Antenatal Electronic Fetal Monitoring Guideline

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		Obstetric Group - Extended whilst review is undertaken	23.03.2022	23.03.2022	23.09.2022
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Brief Summary of Document:	To provide safe care and management of women who require electronic fetal monitoring of their babies during the antenatal period from 26/28 weeks gestation
Scope	Maternity wards and Day Assessment Units within the Health Board. To be used for women in the antenatal period when there are concerns regarding fetal well-being from 26 weeks gestation. 'The term "woman/women" in the context of this document is used as a biologically based term and is not intended to exclude trans and non-binary people who do not identify as women.'

ad	667 – Management of Induction of Labour All Wales Fetal Movement in Pregnancy Guideline http://www.1000livesplus.wales.nhs.uk/sitesplus/documents/1011/Altered%20Fetal%20Movement%20Guide Intrapartum Continuous Electronic Fetal Monitoring
on:	Include links to Patient Information Library

Owning committee/	Obstetric Guideline and Audit Group

group	

Reviews and updates		
Version no:	Summary of Amendments:	Date Approved:
1	New guideline	12/03/2019

Glossary of terms

Term	Definition
ADAU	Antenatal Day Assessment Unit
CLC	Consultant led care
CTG	Cardiotocograph
EFM	Electronic fetal monitoring
FHR	Fetal heart rate
FMs	Fetal movements
MLC	Midwife-led care
TENS	Transcutaneous Electrical Nerve Stimulation
USS	Ultrasound scan

Keywords	Continuous electronic fetal monitoring, cardiotocograph, antenatal, Dawes Redman criteria

Contents Page

1. Aim of guideline
2. Objectives
3. Scope
4. Introduction
5. Management
5.1 **Rationale for Computerised CTG**
5.2 Eligibility for Antenatal CTG
5.3 Induction of Labour
5.4 Twins
5.4 Technique for performing traditional and computerised antenatal electronic fetal monitoring
5.4.1 Duration of CTG Monitoring
6. Antenatal CTG Interpretation Using Dawes Redman Analysis or Traditional CTG Interpretation

6. Interpretation of the CTG Recording in Labour
6.1 Dawes Redman Analysis: Criteria Met
6.1.1 Dawes Redman Analysis: Criteria Not Met
7. Record Keeping
8. Communication
9. Education and Training
10. References

Appendix 1 Dawes Redman Analysis Flowchart
Appendix 2 Antenatal CTG Sticker
Appendix 3 Reasons for Dawes Redman Criteria not being met: Codes.

1. Aim of Guideline

To assist midwives and obstetricians in the interpretation of antenatal Cardiotocograph (CTG) from 26 weeks gestation. This includes understanding the situations where computerised CTG is indicated and how to interpret the Dawes/Redman Criteria.

2. Objectives

Appropriate use of antenatal CTG monitoring to assess fetal well-being in pregnancies with increased risk of complications enabling early detection of fetuses at risk of developing hypoxaemia/ acidosis.

3. Scope

To be used in the antenatal period from 26+0 weeks gestation where there is a concern regarding fetal well-being.
Prior to 26 weeks gestation a CTG should not be performed during the antenatal period.
Auscultation of the fetal heart should be undertaken with sonicaid or pinard or visualisation of FH with USS.

The term “woman/women” in the context of this document is used as a biologically based term and is not intended to exclude trans and non-binary people who do not identify as women.’

4. Introduction

The aim of antenatal CTG monitoring is to assess fetal well-being in pregnancies with increased risk of complications. The use of CTG monitoring using computerised CTG analysis has been shown to significantly reduce perinatal mortality. There is no clear evidence that antenatal CTG improves perinatal outcomes or caesarean section rates.

The Dawes Redman CTG analysis can be used for **antenatal** CTG. It is valid for any gestation over 26 weeks but it is **not** suitable for intrapartum CTG analysis.

The use of antenatal CTG to assess fetal well-being in a low risk pregnancy is not recommended.

5. Management

5.1 Rationale for Computerised CTG

- Computerised CTG provides an objective CTG interpretation. It allows communication of robust, numeric facts instead of opinion.
- The Dawes/Redman analysis has a database of 100,000 traces. By using this numeric data and relating it to outcomes, it acts as an expert assistant for CTG interpretation and accurate interpretation criteria.
- The final clinical judgement should be based on the **entire clinical assessment** with CTG forming a part of this holistic approach to pregnancy management.

