Fetal Monitoring
Webinar 4
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Presentation Outline

- Purpose of monitoring
- Fetal monitoring at routine ANC
- Antenatal CTG
- Intrapartum CTG
- Deciding on actions
- Documentation
- Investigation if baby born low apgar<7 in 5 min

Purpose

- Fetal monitoring aims to assess fetal wellbeing during viable pregnancies – antenatally and during labour.
- Clinicians should be confident in CTG interpretation and respond to the CTG pattern by applying the standardized process of interpretation, documentation, and management of cardiotocographs (CTG), in particular where variations from ‘normal’ occur.
- The goal of the assessment is to provide information that will guide decision making around whether medical intervention is required and the timing and nature thereof.
- CTGs should be interpreted in the context of the entire clinical situation, including the gestational age, fetal growth, fetal movements, and progress and stage of labour.

Figure 8-1 Fetal monitoring at routine clinic visits

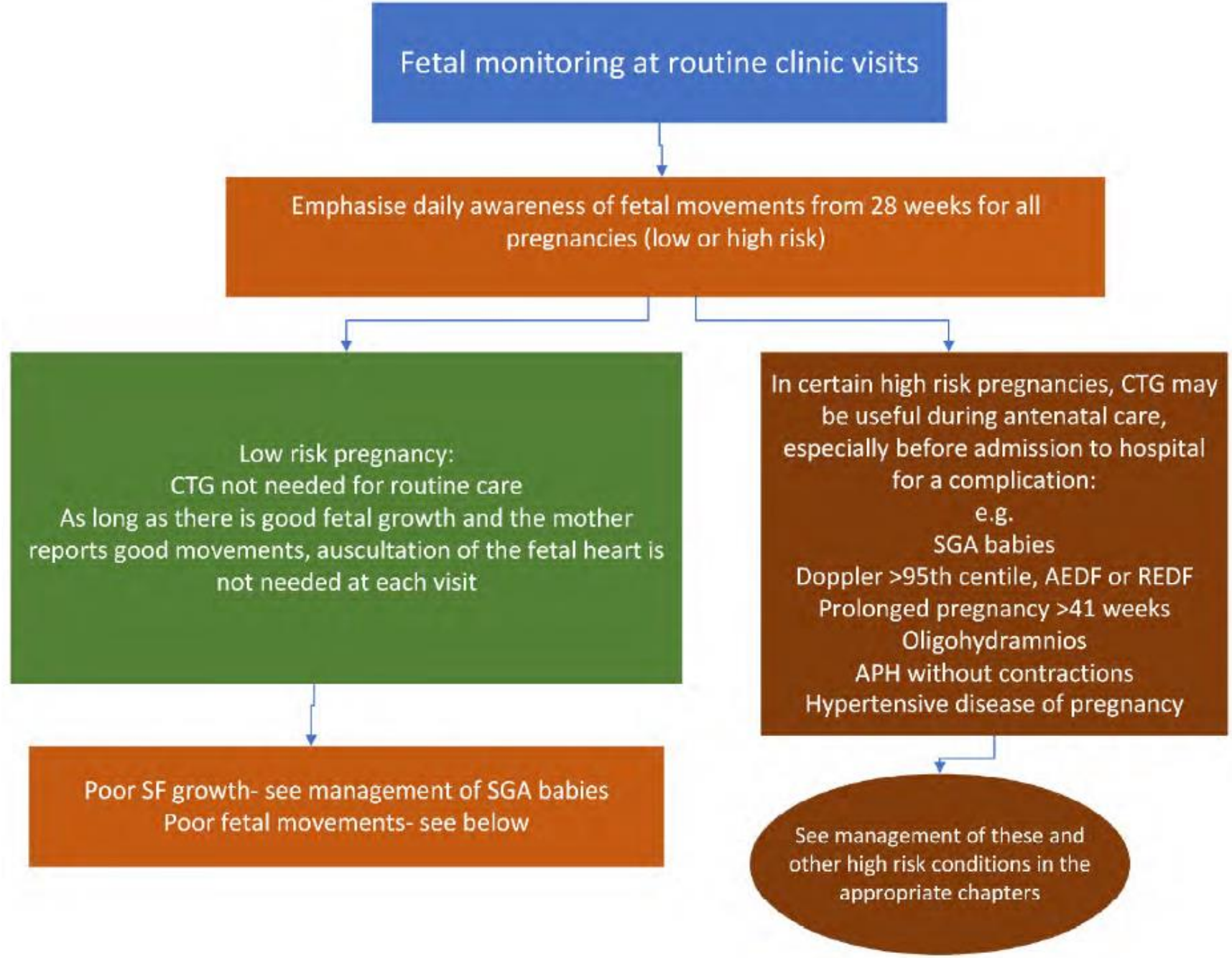
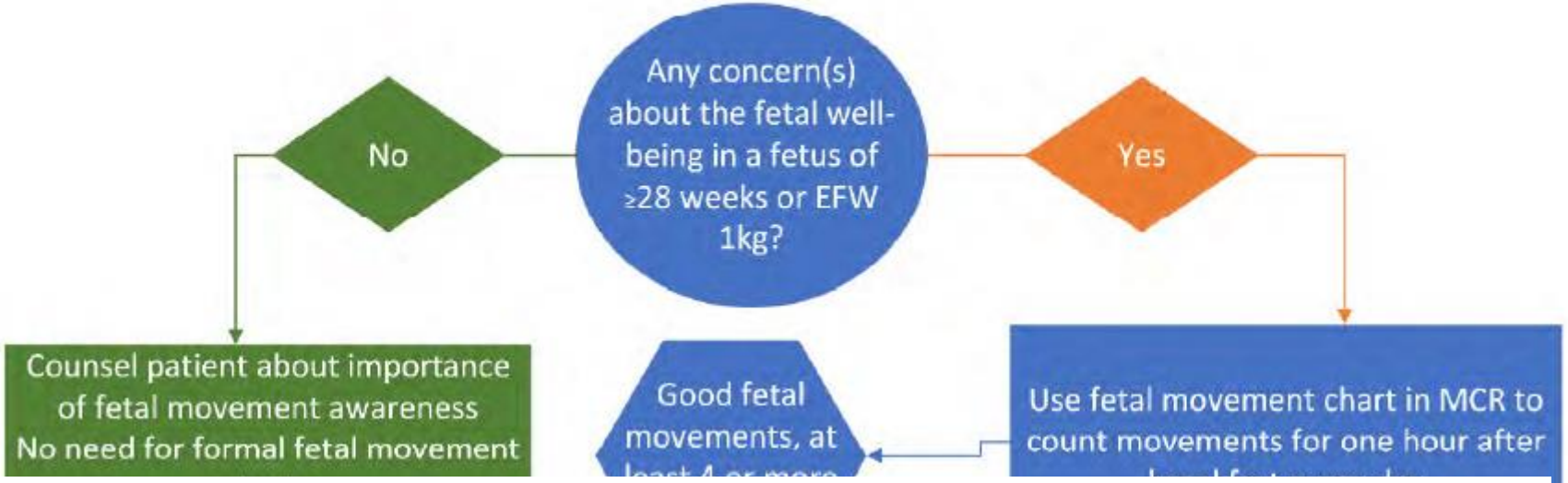


Figure 8-2 When and how do we use Fetal Movement Charts?



