Electronic Fetal Heart Rate Monitoring Policy

1. Background

Cardiotocography (CTG) or electronic fetal monitoring (EFM) is the most widely used technique for assessing fetal wellbeing in the developed world. The primary purpose of fetal surveillance by CTG is to prevent adverse fetal outcomes.

CTGs have a high degree of sensitivity but a low level of specificity which means that they are very good at identifying which fetuses are well but are poor at identifying which fetuses are unwell. The differences in individual fetal responses to a decrease in oxygen (and therefore differences in heart rate changes) mean that the positive predictive value of CTG for adverse outcome is low and the negative predictive value high. The increased intervention rates associated with EFM can be reduced with the use of fetal blood sampling (FBS).

The aims of this policy are to:

- ensure compliance with the Department of Health WA Mandatory Policy: MP 0076/18 Cardiotocography Monitoring Policy.
- reduce the likelihood of CTG interpretation errors
- ensure timely and appropriate clinical response for non-reassuring and abnormal CTGs at WA Country Health Service (WACHS) maternity sites
- improve the confidence of clinicians when describing CTGs
- improve the accuracy of verbal CTG handovers between clinicians
- describe WACHS clinician guidance where it is required to differ from the endorsed KEMH clinical guidelines for fetal heart rate monitoring.

2. Policy Statement

WACHS maternity clinicians are to follow this policy in conjunction with the:

- WA Health Mandatory Policy: MP 0076/18 Cardiotocography Monitoring Policy and Cardiotocography Monitoring Standard in relation to:.
  - Educational requirements for midwives and Obstetric doctors
  - Clinical requirements
  - CTG recording and reporting
  - Clinical care escalation including Appendix A: Escalation pathways
  - Clinical audit
- KEMH Clinical Practice Guidelines for Fetal Heart Rate Monitoring including:
  - the procedure for CTG Mandatory Education Requirements for Staff
  - the clinical guideline for Fetal compromise / Distress (Acute)
    except that:
    - the KEMH ‘Obstetric registrar/Senior Registrar or Consultant’ means the obstetric duty doctor.

  - the KEMH MR 255 means the WACHS MR 55 (Inpatient Progress Notes) and the MR 226 means the WACHS Maternal Fetal Assessment Record (MR8).
  - the **clinical indications for CTG** are found in Appendix 1 of this policy.
- The WACHS CTG definitions are found in Appendix 4.

3. Additional WACHS requirements

3.1 Standard CTG settings

All CTG machines are to be set to a CTG paper scale of 30/240. This will ensure the CTG records the fetal heart at the actual baseline rate and reduces the likelihood of misinterpretation errors when the incorrect paper scale records the baseline rate incorrectly for the machine setting.

3.2 Two clinician classification of all CTGs

- All CTGs must be classified by two clinicians (neither of which are students) with appropriate expertise in CTG interpretation either:
  - two midwives – one of whom should be senior
  - one midwife and one obstetric doctor

  or
  - two obstetric doctors
- Where there are not two appropriately skilled staff on site (usually one midwife sites), the midwife performing the CTG may request classification from their Regional Resource Centre midwives on duty (see Appendix 3 for this process).
- Where the midwife performing the CTG has any concerns that the CTG is possibly abnormal, escalation is direct to the duty/on-call obstetric doctor in the first instance
- For antenatal women, the CTG must be classified as normal by two clinicians prior to the woman being discharged

3.3 Interpretation and documentation

- Interpretation and documentation of CTG findings should occur at the bedside by both clinicians (CTGs should not be separated from machines where two CTG clinicians are on site).
- The standardised CTG reporting sticker is to be used in the woman's medical record by both clinicians on each occasion of review / interpretation as per Appendix 1**.**
- **Antenatal** – the CTG sticker should be placed on the front/back of the actual CTG trace and then stored as per local practices i.e. paper based or electronic.
- **Intrapartum** – the CTG sticker is to be placed in the inpatient progress note (MR55):
  - every 30 minutes as a routine by the primary midwife caring for that woman

  and
  - by a second clinician as below:
    - For a fresh eyes review - minimum two (2) hourly
    - Every occasion of Obstetric review or assessment
    - Every time a CTG abnormality is identified by the primary midwife.

