseline variability within*** • ***Failure to return to baseline*** • ***Biphasic (W) shape*** • ***No shouldering***	None Early Variable decelerations with no concerning features <90 minutes	Variable decelerations with no concerning features for >90 minutes	Variable decelerations with any concerning features <50% of contractions for >30 minutes **OR** in >50% contractions for <30 minutes	Late decelerations in >50% of contractions for <30 minutes	Variable decelerations with any concerning feature >50% contractions for >30 minutes Late decelerations >30 minutes (less if risk factors present) Acute bradycardia or single prolonged deceleration lasting >3 minutes.
3. IMPRESSION AND PLAN					
	All features are reassuring ⇩	1 non reassuring **and** 2 reassuring ⇩			1 abnormal **or** 2 non reassuring ⇩
Opinion	**Normal CTG**	**SUSPICIOUS CTG**			**PATHOLOGICAL CTG**
Management Plan	Continue CTG and normal care	Correct hypotension/hyperstimulation Full set of maternal observations Inform an obstetrician/senior Midwife Review whole clinical picture and CTG findings and document a plan			Review by Obstetrician and Senior Midwife Exclude acute events Correct hypotension Correct hyperstimulation Conservative measures FBS/Scalp stimulation Consider delivery

APPENDIX 1.

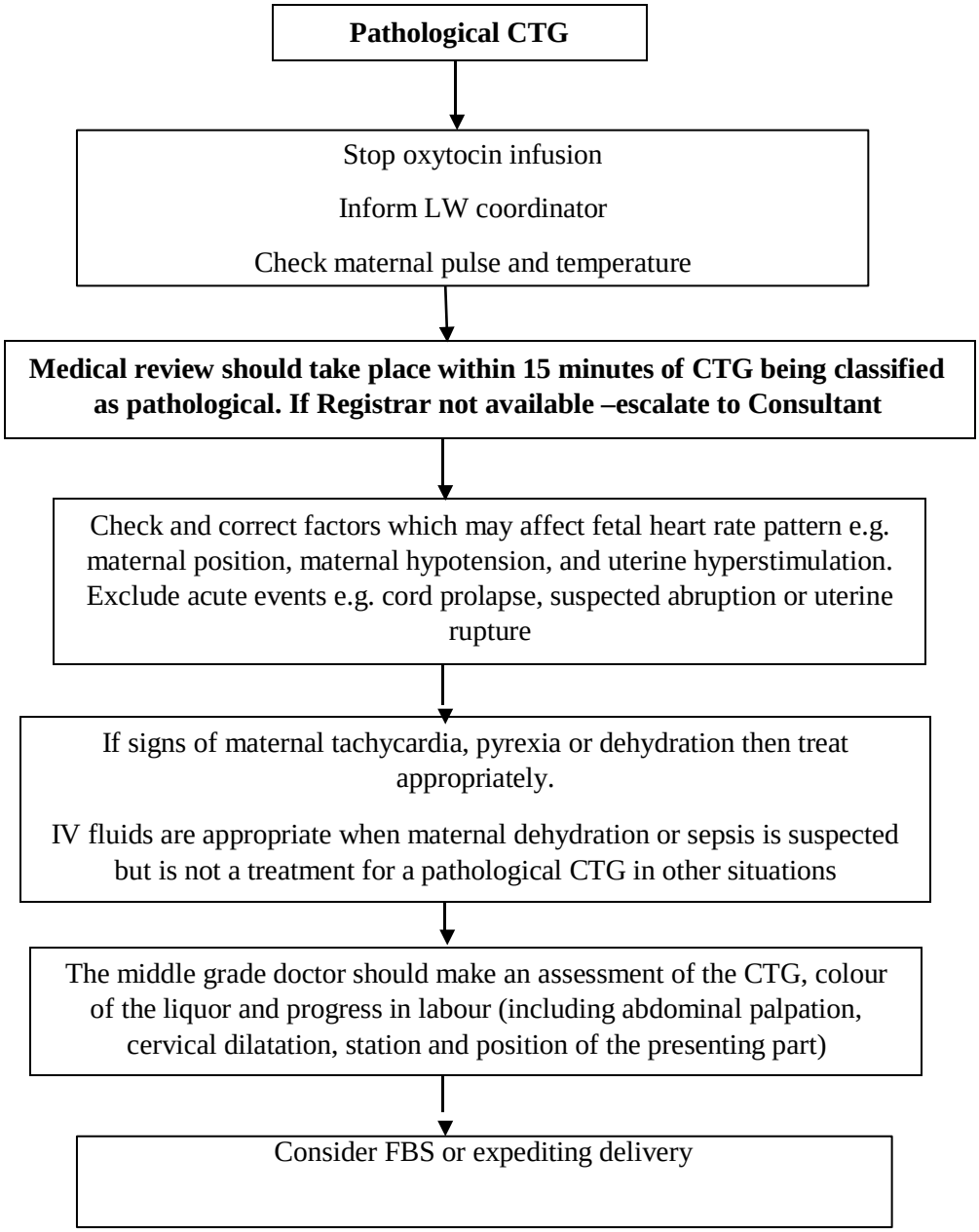
Suspicious CTG

- Check the quality of recording. If continuous monitoring is indicated and cannot be obtained abdominally a fetal scalp electrode should be applied.
- Check for uterine tachysystole and if present stop the oxytocin infusion and consider tocolysis. Aim for 3 – 4 moderate to strong contractions every 10 minutes.
- Remember contracting >5 in 10 minutes is tachysystole and is not normal.



