Antenatal Cardiotocography UHL Obstetric Guideline

University Hospitals of Leicester NHS
NHS Trust

Trust Ref: C21/2021

Contents

1. Introduction and Who Guideline applies to

Cardiotocography (CTG) is a widely used tool for fetal assessment in the antenatal period. At present, antenatal CTG is not thought to be useful as a method of routine fetal assessment in low risk pregnancies and its use in the antenatal period implies that a risk factor has been identified.

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)).

'Saving babies lives v3' recommends the use of antenatal computerised CTG (cCTG) as human error in

antenatal visual CTG interpretation has been identified as a significant course of still birth and serious brain injury (NHS England 2023). However, it is important to be aware that the CTG does not show abnormalities for non-hypoxic risk factors or complications.

A normal CTG (Visual interpretation or computerised) is only a clinical diagnostic tool and cannot be used as a predictive or screening test. It only indicates current fetal state, and it cannot predict catastrophes such as sudden abruption.

For effective clinical decision-making, a full clinical risk assessment is required for both vCTG and cCTG

The most recent systematic review and meta-analysis on Comparison of visual and computerised antenatal cardiotocography in the prevention of perinatal morbidity and mortality showed:

- There is a non-significant reduction in perinatal mortality with cCTG
- Despite no clear reduction in perinatal mortality and morbidity with cCTG, it is objective and may reduce time spent in hospital and further investigations for women.
  (Eur J Obstet Gynecol Reprod Biol 2021 Aug:263:33-43.doi: 10.1016/j.ejogrb.2021.05.048. Epub 2021 Jun 4.)

Key Points

- **Outside of maternal dehydration, IV fluids play no part in the management of abnormal antenatal CTGs.**
- **If it is proving impossible to obtain a trace of interpretable quality after 10 minutes, without an obvious reason escalate concerns**
- **Where the CTG appears abnormal, with any visually concerning features or cause of concern, escalate immediately, do not wait for 60 mins. Continue monitoring**
- **DO NOT act on the basis of the CTG analysis alone, which is an aid to pregnancy management, not a diagnostic tool**
- **The classification of an Antenatal CTG is Normal or Abnormal**

What's new?

- Added that in some clinical scenarios, such as the monitoring of severely growth restricted fetuses, analysis will need to continue for longer, EVEN if the criteria are met. The STV value in these cases is only valid after 60 mins.
- Added gestational specific STV ranges
- Prior to administration of Propess, Prostin, Foleys balloon catheter or ARM, a computerised cCTG can be performed if there is no uterine activity
- Updated indications for AN CTG table
- Removed reference to Dawes Redman codes
- Added computerised CTG criteria table
- In cases of high frequency/suspected sinusoidal rhythm, take maternal blood sample for urgent Kleihauer test to assess for risk of feto-maternal haemorrhage.
- Added escalation of conflicting opinion tool
- Ensure fresh eyes review if AN cCTG has not met criteria at 60 minutes

Related documents:

Antenatal Management of Multiple Pregnancy & Intrapartum Management of Twin Pregnancy Trust ref: C62/2023
Maternity Assessment Unit Trust ref: C29/2008
Altered Fetal Movements Trust ref: C70/2004

Flow Chart 1: Commencing and discontinuing Computerised CTG

Computerised CTG should be used to assess antenatal singleton pregnancies.
Computerised CTG can also be used in twin pregnancies but without the inclusion of the fetal activity button.
Computerised CTG should not be used in triplets or higher order pregnancies.

Is the pregnancy beyond 26+0 weeks?

No → CTG **NOT** indicated. Auscultate with Pinards stethoscope or sonicaid

Confirm the rationale for CTG.
Is there a maternal or fetal condition or risk factor that could negatively impact fetal development?

No → CTG **NOT** indicated

Yes

Commence computerised recording unless uterine activity is present
(The first result is available at 10 minutes and every 2 minutes thereafter until a maximum of 60 minutes)
There must be no deceleration or artefact at the end of the recording

Note: Outside of maternal dehydration, IV fluids play no part in the management of abnormal antenatal CTGs.

CRITERIA MET
Visually review and classify the CTG. If this is normal and there are no other on-going clinical concerns, the analysis can be **stopped.**

Analysis can be complete within as little as 10 minutes recording time.
The printer will produce a report of the analysis results.