- Counsel woman at each visit for an urgent (same day) attendance at a health facility if there are reduced movements (less than 4 movements per that hour persist for 2 consecutive hours)

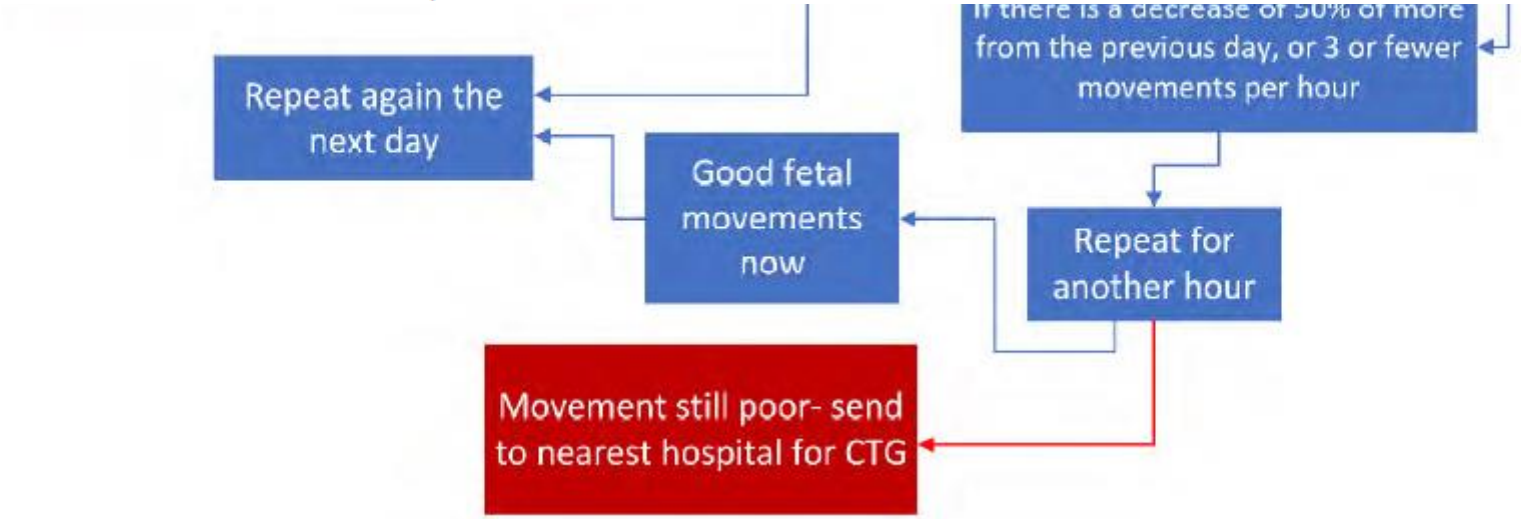
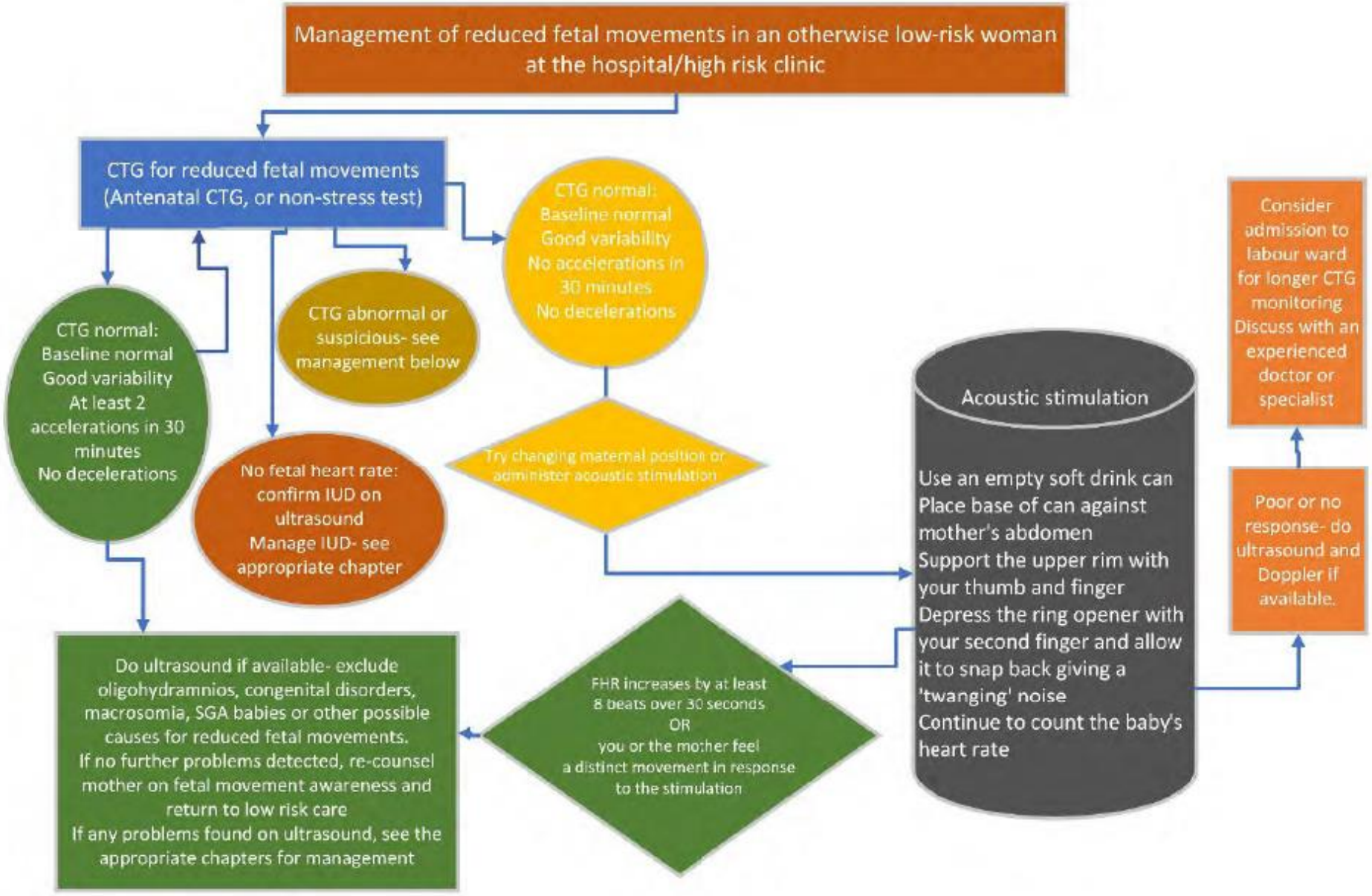


Figure 8-3 Reduced fetal movements at the hospital or high risk clinic




Coca-Cola

Antenatal CTG

- The antenatal CTG is one of the most common antenatal tests to access fetal wellbeing after 28 weeks in high risk women .
- The CTG is done in OPD after registration .
- Ask the women to if she feels normal fetal movements and check if she is documenting fetal kicks in MCR .
- The women should be in the semi-reclined position.
- An electronic fetal monitor is used to record the fetal heart rate and uterine activity.
- The recording should be conducted for at least 20 minutes and is normal if 2 accelerations are observed .
- The trace is classified as Normal or abnormal based on the 4 features of a CTG – baseline, variability, accelerations, decelerations.

Antenatal tracing

- Antenatal tracing should always contain 2 accelerations in 20min to be considered reactive.
- This indicates a fetus with a properly functioning autonomic nervous system and is good indication of fetal wellbeing.
- However, a healthy fetus may be in quiet sleep/quiescence for 40 minutes (occasionally longer)
- The CTG may have to be continued for at least 40 minutes before accelerations appear.
- The absence of accelerations of more than 40 minutes is not normal.
- The other features of the CTG along with the whole clinical information must be taken into account – are there any other abnormalities.

