Greater Manchester and Eastern Cheshire SCN

Antenatal CTG Interpretation Guideline

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Document Control

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Contents

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1. Introduction and scope

The aim of antenatal fetal surveillance is to identify fetuses at risk of hypoxia and acidaemia. Cardiotocography (CTG) is the most commonly adopted tool used to assess fetal wellbeing and prevent stillbirth in the antenatal period. CTG contributes to decision-making related to timing, place and mode of delivery but there is considerable variation in the interpretation of CTGs which affects the reliability of the test.

Computerised fetal heart rate analysis systems or computerised CTG (cCTG) have been developed to allow the automated evaluation of the CTG with the aim of bringing objectivity and reliability to CTG interpretation. It is derived from the world's largest CTG database linked to outcomes and analyses certain features on the CTG and applies 12 criteria, known as Dawes Redman (DR), to evaluate the CTG.

Reductions in perinatal mortality have been demonstrated with cCTG (Grivell et al., 2015). These have been found to be non-significant, however cCTG may reduce inter- and intra-observer variations in interpretation because it is more objective than visual CTG (vCTG) interpretation and therefore may also improve care by reducing time spent in hospital and the need for further investigations (Baker et al., 2021). For effective clinical decision-making, a full clinical risk assessment is required for both vCTG and cCTG.

The aim of this guideline is to help identify fetuses demonstrating signs of hypoxia on antenatal CTG by providing guidance on:

- The use of cCTG and DR Criteria
- How to approach situations where the DR criteria are not met on cCTG
- Visual interpretation where cCTG is inappropriate for use

There is no definitive national guidance on antenatal electronic fetal monitoring. RCOG and NICE guidelines focus on use of intrapartum CTG and they have no guidance on its use in antenatal period (NICE 2022, RCOG 2011). Antenatal CTG monitoring is widely used as a method of assessing fetal wellbeing, predominantly in pregnancies with risk factors for complications (Grivell et al, 2015). Saving Babies' Lives version 2 recommends the use of antenatal computerised CTG, as human error in antenatal visual CTG interpretation has been identified as a significant cause of stillbirth and serious brain injury (NHS England, 2019). However, it is important to be aware that CTG may not show abnormalities for non-hypoxic risk factors or complications. Therefore, clinical decisions should be based on a full clinical assessment and CTG should not be used in isolation for decision-making. It only provides information about fetal condition at the time of recording, and it is not a predictive tool.

These guidelines cannot anticipate all possible circumstances and exist only to provide general guidance on clinical management to clinicians. The interpretation and application of clinical guidelines will remain the responsibility of the individual clinician. If in doubt, contact a senior colleague or expert. All staff who provide care for women who require a CTG must

be trained in the use and interpretation of Antenatal CTGs. This guideline has been approved and ratified in accordance with the agreed process.

2. Holistic assessment

Principles of holistic care and whole clinical picture review as outlined for intrapartum care (NICE, 2022) also apply to antenatal care and interpretation of fetal monitoring prior to labour.

- Make a documented systematic assessment of the condition of the woman and unborn baby.
- Do not make any decision about a woman's care based on CTG findings alone.
- Consider the women's preferences, antenatal risk factors, current wellbeing, and signs of labour.
- Ensure the focus of care remains on the woman and baby rather than the CTG trace in isolation.

3. Antenatal Auscultation

Fetal heart rate monitoring may be carried out antenatally and can be performed in the community or hospital setting. This will be in the form of auscultation with a pinard stethoscope or handheld doppler.

Auscultation of the fetal heart may confirm that the fetus is alive but is unlikely to have any predictive value and routine listening is therefore not recommended. However, when requested by the mother, auscultation of the fetal heart may provide reassurance. Auscultation should be preceded by a detailed discussion on fetal movements.

- Auscultation must be accompanied by simultaneous palpation of maternal pulse
- The baseline fetal heart rate should be established over a minimum of one minute with the expected rate to be between 110-160bpm
- The findings should be documented as a single figure
- Any potential abnormalities detected, including tachycardia, bradycardia and decelerations should be escalated as an emergency

If the fetus is beyond 26 weeks' gestation, continuous electronic fetal monitoring would be indicated. If the fetal heart cannot be heard when auscultation is attempted after 16 weeks gestation, the woman should immediately be referred to the maternity unit according to the local unit pathway.

