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Fetal Surveillance Care Bundle

Introduction and Aim

The aim of the Fetal Surveillance Care Bundle is to enhance safety of women and their babies in labour, minimise unnecessary interventions and prevent harm. C&VUHB follows principles of 'Prudent Health care', launched by Professor Mark Drakeford AM (1) on behalf of the Bevan Commission: 'Do only what is needed, no more, no less; and do no harm'.

Objectives

- Enhance safety of women and their babies in labour.
- Ensure interventions in labour are appropriate.
- Prevent harm.

Scope

This guideline applies to all our staff in all locations including those with honorary contracts.

Equality Health Impact Assessment	An Equality Health Impact Assessment (EHIA) has not been completed. This is because this is a guideline and not a policy or procedure.
Documents to read alongside this Procedure	
Approved by	Maternity Professional Forum Quality & Safety, Obstetrics & Gynaecology Directorate.

Accountable Executive or Clinical Board Director	Abigail Holmes Director of Midwifery

Author(s)	Ms Pina Amin (Consultant obstetrician) Sarah Davies (Fetal surveillance midwife) Victoria Eaton (MLU midwife) Lindsey Hilldrup (Senior midwifery manager) Sarah James (Consultant midwife) Stacey McCormack (Delivery suite co-ordinator) Laura Merrett (MLU midwife) Naomi Price-Bates (Operational lead for the MLU)

Summary of reviews/amendments

Version Number	Date of Review Approved	Date Published	Summary of Amendments
2	03/06/2019	13/06/2019	Revised document
2a			No change to content. Reformatted to improve navigation in document.
3	30/03/2022	30/03/2022	R. Halabi: Extension of expiry date to June 2022 to allow review and update.
4	15/03/2024	18/4/24	Removal of STAN monitoring Addition of physiological interpretation MLU care and holistic assessments Inclusion of AN fetal monitoring

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1 Background

The aim of the Fetal Surveillance Care Bundle is to enhance safety of women and their babies, minimise unnecessary interventions and prevent harm. Cardiff and Vale University Health Board (CAVUHB) follows principles of 'Prudent Health care', launched by Professor Mark Drakeford AM (1) on behalf of the Bevan Commission: 'Do only what is needed, no more, no less; and do no harm'.

The above principles are echoed by the Each Baby Counts reports (2): "No normally formed, term baby whose mothers labour; should suffer death either during or shortly after birth or suffer a severe disability as a result of an event in labour". The report also emphasises, 'maternity services should learn from mistakes to reduce and prevent avoidable harm'.

The 4th Confidential Enquiry into Stillbirths and Deaths in Infancy (CESDI) Report (3) identified the above common themes over two decades ago and specified root causes of avoidable harm in labour. These continue to be an issue in more recent reports(6).

- Misinterpretation of a Cardiotocograph (CTG), and lack of pattern recognition.
- Failure to integrate clinical picture i.e. risk factors such as meconium, IUGR, infection, slow progress, absence of liquor in labour.
- Incoherent team functions, mainly poor communication amongst key members.
- Delay in action and inappropriate action, once a decision to deliver the baby is made.

Subsequent to the CESDI Report, other reports, such as '500 missed opportunities' by the Chief Medical Officer in 2006 (4) and the NHS Litigation Authority (NHSLA) Report (5) have identified and referenced these recurrent themes. Hence, urgent need for changes and improvement in care of women in labour is necessary.

The Each Baby Counts Report has also added: 'efficient Multi-Disciplinary Team' working is essential. In particular, with anaesthetic and neonatal colleagues when a decision to deliver the baby is made. It is vital to:

- Clarify mode of birth
- Specify location of birth
- Communicate category of urgency

Both the Nursing and Midwifery Council (NMC) and the General Medical Council (GMC) codes of conduct, require that registrants must keep their knowledge and skills up to date and take part in activities that maintain their competence and performance (7) (8). This is assessed annually through the appraisal process. They must recognise the limits of their competence and respect the skills, expertise and contributions of colleagues, consulting with them when appropriate and work with them to preserve the safety of those receiving care.

2 Commencing a CTG

An abdominal palpation must be performed before commencing a CTG.