3.4 CTG handover

- CTG handover is to follow a standardised process to ensure all features of the CTG are considered during interpretation, when describing and when documenting CTG findings.
- **DR C BraVADO** is the preferred acronym to follow when interpreting and describing (verbal or written) CTGs:
  - **DR – D**etermine **R**isks (i.e. indication for CTG)
  - **C – C**ontraction pattern
  - **Bra –** Baseline **Ra**te
  - **V –** Variability
  - **A – A**cceleration presence
  - **D –** Deceleration pattern
  - **O – O**verall classification and **O**utcomes agreed

4. Roles and Responsibilities

- Regional Nursing and Medical Directors are to ensure that all midwifery and obstetric medical staff have read and understood this policy.
- Maternity managers are to monitor compliance with this policy as set out below in **6. Evaluation.**
- All midwives and obstetric doctors are to follow this policy when performing and/or classifying CTGs.

5. Compliance

Failure to comply with this policy may constitute a breach of the WA Health Code of Conduct (Code). The Code is part of the Employment Policy Framework issued pursuant to section 26 of the *Health Services Act 2016* (HSA) and is binding on all WACHS staff which for this purpose includes trainees, students, volunteers, researchers, contractors for service (including all visiting health professionals and agency staff) and persons delivering training or education within WACHS.

WACHS staff are reminded that compliance with all policies is mandatory.

6. Evaluation

Health Service Providers must audit their compliance with the WA Health Cardiotocograph Policy within 12 months of implementation using the audit tool provided in Appendix C of the *Cardiotocography Monitoring Standards*, and provide results of this audit to the System Manager via safetyandquality@health.wa.gov.au within one month of audit.

Maternity managers are to:

- monitor, investigate and escalate any clinical incidents where the CTG was identified as a contributing factor
- regularly monitor compliance with this WACHS policy using the WACHS In-MATernity audit tool (found on the S&Q Clinical Audit page). Where gaps are identified in CTG documentation, the specific CTG audit tool (housed in the WACHS Data Collection tool) can be used to drill down on care delivery issues.

- Report audit results to the local Obstetric governance committee and the WACHS O & G CAPS meetings.

7. Standards

National Safety and Quality Health Service Standards (First edition 2012) - 1.7.1, 1.7.2, 1.9, 1.18.1

National Safety and Quality Health Service Standards (Second edition 2017) - 1.1b, 1.1c, 1.7a, 1.27a, 6.1, 6.11, 5.5, 2.5a, 2.5b, 2.6, 2.7, 5.3

8. References

The Royal Australian and New Zealand College of Obstetricians and Gynaecologists (2014) Intrapartum Fetal Surveillance Clinical Guidelines. 3rd Ed

Department of Health WA Mandatory Policy: MP 0076/18 Cardiotocography Monitoring Policy and Cardiotocography Monitoring Standard.

9. Related WA Health System Policies

IC 0179/14 Guidelines for the Transmission of Personal Health Information by Facsimile Machine

MP 0067/17 Information Security Mandatory Policy

MP 0076/18 Cardiotocography Monitoring Policy.

10. Appendices

Appendix 1 – Clinical indications for fetal surveillance via CTG

Appendix 2 – CTG reporting sticker (and order details)

Appendix 3 - Process for 2nd clinician review at one midwife sites after hours

Appendix 4 – CTG definitions

This document can be made available in alternative formats on request for a person with a disability