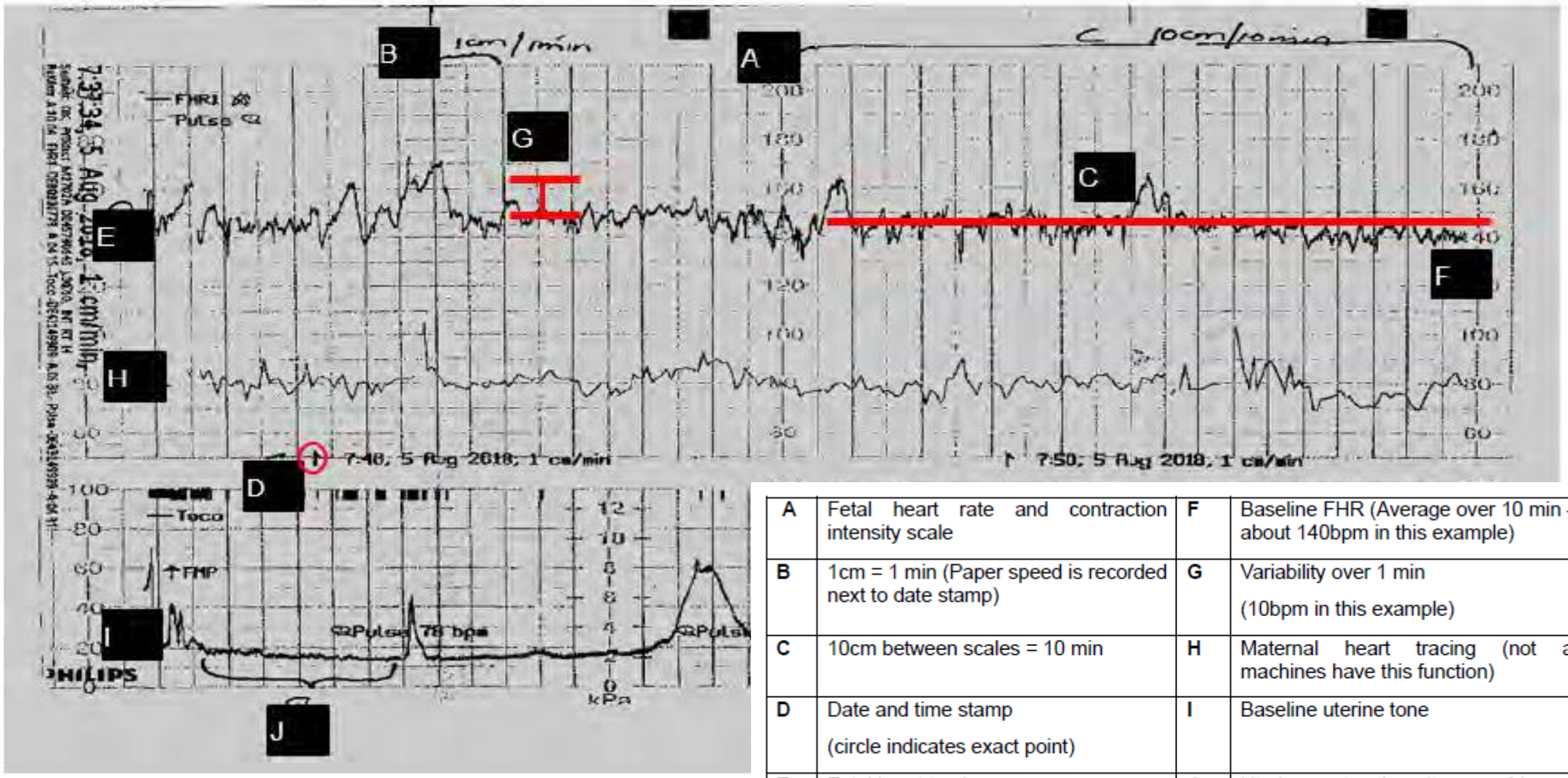
Antenatal CTG (Decelerations occurring without any contractions. Fetal decompensation at rest.
Often the first clinical sign of abruption OR End stage placental dysfunction
Indications: Diabetes ,Hypertension , IUGR ,Reduced fetal movements ,Postdates ,Twin pregnancy .

Pathological trace. Management :Ultrasound ,Doppler and delivery is indicated .

How does a CTG work?

- **CTGs are an indirect measure of several aspects of fetal health, including central nervous system function, fetal oxygenation, autonomic control of heart rate and sleep-wake cycles.**
  - These are all influenced by the condition of the baby and its in-utero environment.
- **When the baby has limited reserve, he or she may become hypoxic during uterine contractions.**
  - When oxygen deprivation occurs temporarily during labour contractions, this mechanism may cause repetitive slowing of the heart rate (decelerations)
- **Decelerations can also be due to**
  - compression of the baby's head during labour (early decelerations)
  - cord compression (variable decelerations)

Figure 8-4 Worked example of a CTG



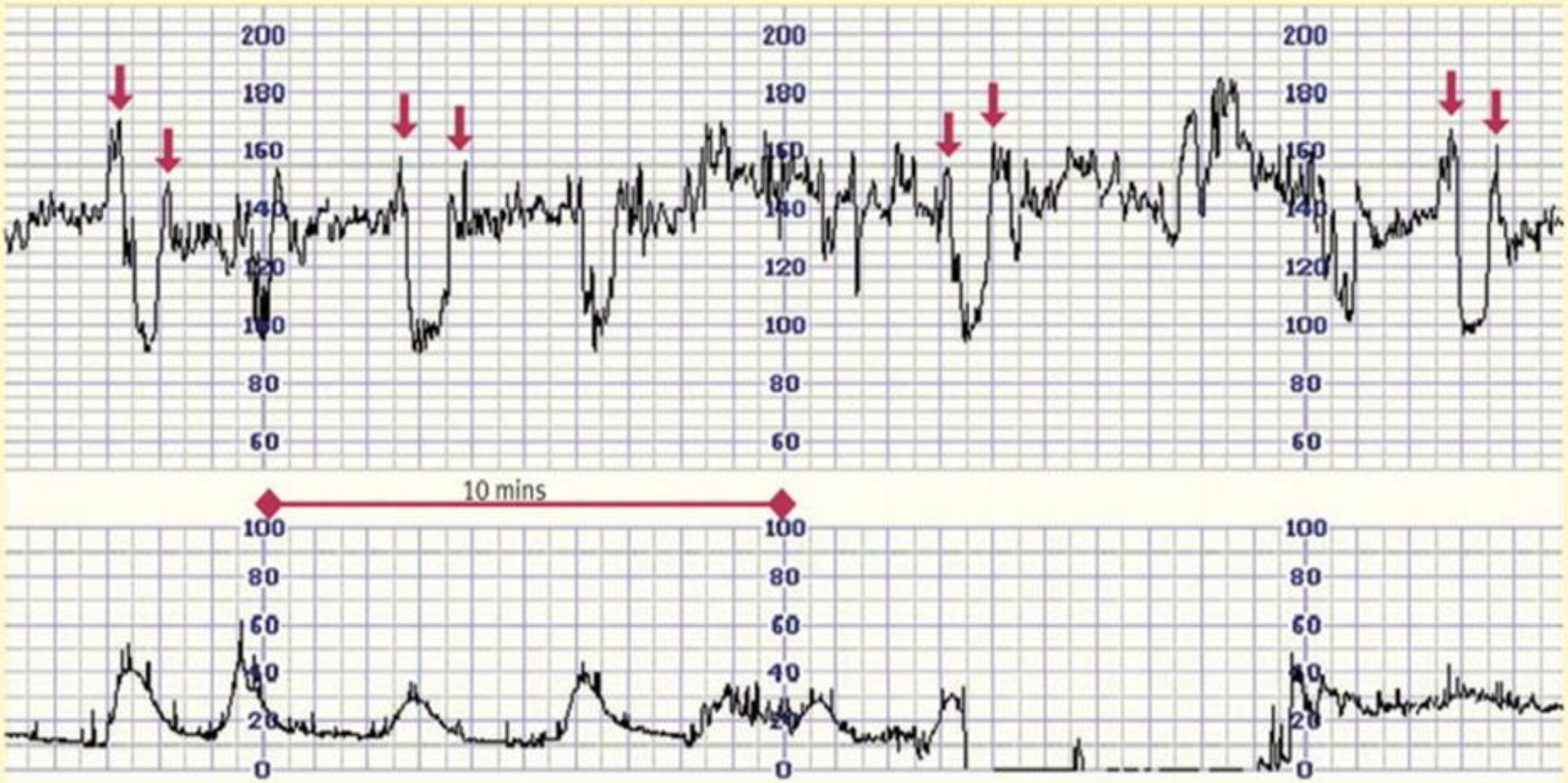
A	Fetal heart rate and contraction intensity scale	**F**	Baseline FHR (Average over 10 min – about 140bpm in this example)
B	1cm = 1 min (Paper speed is recorded next to date stamp)	**G**	Variability over 1 min (10bpm in this example)
C	10cm between scales = 10 min	**H**	Maternal heart tracing (not al machines have this function)
D	Date and time stamp (circle indicates exact point)	**I**	Baseline uterine tone
E	Fetal heart tracing	**J**	Uterine contractions (tocograph)