4. Indications for Antenatal CTG (from 26+0 weeks' gestation onwards)

The normal fetal heart rate varies with vagal and sympathetic tone adjustments and therefore varies with gestational age due to maturation of the autonomic nervous system. Antenatal CTG monitoring performed before 30 weeks should be interpreted with caution because:

- There is a physiologically higher baseline
- Reduced frequency and amplitude of accelerations are seen
- It is more common to observe an absence of high variation (not concerning at early gestations if no other clinical or CTG concerns, see also Appendix 1)
- There is reduced variability
- Occurrence of sporadic decelerations may be seen

Any clinical decisions based on suspected fetal compromise identified from CTG monitoring before 30 weeks' gestation should be discussed with a consultant obstetrician.

4.1 Table 1: Indications for CTG

(*Stable pre-existing maternal conditions will not always indicate use of CTG in isolation)

Maternal – Pre-existing	Maternal – Gestational	Fetal
Cardiac disease *	Gestational Diabetes	Reduced fetal movements
Pulmonary disease *	New onset raised blood pressure (>140/90 mmHg twice at least 20 minutes apart)	Known or suspected fetal growth restriction, follow Guidance for frequency in the North West FGR & eFGR pathway
Renal Disease*	Preterm Prolonged Rupture of Membranes (PPROM)	Fetal heart rate abnormality heard on auscultation
Thyroid Disease*	Antepartum haemorrhage	Oligohydramnios
Autoimmune Disease*	Abdominal pain	Abnormal fetal dopplers i.e Umbilical artery Dopplers MCA, Ductus Venosus.
Raised Blood Pressure* (Women with pre-existing or known hypertension should not routinely undergo a CTG unless requested by the obstetrician caring for them.)	Abdominal Trauma – Inclusive of surgical or anaesthetic procedure	Multiple pregnancy
Diabetes*	Uterine Tenderness	Multiple pregnancy
	Pre and post external cephalic version (ECV)	
	Raised MEOWS ≥3	
	Prolonged pregnancy >42 wks - twice weekly with an ultrasound scan for liquor volume and umbilical artery Doppler	
	Maternal blood sugar > 10	
	Maternal Pyrexia /infection	
	Pre-eclampsia	

5. Computerised CTG (cCTG)

5.1 Criteria for use of cCTG

The use of cCTG is valid for any gestation beyond 26+0 weeks, but should only performed when clinically indicated or at maternal request.

DR criteria can be used to monitor twin pregnancies. The analysis does not take into account fetal movement when analysing twins.

Care should be taken to assess the suitability for cCTG of those women with risk maternal or fetal risk factors as highlighted above (Table 1). If there is uterine activity, do not use cCTG. In this situation, visual interpretation must be employed (section 7) The Antenatal sticker or equivalent digital recording tool should be used to assess fetal wellbeing. Intrapartum CTG interpretation must not be applied to an antenatal CTG interpretation.

5.2 When cCTG is NOT appropriate

- Women showing any signs of labour or uterine activity as determined by symptoms (contractions reported by the woman) or palpation of contractions (See Fetal Monitoring in Labour Guideline)
- After induction of labour has commenced (see Induction of Labour guideline)

5.3 Prior to commencement of CTG

Ensure an in-depth medical and obstetric history has been obtained and documented looking at the whole clinical situation, including completion of risk assessment and the rationale for performing the CTG and gestational age.
Explain to the woman:

- The reasons of performing a continuous CTG
- The benefits, risks and limitations of CTGs
- That she will be included in discussions and plans regarding her care

If the woman or birthing person declines monitoring, discuss her reasons/concerns and document in hand held and digital records.