Do not review the numeric data as the CTG has been classified as normal and this data is, therefore, insignificant. STV is not accurate prior to 60 minutes.

In some clinical scenarios such as the monitoring of severely growth restricted fetuses, analysis will need to continue for longer, EVEN if the criteria are met. The STV value in these cases is only valid after 60 mins. This will be be on an individual basis

CRITERIA NOT MET BEFORE 60 MINUTES

If visually normal, timely senior review (ST4 or above) Continue the recording until the criteria are met and senior review is completed. Complete an individualised care plan.
Short-term variation (STV) is not accurate prior to 60 minutes; do not review this numeric data.

Where the CTG appears abnormal, with any visually concerning features or cause of concern, escalate immediately; **do not wait for 60** mins. Continue the CTG, contact an Obstetrician (ST6 or above) to arrange transfer to Labour ward +/- delivery.

DO NOT otherwise prematurely stop the recording. If the analysis has been stopped before criteria are met and before 60 minutes IT IS NOT VALID.

CRITERIA NOT MET AFTER 60 MINUTES OF ANALYSIS
Indicates that normality has not been demonstrated
In the context of antenatal CTG classification, this is an "abnormal" outcome.
A Senior obstetric (ST6 or above) review must take place and an individualised plan made based on reasons for failure, visual trace review and holistic review of the pregnancy. If only an ST4 is available, a review must take place followed by discussion with the Consultant.

The STV should be taken into account and the trend reviewed if previous analysis has been performed. It has a predictive value for foetuses at risk of metabolic acidaemia and IUD.

STV cannot be assessed visually. It can only be analysed with a full 60 minutes.
STV MUST NOT be used in isolation as an indicator of fetal condition
STV values:

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

If the STV is abnormal for gestation a Consultant review must be undertaken
Where the analysis suggests a pre-terminal or sinusoidal, delivery should be immediately arranged.

N.B. if it is proving impossible to obtain a trace of interpretable quality after 10 mins, without an obvious reason (i.e. significantly raised BMI, excessive fetal movements). Review entire clinical presentation and escalate concerns.

DO NOT act on the basis of the CTG analysis alone, which is an aid to pregnancy management, not a diagnostic tool

2. Antenatal Cardiotocography

Fetal monitoring may be carried out antepartum either on an in-patient or outpatient basis for on-going surveillance of the fetus. All service users who present with an antepartum problem must be offered as a minimum, an auscultation of the fetal heart at any gestation. If there is a clinical indication, a computerised electronic fetal monitoring cCTG should be performed**.**
It must be noted that computerised cCTG is contraindicated in the presence of uterine activity.

CTG should only be performed in the antenatal period for fetal surveillance as per clinical indications. All service users will be offered computerised (cCTG) if a CTG is indicated and appropriate in the antenatal period. If a computerised (cCTG) is not available a systematic assessment of the CTG using visual interpretation (vCTG) should be used.

During the induction of labour process, prior to administration of Propess, Prostin, Foleys balloon catheter or ARM, a computerised cCTG can be performed if there is no uterine activity. Post administration of Propess, Prostin, Foleys balloon catheter or ARM, a visual CTG (vCTG) should be used (see Fetal Monitoring in Labour UHL Obstetric Guideline.pdf).

Latent phase of labour CTG monitoring see Latent Phase of Labour

Exceptions can be made on an individual basis by the obstetric consultant with the agreement of the service user.

2.1 Indications for an antenatal CTG

Table 1: Indications for antenatal CTG

Maternal – pre-existing	Maternal – Gestational	Fetal
Cardiac Disease*	Gestational diabetes	Altered fetal movements
Pulmonary Disease*	Pre-eclampsia	Known or suspected fetal growth restriction
Renal Disease*	PPROM	Infection
Thyroid Disease*	Prolonged Rupture of Membranes ≥ 24 hours pre-labour unless delivery is imminent	Multiple pregnancy
Autoimmune Disease*	Vaginal bleeding	Fetal arrhythmias
Raised BP*	Abdominal Trauma	Oligohydramnios
Diabetes*	Suspected pre-term labour	ECV
	Maternal infection/pyrexia	Fetal heart rate abnormality heard on auscultation
	Prolonged pregnancy >42 weeks twice weekly USS for liquor volume and uterine artery doppler	
	Pre-post ECV	
	Maternal adverse reaction to medical treatment	

*** Stable pre-existing maternal conditions will not always indicate use of CTG in isolation**
The list is not final, there may be other concerns that you will need to monitor the fetus for.