Contact:	WACHS Coordinator of Midwifery (K.Reynolds)		
Directorate:	Nursing and Midwifery Services	**EDRMS Record #**	ED-CO-14-25314
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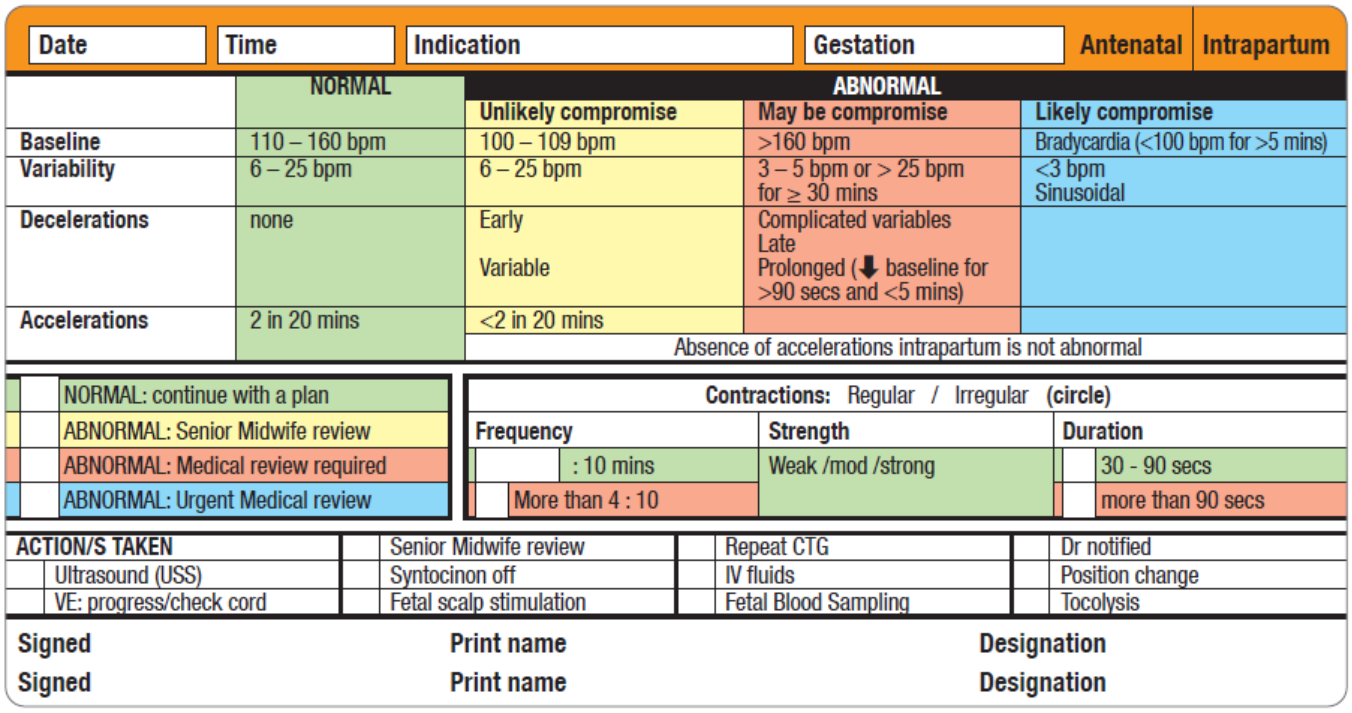
Appendix 1 – Clinical indications for CTG (RANZCOG, KEMH and WACHS)

ANTENATAL or INTRAPARTUM	
Abnormal antenatal Doppler flows (umbilical artery velocimetry)	
Abnormal fetal heart rate on auscultation	
Maternal (essential) hypertension/ pre-eclampsia	
Antepartum haemorrhage	
Multiple pregnancy	
Known fetal abnormality constituting a fetal risk	
Maternal medical conditions constituting a fetal risk	
ANTENATAL	**INTRAPARTUM**
Decreased fetal movements	Decreased fetal movements in week prior
Oligohydramnious (AFI <5)	Oligo or poly hydramnious (AFI < 5 or > 25)
Confirmed IUGR	Suspected or confirmed IUGR
Diabetes requiring medication	Diabetes - requiring medication or poorly controlled or macrosomia
Pre and post external cephalic version	Abnormal presentation (breech or transverse)
Prolonged Prelabour RoM (> 24 hours)	Prolonged ROM (> 24 hours)
Threatened preterm labour	Preterm labour
Abdominal trauma	Prior uterine scar
Post-dates pregnancy (> 41 weeks)	Prolonged pregnancy 42 weeks
Rhesus isoimmunization	Abnormal vaginal bleeding
Spurious labour (long latent phase)	Prolonged 1st stage (>12 hours once Cx 4 cm and with regular contractions)
	Prolonged 2nd stage (pushing > 1 hour & birth not imminent)
	Induction with prostaglandin **or** oxytocin
	Augmentation with oxytocin
	Abnormal antenatal CTG
	Meconium or blood stained liquor
	Absent liquor following amniotomy
	Maternal obesity (BMI ≥ 40)
	Maternal age ≥ 42
	Fever ≥ 38 c
	Regional anaesthesia (epidural/ spinal/ parcervical)
	Tachysystole: more than 4 contractions in 10 mins
	Hypertonus: contractions lasting more than 90 seconds or within 60 seconds of each other
Consider INTRAPARTUM if more than one of the below present	
Gestation 41 – 41+6 weeks	Maternal age 40 – 42 years
Gestational hypertension	Fever 37.8 - 38
Gestational diabetes without complication	Abnormal maternal screening associated with fetal compromise i.e. low PAPP -A <0.4MoM
BMI 30 - 40	