5.4 Commencing the CTG

- Record maternal observations (See MEOWS Guideline)
- Palpate abdomen. Only measure the symphysis-fundal height and plot on growth chart if not measured, nor has had a growth scan, in last 2 weeks
- Auscultate the fetal heart with Pinard or Sonicaid for 1 minute simultaneously with maternal pulse to differentiate the maternal pulse from the fetal heart prior to

commencing the CTG, record the fetal heart rate as a single number in the maternal records
- The trace must be labelled with the woman's name and hospital number and the maternal heart rate documented
- Check the date and time of commencement of CTG is correct and recorded on the CTG trace
- Follow individual monitor guidance for turning the analysis on
- Enter the gestation into the cCTG analysis to ensure appropriate gestational dependent interpretation
- Ensure the monitor is running at 1cm per minute
- Apply the abdominal transducers to obtain the best possible contact with the fetal heart and uterine activity. The quality of monitoring of both uterine and FHR must allow for accurate interpretation of the CTG recording
- Where available, ensure maternal pulse oximeter is attached
- Ensure the comfort of the woman and avoid lying flat to prevent supine hypotension
- Give the patient the fetal movement button and explain how to use it

6. Use and interpretation of the antenatal cCTG

- Ensure the women's demographics are entered into the cCTG, including her age and the gestational age
- The tocodynamometer (toco) and fetal heart rate transducers should be optimally positioned and continued for the maximum record length of 60 minutes
- If the CTG is suspected to be abnormal at any point, an immediate review should be sought from an Obstetrician
- If the CTG is being repeated, ensure any changes in the clinical situation since the last CTG have been recognised and included as part of further CTG interpretations
- cCTG should not be used in the latent phase of labour
- Antenatal vCTG interpretation should be employed in the latent phase of labour; do not use cCTG in the presence of uterine activity

The first analysis is made at 10 minutes and then re-evaluated every 2 minutes until all parameters are met or until 60 minutes, whichever is sooner.

6.1 Criteria met

cCTG is an “expert assistant”, however it also requires robust clinical judgement and confirmation. cCTG is not a diagnostic or prognostic tool. A CTG can meet the DR criteria as early as 10 minutes into an episode of fetal monitoring.

- Once the Criteria meets, assess the full clinical picture, provide a holistic approach and if the CTG is visually normal, the CTG can be discontinued
- If DR criteria are met but there are concerns about the normality of the CTG, an Obstetric review (ST3 or above) should be sought
- Record the results in the patient’s notes using an antenatal cCTG sticker or equivalent digital recording tool and ensure documentation of the specific Baseline Rate for future reference

6.2 Criteria not met

The criteria may be met at 10 minutes and every 2 minutes thereafter. Upon completion of the computerised analysis the outcome will be printed on the end of the CTG. Displayed will be *“Dawes-Redman criteria met*” or *“Dawes-Redman criteria not met”.* Where the criteria are not met, the reason/s will also be printed. The outcome should be clearly written in the medical notes alongside a plan of care taking into consideration the whole clinical picture and any known risk factors.

- If the criteria are not met, the CTG should be continued for the full 60 minutes
    - If there are any visually concerning features or cause of concern, escalate appropriately and continue the CTG, until urgent senior review is completed.
    - If CTG is visually normal, then timely senior review will still be required to decide frequency or continuation of CTG and review the individualised care plan
- Gestations below 32 weeks may take longer to achieve criteria due to immature central nervous system
- A low short term variation (STV) is most commonly associated with fetal growth restriction and a chronic hypoxic stress in the fetus
- If the CTG appears normal at 60 minutes and the clinical situation is stable, but the DR criteria are not met, the CTG may be discontinued following senior obstetric bedside review (ST3 and above)
- If the criteria are not met at 60 minutes, the STV criteria based on the TRUFFLE safety net and ISUOG guidance (Lees et al, 2015, Bilardo et al, 2017 and Mylrea-Foley et al., 2022), should be utilised to support clinical decision making – see table 2. **These should only be used where the criteria have not met. If the criteria are met, the STV value should not be further examined**

6.3 Table 2: Low STV for gestational age

Based on TRUFFLE safety net and ISUOG guidance

Gestational range	Abnormal STV
26+0 – 28+6 weeks	≤2.6
29+0 – 31+6 weeks	≤3.0
32+0 – 33+6 weeks	≤3.5
after 34 weeks	≤4.5