Table 8-1 Some Indications for intrapartum cardiotocography

The frequency of CTG monitoring required in labour may vary according to the risk factor and the stage of labour. Where CTG monitoring is intermittent, then auscultation should be used in between the periods of CTG monitoring
Vaginal bleeding during labour
Oxytocin augmentation
Meconium-stained liquor
Epidural anaesthesia
Labour after Caesarean section in a previous pregnancy
Suspected chorioamnionitis
Impaired fetal growth
Concern about FHR on auscultation or previous suspicious trace
Tachysystole (>5 contractions in 10min, FHR normal) / uterine hypertonus (contractions lasting >2min)
Maternal diabetes
Pre-eclampsia
Multiple pregnancy
Post-term pregnancy (≥42 weeks)
Stillbirth or labour-related neonatal death in previous pregnancy
Oligohydramnios prior to labour
Preterm labour <34 weeks (or EFW <2000g) (On admission to exclude fetal distress prior to tocolysis, then as indicated)
Poor progress in labour

Decelerations: features

1. Depth of deceleration . If > 45 beats from baseline heart rate
2. Duration > 60 seconds
3. Recovery : slow recovery
4. Timing : Early ,late ,variable
5. Repetitive: occur with more 50 % contractions

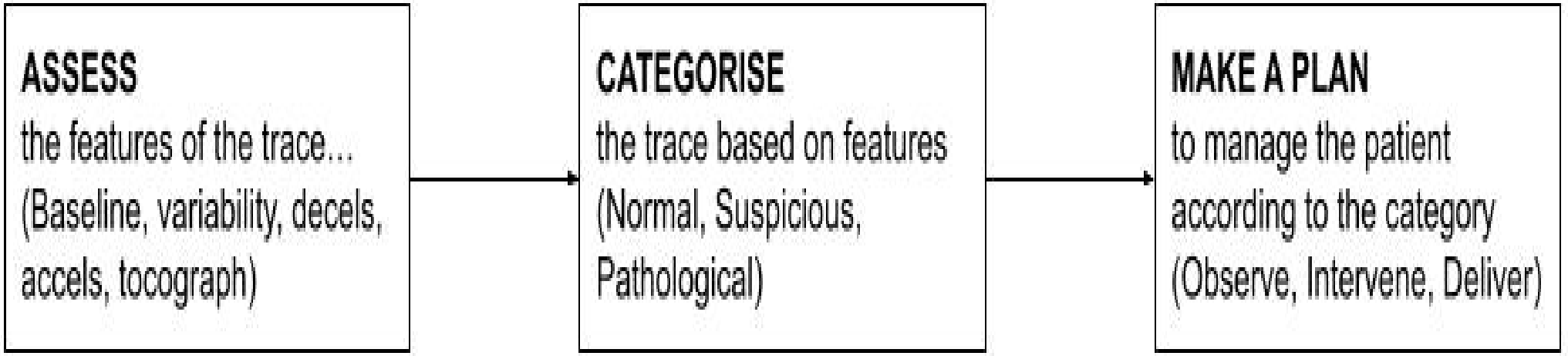


Arrows indicate 'shoulders'

Variable decelerations with concerning features

- Depth of deceleration >60 beats from baseline heart rate
- Duration > 60 seconds
- Recovery : slow recovery
- Biphasic
- Reduced variability
- Baseline drops
- Absent shouldering

CTG analysis PROCESS



Decelerations / cord compression or reduced placental perfusion

CLINICAL QUESTIONS

- What is the woman's position?
- Is the woman hypotensive?
- Has the woman just had a vaginal examination?
- Has the woman just used a bedpan?
- Has the woman been vomiting?
- Has the woman had a vasovagal episode?
- Has the woman had an epidural sited or topped up?
- Have the membranes just ruptured?

Action to take if variable decelerations

- Change maternal position
- Check the blood pressure
- Give 500ml bolus crystalloid if hypotensive (max 1L)
- Consider vaginal examination to exclude cord prolapse

CTG analysis
STEP 1 – look at each feature

Step 1: Decide whether the CTG features are Reassuring, Non-Reassuring or Abnormal

DESCRIPTION OF FEATURE	REASSURING	NON-REASSURING	ABNORMAL
Baseline (bpm)	110-160	100-109 or 161-180	Less than 100 > 5min or Greater than 180
Variability	5-25 bpm	Reduced <5 bpm for 30 to 50 min	Reduced <5 bpm for >50 min or Sinusoidal pattern
Decelerations	None or Early decelerations	Variable decelerations without concerning features	Variable decelerations with concerning features or Late decelerations or A single prolonged deceleration lasting 3 minutes or more.

