Guideline for Fetal Auscultation (including Electronic Fetal Monitoring)

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Table of Contents

	Section heading			Page
1.0	Introduction			4
2.0	Objective			4
3.0	Scope			4
4.0	Process for Electronic Fetal Monitoring			4
	4.1	Monitoring in Preterm Infants		4
5.0	Monitoring the Fetal Heart Rate in the Antenatal Period			4
	5.1	Antenatal CTG tracings - Computerised CTG (cCTG)		5
		5.1.1	Duration of antenatal monitoring	5
		5.1.2	Abnormal CTG	5
		5.1.3	Dawes Redman Criteria met	5-6
		5.1.4	Dawes Redman criteria are not met after ten minutes	6
		5.1.5	Dawes Redman Criteria still not met at 60 minutes	6
	5.2	Antenatal CTG tracings using a conventional non-computerised machine		6-7
6.0	Monitoring Women Undergoing a Caesarean Section			7
7.0	Monitoring Women Undergoing Induction of Labour			7
8.0	“Fresh Eyes” of a CTG			7-8
	8.1.0 Fresh Eyes in the Antenatal period			8
	8.2.0 Fresh Eyes in the Intrapartum period			8
9.0	Conservative Measures			8-9
10.0	Actions to be taken in the event of a poor quality CTG tracing			9
11.0	Paired cord pH samples			9

	11.1	Storage cord pH results	10
12.0	Storage of cCTG and CTG tracings		10
13	Main body of the document		11
	13.1	Link to NICE guideline NG229	11
	13.2	Exceptions/additional information to NICE NG229	11
14.0	Roles and responsibilities for the Midwives and Obstetricians		11
	14.1	Associated documents and references	11-12
15.0	Training and resources		12
16.0	Monitoring and audit		12
17.0	Equality and Diversity		12
18.0	Recording and Monitoring of Equality & Diversity		13
	Appendix 1 Glossary of Terms		13
	Appendix 2 Risk assessment for undertaking continuous fetal monitoring in labour		14
	Appendix 3 – Ongoing Risk assessment for low risk women to be undertaken throughout labour		15-16
	Appendix 4- Codes for when Dawes Redman Criteria Not Met		16-18
	Appendix 5- Clinical escalation flow chart (adapted from Manchester University Hospitals)		19-21
	Appendix 6 – CTG Fresh Eyes Review Sticker		22
	Appendix 7 Fail Pathways for Midwives		23
	Appendix 8 Fail Pathway for Doctors		24
	Appendix 9 Document History and Version Control		25

1.0 Introduction

The guideline uses the terms ‘woman’ or ‘mother’ throughout. These should be taken to include people who do not identify as a woman but who are pregnant.

The monitoring of the fetal heart rate aims to assess fetal wellbeing, identify hypoxia and instigate appropriate management plans to reduce the chance of poor neurological outcomes for babies.

2.0 Objective

To ensure the appropriate monitoring of the fetus in utero by clinical and technical means.

To detect fetal compromise at the earliest instance and reduce the risk of negative outcomes.

3.0 Scope

This guideline applies to all obstetricians and midwifery staff working on the maternity unit and midwives working in community.

4.0 Process for performing Electronic Fetal Monitoring

- Explain the procedure to the woman and gain verbal consent
- Perform an abdominal palpation
- Auscultate the fetal heart rate with a Pinnard stethoscope or hand held Doppler
- Check maternal pulse
- Check the machine settings are correct and that the time displayed is the same as any watch/clock being used by the clinician.
- Attach a completed ‘start of CTG’ sticker to the monitor paper, ensuring the woman’s name, unit number, pulse rate, date and time are all documented, alongside consent gained and risks and benefits discussed.
- Position the TOCO and ultrasound transducers
- Connect the fetal event marker and show the patient how to use it

4.1 Monitoring in pre-term infants

Antenatal Electronic Fetal Monitoring (EFM) should not be performed prior to 26 weeks gestation as reliability is less certain due to the immaturity of the central nervous system.
Monitoring should be considered when risk factors are present (see table 2) between 26 and 28 weeks. If unsure discuss with a senior midwife or Obstetrician.

5.0 Monitoring the fetal heart rate in the antenatal period

Antenatal auscultation is used to confirm that the fetus is alive and provides reassurance but is of no predictive value. Therefore, routine auscultation at all antenatal appointments of the fetal heart in no longer recommended (NICE, 2021).

Women on the antenatal ward who are low risk but in the latent phase of labour should have a comprehensive assessment of maternal and fetal wellbeing at four hourly intervals. External CTG should be performed if there are any risk factors from the assessment which could impact on fetal wellbeing.

Women on the antenatal ward who are assessed as high risk will require an admission CTG. Following this, a personalised fetal monitoring plan will be made by the Obstetrician admitting the woman.

5.1 Antenatal CTG tracings - Computerised CTG (cCTG)

*Dawes Redman cCTG to be used if there is **no** palpable uterine activity*

Computerised CTG provides an objective CTG interpretation and is recommended for CTGs performed in the antenatal period (Saving Babies Lives – version two) as it reduces human error and allows communication of robust numerical data rather than opinion. 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.

It is advised to ensure the patient has the fetal movement button to press whilst a cCTG is in place.

If **prolonged** monitoring is required due to antenatal condition e.g. active bleeding (APH), conventional non-computerised CTG should be used.

Dawes Redman criteria can be used for a fetal gestation of 26^{+0} until the woman is in labour. Prior to that gestation, auscultation with Pinnard Stethoscope or Sonicaid is appropriate.

The final clinical judgement should be based on the entire clinical assessment with cCTG forming part of this holistic approach to pregnancy management. A Computerised CTG is only a clinical diagnostic tool and cannot be used as a predictive or screening test. It only indicates the current fetal state.

5.1.1 Duration of antenatal monitoring

The maximum record length is 60 minutes. The computer analyses the CTG data and compares it with the Dawes/Redman criteria at ten minutes and every two minutes thereafter. Whilst using cCTG the computer analyses the data and compares it to Dawes Redman criteria at ten minutes and every two minutes thereafter. The maximum time limit is 60 minutes, if criteria is not met at this point then press the print button to print the analysis and continue as a normal CTG whilst awaiting Dr review.