- These codes should be evaluated in the context of the gestational age, full clinical picture with consideration of both hypoxic and non-hypoxic risk factors.
- If the STV is abnormal for gestation, a consultant review must be undertaken to determine either a clear plan for delivery, or if this is deemed not appropriate a plan for further monitoring and review of the individualised care plan is required (Consultant-led decision)
- Dependent on the clinical picture, it may be reasonable to consider administration of steroids and magnesium sulphate if these are clinically indicated (consultant-led decision). In this situation, a holistic approach is required to determine a suitable interim plan for monitoring of the patient and fetus
- The STV, other criteria codes and rationale for management plan must be reviewed and documented as this may help to identify why the CTG has not met criteria.
- In a situation where criteria are not met and the STV is reassuring (see Table 2) then consultant review must be undertaken to determine either a clear plan for further monitoring or a plan for delivery, if necessary. As a minimum, further assessment should consider the full clinical picture, including gestational age, any possible hypoxic and non-hypoxic risk factors
- In the case of early onset FGR, where a clear plan has been made by the named consultant, if the STV is normal but criteria has not met, CTG can be discontinued if the CTG is visually normal, and the clinical picture is stable. Escalation and review is still required if the clinical picture is changing or there are other concerns present.
- See Appendix 1 for full explanation of DR codes. These can be considered in the context of the clinical situation to facilitate decision-making decisions and management plans

Decisions regarding timing and frequency of fetal monitoring must be made by considering the clinical context and not based on the CTG in isolation. If the clinical picture is unstable, the CTG should continue (even if the criteria has met) and a management plan made by an obstetrician ST3 equivalent or above.

7. Antenatal CTG – Visual Interpretation

In certain circumstances, where computerised CTG is contraindicated or required to remain in progress following Dawes Redman analysis, it is necessary to make a systematic assessment of the CTG using visual interpretation. These situations include:

- During the induction of labour process
- Latent phase of labour – this should be determined by performing a holistic assessment. If CTG changes are noted compared to a previous CTG, then repeat assessment to answer the question of active or latent labour is required. If artificial rupture of membranes is possible, the Bishop's score should also be considered within the assessment of active or latent labour
- In a situation where there are evolving risk factors or while stabilising maternal condition

These principles should be applied for assessment of fetal wellbeing and consider all other existing risk factors as well as the fetal heart rate tracing. All reviews should take into consideration the full clinical picture. CTG must be longer than 20 minutes before the CTG can be visually interpreted and classified (this does not apply to computerised CTG). However, if there are clear abnormal features, or any cause of concern escalation should be sooner. During this time regular visual inspections of the CTG should be made.

Each feature of the CTG should be reviewed in turn:

- Is the Baseline rate appropriate for gestation and stable?
- Is there normal variability and cycling?
- Are accelerations present?
- Presence/absence of decelerations

All 4 features must be normal after a maximum of 40 minutes for the CTG to be categorised as normal. The categories for a CTG in a non-labouring woman are therefore:

- Normal
- Abnormal

Consider the full clinical picture, document all risk factors present and your overall impression and document this with a comprehensive management plan.

Where assessment is difficult or there is a difference of opinion between staff, a review by a senior midwife or obstetrician (ST3 or above) is encouraged using fresh eyes (section 6.4) and should be obtained.

7.1 Latent Phase of Labour

A full clinical assessment of the below factors (Table 3) must be evaluated in combination to support the decision to use antenatal CTG interpretation or intrapartum CTG interpretation. If Latent phase is confirmed, apply antenatal visual interpretation, not cCTG.

Table 3: To support assessment of latent phase the following should be performed

Latent Phase – Use this guideline	Active Phase – Do **NOT** use this guideline: Refer to Care in labour guideline
Palpate contractions for strength duration and frequency – <3:10, mild to palpate <30 seconds	Palpate contractions for strength duration and frequency – >3:10, moderate-strong to palpate >30 seconds
Assess maternal behaviour and pain score	Assess maternal behaviour and pain score
Vaginal Examination, assessment of Bishop score, no change from previous examination	Vaginal examination; Assessment of Bishop's score, cervical changes to compared to previous examination
Assessments need to be repeated and clinical picture revaluated appropriately to ensure detection and management of active labour, where intrapartum CTG interpretation and 1:1 care should be provided.	

7.2 Fresh Eyes

The Fresh eyes approach has been introduced to reduce the risk of CTG misinterpretation. The midwife caring for the woman should identify another midwife (where possible, this should be a midwife who is Band 6 or above) to act as "Fresh Eyes" and the CTG should be interpreted separately.

As a minimum, fresh eyes should be completed as follows:

- At discontinuation of the CTG
- Every hour if still in progress
- If there is a change in the trace
- If there is any difference of opinion between professionals
- If the clinical context does not correlate with the cCTG assessment

"Fresh Eyes" review is not necessary when the DR criteria have been met on cCTG and the clinical picture is stable.