2.2 Documentation and CTG Storage

Rationale for antenatal CTG documented in maternal notes.

COMPUTERISED CTG (cCTG)

- Set ;
  - Name
  - S number
  - Gestation
- Complete the start of CTG sticker (see below)
- The cCTG must be left to run to allow the breakdown to be printed
- It should be documented in the health record that the computerised criteria has been met or not met and the length of time it took to meet.

VISUAL INTERPRETATION (NON-COMPUTERISED VCTG)

- **At the start of the CTG:**
- **Complete the start of CTG sticker (see below)**
- **Check printing speed 1cm/min**
- **The CTG should run for a minimum of 30 mins**

CTG check list (attach to start of CTG trace)	University Hospitals of Leicester NHS	
Reason for CTG:		
Date:	Date set correctly on CTG? (tick)	
Time:	Time set correctly on CTG? (tick)	
Name:	Paper speed set to 1cm per min (tick)	
Hospital Number:	Gestation:	
(or attach addressograph)	Maternal Pulse:	
	FH auscultated prior to CTG (rate):	

Assessment of fetal wellbeing

Assessment of fetal wellbeing should consider:

- all other existing risk factors
- the fetal heart rate tracing.
- CTG must be longer than 30 minutes before the CTG can be visually interpreted and classified (this does not apply to computerised CTG).
- However, if any abnormal features are evident, or there is a cause for concern, immediate escalation is warranted. During this period one to one care must be initiated promptly, and continuous visual assessment of the CTG must be maintained.

Each feature of the CTG should be reviewed in turn:

- Risk factors – documented
- Maternal pulse rate
- Contractions- comment on uterine activity, strength , length and frequency
- Baseline: Is the Baseline rate appropriate for gestation and stable?
- Variability: Is there normal variability and cycling?
- Accelerations: Are accelerations present?
- Decelerations: Presence/absence of decelerations
- Overall classification- normal or abnormal
- Plan of care documented

2.3 CTG Monitors

Within UHL Maternity services we have a range of CTG monitors available.
CTG's available for use in the Antenatal period are as follows;

Huntleigh (Dawes Redman criteria)

- Start the CTG
- turn 'analysis on'
- Enter the gestational age in weeks and days.
- Turn the printing on.
- After 10 minutes if the computerised cCTG criteria is met, this will be displayed on the bottom of the screen (with a tick).
- If you want to **review** press menu and then press "review".
- If you want to **generate the report** then stop the recording and press print (Do not turn off the CTG machine until it has completed printing).
- **If the computerised cCTG criteria is not met then continue to record the CTG.**

Philips Non – stress test (NST) computerised CTG criteria

The computer software assesses the above mentioned dataset and creates a report. The first result is after 10 minutes and is updated every 2 mins up to max of 60 mins.

There are 2 possible outcomes:

- Criteria met
- Criteria not met

2.4 Applying the computerised CTG criteria:

I. What to do when Criteria are met:

This can be met after as little as 10 minutes (i.e. after the first analysis).

- It indicates a normal trace.

- The cCTG can be stopped subject to visual assessment and clinical judgment.
- Do not rely on the analysis in isolation.
- It may not always identify unusual or pathological patterns that may be more obvious from visual interpretation, holistic assessment of, and knowledge of, the whole clinical scenario.

II. What to do when Criteria not met BEFORE 60 minutes:

- Unless there are clear abnormal features of any cause for concern, continue the recording until the criteria are met.
- Short-term variation (STV) is not accurate prior to 60 minutes; do not review the STV data until after 60 minutes.

III. Where the CTG appears abnormal;

- **do not wait for 60 mins**,
- contact an Obstetrician (ST6 or above) . If a ST6/Consultant is not available see escalation pathway.
- arrange transfer to Labour ward (if not already there)+/- delivery.
- Immediate escalation is warranted. During this period one to one care must be initiated promptly, and continuous visual assessment of the CTG must be maintained

DO NOT otherwise prematurely stop the recording. If the analysis has been stopped before criteria are met and before 60 minutes IT IS NOT VALID.