The practitioner commencing the CTG **must** return within ten minutes to ensure the quality and assess visually, whether the monitoring is normal.

5.1.2 Abnormal CTG

If the CTG is suspected to be abnormal at any point, an immediate obstetric review **must** be sought.

Whenever the CTG is reviewed during the analysis, the practitioner must sign/annotate the CTG trace to evidence this and any actions taken.

5.1.3 Dawes Redman Criteria met

The Dawes Redman criteria can be achieved as early as ten minutes. If the cCTG meets the Dawes/Redman criteria, this is a normal result. Unless there are other clinical concerns, the analysis can be stopped and a report of the analysis is printed. The cCTG does not need to be continued for the traditional 20 minutes.

If the cCTG has continued for twenty minutes or longer then complete the steps as above and complete a preformatted antenatal CTG sticker to confirm that the cCTG is normal as per NICE guidance. The practitioner who stops the cCTG must sign the cCTG at the end of the print out.

NB Do not rely on the analysis in isolation. Assessment of the whole clinical scenario is important.

5.1.4 Dawes Redman criteria not met after ten minutes

Reasons for failure to meet the criteria are shown as reason codes (See Appendix 4). Unless there are clear pathological features, or any cause for concern, continue the trace until the criteria is met. Once Dawes Redman criteria is met complete a visual trace review and assessment. If confirmed the CTG is normal, as per NICE, it can then be discontinued.

5.1.5 Dawes Redman Criteria not met at 60 minutes

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 cCTG should then be switched to a normal CTG and continued until Senior obstetric review. 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. See Appendix 4 for the management when the cCTG has not met Dawes-Redman.

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

5.2 Antenatal CTG tracings using a conventional non-computerised machine

Ideally antenatal CTGs will be interpreted using a computerised CTG. If this is not possible and a non-computerised CTG is used, the CTG will be assessed according to NICE recommendations; the findings should be recorded on the tracing, signed, dated and Fresh eyes performed. Any actions resulting from the assessment of the tracing should be documented in the woman’s records.

The aim of an antenatal CTG is to confirm fetal wellbeing. Four features will be assessed after a **maximum of 40 minutes** and classified as normal or abnormal according to the criteria in the table below:

Antenatal CTG (No uterine activity or Uterine activity with no cervical changes)	**Risk factors:**
Reason for CTG:	

		NHS Barnsley Hospital NHS Foundation Trust	
Gestation: **Maternal Pulse:**	**NAME:** **UN:** **D.O.B:**	**Dawes Redman Criteria**	
		Met	
		Not Met	
Baseline rate	110-160bpm	Above 160 bpm or Below 110bpm	
Variability	5-25 bpm	Less than 5bpm	
Accelerations	Present	Absent	
Decelerations	None	Present	
Overall	Normal	Abnormal (seek SpR or above review)	
Plan:			
Signature 1		Date and Time	
Fresh eyes Signature (not needed if Dawes Redman criteria met)	I agree/disagree	Date and Time	

Document on the tracing any significant events. This includes any action or occurrence which affects either the quality of the tracing or the fetal heart rate itself.

6.0 Monitoring of women undergoing a Caesarean section

Women undergoing Elective Caesarean Section should have the fetal heart rate auscultated immediately prior to knife to skin, following anaesthesia. The fetal heart and method of auscultation should be recorded on the partogram. The midwife should ensure the surgeon is aware of the fetal heart rate prior to commencing the procedure.

Women undergoing Emergency Caesarean Section should have continuous fetal heart rate monitoring up to cleaning the abdomen. The surgeon should be aware of the fetal heart rate prior to commencement of the procedure.

7.0 Monitoring women undergoing Induction of labour

Computerised electronic fetal monitoring (cCTG) should be used for the **pre-induction** CTG tracing in women who undergo induction of labour unless there are contra-indications. Please see induction of labour guideline.
Once uterine activity palpable, use conventional CTG monitoring as per NICE guidelines.

8.0 “Fresh Eyes” of a CTG

A fresh eyes approach has been shown to prevent adverse outcomes where CTG monitoring is utilised. A fresh eyes is a secondary review of the CTG by another clinician professionally trained in

CTG interpretation. An independent classification of the CTG is to be undertaken ensuring the clinical risk factors are reviewed as recommended by NICE 2022.

8.1.0 Fresh Eyes in the Antenatal period

During the antenatal period this is be undertaken when the CTG has finished or hourly while undergoing continuous review unless a cCTG analysis is performed.

8.2.0 Fresh Eyes in the Intrapartum period

During labour the midwife providing one to one care is to classify the CTG hourly in the first stage of labour and every 30 minutes during the second stage of labour via the CTG classification sticker (appendix four).

The second opinion from another midwife (ideally, the assigned buddy midwife) or obstetrician, including a review of the risk factors and CTG categorisation is documented on the CTG tracing and in the labour records with the date, time and signature. Confirming the on-going plan of care.

If there is non-agreement on the categorisation of the CTG, this should be documented on the woman's records and a further opinion will be sought from a senior person (midwife or obstetrician).

If there is still disagreement the CTG will be reviewed by the Consultant Obstetrician. The final agreed categorisation will be documented on the CTG and in the woman's records with a management plan. The birthing person and their birth partners should be kept fully up to date at all times and included in any discussions. See Escalation flow chart in appendix five.

9.0 Conservative Measures and CTG management

In the presence of any concerning CTG features please refer to the conservative measures below to improve fetal oxygenation or maternal condition.