If the CTG is classified as abnormal by a midwife, this should be referred to an experienced obstetrician (ST3 or above) for review within 20 minutes from the time that the review was requested. The Labour ward co-ordinator should also be informed. If review does not occur, this should be escalated (see Appendix 3).

Where senior review is delayed, the woman should be transferred to Labour ward where possible, to facilitate provision of 1:1 care, a holistic review and definitive plan is agreed. Escalation in the event of delays for review or transfer should follow local unit policies. The reasons for the delay should be documented, including any actions taken.

An individualised management plan may include referral for further tests, such as an ultrasound scan, doppler studies or consideration for expediting birth and if so, the mode of delivery discussion and decision.

7.3 Documentation

The clinical picture and all features of fetal heart rate should be considered when assessing a CTG and an antenatal CTG sticker or equivalent digital recording tool completed for documentation for each individual review, including fresh eyes which requires a separate antenatal CTG or equivalent digital recording tool.
Plans of care should be discussed with the patient and clearly documented in the maternity records.

8. Escalation

If there are any concerns regarding a woman, baby or a CTG, this must be escalated to the appropriate person for the most appropriate response as specified in previous sections.

Use clear safety critical language to escalate concerns using the AID tool; this allows all healthcare staff to have a shared understanding of the escalation that is taking place. Please see Appendix 2 for more details.

If barriers are encountered, such as a difference in clinical opinion, or if a member of healthcare staff feels the need to challenge the plan made or has not received the appropriate response then a Teach or Treat (Appendix 2) communication strategy should be adopted, which encourages discussion about a clinical situation being escalated. Healthcare staff should explain their conclusions to the concerned practitioner, which allows a second chance to review their plan and identify any errors. If there are still concerns, a 3rd opinion should be sought.

Further guidance available https://www.rcog.org.uk/about-us/groups-and-societies/the-rcog-centre-for-quality-improvement-and-clinical-audit/each-baby-counts-learn-support/

See Appendix 2 for further support.

9. Conservative Measures and Principles of Management

The recommendation of conservative measures in the management of antenatal CTG traces should be made with caution. See Table 4

Table 4: Appropriate Conservative Measures and Principles of Management

Do	Do Not
A position change can be considered where there is evidence of aortocaval compression by the gravid uterus.	Intravenous fluids should not be routinely given. In the antenatal period intravenous fluids should only be administered when a woman presents with evidence of dehydration, hypotension, or if the woman shows signs of sepsis.
Escalate concerns, seek fresh eyes, apply Teach or Treat (Appendix 2)	Oral administration of cold water (or cold drinks) will not improve the fetal environment or outcome of a hypoxic fetus and may delay definitive management.

10. Frequency of CTGs for inpatients

There needs to be a clear and comprehensively documented clinical indication in order to perform a CTG. Not all women in hospital require daily CTGs, particularly if they are clinically stable and their baby is moving (See Reduced Fetal Movements Guideline).
If a CTG is normal it should only be performed more than once a day, if the clinical situation deteriorates or changes or on the request of a consultant, as applicable.

11. Communication

11.1 Information and discussion

All women with learning disabilities, visual or hearing impairments or those whose first language is not English must be offered assistance with interpretation where applicable, and where appropriate a telephone interpreter must be used. It is paramount that clear channels of communication are maintained at all times between all staff, the women and their families.

Once any decisions have been made/agreed, comprehensive and clear details must be given to the woman thereby confirming the wishes of the women and their families.

The contents of any leaflet issued must be explained in full at the time it is issued.

The provision and discussion of information of the risks and benefits with women during the antenatal, intrapartum, and postnatal periods must be ensured. All details surrounding discussion of the risks and benefits together with explicit details of proposed management must be documented contemporaneously, in both handheld notes and the main notes as appropriate (NMC, 2015).