The fetal heart **MUST** be auscultated with a Pinard or hand held doppler, palpating the maternal pulse at the same time, prior to commencing a CTG. This is to confirm the presence of a fetal heart and to reduce the risk of monitoring the maternal heart rate in error.

Documented either on the CTG or in the woman's notes should be:

- Maternal details
- Date and time.
- Indication for CTG

- Maternal pulse
- Check time is correct.
- Check paper speed.
- Sign/date and time at end of CTG.

On completing a CTG, it is the midwife's responsibility to ensure the monitor is clean and ready for use.

To remove a Fetal scalp electrode (FSE) **DO NOT** cut the wires or pull them apart.

Either perform a VE and grasp the FSE as close to the presenting part as possible and turn anticlockwise or put some tension on the wire and turn it anticlockwise until it is free.

3 Antenatal Fetal Heart Monitoring

Term antenatal CTGs should be classified as **Normal/Abnormal.** To be classified as normal the CTG should demonstrate:

- Appropriate baseline for gestation/this baby (with reference to any previous baseline)
- Variability 5-25 beats
- Acceleration
- No significant deceleration
- Presence of cycling
- FM marked

It should be noted that the absence of cycling and acceleration is not uncommon in preterm CTGs (before 32-34 weeks), due to the immature nervous system. Fleeting decelerations may also be noted.

Where the CTG is classified as 'Abnormal' a review should be carried out by either the DS co-ordinator, MUM, Senior registrar, or obstetric consultant.

For women on continuous monitoring, but not in established labour e.g. epidural/oxytocin/continuous monitoring following ARM, the **intrapartum** classification should be used. Senior clinical input (Band 7 coordinator/ Senior Registrar/obstetric consultant) should be sought where all the features of a normal antenatal CTG are not present. The intrapartum definition should be used with caution and with close reference to the clinical picture.

3.1 Women admitted under the care of other clinical specialities.

CTG monitoring should not be performed routinely where there are normal fetal movements in women admitted with significant comorbidities as 'outliers' unless clearly indicated. The clinical justification should be carefully considered and documented by a senior obstetrician, along with a plan for frequency and timing of CTGs/FHR. In addition, the risks associated with undertaking high-risk caesarean section out of hours must be fully evaluated.

Peri operative CTG monitoring should not be performed as standard practice. If, following a comprehensive assessment, a CTG is performed following general anaesthetic It is likely that there will be a period of reduced variability.

3.2 Dawes-Redman Analysis

Please see the Dawes-Redman Antenatal Computerised Analysis guidelines (2023) for its' use and interpretation in antenatal care. Dawes Redman Computerised Antenatal CTG) 2023.docx (To access - Highlight – CTRL button – Click on link)

3.3 Induction of Labour

Please see the Induction of Labour guidelines (2024) for recommendations on methods and frequency of fetal heart monitoring during induction of labour.

3.4 Latent Phase of Labour

Maternal and fetal assessment should be conducted every 60 minutes. This should include monitoring the frequency and length of the contractions. If the woman is asleep (unless Pethidine induced) this assessment can be left to allow the woman to rest.

The fetal heart should be recorded using a Pinard or handheld doppler and fetal movements should be monitored and recorded.

A CTG should be performed prior to the administration of Pethidine for women who will be having continuous monitoring in labour. Maternal and fetal assessment should continue every 60 minutes.

The midwife should remain astute to the progress of labour and ensure the recommended method of fetal monitoring for each woman is adopted in the active phase.

4 Principles of Intrapartum Fetal Surveillance

All women should be given informed choice regarding methods of monitoring the fetal heart rate in labour. This should be discussed during the antenatal period and should include information on the use of a FSE when necessary, continuous fetal monitoring, telemetry and

hand-held doppler. This should be part of the birthplace discussion at 36 weeks of pregnancy with the named midwife or obstetrician.

A risk assessment should be completed for all women at the onset of the labour, to determine the appropriate method of monitoring taking into consideration the wishes of the woman. The 'Suitability for Midwifery Led Care' section of the 'Assessment Unit' form on Badgering should be used to complete this risk assessment.

5 Risk Assessment for Fetal Surveillance (CLU)

The purpose of completing this form is to provide evidence that a risk assessment has been undertaken to ensure the method of fetal monitoring is appropriate.