<table>
<tr><td colspan="3">CTG classification and Management</td></tr>
<tr><td colspan="3">All features White-NORMAL CTG</td></tr>
<tr><td>Management</td><td colspan="2">• Continue CTG and usual care
• Continue to perform full risk assessment at least hourly and document findings
• If CTG was commenced because of concerns arising from intermittent auscultation and there are no ongoing antenatal or intrapartum risk factors
• CTG can be discontinued and revert back to MLC following obstetric holistic review
<u>Decelerations</u>
• If variable decelerations with no concerning characteristics and no other CTG changes are observed, including no rise in the baseline FHR, be aware that these are very common and can be a normal feature in an otherwise uncomplicated labour and birth and are usually the result of cord compression
• Early decelerations are benign and usually associated with head compression and are not accompanied by any other CTG changes such as reduced variability or a rise in baseline FHR</td></tr>
<tr><td colspan="2">One Amber feature- SUSPICIOUS CTG with no other concerning risk factors</td><td>Conservative Measures</td></tr>
</table>

<table>
<tr><td rowspan="2">Management</td><td>• Perform a full risk assessment including full set of maternal observations, considering the whole clinical picture and document the findings
• Note that if accelerations are present then fetal acidosis is unlikely
• If the CTG trace was previously normal consider underlying reasons for the change
• Undertake Conservative Measures</td><td>• Change maternal position accordingly, avoid being supine-aim to improve uterine blood flow and minimise cord compression
• Maternal Hypotension
-Do not offer IV fluids to treat FHR abnormalities unless the woman is hypotensive or has signs of sepsis

-If the woman is hypotensive secondary to an epidural top up, start IV fluids, move her to Left lateral position and call anaesthetist to review

• Excessive contraction frequency (including hypertonus)
-Reduce contraction frequency by reducing or stopping oxytocin if it is being used

-Offer a tocolytic drug (subcutaneous terbutaline 0.25mg)</td></tr>
<tr><td colspan="2">SUSPICIOUS CTG with additional intrapartum risk factors such as slow progress, sepsis or meconium</td></tr>
<tr><td>Management</td><td colspan="2">• Perform a full risk assessment including full set of maternal observations, considering the whole clinical picture and document the findings
• Obtain an urgent review by an obstetrician or senior midwife
• Consider possible underlying causes and undertake conservative measures
CONSIDER

• Fetal scalp stimulation* (only if CTG trace is suspicious with antenatal or intrapartum risk factors for fetal compromise. If this leads to an acceleration in the FHR AND a sustained improvement in the CTG continue to monitor the FHR and the clinical picture)
• Expediting birth (especially in the absence of an acceleration in response to fetal scalp stimulation)</td></tr>
<tr><td></td><td colspan="2">One red feature OR 2 or more Amber features- PATHOLOGICAL CTG</td></tr>
<tr><td rowspan="3">Management</td><td colspan="2">Obtain an urgent review by an obstetrician and a senior midwife

Exclude acute events (Cord prolapse, suspected abruption, uterine rupture) that need immediate intervention

Perform a full risk assessment including a full set of maternal observations, considering the full clinical picture and document the findings

Consider possible underlying causes and undertake conservative measures</td></tr>
<tr><td>CTG remains pathological despite conservative measures</td><td>Acute Bradycardia or prolonged decelerations ≥3 mins</td></tr>
<tr><td>Obtain a further urgent review by an obstetrician and senior midwife
Evaluate the whole clinical picture and consider expediting birth
If there are evolving intrapartum risk factors for fetal compromise have a very low threshold for expediting birth</td><td>Urgently seek obstetric review Call 2222 for obstetric emergency.
If there has been acute event expedite birth
Consider possible underlying causes and undertake conservative measures
Make preparations for an urgent birth, including a request for paediatric or neonatal support
Expedite the birth if the acute bradycardia persists for 9 minutes or less if there are significant antenatal or intrapartum risk factors for fetal compromise
If the FHR recovers at any time up to 9 minutes reassess any decision to expedite delivery the birth</td></tr>
</table>

10.0 Actions to be taken in the event of a poor quality CTG tracing

<u>Do not assume the machine is at fault, if there is poor quality tracing then the CTG should be managed as if pathological and escalated for senior review.</u>

Full interpretation of a CTG tracing is only possible if:

- The CTG settings are appropriate
- The time is accurate
- The woman's details are accurately recorded
- The transducer is recording the fetal heart rate consistently
- There are no interruptions to the CTG tracing
- The TOCO lead is recording the length and frequency of contractions

11.0 Paired cord pH samples

Cord blood sampling provides valuable objective evidence of the metabolic condition of neonates at birth, therefore paired cord samples should be obtained for analysis in the following cases:

- Multiple pregnancy
- Babies of diabetic mothers
- Babies with intra-uterine growth restriction
- Preterm labour
- All deliveries which take place in Labour ward theatre
- Instrumental deliveries
- Caesarean sections performed for suspected or confirmed fetal compromise
- Shoulder dystocia
- Vaginal breech delivery
- Abnormal CTG
- Prolonged second stage
- Meconium liquor
- Fetal blood sampling in labour
- Women with an intrapartum temperature of >38.0°C
- Low Apgar scores (< 4)
- Babies admitted to the Neonatal Unit from the Labour ward

Samples should be taken in heparinised plastic syringes. Ideally samples should be taken and analysed at delivery, however samples can be taken from a clamped section of the cord at room temperature up to 30 minutes.

If it is not possible to analyse the samples immediately after taking them they can be stored in the fridge for up to 60 minutes. If cord samples are taken record the time the cord was clamped. Record the results on the partogram.

If the pH is **less than 7.05** arterial **or less than 7.10** venous and/or Base Excess more thanor equal to **-12**, a Datix is to be completed to enable oversight of care. The neonatal doctors are to be informed of any abnormal result to enable an individualised plan of care for the baby.

11.1 Storage of cord pH results

Place the cord pH result in the envelope with the baby's name, date of birth and unit number clearly marked on the front. File the envelope in the maternal notes.

12.0 Storage of cCTG and CTG tracings

Tracings should be filed in the appropriate envelope and secured in the woman's records in accordance with the Record Keeping Guideline.