11.2 Recording keeping

To ensure accurate record keeping for CTG:

- Make sure that date and time clocks on the CTG monitor are set correctly
- Label traces with the woman's name, date of birth and hospital number or NHS number, the date, time and the woman's pulse at the start of monitoring
- Relevant intrapartum events (for example, vaginal examination, fetal blood sampling and siting of an epidural) should be documented on the CTG trace/ electronic trace and in the maternal records
- Keep CTG traces for 25 years and, if possible, store them electronically. In cases where there is concern that the baby may experience developmental delay, photocopy CTG traces and store them indefinitely in case of possible adverse outcomes
- All paper traces should be placed in an envelope and stored in the maternal records. The trace should always be returned to the notes

12. CTG Training

12.1 Competency using the equipment

All staff who commence/monitor/discontinue and review antenatal CTGs must have undergone training including how to start and set up the machine and the *Dawes Redman* analysis, teaching on local action plans or lessons learnt which involve antenatal fetal monitoring, how to interpret the *Dawes Redman* criteria, taking a holistic view and considering the full clinical picture and the contents of this guideline.

12.2 Escalation and appropriate response

Tools available to help deal with challenges and barriers to escalation, safety critical language and encouraging psychological safety within the unit to improve escalation and ensure an appropriate response can be found at https://www.rcog.org.uk/about-us/groups-and-societies/the-rcog-centre-for-quality-improvement-and-clinical-audit/each-baby-counts-learn-support/.

Appendix 1:

Codes for when Dawes Redman criteria has not been met

Code	Criteria	Recommended action
1	**Basal heart rate outside of normal range** Basal rate is not the same as baseline rate and may differ significantly from visual assessment of baseline rate.	If trace otherwise normal and no clinical concerns obstetric plan required to include a plan for further fetal monitoring
		If Clinical Concerns: Obstetric review (<20 mins) if change in baseline or significant clinical concerns
2	**Large Decelerations** If isolated decelerations and the trace is otherwise normal this can be noted as an unprovoked variable deceleration but does not require immediate action and the trace should be repeated later.	≤31+6 - to stop CTG and repeat after 1hour (early onset FGR pathway, ICP, GMEC)
		If Clinical Concerns: Obstetric review – full clinical review and plan that includes: a) plan for further fetal monitoring: b) if clinically appropriate (i.e., does not require imminent delivery), consider doppler and liquor volume assessment
	If there are recurrent decelerations or concerns within other parameters or clinical concerns	Continue the CTG and obtain urgent obstetric review is required
3	**No episode of high variation** This is different to baseline variability and relates to alternating active and quiescent fetal sleep (cycling)	Preterm: If the STV is normal and no other CTG or clinical concerns, obstetric plan required to include a plan for further fetal monitoring Term: Plan as above and also consider a plan of delivery (IOL or Caesarean, as clinically appropriate)
		If other CTG or clinical concerns – for obstetric review (urgency of review depends on full clinical concerns)
4	**No movement and fewer than 3 accelerations**	Obstetric review– this might indicate expediting delivery or repeating fetal monitoring, dependent on the clinical picture
5	**Baseline fitting is uncertain** If CTG otherwise normal and baseline rate falls within normal parameters, then this is not significant. Normal range is 110-160bpm	If CTG otherwise normal, repeat trace 4-8 hours
		If Clinical Concerns: continue the CTG and escalate for obstetric review

<table>
<tr><th>Code</th><th>Criteria</th><th>Recommended action</th></tr>
<tr><td>6</td><td>Short term variability (STV) is less than 3ms
A value of less than 3ms when gestation ≥29+0/40* is strongly linked to the development of metabolic acidaemia and impending intrauterine death. Particularly with the absence of an episode of high variation.
*STV <2.6ms at ≤ 28+6/40 (early onset FGR pathway, ICP, GMEC)</td><td>Continue CTG and urgent obstetric review with a view to preparing for delivery

When criteria not met, use TRUFFLE STV cut offs and full clinical review to determine if delivery is indicated:
<table><tr><td>Gestational range</td><td>Abnormal STV</td></tr><tr><td>26+0 – 28+6 weeks</td><td>≤2.6</td></tr><tr><td>29+0 – 31+6 weeks</td><td>≤3.0</td></tr><tr><td>32+0 – 33+6 weeks</td><td>≤3.5</td></tr><tr><td>after 34 weeks</td><td>≤4.5</td></tr></table></td></tr>
<tr><td rowspan="2">7</td><td rowspan="2">Possible error at end of record
This occurs when a possible abnormality is detected at the end of a CTG which would otherwise have met criteria.</td><td>If not a major abnormality or clinical concerns, continue trace until criteria met</td></tr>
<tr><td><u>If Clinical Concerns:</u>
continue the CTG and escalate for obstetric review</td></tr>
<tr><td>8</td><td>Deceleration at the end of the record</td><td>Continue the CTG and escalate for obstetric review– this might indicate expediting delivery or repeating fetal monitoring, dependent on the clinical picture</td></tr>
<tr><td>9</td><td>High frequency sinusoidal rhythm
Associated with fetal anaemia and/or fetal hypoxia with acidosis.</td><td>Continue CTG, request urgent obstetric review. If expediting delivery is not indicated on review of clinical picture, take maternal blood sample for urgent Kleihauer test to assess for risk of feto-maternal haemorrhage.</td></tr>
</table>