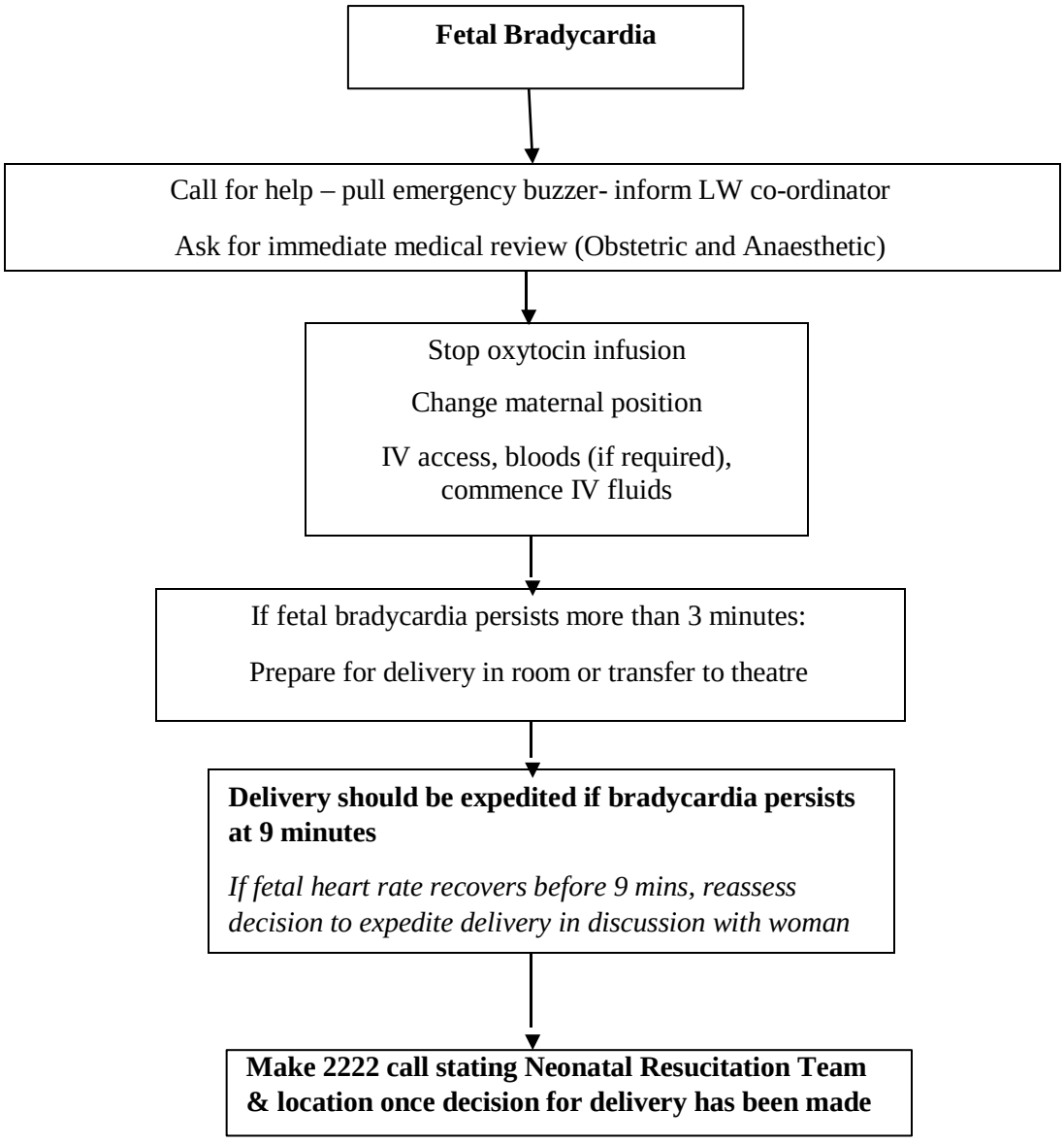
Pathological CTG

- Check the quality of the recording. If continuous monitoring is indicated and cannot be obtained abdominally a fetal scalp electrode should be applied.
- Check for uterine tachysystole and if present stop oxytocin infusion and consider subcutaneous terbutaline.



Fetal Bradycardia

- Prolonged deceleration for >3 minutes requires urgent intervention –causes for this can include placental abruption, cord occlusion, cord prolapse and scar dehiscence, all require immediate delivery.
- Stop oxytocin infusion
- Check for uterine hyperstimulation and if present administer subcutaneous terbutaline.



APPENDIX 2

Recommended documentation of CTG assessment and CTG Peer review on Badgernet.

In Assessment section

Midwife caring for patient

- Select CTG monitoring tab
- Tick REVIEWED and complete page and save

Peer Review

- Select CTG monitoring tab
- Tick PEER CTG REVIEW and complete page and save.

In First and Second stage.

CTG review hourly in LABOUR ASSESSEMENT tab followed by a peer CTG review.

Midwife caring for patient

- Select LABOUR ASSESSMENT
- Select Fetal Heart Rate = yes
- Fetal Heart Rate Monitoring = yes
- Select Continuous or Intermittent
- Select Fetus 1
- Complete CTG information in labour assessment and save

Peer Review

- Select PEER CTG REVIEW tab
- Tick PEER CTG REVIEW and complete page and save

If CTG review by medical staff a PEER CTG REVIEW should be completed

Fetal heart review every 30 minutes in labour assessment

CTG hourly review in labour assessment

Peer CTG Review hourly

Completion of the CTG mnemonic (Dr C Bravado) is NOT required.