13.0 Main body of the document

13.1 Link to NICE guideline NG229

For the management of fetal monitoring in labour please follow *Fetal monitoring in labour* [NG229] Published 14 December 2022 Fetal monitoring in labour

See Appendix 2 for the risk assessment to be undertaken for each birthing person to ensure the correct mode of fetal monitoring is offered in labour.

13.2 Exceptions/additional information to NICE NG229

NICE (2022) states on intermittent auscultation ‘‘If fetal heart rate concerns are confirmed transfer the woman from midwifery-led to obstetric-led care, providing that it is safe and appropriate to do so’’. Barnsley maternity does not have a separate obstetric unit, these women should have an in person obstetric review.

14.0 Roles and responsibilities for the Midwives and Obstetricians

To provide the best evidence-based care for women in accordance with appropriate guidance from diagnosis to delivery.

14.1 Associated documents and references

National Institute for Health and Care Excellence. Clinical guideline 62. Antenatal care: Routine care for the healthy pregnant woman, (2008). https://www.nice.org.uk/guidance/cg62/resources/antenatal-care-for-uncomplicated-pregnancies-pdf-975564597445

National Institute for health and Care Excellence. Clinical guideline 190. Intrapartum care: care of healthy women and their babies during childbirth (2014 updated 2017). https://www.nice.org.uk/guidance/cg190/resources/intrapartum-care-for-healthy-women-and-babies-pdf-35109866447557

National Institute for Health and Care Excellence. Clinical guideline 121 Intrapartum care for women with existing medical condition or obstetric complications and their babies (2019). https://www.nice.org.uk/guidance/ng121/resources/intrapartum-care-for-women-with-existing-medical-conditions-or-obstetric-complications-and-their-babies-pdf-66141653845957

NHS England Saving babies lives version 2: A care bundle for reducing perinatal mortality (2019) [online] www.england.nhs.uk

Lees C, Marlow N, Arabin B, Bilardo CM, Brezinka C, Derks JB, Duvekot J, Frusca T, Diemert A, Ferrazzi E, Ganzevoort W, Hecher K, Martinelli P, Ostermayer E, Papageorghiou AT, Schlembach D, Schneider KT, Thilaganathan B, Todros T, van Wassenaer-Leemhuis A, Valcamonico A, Visser

GH, Wolf H; TRUFFLE Group. Perinatal morbidity and mortality in early-onset fetal growth restriction: cohort outcomes of the trial of randomized umbilical and fetal flow in Europe (TRUFFLE). Ultrasound Obstet Gynecol. 2013 Oct;42(4):400-8.

15.0 Training and resources

Training will be facilitated as outlined in the Maternity Training Needs Analysis. This is updated on an annual basis. See appendix 7 and 8 for failed assessment pathway processes for the staff competency test.

16.0 Monitoring and audit

Any adverse incidents relating to fetal auscultation will be monitored via the incident reporting system. Any problems will be actioned via the case review and root cause analysis action plans. The action plans are monitored by the risk midwife to ensure that improvements in care are made. The trends and any root cause analysis are discussed at the monthly risk meetings to ensure that appropriate action has been taken to maintain safety.

The guideline for Fetal Auscultation (including Electronic Fetal Monitoring) will be audited in line with the annual audit programme, as agreed by the CBU. The audit action plan will be reviewed at the monthly risk management meetings on a quarterly basis and monitored by the risk midwife to ensure that improvements in care are made.

17.0 Equality and Diversity

The Trust is committed to an environment that promotes equality and embraces diversity in its performance as an employer and service provider.

It will adhere to legal and performance requirements and will mainstream equality, diversity and inclusion principles through its policies, procedures and processes. This guideline should be implemented with due regard to this commitment.

To ensure that the implementation of this guideline does not have an adverse impact in response to the requirements of the Equality Act 2010 this policy has been screened for relevance during the policy development process and a full equality impact assessment is conducted where necessary prior to consultation. The Trust will take remedial action when necessary to address any unexpected or unwarranted disparities and monitor practice to ensure that this policy is fairly implemented.

This guideline can be made available in alternative formats on request including large print, Braille, moon, audio, and different languages. To arrange this please refer to the Trust translation and interpretation policy in the first instance.

The Trust will make reasonable adjustments to accommodate any employee/patient with particular equality, diversity and inclusion requirements in implementing this guideline. This may include accessibility of meeting/appointment venues, providing translation, arranging an interpreter to attend appointments/meetings, extending policy timeframes to enable translation to be undertaken, or assistance with formulating any written statements.

18.0 Recording and Monitoring of Equality & Diversity

The Trust understands the business case for equality, diversity and inclusion and will make sure that this is translated into practice. Accordingly, all guidelines will be monitored to ensure their effectiveness.

Monitoring information will be collated, analysed and published on an annual basis as part of Equality Delivery System. The monitoring will cover the nine protected characteristics and will meet statutory employment duties under the Equality Act 2010. Where adverse impact is identified through the monitoring process the Trust will investigate and take corrective action to mitigate and prevent any negative impact.

Appendix 1 - Glossary of Terms

BHNFT – Barnsley Hospital NHS Foundation Trust
cCTG – Computerised CTG
CTG – Cardiotocograph
CEFM- Continuous Electronic Fetal Monitoring
FHR – Fetal heart rate
IUGR – Intra-uterine growth retardation
NHS – National Health Service
NICE – National Institute for Clinical Excellence
LTV – Long term variation
STV – Short term variation

Appendix 2 - Risk assessment for undertaking continuous fetal monitoring in labour