IV. What to do when Criteria are not met AT 60 minutes:

- **Escalate**

- Upon the completion of 60 minutes, the computerised CTG analysis will be printed on the CTG. Where the criteria have not met the reason/s will be printed.
- In the context of an antenatal CTG, this must be considered an 'ABNORMAL' outcome and urgent action must be taken based on reasons for failure, visual trace review and a holistic assessment of the pregnancy.
- The outcome should be clearly documented on an antenatal sticker in the medical notes alongside an action plan and ongoing plan of care taking into consideration the whole clinical picture and any known risk factors.
- Fresh eyes
- The review should be performed ideally by an ST6 /Consultant to plan further management. If a ST6/Consultant is not available see escalation pathway.

Do NOT act on the basis of the CTG analysis alone, as it is an aid to pregnancy management, not a diagnostic tool a diagnostic tool

Table 2: Computerised CTG criteria

cCTG Criteria	Recommended action
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
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.	**Senior review-** If no deceleration on visual inspection stop and do not repeat the CTG e.g. Loss of contact known, Maternal pulse confirmed. If isolated deceleration- no clinical concerns or risk factors continue CTG for 60 mins and review
	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
No episode of high variation This is different to baseline variability and relates to alternating active and quiescent fetal sleep (cycling)	**Preterm: <32 weeks** Obstetric review If the STV is normal and no other CTG or clinical concerns, obstetric plan required including a plan for further fetal monitoring and vCTG looks normal needs full assessment including growth scan if needed if CTG not met at 120 mins. **32-26 weeks** -obstetric review-Urgent USS, Continue CTG for up to 120 mins if no USS available review the clinical picture **Term: 37> weeks**-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)
No movement and fewer than 3 accelerations	**Obstetric review–** this might indicate expediting delivery or repeating fetal monitoring, dependent on the clinical picture. Ensure movement button has been given for singleton pregnancies and women/birthing person is aware when to press. Are Fetal movements seen on USS?

<table>
<tr><td>Baseline heart rate is uncertain
If CTG otherwise normal and baseline rate falls within normal parameters, then this is not significant. Normal range is 110-160bpm</td><td>If CTG otherwise normal, repeat CTG 4- 8 hours

If Clinical Concerns: continue the CTG and escalate for obstetric review</td></tr>
<tr><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

ESCALATE FOR SENIOR REVIEW</td><td>Continue CTG and urgent obstetric review with a view to preparing for delivery. If preterm, consider implementing peri-prem passport if appropriate
When criteria not met, use TRUFFLE STV cut offs and full clinical review to determine if delivery is indicated:
Gestational range

<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>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

<u>If Clinical Concerns:</u> continue the CTG and escalate for obstetric review using vCTG</td></tr>
<tr><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>High frequency sinusoidal rhythm
Associated with fetal anaemia and/or fetal hypoxia with acidosis.

URGENT OBSTERIC REVIEW</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.
If able to obtain an immediate MCA/PSV doppler this may give additional information
DO NOT DELAY DELIVERY IF INDICATED
ESCALTION TO NEONATAL TEAM REQUIRED</td></tr>
<tr><td>Suspected sinusoidal rhythm
As above.</td><td>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 able to obtain an immediate MCA/PSV doppler this may give additional information</td></tr>
</table>

	DO NOT DELAY DELIVERY IF INDICATED ESCALTION TO NEONATAL TEAM REQUIRED
	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
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 OBSTERIC REVIEW (manage as per STV) This is rarely as isolated reason often found with no high episodes – Requires holistic review and a plan for repeat CTG monitoring or delivery depending on concerns
No accelerations Accelerations assessed using a slightly lower threshold (>10bpm) than FIGO and NICE.	CTG otherwise normal – obstetric review is required
	<u>If Clinical Concerns:</u> 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. Can be the first sign of chronic hypoxia especially at term

2.5 End of CTG documentation

The fetal heart rate baseline should be documented in the handheld records after every CTG.
At the end of the vCTG use the Antenatal CTG sticker to document findings

Antenatal CTG Proforma	University Hospitals of Leicester NHS NHS Trust	
	Reassuring	Non-Reassuring
Baseline rate (bpm)	110 - 160 Rate:	Less than 109 Rate: More than 161 Rate: Sinusoidal pattern for 10 minutes or more
N.B Rising baseline rate even within normal range may be of concern if other non-reassuring features present.		
Variability (bpm)	5 bpm or more	Less than 5 bpm for more than 40 minutes
Accelerations	Present	None for 40 minutes
Decelerations	None	Unprovoked deceleration/s Decelerations related to uterine tightenings (not in labour)
Opinion	*Normal CTG* (All features reassuring)	*Abnormal CTG* (1 or more non reassuring feature)
Maternal pulse:	Membranes ruptured: Y / N If yes, date and time:	
Liquor colour:	Gestation (wks):	
Reason for CTG:		
Action (An abnormal CTG requires prompt review by experienced obstetrician/senior midwife)		
Date: Time:	Signature:	
Print Name:	Designation:	

- The CTG trace should be filed in the CTG envelope as normal.