The 'Suitability for Midwifery Led Care' section of the 'Assessment Unit' form on Badgernet should be used to complete this risk assessment.

Prior to the assessment, the case notes should be reviewed for a high-risk management plan or comments from obstetric staff regarding fetal monitoring.

6 Classification of the Fetal Heart Rate

6.1 Continuous CTG monitoring

CAVUHB practice physiological interpretation of the CTG. This facilitates "individualisation of care without using the same population-based parameters and arbitrary time limits for all human fetuses" (10) that guidelines can impose.

The principles of physiological CTG interpretation include:

- **Is the baby "fit for labour?" (use the following checklist)**

1. Is the baseline appropriate for gestation and this baby?

   (Use the baby as its own control and compare current baseline to previous monitoring)

2. Confirm normal variability and cycling.

3. Confirm presence of accelerations (not in labour/early labour)

4. Exclude shallow/late decelerations.

5. Consider the wider clinical picture: for example: meconium, temperature, fetal growth, chorioamnionitis.

- **How is the baby?**

  Is the baby exposed to hypoxic stress?
  Is the baby compensating for it?
  Are there signs of decompensation?

- **What is the clinical picture?**

The CTG Review Tool is used to physiologically interpret intrapartum CTGs in CAVUHB. The CTG should not be classified using terms such as suspicious or pathological. The midwife providing 1:1 care for the woman should complete this assessment hourly or sooner if there are concerns regarding the CTG.

Midwifery and Obstetric staff are required to use their skills and knowledge, in pattern recognition and their understanding of the underlying physiology and pathophysiology and be able to integrate this into clinical picture e.g. any risk factors, including progress of the labour. Any concerns that arise as a result of considering these, should be communicated to a Band 7 midwife or obstetric registrar, or consultant obstetrician in a timely manner. Using an SBAR or the AID tool should be considered. The woman should be informed of these concerns in a professional manner, and this must be recorded in the maternal case notes.

7 Central Monitoring System

The central monitoring system allows members of staff to view and discuss CTGs without compromising a woman's privacy and dignity. The central monitoring system also provides a unique opportunity for teaching/learning CTG patterns and evolving changes for all the staff without the woman becoming unnecessarily anxious during such discussions.

However, it is important that a review of the CTG on central monitoring does not replace assessment of a woman at her bedside when required or requested by the labour ward co-ordinator or midwife caring for the woman.

The following standards **must** apply to all women monitored by a continuous CTG on the delivery suite:

i. All women should have their name and hospital number entered electronically at the beginning of the CTG.

ii. If the name cannot be put into the monitor in the room this should be done by the coordinator or midwife giving one to one care at the central station.

iii. The date and time of each monitor must be checked prior to use. Seek advice from the DS coordinator if experiencing any difficulty with this.

iv. The CTG must be reviewed by the Delivery suite (DS) co-ordinator / the Midwifery Unit Manager (MUM)/ Senior Registrar or above level within an hour of admission to the DS. This review should take place as soon as possible if the woman is admitted due to 'CTG concerns' or if the 1:1 MW is concerned about the CTG. Should be documented in Badgernet. If a review of a CTG by a senior midwife or obstetrician is requested at the central monitoring station at any point during labour, this should be documented on Badgernet. However, if there are any clinical concerns this must be a full review at the bedside and this documented in the woman's notes.

v. The central monitoring is an additional supportive aid and not a substitute for midwifery care. The midwife providing 1:1 care for the woman should not assume that the CTG is being monitored/watched by a senior member of staff on the central monitoring screen or use it to spend long periods away from the woman. If there are any concerns about the CTG in the room, the midwife must seek appropriate and timely help. Equally, if a senior member of staff has concerns about a CTG on the central monitoring screen or a woman, she/he must make enquiries with the midwife providing 1:1 care to the woman. Hence, the central monitoring system acts as a 'fail safe mechanism' when used by vigilant staff.

vi. Any reviews / safety huddles that take place at the central monitoring station must be entered onto Badgernet and should not replace a bedside review when indicated.

7.1 Seeking a 2nd opinion/ Fresh Eyes

Delivery Suite
The evidence from the Royal College of Midwives and Royal College of Obstetricians and Gynaecologists (RCM/RCOG) (11) suggest, "Maternal and fetal outcomes improve, rate of interventions reduce, when women labour in a quiet, comfortable setting". The rationale behind this is that being quiet and in a comfortable setting reduces adrenaline surges in the woman and increases the natural production of oxytocin to enhance labour.