Maternal risk factors which may directly affect the fetus in labour	**Intrapartum risk factors**
Post term pregnancy more than 42 weeks	
Previous Caesarean birth or any full thickness uterine scar	Any vaginal blood loss other than a show in labour.
Type 1 or 2 Diabetes or GDM requiring medication	Temp 38C or above on a single reading, or above 37.5C on 2 consecutive occasions one hour apart
Pre-eclampsia or Hypertension requiring medication	Pulse rate over 120bpm (2 occasions 30 mins apart)
Prolonged rupture of membranes >24 hours **prior to the onset of labour**	Hypertension ≥140/90 on two occasions one hour apart or ≥160/110 on one occasion.
Suspected chorioamnionitis or maternal sepsis	Severe hypertension (single reading of systolic of 160mmhg or more or diastolic of 110mmgh or more), measured between contractions.
Any vaginal blood loss other than a show.	2+ protein on urinalysis and a single reading of either raised diastolic 140mmhg or more or raised diastolic blood pressure (90mmgh or more)
Fetal Risk factors	Oxytocin use
FH abnormalities detected on initial auscultation	The presence of any meconium
Estimated fetal weight below 3rd centile or below 10th centile **with abnormal dopplers or oligohydramnios**	Pain reported by the woman that differs than the pain normally associated with contractions.
Preterm (less than 37 weeks)	Blood stained liquor not associated with vaginal examination, that may be a suspected haemorrhage
Anhydramnios or Polyhydramnios	Contractions that last longer than 2 minutes, or 5 or more contractions in 10 mins.
Reduced fetal movements **in the 24 hours** before onset of labour contractions or induction of labour for reduced fetal movements.	Suspected chorioamnionitis or maternal sepsis in labour.
Abnormal doppler scan results	Hourly risk assessments should be based on the full holistic clinical picture and not just IA or CTG alone, considering the woman's thoughts and preferences.
Multiple pregnancy	
Non- cephalic presentation including breech/ transverse/ oblique or cord including while a decision is made about mode of birth.	

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Appendix 3 – Ongoing Risk assessment for low risk women to be undertaken throughout labour

If a woman scores has a score ≥1 offer CEFM

Name:

Unit number

DOB:

Developing Risk Factors (This is ongoing assessment that should be documented hourly as a minimum)	Date/time	Date/time	Date/time	Date/time **Peer review**	Date/time	Date/time	Date/time	Date/time **Peer review**	Date/time	Date/time	Date/time	Date/time **Peer review**
Pulse ≥ 120bpm x2 30 min apart												
BP≥ 160/110 **or** 2+ proteinuria BP ≥140/90 **or**X2 ≥140/90 30 mins apart												
Tachysystole (≥5:10) **or** **H**ypertonia (>120 secs)												
Maternal Pyrexia ≥38°C **or** ≥37.5°C x2 1 hr apart												
Meconium liquor												
APH or Bloodstained liquor												
Delayed 1st **or** 2nd stage of labour												

Baseline rise >10% or deceleration/ acceleration after contractions on IA												
No risk factors identified												

Appendix 4 - Codes for when Dawes Redman Criteria Not Met

Code	Criteria	Recommended action
1	**Basal heart rate outside normal range** Basal heart rate is not the same as the baseline rate and may differs significantly from visual assessment of the baseline rate.	**If NO clinical concerns:** If the cCTG is otherwise normal an obstetric plan is required to include a plan for further fetal monitoring. **If clinical concerns:** Obstetric review (<20min) if change in the 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. **If there are recurrent decelerations or concerns within other parameters or clinical concerns**	≤31+6 - to stop CTG and repeat after one hour If clinical concerns or ≥ 31+6: An Obstetric review is required encompassing the full clinical picture and plan is to be documented in the maternal record 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 Continue the CTG and obtain urgent obstetric review is required
3	**No episode of high variation** This is difference to the baseline variability and relates to the alternating active and quiescent fetal sleepy (cycling)	**If there are other CTG concerns escalated for a senior review –** **Preterm (36/40):** If the STV is normal for gestation and there are no other CTG or clinical concerns then an obstetric plan is required which includes timings of further fetal monitoring. **Term (>37/40 gestation):** A plan for birth is to be made either via an induction of labour or caesarean section.
4	**No movement and fewer than 3 accelerations**	Obstetric review– this might indicate expediting delivery or repeating fetal monitoring, dependent on the clinical picture

<table>
<tr><th>Code</th><th>Criteria</th><th>Recommended action</th></tr>
<tr><td>5</td><td>Baseline fitting is uncertain</td><td>If the cCTG is otherwise normal, repeat the cCTG within 4-8 hours

If clinical concerns: Continue the cCTG and escalate for an obstetric review.</td></tr>
<tr><td>6</td><td>STV less that 3ms

A value of less than 3ms when the gestation is ≥29+0/40 is strongly linked to development of metabolic acidemia and impending uterine fetal death. Particularly with the absences of an episode of high variation.</td><td>Continue the CTG and escalate for an urgent obstetric review and prepare to expediate birth

When criteria is not met use TRUFFLE STV values and the full clinical history to determine if birth is required
<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>≥ 34 weeks</td><td>≤4.5</td></tr>
</table></td></tr>
<tr><td>7</td><td>Possible error at the end of recording

This occurs when a possible abnormality is detected at the end of a cCTG which otherwise would have met criteria</td><td>If not abnormal by NICE or any clinical concerns continue the cCTG until the criteria is met.

