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Dawes Redman Antenatal Computerised CTG Analysis

Introduction and Aim

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

Objectives

The aim of antenatal fetal surveillance is to identify fetuses at risk of intrauterine hypoxia and acidaemia. Timely, appropriate intervention will avoid fetal neurological damage or death.

CTG is the most commonly adopted tool for antenatal fetal assessment. It should not be used in isolation.

There is no clear evidence that antenatal CTG improves perinatal outcomes or caesarean section rates. However, a comparison of cCTG versus traditional CTG showed a significant reduction in perinatal mortality with cCTG. (Cochrane review, 2015)

CTG interpretation must be used within the context of the clinical situation.

Scope

This policy applies to all healthcare professionals in all locations including those with honorary contracts

Equality Health Impact Assessment	*An Equality Health Impact Assessment (EHIA) has not been completed.*
Documents to read alongside this Procedure	*Fetal Surveillance Guideline*
Approved by	*Maternity Professional Forum and Obstetrics & Gynaecology Quality & Safety*

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Disclaimer

If the review date of this document has passed please ensure that the version you are using is the most up to date either by contacting the document author or the Governance Directorate.

Summary of reviews/amendments			
Version Number	**Date of Review Approved**	**Date Published**	**Summary of Amendments**
1	*06/09/2019*	*06/09/2019*	New Document

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2 Aim/Purpose of this Guideline

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

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3 Definition and Background

The aim of antenatal fetal surveillance is to identify fetuses at risk of intrauterine hypoxia and acidaemia. Timely, appropriate intervention will avoid fetal neurological damage or death.

CTG is the most commonly adopted tool for antenatal fetal assessment. It should not be used in isolation.

There is no clear evidence that antenatal CTG improves perinatal outcomes or caesarean section rates. However, a comparison of cCTG versus traditional CTG showed a significant reduction in perinatal mortality with cCTG. (Cochrane review, 2015).

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4 COMPUTERISED CTG (cCTG)

cCTG provides 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 vast 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 cCTG forming part of this holistic approach to pregnancy management.

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4.1 ELIGIBILITY FOR CTG

Dawes/Redman Criteria is NOT appropriate for intrapartum fetal monitoring. It must be discontinued once the woman is in active labour.

cCTG should only be performed in the antenatal period for fetal surveillance as per clinical indications.

Dawes/Redman criteria should not be used during induction of labour

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

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4.2 EQUIPMENT

A Huntleigh Sonicaid Team3 monitor must be used for all antenatal CTG's (excluding those women having an induction of labour.

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4.3 SETTING UP THE MONITOR

The fetal heart must be auscultated with a Pinard Stethoscope or sonicaid before commencing the cCTG and documented.

Turn on the machine by touching the on/off switch for 3 seconds (front, upper right of machine)

Position the toco and ultrasound transducers.

Connect the fetal event marker and show the patient how to use it.

Input patient name, hospital number and EDD (from scan), gestational age. DO NOT use LMP. Analysis is now ready to start. Ensure maternal pulse is recorded. Ensure date and time is correct and sign cCTG.

NOTE the analysis will not start unless the gestation is entered.

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4.4 DURATION OF MONITORING

The maximum record length is 60 minutes for Dawes Redman analysis at this pint criteria is either *Met* or *Not Met*. If the criteria is met the cCTG can be removed. If it is not met the trace must continue until you have sought senior review

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 ensure the quality of the cCTG is adequate

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4.5 DOCUMENTATION FOR cCTG

Rationale for antenatal CTG should be documented in maternal notes.

At the start of the CTG, enter the woman's name and hospital number (use patient identification sticker) and legible name, designation and signature of the midwife (use printed stamp for clarity)

Add the Maternal pulse at the start of the CTG.

Confirmation that the date and time on the CTG is correctly set and signed by the midwife.

Confirmation that the monitor is set to run at 1cm per minute.

Any event, review or action related to the CTG will be entered on the trace with a legible name, signature and designation.

At the end of the CTG, the above classification is documented with the date, time and legible staff name, signature and designation.

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4.6 STORAGE OF CTG's

Antenatal CTG paper print outs must be stored in the CTG envelope in the patient's record. The envelope must be identified with the patient's name, and hospital number; include the date and reason for CTG.

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5 ABNORMAL CTG

If the CTG is suspected to be abnormal at any point, an immediate obstetric review **MUST** be sought using the appropriate SBAR escalation protocol.

Whenever the CTG is reviewed during the analysis, the practitioner must sign/annotate to evidence and document in the notes.

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6 RESULTS

6.1 Criteria met

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.

This criteria can be achieved as early as 10 minutes. The CTG does not need to be continued if there are no clinical concerns.

The practitioner who stops the CTG must sign the CTG at the end of the print out and include a visual assessment, to confirm that the CTG is normal. If at any point the practitioner disagrees with the outcome onthe printout this must be escalated to a senior registrar/consultant.

The cCTG must then be filed in the patients notes.

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6.2 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 but the trace will continue and print the results on the trace. The reasons why the criteria were not met are highlighted as coded numbers.

Continue the cCTG until the case is reviewed by a senior obstetrician and action taken, based on the reasons for “Criteria not met”, visual trace review and a holistic assessment of the pregnancy.