Code	Criteria	Recommended action
10	**Suspected sinusoidal rhythm** As above.	Continue CTG, request urgent obstetric review. If it does not resolve spontaneously then take maternal blood sample for urgent Kleihauer test to assess for risk of feto-maternal haemorrhage.
		If spontaneously resolves AND no other clinical concerns, needs Senior input, but usually associated with good clinical outcomes If it does not resolve, the whole clinical picture requires review for plan of care which may consider delivery
11	**Long term variations in high episodes below acceptable level** Long Term Variation (LTV) is similar to baseline rate variability. Measured over a 1-minute sample, the difference between the high and low FH values is analysed. LTV is reported as "high" or "low" episodes.	Urgent obstetric review (manage as per STV = code 6)
12	**No accelerations** Accelerations assessed using a slightly lower threshold (>10bpm) than FIGO and NICE.	CTG otherwise normal – obstetric review is required
		If Clinical Concerns: Visual assessment also abnormal – Continue the CTG and escalate for urgent obstetric review– this might indicate expediting delivery or repeating fetal monitoring, dependent on the clinical picture

Appendix 2: Clinical Escalation Flowchart

IDENTIFY - COMMUNICATE - ACT

1. IDENTIFY clinical concerns or risk factors

using clinical assessment, clinical knowledge and / or tools

Identify:
Who to escalate to, what response and time frame needed?

Midwifery concerns

Consider escalation to:

- Midwife
- Midwife shift lead
- Labour ward co-ordinators
- Operational co-ordinator
- Midwifery Leadership team

Depending on clinical situation, skill set, in/out of hours, response required

Obstetric, Neonatal and Anaesthetic concerns

Consider escalation to:

Shift lead/co-ordinator and either:

- On-call SHO
- On-call Registrar
- On-call Consultant

Depending on clinical situation, skill set, in/out of hours, response required

Other concerns: Specialist teams

(e.g., Medical / Surgical / Cardiology / Outreach / ITU etc)

Consider escalation to:

Shift lead/co-ordinator and either:

- On-call registrar
- On-call Consultant

2. COMMUNICATE concern

What is needed and when....is it **Advice**, to **Inform** or to **Do** something (AID)?
use SBAR, safety critical language and closed loop feedback

TIME FRAMES:
Red - immediate review
Orange - urgent review *(See within 15 mins)*
Yellow – advice / review *(See within 1 hour)*
Green – non urgent advice / review *(see within 4 hours)*

3. ACT (right response)

Get the right person(s), at the right time, in the right place with the right response
use **TEACH or TREAT** *conversational approach for effective decision making*

Ask:
Does response feel appropriate?

YES
Reassured / improvement noted

NO
Not reassured / No improvement

De-escalate

(If improvement and/or adequate response)

- Continue care as per new plan
- Observe for further or new deterioration

Is there a conflict of opinion?

repeat **Teach or Treat**
or
Escalate for 2nd opinion and/or support
to next appropriate level of clinician or team
(Depending on concern, response needed)

Any further concern?
Re-escalate

COMMUNICATE

Clinical concern to next appropriate level of available clinician *(as above)*

ACT

Get the right response – think right person, place, time and response *(as above)*

Techniques to support effective clinical escalation

The Each Baby Counts Learn and Support programme (RCOG, 2022a) developed three behavioural tools and techniques to build the right culture, behaviours and conditions that enable effective clinical escalation. These techniques promote improved communication, civility, teamworking and psychological safety with teams. They support an environment of constructive friction; whereby individuals within teams can understand and compassionately challenge the perceptions of others and contribute to decision-making. The techniques are aligned to the three-step escalation process of **IDENTIFY-COMMUNICATE-ACT**.