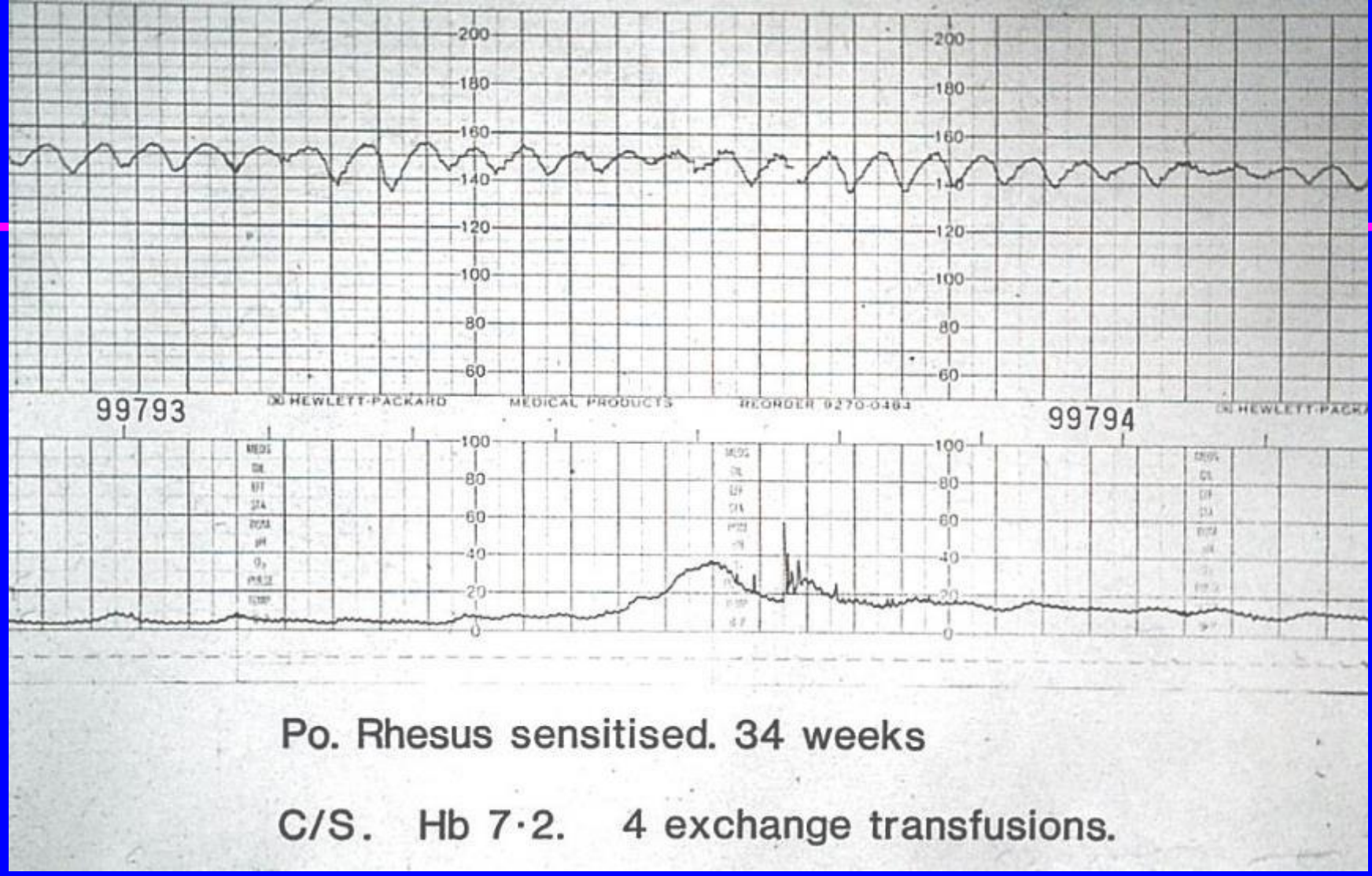
Note that this table has been simplified for practical implementation, to make it safe and understandable. Clinicians are encouraged to consult references such as the 2022 NICE Guidelines (https://www.nice.org.uk/guidance/ng229) for more detail.

CTG analysis
STEP 2 – categorise the trace

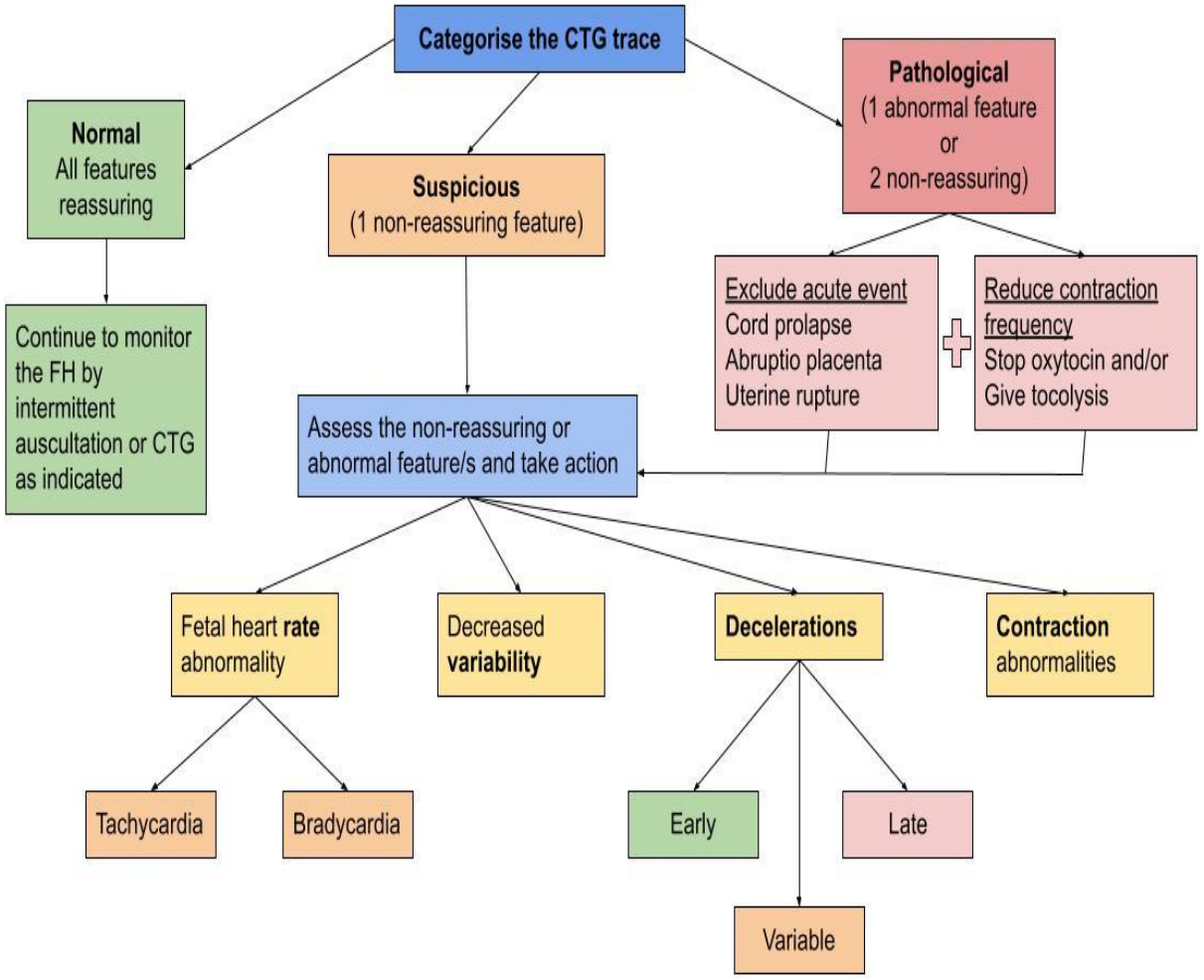
Step 2: Categorise the trace based on the presence of Reassuring, Non-Reassuring or Abnormal features.