5.2 Eligibility for Antenatal CTG (Appendix 1)

- Dawes/Redman Criteria is **NOT** appropriate for intrapartum fetal monitoring.
- It can be used during the latent phase of labour, but it must be discontinued once the woman is in active labour.
- CTG should only be performed in the antenatal period for fetal surveillance as per clinical indications.
- 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 Pinards Stethoscope or Sonicaid is appropriate.
- CTG's performed before 28 weeks should be undertaken and interpreted with caution and must be made on an individual basis by a senior obstetrician. Prior to 28 weeks gestation patterns of fetal heart rate which may be expected at later gestations are not present and there is increased possibility of signal loss and poor quality CTG.
- CTG should not be undertaken for reduced fetal movements prior to 28+0 weeks

5.3 Induction of Labour

- Dawes Redman analysis can be used during induction of labour.
- **It is not valid for use when established labour has been confirmed.**

5.3.1 Twin Pregnancy

- Dawes Redman analysis can be used.
- An ultrasound examination should be performed prior to commencement to confirm location of two individual fetal hearts. The 20 beat fetal heart separation should be applied to differentiate between twins.

5.4 Technique for performing traditional and computerised antenatal electronic fetal monitoring

- The fetal heart must be auscultated with a Pinards Stethoscope or sonic aid before commencing the CTG.
- Ensure the date and time on the CTG is correctly set.
- Ensure that the monitor is set to run at 1cm per minute
- Position the toco and ultrasound transducer.
- Connect the fetal event marker and show the mother how to use it.
- Turn the analysis on and ensure the Gestation, Patients name and hospital number, maternal pulse, date and time are clearly recorded.

Dawes Redman analysis will not start unless the gestation is entered.

5.4.1 Duration of Monitoring

- The maximum record length is 60 minutes
- The computer analyses the CTG data and compares it with the Dawes/Redman criteria at 10 minutes and every 2 minutes thereafter.
- The practitioner commencing the CTG MUST return within 10 minutes to ensure the quality and assess, visually, whether the monitoring is normal.

5.4.2 **Quality of Monitoring**

- The quality of monitoring of both uterine activity and FHR must allow for accurate interpretation of the CTG tracing.

6. Antenatal CTG Interpretation Using Dawes Redman Analysis or Traditional CTG Interpretation

- Knowledge of the basic features (baseline heart rate, variability, accelerations and decelerations) are derived from intrapartum CTG interpretation.
- A traditional CTG should be no less than 20 minutes in duration.
- If the CTG continues for longer, there should be a regular review of the CTG by a qualified member of staff. This should be annotated on the CTG with legible signature, print and time; the CTG should never be left attended for longer than 20 minutes.
- A structured review of all the features of the CTG should be performed and documented on the preformatted Antenatal CTG Sticker at the end of the CTG (appendix 2). The trace should be classified as NORMAL or ABNORMAL.
- **An abnormal CTG should not be discontinued and immediate obstetric review must be requested.**
- The healthcare professional should print, sign, date and time when the CTG is discontinued together with the reason for discontinuation.

6.1 Dawes Redman Analysis: Criteria Met

- If the CTG 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.
- This criteria can be achieved as early as 10 minutes. The CTG does not need to be continued for the traditional 20 minutes.
- The practitioner who stops the CTG must sign the CTG at the end of the print out. Include a visual assessment, to confirm that the CTG is normal, and complete the preformatted antenatal CTG sticker.

6.1.1. Criteria NOT met

- The CTG must continue for the **full** 60 minutes.
- If it the criteria is still not met at 60 minutes, the computer will end the analysis and print the results on the trace. The reasons why the criteria were not met are highlighted as coded numbers (appendix 3).
- The CTG must be reviewed by a senior obstetrician and action taken, based on the reasons for failure, visual trace review and a holistic assessment of the pregnancy.

7. Record Keeping

- A label must be completed and attached prior to the start of the tracing completed with:
  - the woman's name,
  - date of birth
  - hospital number,
  - the date

- the woman's pulse
- Reason for CTG recording

- Whenever the CTG is reviewed during the analysis, the practitioner must sign/annotate to evidence.
- On completion of the CTG monitoring:
- time CTG is discontinued
- the classification
- any on-going plan of care/ management
- signature of the midwife/ obstetrician

- The CTG tracing needs to be stored in the designated wallet and placed appropriately in the maternal records and kept for 25 years. The woman's details must be clearly recorded on the front of the wallet.
- All relevant information that may affect the fetal heart should also be noted contemporaneously on the cardiotocograph (eg. administration of drugs, vomiting, maternal position)
- Any member of staff who is asked to provide an opinion on a trace should date/time and sign the cardiotocograph and note any findings in the maternal case notes. The same should happen at any staff change over
- At the end of the CTG the CTG should be classified using the Antenatal CTG Classification Sticker (Appendix 2)
- The date, time and legible staff name, signature and designation.

8. Communication

Maternal wishes and concerns should be discussed and recorded.

- The benefits, risks and limitations of antenatal CTG monitoring should be explained.
- Consent should be sought prior to any interventions.
- The woman should be included in the decision making process regarding her care.

9. Education and Training

Health professionals performing, interpreting and managing CTGs and performing intermittent auscultation of the fetal heart during labour should update their skills regularly.
The updates should be multidisciplinary to ensure use of common terminology and shared understanding. Midwives and obstetricians will be allocated annually:

- Two hours on the PROMPT Mandatory day.
- Two hours on the Maternity Update Day.
- A further two hours to be accessed via weekly CTG and Intrapartum Case Reflection.