The All-Wales Intrapartum Fetal Surveillance guideline (13) Standard 6 advises: 'Women requiring continuous electronic fetal monitoring must undergo assessment with additional fresh eyes and clear documentation of findings. This review can be undertaken by another midwife (band 6/band 7) or an obstetrician ST6 and above; within a maximum period of two hours.

It is the responsibility of the midwife providing 1:1 care for the woman to request this "fresh eyes" review.

As a result of this evidence CAVUHB has taken the approach of providing quiet and comfortable settings for women and ensuring their dignity in labour. This is done by

conducting “fresh eyes” via the central monitoring and therefore reducing staff entering rooms unnecessarily. This review should be documented on the Peer CTG Tool on Badgernet. Thus, every 2 hours there will be 2 intrapartum CTG review tools in the woman’s notes.

In addition, the midwife in the room should make anonymised electronic notes on central Monitoring from the onset of the CTG. This should include the gestation and other relevant risk factors. If a member of staff enters the room, their grade rather than their name should be noted on the CTG. Their names can be documented in the notes.

The midwife providing 1:1 care in labour is responsible for seeking help from a senior member of staff. If she is concerned about the woman or her baby, the chain of command on the Delivery suite states that this should be a Band 7 midwife in the 1st instance, who will then escalate as necessary to the obstetric team.

When seeking assistance, the 1:1 midwife is required to document the name and level of staff they have escalated to in the notes. If the midwife is unable to leave the room escalation should be via the call bell system. The Band 7, Senior obstetric registrar (ST6 and above) or consultant, when reviewing the CTG/woman, should take a holistic approach including CTG changes, progress of the labour and any changes in the risk factors.

When a senior obstetric review is requested by the 1:1 midwife or the Band 7 midwife that member of the obstetric staff must review the woman themselves and not delegate to a junior member of staff. If the senior member of staff is unavailable, this should be documented with the reason/s and consideration should be given to escalation to the on-call Consultant.

The senior obstetric staff should discuss their review and plan with the Band 7 midwife.

The member of staff reviewing a woman should clearly document their review, findings, and plan in the notes. This should include:

- Date and time.
- Overview of the CTG.
- Overall clinical picture.
- Actions taken / management plan.
- Time for the next review.

Consideration should be given to the following when reviewing a CTG:

- Fetal Heart Rate (FHR) changes such as rise in the base line rate, decrease in variability and/or absence of cycling should raise concern.

- These changes become more significant in the presence of infection or suspected infection with other risk factors. The baby develops metabolic acidosis at an accelerated rate in the presence of infection.

- Non-reassuring features on the CTG are more significant in the presence of risk factors such as: IUGR, thick meconium, oligohydramnios, APH, maternal pyrexia. In these cases, closer monitoring of the mother and the baby is required.

- CTG changes may be due to epidural analgesia. In the presence of CTG concerns, consider stopping the epidural auto bolus as part of conservative measures to improve the CTG. In the event of repeated abnormalities of the fetal heart following epidural doses, consider additional causes related to the mode of analgesia, such as dehydration, sepsis, chorioamnionitis. A review by an obstetrician may be required.
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The FHR should not be classified in isolation and must be reviewed in the context of the clinical situation.

8 A system of hierarchy in CTG interpretation and second opinion.

- ST 1-2 trainees should not interpret a CTG independently and should not carry out a fresh eyes assessment.

- ST 3-5 trainees are encouraged to interpret a CTG independently but should not conduct a fresh eyes assessment. They should always discuss their interpretation with a ST6 or above obstetrician or a Band 7 midwife.

- ST6-7 trainees can interpret the CTG independently, carry out a fresh eyes assessment and if needed, should seek a 2nd opinion from a consultant obstetrician or a Delivery suite Band 7 midwife.

9 Escalation/ Chain of Command/ "Jump Call"

In the event of a difference of opinion regarding the interpretation of a CTG, this should be escalated to a more senior member of staff.

All staff should familiarise themselves with the Escalation & Chain of Command Policy (2022).