TRACE CATEGORY	NORMAL	SUSPICIOUS	PATHOLOGICAL
CTG features	All CTG features normal	1 non-reassuring feature, others normal	2 non-reassuring features or 1 abnormal feature
Hypoxic changes?	No- all normal features	Feature UNLIKELY to be associated with fetal compromise when occurring in isolation	Features LIKELY to be associated with fetal compromise
Action required	NO further action	*OBSERVE if only 1 feature	IMMEDIATE MANAGEMENT (see flowcharts- stop induction or augmentation, give tocolysis, change position, attend to maternal compromise) OR DELIVERY if pattern persists

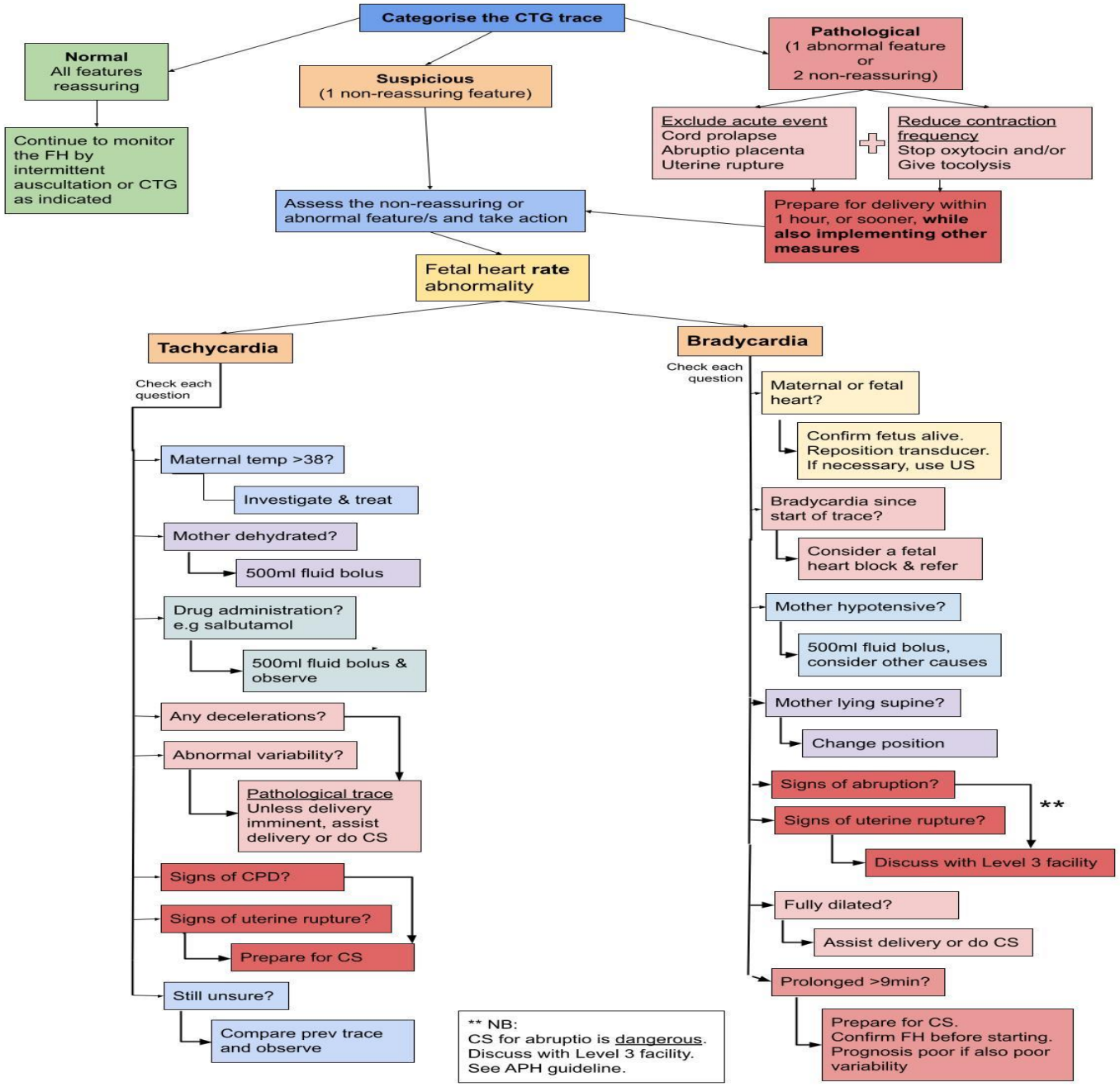
*A suspicious CTG is not an indication of fetal hypoxia. Many CTGs fall into the suspicious category, and in most cases, there is nothing wrong with the fetus. However, it is an indication for ongoing CTG monitoring to see if the CTG becomes reassuring or whether further non-reassuring or abnormal features develop.



1. No fetal movements 2. Baseline usually normal 3. Reduced variability
4. Sine-like fluctuations at 2-5 cycles per minute
= Sinusiodal CTG: iminent risk of death from anaemia (very rare)



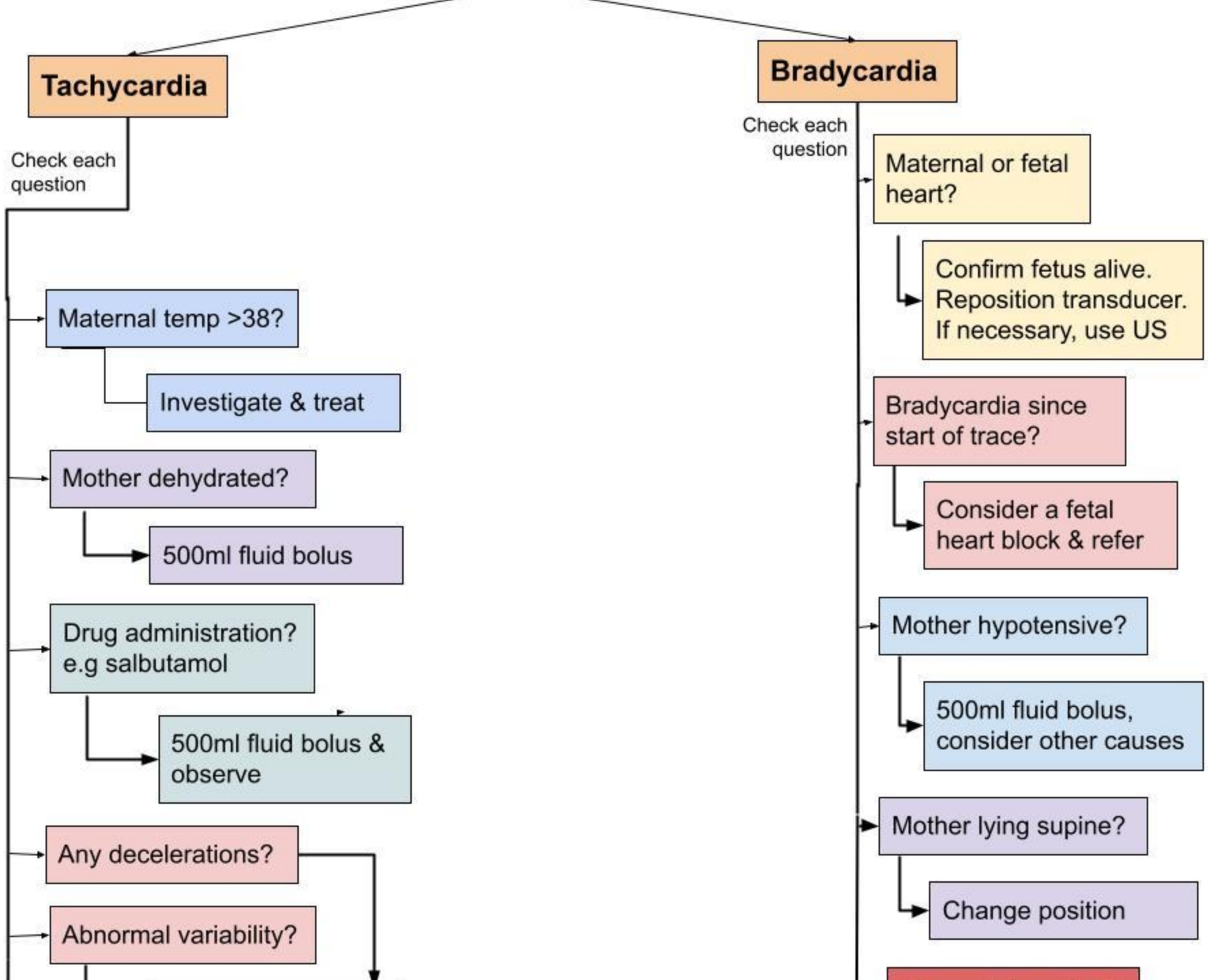
CTG analysis – CATEGORISE and DEFINE the abnormality