Appendix 2: CTG Documentation Sticker

(order via iProc: **UCN 54292Y** "WACHS CTG BIRTHING LABEL")



Date	Time	Indication	Gestation	Antenatal	Intrapartum

	NORMAL	ABNORMAL		
		Unlikely compromise	May be compromise	Likely compromise
Baseline	110 – 160 bpm	100 – 109 bpm	>160 bpm	Bradycardia (<100 bpm for >5 mins)
Variability	6 – 25 bpm	6 – 25 bpm	3 – 5 bpm or > 25 bpm for ≥ 30 mins	<3 bpm Sinusoidal
Decelerations	none	Early Variable	Complicated variables Late Prolonged (⬇ baseline for >90 secs and <5 mins)	
Accelerations	2 in 20 mins	<2 in 20 mins		
		Absence of accelerations intrapartum is not abnormal		

	NORMAL: continue with a plan
	ABNORMAL: Senior Midwife review
	ABNORMAL: Medical review required
	ABNORMAL: Urgent Medical review

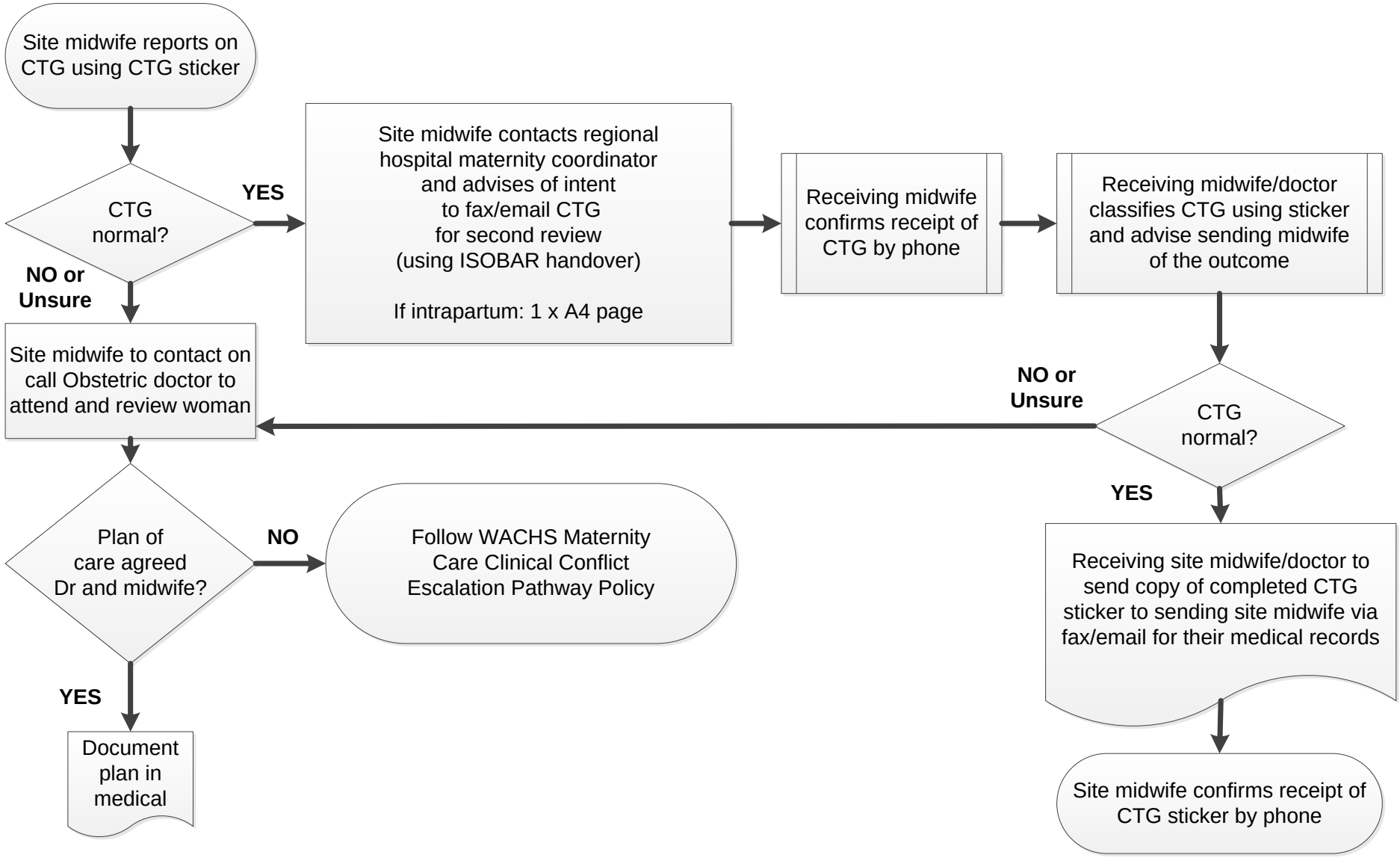
Contractions: Regular / Irregular **(circle)**