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6.3 Reasons for not meeting the criteria (see appendix 1)

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) is less than 3ms
7	Possible error at the end of the record
8	Deceleration at the end of the record
9	High frequency sinusoidal rhythm
10	Suspected sinusoidal rhythm
11	Long-term variation (LTV) in high episodes below acceptable level
12	No accelerations

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6.4 Summary of Actions Following cCTG

6.4.1 CRITERIA MET

- Visually review and classify the cCTG. If this is normal and there are no ongoing clinical concerns the analysis can be **stopped.**
- This can be with 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 cCTG has been classified as normal and this data is therefore insignificant

6.4.2 CRITERIA NOT MET BEFORE 60 MINUTES

- Unless there are clear abnormal features or any cause for concern continue the recording until the criteria are met.
- Short term variation (STV) is uninterpretable prior to 60 minutes; **DO NOT** review the numeric data.
- **DO NOT** prematurely stop the recording. If th analysis has been stopped before criteria are met and before 60 minutes it is not valid.

6.4.3 CRITERIA NOT MET AFTER 60 MINUTES OF ANALYSIS

- Indicates that normality has not been demonstrated
- In the context of an antenatal CTG classification this is an abnormal outcome
- The case 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
- STV cannot be assessed visually it can only be calculated following 60 minutes of analysis.
- The STV should be taken into account but **MUST NOT** be used in isolation as an indicator of fetal condition.
    - ≥ 4ms is normal
    - < 4ms is low
    - < 3ms is abnormal
    - < 2ms is highly abnormal

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7 Reasons for Not Meeting Dawes-Redman Criteria and Actions

7.1 Basal Heart Rate outside normal range

The FIGO and NICE guidelines agree that a normal baseline fetal heart rate for a term fetus is 110 – 160 beats per minute. Baseline FH Rates must be assessed in consideration of expected baseline for a fetus of the gestation being monitored.

The Dawes/ Redman analyses the intervals between beats and converts into a Basal Heart Rate. Basal rate is not the same as baseline rate and may deviate slightly from a visual assessment of baseline rate.

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7.2 Large decelerations

These will be unprovoked decelerations. Review by obstetric Registrar. Immediate intervention if the trace is otherwise abnormal, or significant clinical concerns.

If the trace is otherwise normal and there are no clinical concerns, the CTG should be should be repeated later, as per Obstetric Registrar management plan.

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7.3 No episodes of high variation

Long Term Variation (LTV) is essentially equivalent to traditional baseline variability.

Measured over a 1 minute sample, the difference between the high and low FH values is analysed. Important evidence of normality is the episodic variation in the baseline heart rate. LTV is reported as “High” or “Low” episodes.

In deep sleep the fetal heart rate is relatively constant with lower short-term variation but this should not normally exceed 50 minutes.

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7.4 No movements and fewer than 3 accelerations

This is significant and requires review by the obstetric team.

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7.5 Baseline fitting is uncertain

If all else is normal and the baseline falls within normal parameters then this can be ignored.

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7.6 Short-term variation (STV) is less than 3ms

DO NOT rely on STV values if cCTG has been on for less than 1 hour

Short-term variation is a computerised measure of the micro fluctuations of the fetal heart. These are not visible to the human eye.

A value of less than 3ms is strongly linked to the development of metabolic acidaemia and impending intrauterine death - Particularly with theabsence of an episode of high variation. STV can only be analysed after a full 60 minutes.

STV (ms)	**<2.6**	**2.6-3.0**	**>3.0**
Metabolic acidaemia	10.3%	4.0%	2.7%
IUD	24.1%	4.3%	0.0%

STV of less than 3ms is significant and should be discussed and reviewed by the Obstetric Senior Registrar or Consultant.

Urgent review is required if the CTG visual assessment is also abnormal

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7.7 Possible error at end of the record

This occurs when the machine detects a possible abnormality at the end of the trace which would otherwise be passed as CRITERIA MET.

In this event the trace may be continued or, if the clinical evaluation is that it is significantly abnormal, for example prolonged deceleration, then action should be taken as appropriate. Review by Obstetric Registrar or Consultant on call.

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7.8 Deceleration at the end of the record

In this event the trace should be continued and action taken as appropriate. Review by Obstetric Registrar or Consultant on call.

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7.9 High frequency sinusoidal rhythm

Sinusoidal FHR patterns are associated with either severe fetal anaemia or severe/prolonged fetal hypoxia with acidosis and are associated with poor fetal outcomes.

The analysis of the Dawes Redman system should be acted on immediately and discussed with the Obstetric Registrar or Consultant on call.

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7.10 Suspected sinusoidal rhythm

Sinusoidal FHR needs to be distinguished from a pseudosinusoidal FHR which, while it closely resembles a sinusoidal pattern, is usually transient, resolves spontaneously and is associated with a good fetal outcome.

Where a diagnosis of Sinusoidal FHR pattern is made, immediate intervention is required with probable emergency delivery if intrauterine resuscitation is not appropriate.

The CTG should be continued.

Maternal blood should be taken for an urgent Kleihauer test to assess the degree of any fetomaternal haemorrhage.

The Obstetric Registrar, Obstetric Consultant, Neonatal Paediatricians and Haematologist, should be alerted.

7.11 Long-term variation in high episodes below acceptable level

This should be acted upon in the same way as STV.

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7.12 No accelerations

In this event the CTG trace should be continued but should be reviewed by Obstetric Registrar or Consultant.

(Dawes Redman analyses acceleration using a slightly lower threshold (>10bpm) than FIGO and NICE definitions).

DO NOT RELY ON THE ANALYSIS IN ISOLATION
It may not always identify abnormal patterns that may be more obvious from visual interpretation with a holistic expert assessment of the whole clinical scenario.

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8 Reference

Cochrane review, (2015) Antenatal cardiotocography for fetal assessment. Wiley Online.

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