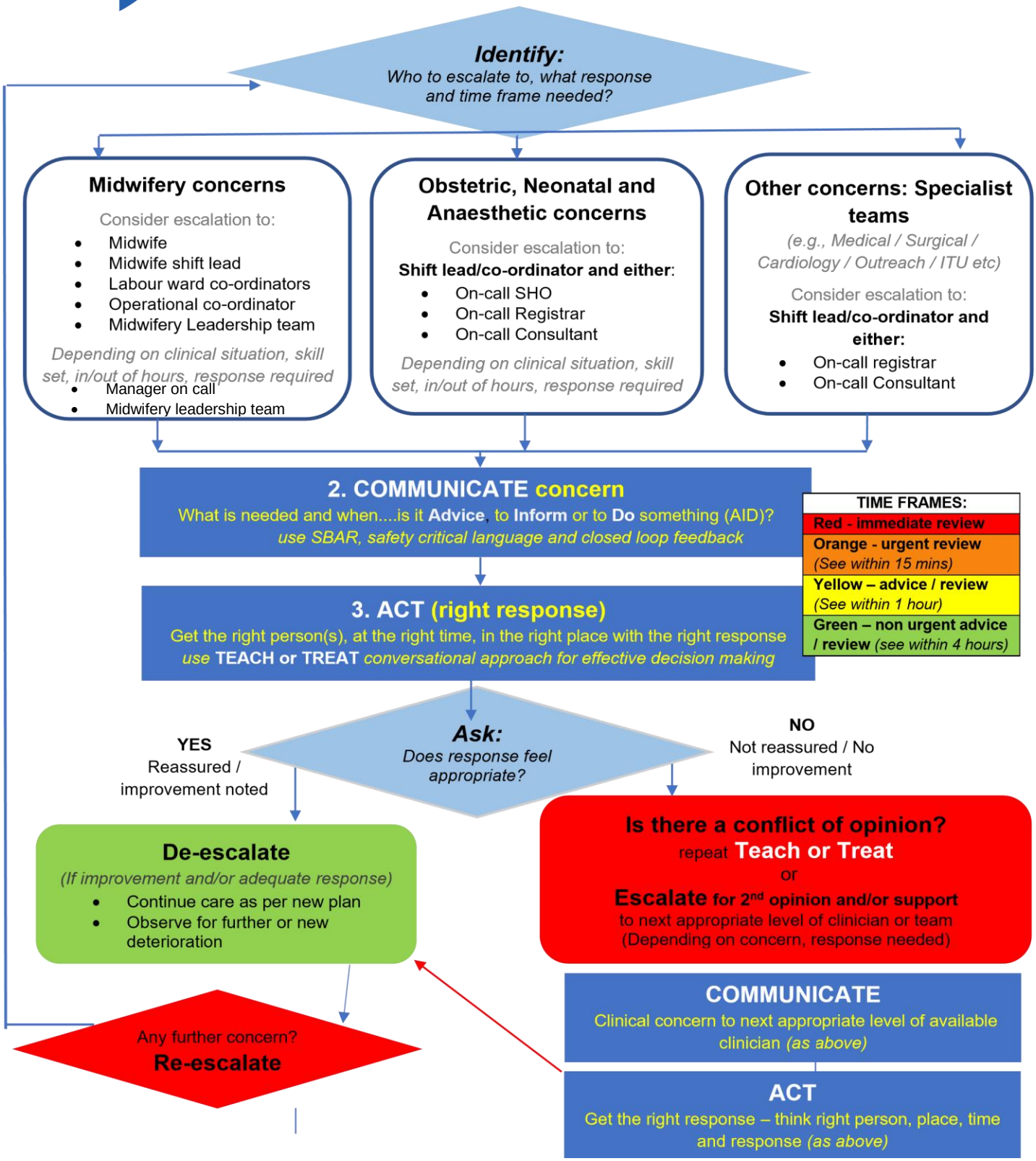
If any clinical concerns:
Continue the cCTG and escalated for an obstetric review</td></tr>
<tr><td>8</td><td>Deceleration at the end of the record</td><td>Continue the cCTG and escalate for an obstetric review. Depending on the clinical picture this may indicate to expediate birth or further fetal monitoring</td></tr>
<tr><td>9</td><td>High frequency sinusoidal rhythm

Associated with fetal anaemia and/or fetal hypoxia with acidosis</td><td>Continue the cCTG and request and urgent obstetric review.

If expediating birth is not indicated on review of the clinical history take urgent bloods for Keilhauer to asses for the risk of feto-maternal haemorrhage</td></tr>
</table>

Code	Criteria	Recommended action
10	**Suspected sinusoidal rhythm** Associated with fetal anaemia and/or fetal hypoxia with acidosis	**Continue the cCTG, escalate for an urgent obstetric review.** If it does not resolve then request urgent Kleihauer bloods to assess for the risk of feto-maternal haemorrhage. If spontaneously resolves and no other clinical risk factors, this is usually associated with a good clinical outcome. Request senior input for a plan of care. If it does not resolve consider expediting birth
11	**Long term variations in high episodes below acceptable level** LTV is similar to the baseline variability rate. This is measures over a one-minute segment. The difference between the high and low FH values are analysed and is reported and “high” or “low” episodes	**Urgent obstetric review is required and manage as per STV code 6**
12	**No accelerations** Accelerations assessed using a slightly lower threshold (>10bpm) than NICE	If the cCTG is otherwise normal continue and request an obstetric review If clinical concerns: Undertake a NICE AN CTG classification, if abnormal request and urgent obstetric review – plan to expediate birth or repeating the cCTG depending on the clinical history.

Appendix 5 - Clinical escalation flow chart (adapted from Manchester University Hospitals)



Techniques to support effective clinical escalation
(The advice below is directly copied from RCOG 2022).

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**.

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.

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 when <u>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>

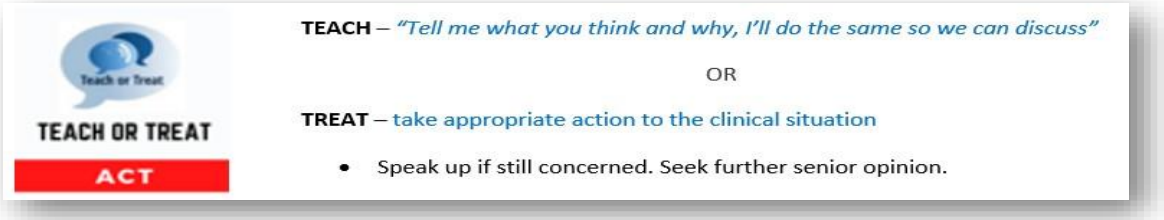
- **A**dvice – Are you asking me for Advice about…?
- **I**nform – Are you (just) Informing me about….?
- **D**o – Do you need me to come and do….

<u>ACT: Teach or Treat</u>

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 nonconfrontational way, exposes different perceptions and allows ongoing development or education, shared learning and the supports shared mental models.