Frequency	Strength	Duration
: 10 mins	Weak /mod /strong	30 - 90 secs
More than 4 : 10		more than 90 secs

ACTION/S TAKEN	Senior Midwife review	Repeat CTG	Dr notified
Ultrasound (USS)	Syntocinon off	IV fluids	Position change
VE: progress/check cord	Fetal scalp stimulation	Fetal Blood Sampling	Tocolysis

Signed	**Print name**	**Designation**
Signed	**Print name**	**Designation**

APPENDIX 3 - Process for obtaining second clinician reviewer at one midwife sites



Appendix 4 – CTG Definitions

BASELINE FETAL HEART RATE	**The mean level of the fetal heart rate when this is stable, excluding accelerations and decelerations and contractions. It is determined over a time period of five or 10 minutes and expressed in bpm. Preterm fetuses tend to have values towards the upper end of this range.** **A progressive rise in the baseline is important as well as the absolute values.**
Normal Baseline	110–160 bpm
Baseline Bradycardia	<110 bpm
Baseline Tachycardia	>160 bpm
BASELINE VARIABILITY	**The minor fluctuations in baseline FHR** **Assessed by estimating the difference in beats per minute between the highest peak and lowest trough in a one minute segment BETWEEN contractions**.
Normal variability	6–25 bpm of the baseline fetal heart rate
Reduced variability	3–5 bpm* *Caution should be exercised in interpreting variability in the presence of an external transducer
Absent variability	< 3 bpm
Increased variability	> 25 bpm
Sinusoidal	A regular oscillation of the baseline FHR resembling a sine wave. This smooth, undulating pattern is persistent, has a relatively fixed period of 2–5 cycles per minute and an amplitude of 6–15 bpm above and below the baseline. Baseline variability is absent and there are no accelerations. **It is typically reflective of severe anaemia, with haemoglobin levels below 50 gm/L**
Accelerations	Transient increases in FHR of 15 bpm or more above the baseline and lasting 15 seconds. Accelerations in the preterm fetus may be of lesser amplitude and shorter duration. The significance of no accelerations on an otherwise normal CTG is unclear.
DECELERATIONS	**Transient episodes of decrease of FHR below the baseline of more than 15 bpm lasting at least 15 seconds, conforming to one of the patterns below:**
Early decelerations	Uniform, repetitive decrease of FHR with slow onset early in the contraction and slow return to baseline by the end of the contraction.

Variable decelerations	Repetitive or intermittent decreasing of FHR with rapid onset and recovery. Time relationships with contraction cycle may be variable but most commonly occur simultaneously with contractions
Complicated variable decelerations	**The following additional features increase the likelihood of fetal hypoxia:** • Rising baseline rate or fetal tachycardia. • Reducing baseline variability. • Slow return to baseline FHR after the end of the contraction. • Large amplitude (by 60 bpm or to 60 bpm) and/or long duration (60 seconds). • Presence of smooth post deceleration overshoots (temporary smooth increase in FHR above baseline).
Prolonged decelerations	Decrease of FHR below the baseline for longer than 90 seconds but less than five minutes.
Late decelerations	Uniform, repetitive decreasing of FHR with, usually, slow onset mid to end of the contraction and nadir more than 20 seconds after the peak of the contraction and ending after the contraction. **Late decelerations will occur with EVERY contraction as they are caused by contractions in the presence of hypoxia** **In a non-accelerative trace with baseline variability < 5 bpm, this includes decelerations of < 15 bpm amplitude**.
CONTRACTIONS	
Tachystystole	Contractions occurring more frequently than 4 in 10 minutes
Hypertonus	Contractions either lasting more than 90 seconds or occurring with less than a 60 second rest period between
Hyperstimulation **(In WACHS, the tachysystole definition differs slightly to RANZCOG for acceptable frequency of contractions to ensure minimum 60 second rest period between.)**	Oxytocin related tachysystole **or** hypertonus associated with abnormal fetal heart rate pattern