1. IDENTIFY concerns AND who to escalate to during the shift *('Team of the shift' checklist)*

The first step in the escalation process involves clear identification of a concern. There are several trigger tools that exist to help with identification of deterioration, an evolving clinical situation or risk factors e.g., MEOWS, Partograms, Fetal monitoring classification tools, risk assessments etc.

At the point of identification of a concern an individual becomes consciously aware of this and that they will need to perform an escalation activity. Escalation activity can include use an emergency buzzer, alerting a colleague about deviation from normal, bleeping another staff member, making a phone call, putting out a 2222 emergency call or simply having a conversation about care plans and deciding management.

Part of the identify stage also involves consideration of time frames and, knowing who to escalate to, feeling psychologically safe to escalate and then deciding to do this. The transient nature of teams in maternity services means that team members do not always know each other or work together regularly, understand individual strengths or work together regularly (Barber et al 2022). **Team of the shift** is a checklist tool (appendix 1) used at the beginning of a shift. It supports all team members to introduce themselves by name and role, to understand skills sets including development or learning needs, to identify emergency team roles and, who to escalate to during the shift.

2. COMMUNICATE: Advice-Inform-Do and SBAR

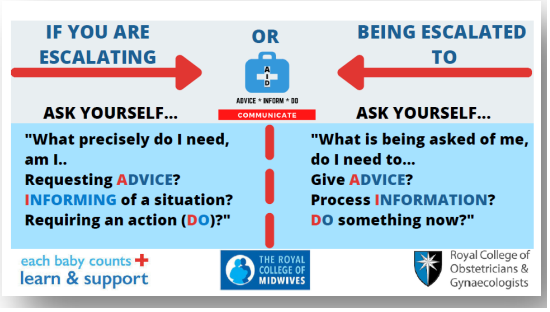
The second step in clinical escalation involves communicating the concern to the right person(s), what is needed and when. High clinical acuity and complex human factors can be a barrier to effective escalation and, to the ability to simultaneously triage multiple escalations as they occur. Communication therefore needs to support this.

The **Advice-Inform-Do** (AID) tool **is used to start the escalation conversation** before conveying key information using the Situation Background Assessment Recommendation (SBAR) framework to ensure key critical information is included and misunderstandings avoided (Institute for Healthcare Improvement 2022). AID enables the recipient to i) promptly recognise an escalation ii) quickly understand what is needed/expected iii) maintain situational awareness when multiple escalations may be occurring.

The communication of clinical escalation can be either 'pushed' (by the person escalating) or 'pulled' (by the person being escalated to). It relies on assertive escalation and receptive action

This can be used <u>when escalating</u>:

- **A**dvice – Can I ask your Advice
- **I**nform – Can I Inform you/let you know
- **D**o – Can you come and do something (e.g., review a CTG)



It can also be used in reverse <u>when being escalated to</u>:

- **A**dvice – Are you asking me for Advice about…?
- **I**nform – Are you (just) Informing me about….?
- **D**o – Do you need me to come and do….

3. ACT: Teach or Treat

The third step in effective clinical escalation involves 'act' (acting in the right way or getting the right response). This involves making appropriate decision(s). Effective decision-making is important for safe care. It is a cognitive process resulting in the selection of a belief or course of action and, is either system 1 (unconscious mind) or system 2 (slower, consciously controlled mind) (Kahneman 2012).

It is important to lead effective decision-making in teams and for team members to feel safe to contribute or to challenge where time permits and when they do not agree with a decision or understand the reason for a decision. An appropriate conversational technique to get the right response is 'TEACH OR TREAT'. This avoids the decision-maker or team lead giving their own opinions at the outset because a different team member may be reluctant to air or contradict the leader (Global Air 2021). It is a safe way to open conversations in a non-confrontational way, exposes different perceptions and allows ongoing development or education, shared learning and the supports shared mental models.

The way in which TEACH or TREAT works is that is enables either the team lead or clinician with concern(s) to ask to 'teach or treat'. The conversation as follows:

TEACH – *"Tell me what you think and why, I'll do the same so we can discuss"*

OR

TREAT – take appropriate action to the clinical situation

- Speak up if still concerned. Seek further senior opinion.

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