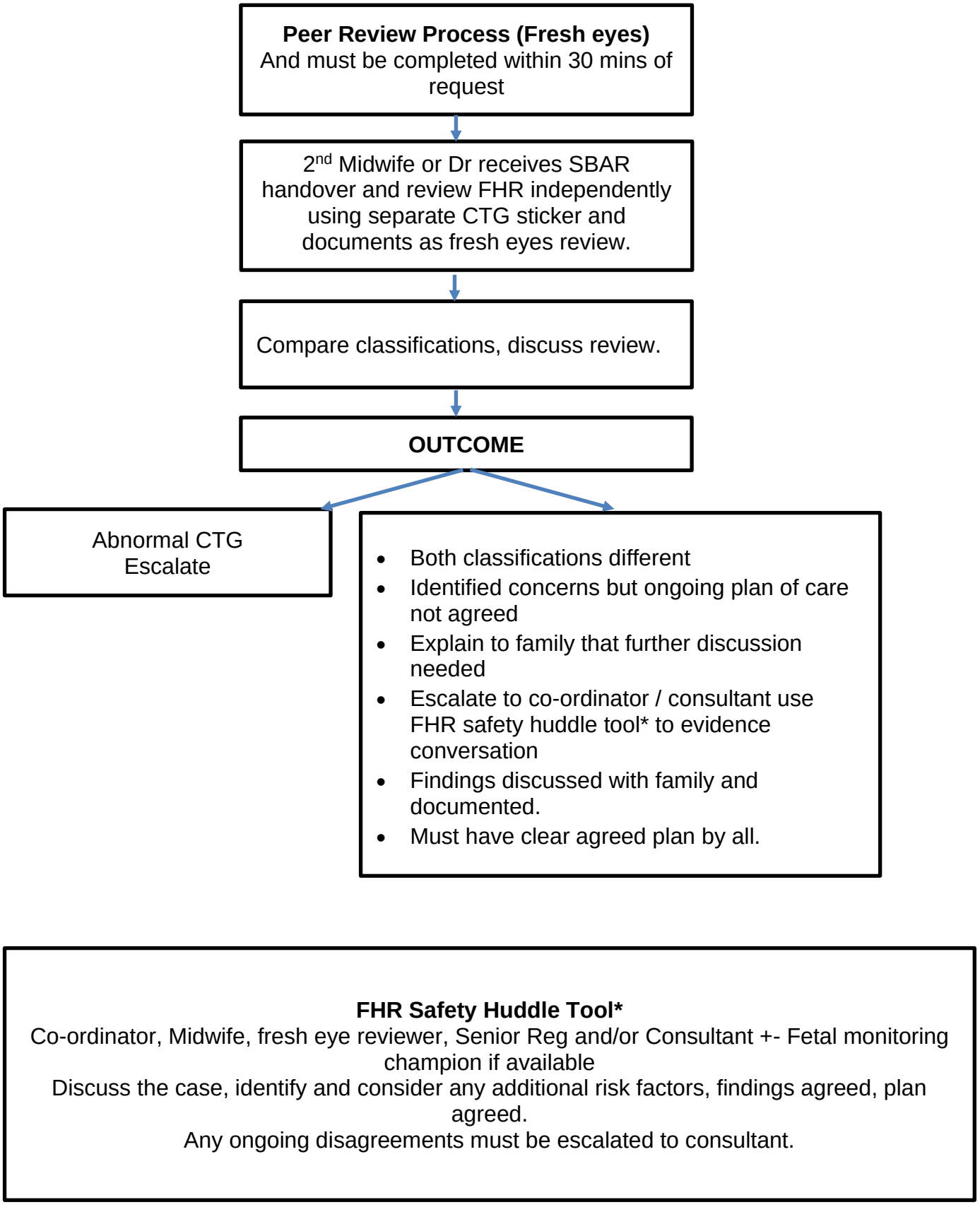
Action related to visual Antenatal CTGs:

- A **Normal v**CTG may be discontinued following review.
- An **Abnormal v**CTG should continue and be reviewed, without delay.
- A 'fresh eyes' should be performed and escalated to an experienced Obstetrician. (ST6 or above)
- If there is going to be a delay – see escalation pathway appendix 2

The categories for a CTG in a non-labouring pregnant woman or pregnant person are therefore:
• Normal
• Abnormal

Consider the full clinical picture, document all risk factors present and your overall clinical assessment 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/co-ordinator or obstetrician (ST6 or above) must be obtained utilising the SBAR tool and fresh eyes approach. (Please also refer to the Conflict of Clinical Opinion guideline)

2.6 Conflict of clinical opinion Escalation tool



2.7 Where senior review is delayed:

- the pregnant woman or pregnant person should be transferred to Labour ward where possible, to facilitate provision of 1:1 care, a holistic review and definitive plan is agreed.
- The reasons for the delay should be documented, including any actions taken and escalated according to policy.

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.

2.8 Fresh Eyes

The Fresh eyes approach has been introduced to reduce the risk of CTG misinterpretation. The midwife caring for the pregnant woman or pregnant person 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 (see section 2.8 page 12)
- If the clinical context does not correlate with the cCTG assessment

If the CTG is classified as abnormal by a midwife:

- this should be referred to an experienced obstetrician (ST6 or above).
- this should be escalated as urgent using escalation tools
- The Labour ward co-ordinator should also be informed

"Fresh Eyes" review is not necessary when:

- the Computerised criteria have been met on cCTG
- and the clinical picture is stable
- and there are no visual concerns

3. Education and Training

Education training is complete at point of registration.

Additional training requirements are fulfilled during annual mandatory MDT fetal monitoring training days.

4. Monitoring Compliance

What will be measured to monitor compliance	How will compliance be monitored	Monitoring Lead	Frequency	Reporting arrangements
Appropriate escalation of abnormal antenatal CTG's	Review of case notes			

5. Supporting References

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NHS England 2023 Saving Babies' Lives Version Three A care bundle for reducing perinatal mortality Version 3.1, July 2023 https://www.england.nhs.uk/wp-content/uploads/2023/05/PRN00614-Saving-babies-lives-version-three-a-care-bundle-for-reducing-perinatal-mortality.pdf

6. Key Words

Antenatal monitoring, computerised CTG, Dawes Redman, Fresh eyes, Huntleigh

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The Trust recognises the diversity of the local community it serves. Our aim therefore is to provide a safe environment free from discrimination and treat all individuals fairly with dignity and appropriately according to their needs.
As part of its development, this policy and its impact on equality have been reviewed and no detriment was identified.

EDI Statement

We are fully committed to being an inclusive employer and oppose all forms of unlawful or unfair discrimination, bullying, harassment and victimisation.

It is our legal and moral duty to provide equity in employment and service delivery to all and to prevent and act upon any forms of discrimination to all people of protected characteristic: Age, Disability (physical, mental and long-term health conditions), Sex, Gender reassignment, Marriage and Civil Partnership, Sexual orientation, Pregnancy and Maternity, Race (including nationality, ethnicity and colour), Religion or Belief, and beyond.

We are also committed to the principles in respect of social deprivation and health inequalities.

Our aim is to create an environment where all staff are able to contribute, develop and progress

based on their ability, competence and performance. We recognise that some staff may require specific initiatives and/or assistance to progress and develop within the organisation.

We are also committed to delivering services that ensure our patients are cared for, comfortable and as far as possible meet their individual needs.