9.1 The Role of the Midwifery Unit Manager

Should the midwifery unit manager (MUM) have any concerns regarding a CTG/case, she is expected to escalate this to the DS co-ordinator or obstetrician. If the DS coordinator/obstetrician are not able to review the CTG/case, then she is expected to carry out this review. Any concerns regarding this case should be then escalated appropriately. In

the situation where there is a difference of opinion regarding the interpretation of the CTG and management of the case, with the DS co-ordinator or obstetrician she is required to act as per the escalation policy.

10 Intermittent Auscultation

The principles of auscultation should be followed as set out in the NICE (2022) guidelines (12).

Offer intermittent auscultation of the fetal heart rate to women at low risk of complications to the baby.

Continuous fetal monitoring should not be used during established labour on the MLU. However, there may be some instances where use of CTG is prudent antenatally. Eg prior to ARM for low-risk induction, part of a holistic assessment during a long latent phase etc.

Use “Assessment unit” form on Badgernet to offer intermittent auscultation to all women who fulfil the criteria for intermittent auscultation in labour, regardless of place of birth.

Use either a Pinard stethoscope or handheld doppler **(CTG transducers are not licenced for IA).**

Use the criteria drop-down tab within the "Suitability for MLC in labour" to confirm that criteria A1- A18 are met. The woman should be asked about fetal movements and whether the baby has been moving in its usual pattern in the 24 hours before the onset of regular contractions. Past reduced fetal movements, including any ongoing plans, should form part of the overall risk assessment. If the baby is not active during the initial assessment, opportunity must be taken during abdominal/scalp stimulation and documented appropriately. To obtain the baseline rate, the fetal heart should be auscultated between contractions when the foetus is at rest. Consider this baseline in relation to gestation and any previous auscultation or CTG (AWCPNL 2023).

Carry out intermittent auscultation immediately after a palpated contraction for at least 1 minute, at least every 15 minutes in the 1st stage of labour and at least every 5 minutes in the 2nd stage.

Auscultation of the fetal heart every 5 minutes should be commenced if it is suspected but not confirmed on vaginal examination that the cervix is fully dilated or full dilation is confirmed but there is no urge to push.

The clinician should place their hand on the woman's abdomen, palpating the contractions to confirm the timing of IA.

In the 1st stage of labour palpate the maternal pulse hourly, or more often if there are any concerns, to differentiate between the maternal and fetal heart rates.

In the 2nd stage of labour palpate the maternal heart rate each time the fetal heart is auscultated, to continue to differentiate between maternal and fetal heart rates. The maternal heart rate should be plotted on the partogram every 15 minutes in the 2nd stage of labour (13)

Document the presence of accelerations or Decelerations on Badgernet, but do not plot these on the partogram.

In the presence of fetal heart concerns:

The midwife caring for the woman must escalate any concerns regarding the fetal heart or clinical picture to the midwife co-ordinating the area.

- Increase frequency of auscultation e.g. Auscultate immediately following the next 3 palpated consecutive contractions.

- Identify possible cause, such as maternal position, fetal movements, vaginal examination.

- Review the whole clinical picture including antenatal and existing or new intrapartum risk factors, maternal observations, contraction frequency (including hypertonus) and the progress of labour.

- Recommend transfer and continuous electronic fetal monitoring if an abnormality in the fetal heart is confirmed or there is uncertainty. Continuous electronic fetal monitoring should not be used in the first or second stage of labour on the midwifery led unit.(12) However, there may be some instances where use of CTG is prudent antenatally. Eg prior to ARM for low-risk induction, part of a holistic assessment during a long latent phase etc.

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- Recommend continuous electronic fetal monitoring, if already birthing on the Delivery suite.

The All-Wales Midwifery Led Guideline together with the clinical picture should be used to determine when the pathway should be exited and transfer to the CLU initiated.

10.1 Hourly holistic assessment

An hourly holistic review must be undertaken when using IIA in all birth settings. This includes review of the partogram, considering is the progress as expected? Are all components of the partogram completed and within expected parameters? Is IA still appropriate?

This should be documented using the Fetal Monitoring Review Tool hourly by the midwife providing one to one care.

10.2 MLU coordinator assessment

On admission and change of shift the MLU coordinator will review the antenatal records, review the initial labour assessment, and complete a holistic review using Fetal Monitoring Labour Review tool. It is expected that the fetal heart pattern will be considered during this review.