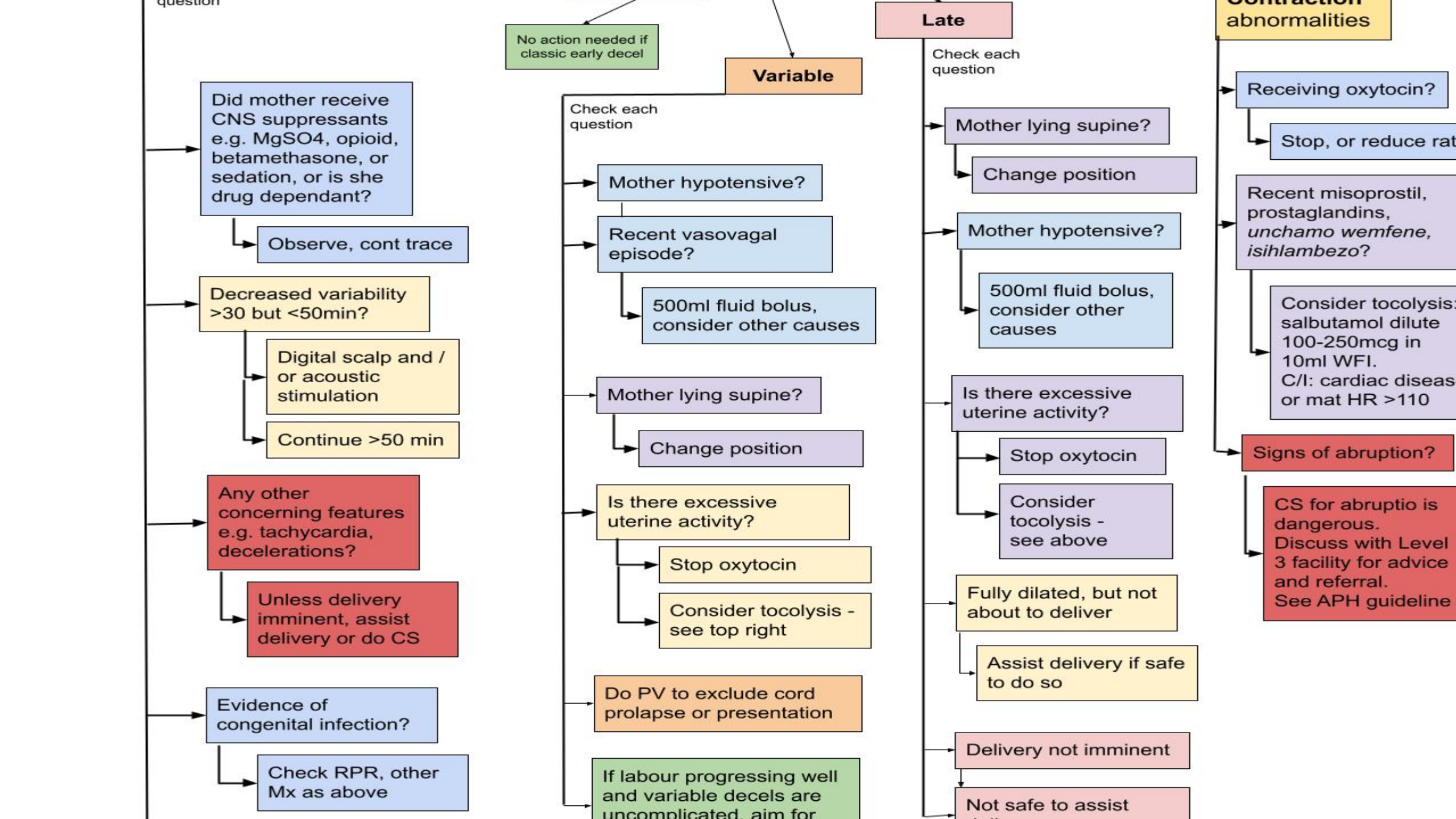


CTG analysis STEP 3 – Take action

Guide to action:

CTG with RATE ABNORMALITY


Tachycardia
Check each question
Maternal temp >38?
Investigate & treat
Mother dehydrated?
500ml fluid bolus
Drug administration? e.g salbutamol
500ml fluid bolus & observe
Any decelerations?
Abnormal variability?
Bradycardia
Check each question
Maternal or fetal heart?
Confirm fetus alive. Reposition transducer. If necessary, use US
Bradycardia since start of trace?
Consider a fetal heart block & refer
Mother hypotensive?
500ml fluid bolus, consider other causes
Mother lying supine?
Change position


No action needed if classic early decel
Variable
Late
Contraction abnormalities
Check each question
Did mother receive CNS suppressants e.g. MgSO4, opioid, betamethasone, or sedation, or is she drug dependant?
Observe, cont trace
Decreased variability >30 but <50min?
Digital scalp and / or acoustic stimulation
Continue >50 min
Any other concerning features e.g. tachycardia, decelerations?
Unless delivery imminent, assist delivery or do CS
Evidence of congenital infection?
Check RPR, other Mx as above
Mother hypotensive?
Recent vasovagal episode?
500ml fluid bolus, consider other causes
Mother lying supine?
Change position
Is there excessive uterine activity?
Stop oxytocin
Consider tocolysis - see top right
Do PV to exclude cord prolapse or presentation
If labour progressing well and variable decels are
Mother lying supine?
Change position
Mother hypotensive?
500ml fluid bolus, consider other causes
Is there excessive uterine activity?
Stop oxytocin
Consider tocolysis - see above
Fully dilated, but not about to deliver
Assist delivery if safe to do so
Delivery not imminent
Not safe to assist
Receiving oxytocin?
Stop, or reduce rat
Recent misoprostil, prostaglandins, unchamo wemfene, isihlambezo?
Consider tocolysis: salbutamol dilute 100-250mcg in 10ml WFI.
C/I: cardiac diseas or mat HR >110
Signs of abruption?
CS for abruptio is dangerous.
Discuss with Level 3 facility for advice and referral.
See APH guideline

Uterine Hyperstimulation

CLINICAL QUESTIONS

- Is the woman receiving oxytocin?
- Has the woman recently received prostaglandins?
- Has she taken misoprostol/traditional medication?

Deciding on action

- **DR C BRAVADO:** DR -define risk, C -contracions ,Bra- Baseline rate ,V- variability ,D-decelerations O –Overall impression
- Define Risk /predisposing factor e.g Previous CS, Diabetic /Pre eclampsia
- Any precipitating event eg uterine rupture, abruption or APH
- How far is progress of labour?