CONTACT AND REVIEW DETAILS			
Guideline Lead (Name and Title) **E Neville – Fetal monitoring specialist midwife** **F Hills – Consultant obstetrician**			**Executive Lead** Chief Nurse
Details of Changes made during review:			
Date	**Issue Number**	**Reviewed By**	**Description Of Changes (If Any)**
February 2025	**3**	**E Neville** **F Hills** **S Blackwell**	Added - In some clinical scenarios such as the monitoring of severely growth restricted fetuses, analysis will need to continue for longer, EVEN if the criteria are met. The STV value in these cases is only valid after 60 mins. Added gestational specific STV ranges Prior to administration of Propess, Prostin, Foleys balloon catheter or ARM, a computerised cCTG can be performed if there is no uterine activity Updated indications for AN CTG table Removed reference to Dawes Redman codes Added computerised CTG criteria table In cases of high frequency/suspected sinusoidal rhythm, take maternal blood sample for urgent Kleihauer test to assess for risk of feto-maternal haemorrhage. Added escalation of conflicting opinion tool

Appendix 1: STV & LTV analysis

Short term variability (STV)

- It's similar to baseline variability, & LTV, but measured over a much smaller interval of just 3.75s (typically 7 to 10 beats)
- It's based on the difference between average beat intervals in each 3.75ssegment

A significant benefit is that it is independent of baseline rate

It **CANNOT** be assessed visually from looking at the trace (there isn't enough detail in the printed trace). It is **NOT** the same as beat-to-beat variability. **It MUST NOT be used in isolation as an indicator of fetal condition – you can have normal STV with a severely compromised fetus**
It is only significant as part of a full 60-minute analysis

- Results from two studies of compromised fetuses (Redman et al) Predict when intervention is likely to become necessary

Thresholds for management (only valid when measured over the full 60 minutes):

- **<4ms Low**
- **<3ms Abnormal**
- **<2ms Highly abnormal**

STV (ms)	<2.6	2.6–3.0	>3.0
Gestation (weeks)	25–38	26–38	27–37
Metabolic acidaemia	10.3%	4.3%	2.7%
IUD	24.1%	4.3%	0.0%

Remember when interpreting Computerised CTG they are more sensitive than conventional CTG at predicting fetal acidemia.

The criteria are not met more often at preterm gestation than pregnancies at term. The risk of adverse perinatal outcome is eight to nine times higher in the group not meeting criteria than when the criteria are met. This finding persists even if cases with low short-term variation are excluded. The cases not meeting criteria should be followed up more closely, particularly when the STV is below 8 ms.

Appendix 2: MAU/Ward Escalation policy for abnormal CTG's

ABNORMAL CTG
Or Computerised criteria **Not met or abnormal** visual CTG
Full SBAR handover must be used to escalate concerns

If there are CTG concerns **BEFORE THE FULL HOUR** either computerised analysis or visual CTG, this should prompt a review earlier.
The patient needs to be physically reviewed by a Registrar who should be ST6 or above, and a plan made.

If there is only a ST4/5 in residence they should discuss the case/management with the consultant on call

08:00-17:00 – ST4 or above
08:30-17:00 – Consultant available on LRI MAU ***
13:00 – 17:00 – Consultant available LGH MAU
If MAU Cons not available, contact ward or delivery suite Consultant

No medical review available, the midwife on MAU/ward should liaise with the co-ordinator, to facilitate prompt transfer of the pregnant woman or pregnant person to delivery suite.
If further escalation is required, escalate to the Maternity Bleep Holder

OUT OF HOURS

Registrar from delivery suite should be contacted (use form 1 as an aid)

Delivery suite co-ordinator should be informed to help facilitate Patient moved to delivery suite

Delivery suite unable to accommodate, the consultant on-call should be informed if before 10pm LRI/8pm LGH

If after 22:00 – no doctor, unable to review and delivery suite unable to accommodate with discussion with co-ordinator consultant on call should be contacted.

Patient or staff safety compromised

Manager on call for Maternity to be contacted VIA switch board.

If review is not available within 30 mins for transfer to delivery suite for 1:1 care or sooner if indicated

Appendix 3: Form 1 – escalation log

Why did you call?		
Staffing issue	Urgent obstetric review required	Covid related :
Capacity issue	Transfer to delivery suite required	BSOTS-related
Obstetric review required	Urgent transfer to delivery suite required	Other
Numbers in MAU?	**Women**:	**Staff** MW: MCA

Who did you call?	**Name**	**Outcome**
Maternity Bleepholder		Awaiting Callback Yes/No Plan
Delivery Suite Co-ordinator		Awaiting Callback Yes/No Plan
Manager – Maternity/On-Call		Awaiting Callback Yes/No Plan
Obstetric SHO		Awaiting Callback Yes/No Plan
Obstetric Registrar Junior/Senior		Awaiting Callback Yes/No Plan
Obstetric Consultant		Awaiting Callback Yes/No Plan

Date: **Time:** **Name of person escalating**