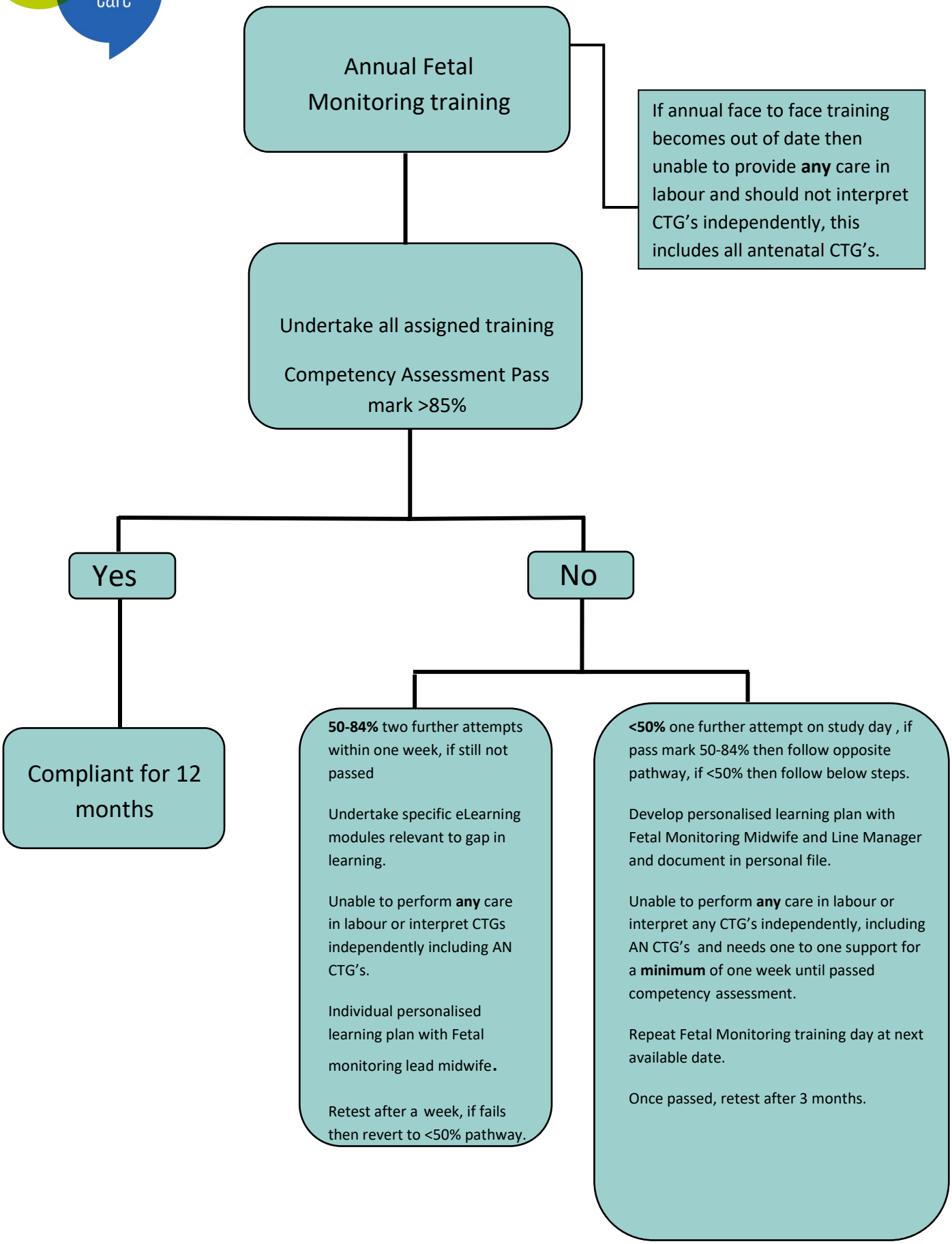
The way in which TEACH or TREAT works is that is enables either the team lead or clinician with concern(s) to ask to 'teach or treat'. The conversation as follows:



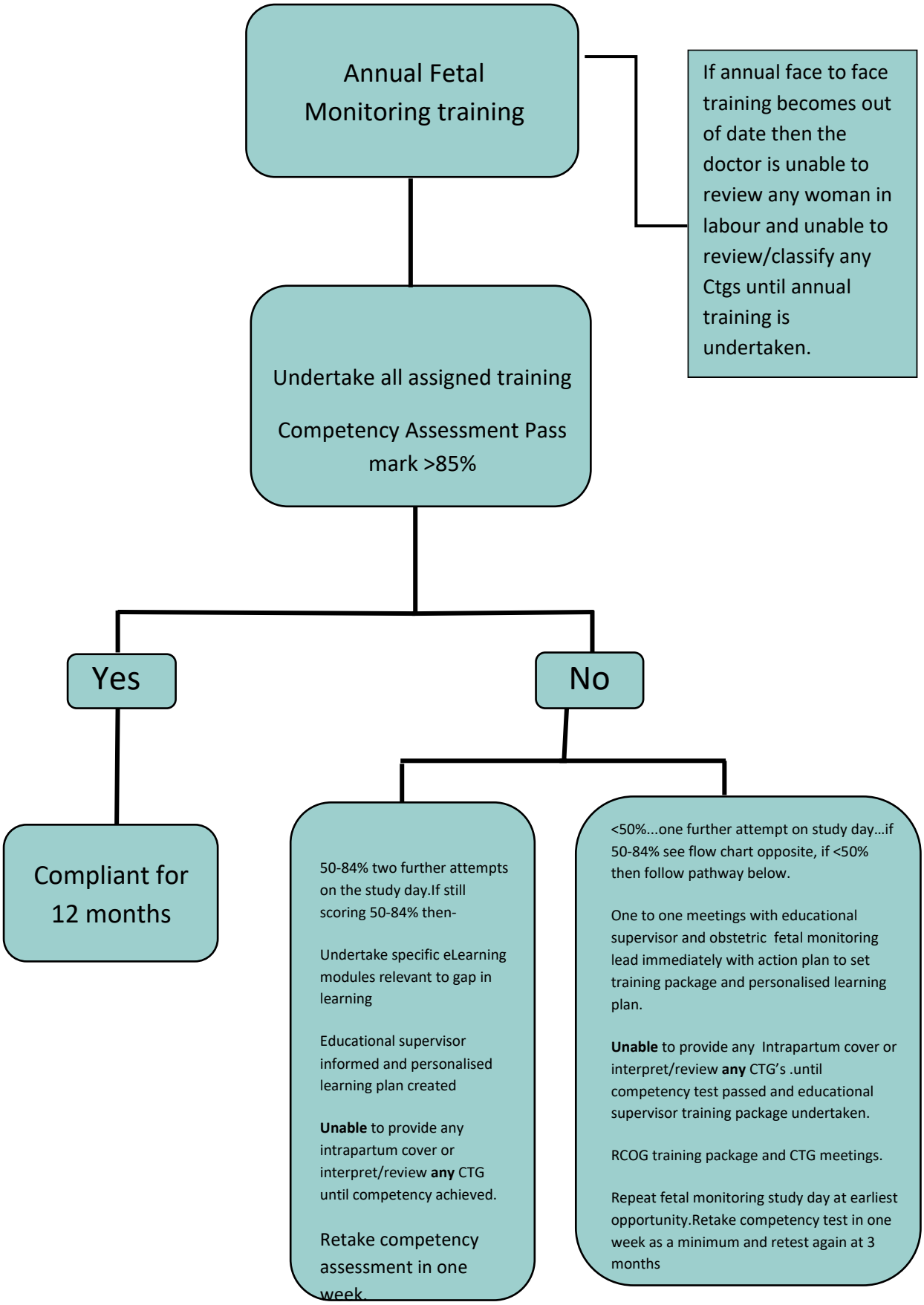
Appendix 6 – CTG Fresh Eyes Review Sticker