10. Auditable standards

- The minimum data set that will be recorded on commencement of all CTG monitoring traces includes: woman's name, hospital number, date and time and maternal pulse.

- The **Antenatal CTG Sticker,** signed and timed and attaching it to the CTG trace and in the maternal health record.

- Assessments will be aimed to be performed hourly

- All intrapartum events that may affect the FHR will be recorded, signed and timed on the CTG trace.
- All second opinions provided during labour will be recorded, signed and timed on the CTG trace by the person providing the second opinion.
- In all cases when the CTG trace is assessed as **abnormal** an action plan will be documented on the Antenatal CTG Sticker and the Antenatal Record/ Induction of Labour Record.
- All antenatal CTG traces will be stored in the CTG envelope securely attached to the maternal health record.
- The minimum data set that will be recorded on completion of CTG includes: classification, date & time, signature.

10. References

- Grivell RM, Alfirevic Z, Gyte GML, Devane (2015) https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD007863.pub4/epdf/full
- Visser GH, Ayres-de-Campos D, FIGO Intrapartum Fetal Monitoring Expert Consensus Panel. FIGO consensus guidelines on intrapartum fetal monitoring: Adjunctive technologies. Int J Gynecol Obstet 2015;131:25–9

11. Appendix 1 - Dawes Redman Analysis flowchart

Confirm reason for CTG
Is there a maternal or fetal condition that will negatively impact fetal well-being?

NO → **CTG NOT** indicated

YES ↓

Gestation greater than 26+0/40?
CTG between 26-28 weeks requires senior obstetrician decision. Antenatal CTG should **NOT** be performed prior to 28/40 for reduced fetal movements

NO → **CTG NOT** indicated. Auscultate FH with Pinards or sonicaid

YES ↓

Commence Dawes Redman Analysis
First analysis is available at 10mins then every 2mins up to a maximum of 60mins

Criteria Met

Review CTG and classify CTG

CTG is normal and there are no other clinical concerns: the analysis can be stopped

The criteria can be met by 10mins of analysis

The CTG will print a report of analysis

Do not review the numeric data as the CTG has been classified as normal

Criteria Not met BEFORE 60 mins

Unless there are clear abnormal features or any other case for concern continue the recording until the criteria are met

Short-term variation (STV) is uninterpretable prior to 60mins.

DO NOT STOP THE RECORDING.
Stopping the analysis before the criteria are met and before 60mins will result in the makes the analysis being invalid

Criteria not met AFTER 60 mins of Analysis

Normality has not been demonstrated

This is an ABNORMAL outcome.

A visual review of the CTG, the reasons for failure and the overall clinical picture must be reviewed by a senior obstetrician.

The STV should be considered and a comparison made with previous CTGs STV has a predictive value for foetuses at risk of metabolic acidaemia and IUD.

STV cannot be assessed visually. It can only be assessed with 60 mins of CTG analysis.

STV MUST NOT be used in isolation as an indicator of fetal condition.

STV values:
>4ms = normal; <4 ms= low
<3ms = abnormal
<2ms = highly abnormal

The CTG analysis aids pregnancy management.
It is **NOT** a diagnostic tool

DO NOT act on the basis of the CTG analysis alone

12. Appendix 2 – Antenatal CTG Classification

ANTENATAL CTG CLASSIFICATION				
Reason for CTG	**Maternal Pulse:**	**Fetal Movements normal?**		**Liquor:**
	Gestation:	**Yes**	**No**	**Contractions:**

CLASSIFICATION	**NORMAL: all features are normal**	**ABNORMAL: any abnormal features**
Baseline normal for gestation *(Please tick)*	• **Yes** • **110 – 160 bpm**	• **No** • **Less than 110bpm** • **Greater than 160bpm**
Variability *(Please tick)*	• **5 -25 bpm**	• **Less than 5 bpm for more than 40mins**
Accelerations *(Please tick)*	• **Present**	• **None for 40mins**
Decelerations *(Please tick)*	• **None**	• **Yes**
Dawes Redman Criteria *(Please tick)*	**Dawes Redman Criteria met at: mins**	**Dawes Redman Criteria NOT met at 60 mins** **Inform Obstetric Registrar and Band 7 Co-ordinator**
Comments:		
Management:		
Reviewed by *(Print name)*		
Date and time:		

13. Appendix 3 – Reasons for Dawes Redman Criteria Not being met

Reasons for Dawes Redman Criteria NOT Being Met	
Code	
1	Basal Heart Rate outside normal range
2	Large decelerations
3	No episodes of high variation
4	No movements and fewer than 3 accelerations
5	Baseline fitting is uncertain
6	Short-term variation (STV) <3
7	Possible error at the end of the recording
8	Deceleration at the end of the recording
9	High frequency sinusoidal rhythm
10	Suspected sinusoidal rhythm
11	Long-term variation (LTV) in high episodes below acceptable level
12	No accelerations