Before you start the CTG…

Important general principles

- Always talk to the woman and her birth companion(s) about what is happening and take her preferences into account. Explain what the CTG does and what your findings are.
- **The CTG should never be interpreted in isolation from the patient.**
  - Do not make any decision about a woman's care in labour based on cardiotocography findings alone - take into account any antenatal and intrapartum risk factors, the current wellbeing of the woman and unborn baby and, intrapartum, the progress of labour.
  - The CTG is never a substitute for good clinical observation and judgement.
- Ensure that the focus of care remains on the woman rather than the cardiotocography trace.
- A running CTG is never a reason to leave the woman unattended during labour. Continue observations and support.
- It is common for the FHR to drop during expulsive efforts in the second stage. This is a vagal response to pressure on the head. Focus on the FHR immediately after the contraction – has it recovered to baseline? If it has and there is no other reason to intervene, continue expectant management.

4 CTG tips

1. If it is difficult to categorise or interpret a cardiotocography trace, obtain a review by a more senior and experienced midwife or a medical officer.
2. If there is doubt about the significance of a finding compare it to previous tracings.
3. When in doubt, continue the tracing until it becomes clear whether there is cause for concern or not.
4. Always document your interpretation of the CTG trace (see Documentation, below)

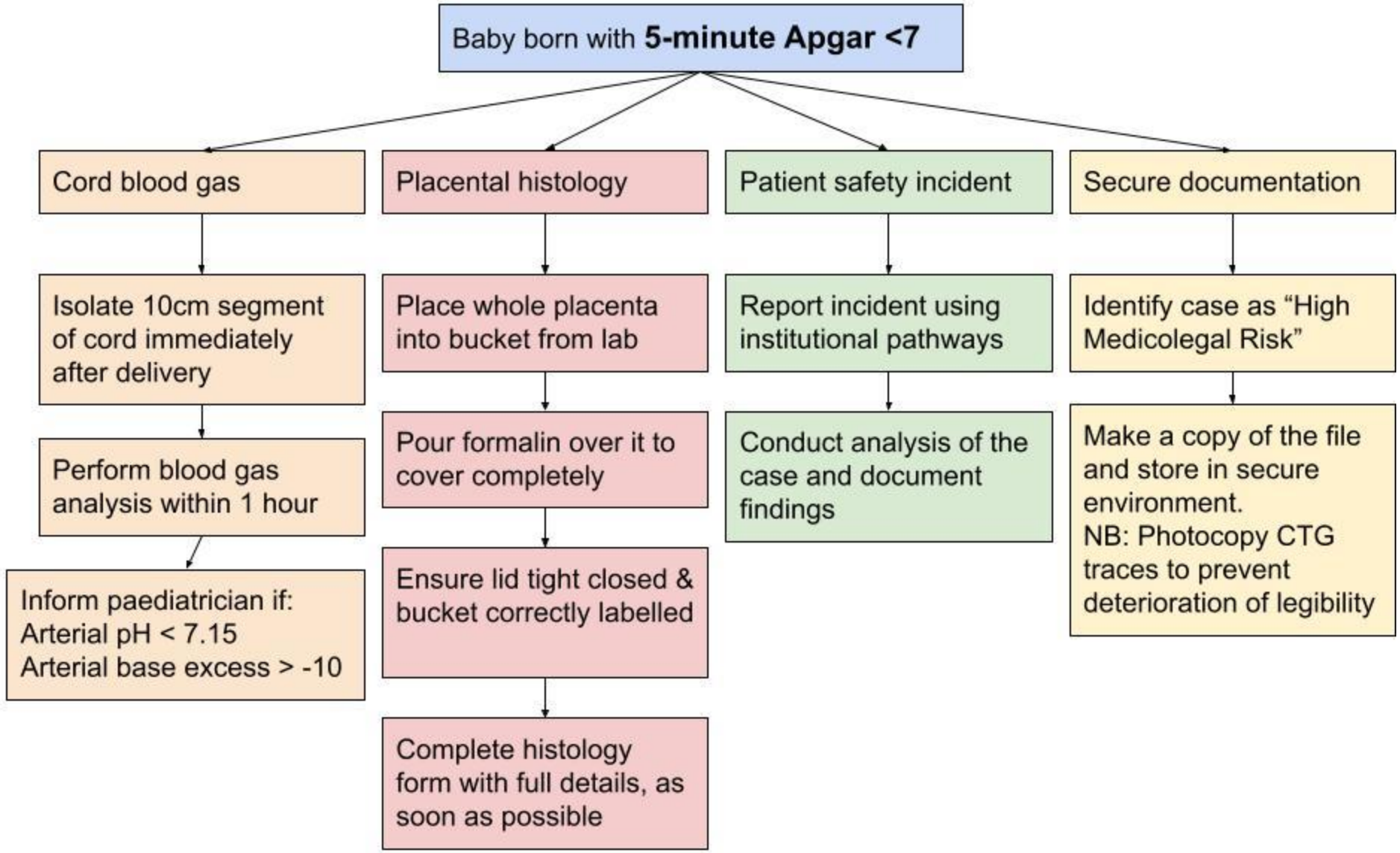
CARDIOTOCOGRAPHY (CTG) (FIGO 2015) – CTG ONLY INDICATED FOR HIGH RISK PREGNANCIES

DD/MM/YYYY: 04/05/2022	HH/MM: 11h44	Indication: Hypertension	Mat pulse: 98bpm

Refer to page:	Normal	Suspicious	Pathological (any one feature)
Baseline	110-160 bpm ☐ 155bpm	Reduced variability for 40minutees	<100 bpm ☐ (make sure it is not maternal pulse)
Variability	5-25 bpm ☐		Reduced (<5 bpm) variability >50 minutes ☐
Decelerations	No repetitive* decelerations ☐ (*Decelerations are repetitive in nature when they are associated with more than 50% of uterine contractions)	Lacking at least one characteristic of normality, but no pathological features ☐ AND variable decels TWO suspicious features therefore PATHOLOGICAL	Repetitive* late decelerations ☐ OR Prolonged (>3min) decelerations during >30 minutes ☐ OR Prolonged (>3min) decelerations during >20 minutes with reduced variability ☐ OR One prolonged deceleration >5 minutes ☐
Interpretation	Fetus with no hypoxia	low probability of hypoxia	Fetus with high probability of hypoxia/acidosis
Contractions	None ☐ Irregular ☑ Regular ☐ Mild ☐ Moderate ☐ Strong ☐ Expulsive ☐		
Clinical management:	No intervention necessary ☐	Action to correct reversible causes if identified ☐ Alert doctor of findings ☐	LL position, fluid bolus 500ml, salbutamol 100mcg, Immediate action to correct reversible causes ☑ If not possible, or no recovery; immediate delivery ☐ Call doctor immediately ☑ prepare for CS if no improvement

I have explained the nature of the findings and planned action to the person and her birth companion ☑

Evaluation done by: Mrs Caring Midwife


Baby born with **5-minute Apgar <7**
Cord blood gas
Isolate 10cm segment of cord immediately after delivery
Perform blood gas analysis within 1 hour
Inform paediatrician if:
Arterial pH < 7.15
Arterial base excess > -10
Placental histology
Place whole placenta into bucket from lab
Pour formalin over it to cover completely
Ensure lid tight closed & bucket correctly labelled
Complete histology form with full details, as soon as possible
Patient safety incident
Report incident using institutional pathways
Conduct analysis of the case and document findings
Secure documentation
Identify case as “High Medicolegal Risk”
Make a copy of the file and store in secure environment.
NB: Photocopy CTG traces to prevent deterioration of legibility

Thank you