S	**Intrapartum CTG** (Palpable uterine activity) **FRESH EYES 1 hourly**		NAME: NHS Barnsley Hospital NHS Foundation Trust				
B	**Hourly risk assessment completed**	**Y** / **N**	UN:				
	Numerical meows score.	**Mat pulse**	D.O.B				
	Known risk factors for woman and baby		**Previous CTG's reviewed** Yes No **Previous CTG categorisation** _____ **Previous baseline rate** _____				
A	**Evolving Risks**		**Contractions:** 10 mins	**Strength**		**Liquor colour:**	
				Duration.		**Syntocinon rate:**	
	Features	**Reassuring**	**Non-reassuring**			**Abnormal**	
			Contractions 5:10 or more Hypertonus lasting more than 2 mins				
	Baseline rate	110-160bpm Rate.....	100-109bpm Rate.....	**Increase** in baseline of 20 or more beats from beginning of labour or last review **OR** Unable to determine baseline.		< 100bpm Rate.....	>160bpm Rate .....
						Increase in baseline or more than **20** beats **in ACTIVE SECOND STAGE**	
	Variability	5-25bpm	<5bpm for	30-50 mins		<5bpm	>50 mins
			>25 bpm for	For up to 10 mins.		>25 bpm	>10mins
						Sinusoidal or Absent	
	Accelerations	Present	None *(The absence in an otherwise normal CTG does not indicated fetal acidosis)*				
	Decelerations Repetitive = >50 % cont (The longer and later the individual decelerations, the higher the risk of fetal compromise, particularly if the decelerations are accompanied by a rise in the baseline, a tachycardia or reduced or increased variability)	None	**Variable**			**Variable**	
		Early	***Concerning characteristics**: Lasting >60 secs. Slow or failure to return to baseline,*	*Loss of previously present shouldering. Reduced variability within the deceleration*		With **ANY** concerning characteristics with **repetitive contractions >50% for >30 mins** *(Less if there are maternal/ fetal risk factors such as bleeding or meconium)*	
		Variable with **NO** evolving concerning characteristics	**ANY** concerning characteristics	Up to 50% of contraction **>30 min**			
			ANY concerning characteristics	**Repetitive (>50%)** contractions **<30min**			
			Late Decelerations			**Late Decelerations**	
			Repetitive contractions **< 30 mins** (no risk factors)			**For 30 mins or more** *(Less if there are risk factors)*	
		Acute Bradycardia (prolonged declaration > 3 mins) URGENT intervention THINK 3-6-9					
	Overall	**Normal**	**Suspicious** (TWO features are PATHOLOGICAL)			**Pathological**	
R	Plan:	**Discussed plan with woman and birth partner(s)** YES NO					
	Name/Designation and Signature 1..... 2.....		I agree ☐		Date and Time		

Appendix 7 Fail Pathways for Midwives



Appendix 8 Fail Pathway for Doctors



Appendix 9 Document History and Version Control

Maintain a record of the document history, reviews and key changes made (including versions and dates)

Version	Date	Comments	Author
1	26/10/2023	Checked and verified by SC	Jill Wyke
1.1	17.04.24	Appendix 2 Line added - Previous Caesarean birth or any full thickness uterine scar	Jill Wyke

Review Process Prior to Ratification:

Name of Group/Department/Committee	Date
Maternity Guideline group	
Women's Business and Governance Meeting	
CBU 3 Overarching Governance Meeting	
Trust NICE Clinical guidelines meeting	

Trust Approved Documents (policies, clinical guidelines and procedures) Approval Form

Please complete the following information and attach to your document when submitting a policy, clinical guideline or procedure for approval.

Document type (policy, clinical guideline or procedure)	
Document title	
Document author (Job title and team)	
New or reviewed document	
List staff groups/departments consulted with during document development	
Approval recommended by (meeting and dates):	
Date of next review (maximum 3 years)	
Key words for search criteria on intranet (max 10 words)	CTG, DAWS, monitoring, abnormal, fresh eyes, heart, variation, meconium, blood staining.
Key messages for staff (consider changes from previous versions and any impact on patient safety)	

I confirm that this is the FINAL version of this document	**Name:** **Designation:**

COMPLETION BY THE CLINICAL GOVERNANCE TEAM

Approved by (group/committee): **Date approved:** **Date Clinical Governance Administrator informed of approval:** **Date uploaded to Trust Approved Documents page:**