A discussion between the midwife caring for the woman and another midwife should occur at least 4 hourly when undertaking IA. This should ideally take place in the birthing room if the woman is in agreement, respecting her birthing environment. The Fetal Monitoring Labour Review tool should be used to systematically assess for any emerging risk factors and to highlight any concerns (13). It is expected that the fetal heart pattern will be considered during this review.

Should a woman be cared for using IA on CLU, this co-ordinator assessment must be undertaken at least four hourly by a band 6 midwife (or above).

This ‘buddy’ support should be made available more frequently to less experienced staff (13).

11 Education and Training

The Each Baby Counts Report (2) states: “staff tasked with CTG interpretation must have documented evidence of annual training”.

All midwifery and obstetric staff should attend an in-house annual training day within 3 months of commencement of employment with CAVUHB.

All CAVUHB obstetric and midwifery staff, who care for women in labour, are required to undertake as a minimum:

An in-house or external fetal surveillance study day (8 hours) annually.

AND

6 Scenario-based reflective case reviews.

2 of these case reviews can be obtained during the study day.

For Obstetricians this includes 4 tabletop reflections.

For all midwives, the remaining 4 reflections include:

- The elfh IIA package
- 3 tabletop case reflections

12 Cord Gas Analysis

- Provides objective information on the acid-base status of the baby.
- Provides information on the occurrence, timing and possible causes of oxygen deficiency.
- Informs neonates of appropriate intervention for the neonate.
- Provides information for medico-legal issues.

Cord gases should be performed:

- When the neonate is born in poor condition
- After an assisted delivery
- After an emergency LSCS

12.1 Method

The cord must be double clamped immediately after delivery and the sample taken between the two clamps. This will give the acid-base status of the neonate at the time of delivery.

Take the arterial sample first, followed by the venous sample (The artery has a smaller lumen and contains less blood than the vein. The distended vein may provide some support for the artery).

Arterial blood reflects the fetal status at birth.

12.2 Paired Samples

A difference of 0.03 in the pH in the results confirms you have an arterial and venous sample and therefore confirms an arterial sample. The pH will be lower in the arterial result.

If you have one sample this is most likely venous and **must not** be interpreted as the arterial result.

12.3 Delayed Cord Clamping

Delayed cord clamping will alter the results, usually lowers the pH.

You must document if your cord gases are taken after delayed cord clamping.

Double clamp the cord when the decision is made to cut the cord and take the samples in the usual way.

12.4 Cord Gas Results

	Normal Range/Results	
	Arterial	**Venous**
pH	7.00 to 7.38	7.16 to 7.47
pCO2	4.9 to 10.7kPa	3.5 to 7.9kPa
Base(Ecf)	-2.8 to -9.4mmols/L	-1.4 to -8.8mmols/L
Lactate	<4mmols/L	N/A
Hb	>160g/dL	N/A

12.5 Interpretation of Results

Large A-V difference: more likely to be an acute event.

Small A-V difference: more likely to be a more chronic event.

Metabolic acidosis: low pH/high base deficit

Cord gas criteria that link cerebral palsy to intrapartum events:

Evidence of metabolic acidosis in arterial cord gas: pH less than 7.00 and Base (Ecf) greater that -12mmol/l

Other criteria that must also be met to link an intrapartum event to the development of cerebral palsy are:

- Early onset (within 24hrs) of severe or moderate neonatal encephalopathy (>34 weeks)
- Exclusion of other pathologies associated with Cerebral Palsy
- Cerebral palsy of the quadriplegic or dyskinetic type

Cord gases should not be interpreted in isolation and the clinical picture and the behaviour of the baby after birth must be included in the neonatal assessment.

The neonatal team must be informed of any abnormal cord gas results.

The cord gas results (both pH and Base (Ecf) must be documented on neonatal notes on E3

It should also be documented in the notes when samples have been attempted but unsuccessful.

13 References

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9. **Chandraharan et al:** Physiological Interpretation Guidelines**.**2018

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12. **National Institute for Health and Care Excellence.** Fetal Monitoring in Labour Guidelines .2022

13. **Royal College of Obstetricians and Gynaecologists.** *Each Baby Counts: 2023*