Intrapartum FHR monitoring interpretation (NICE Guideline)

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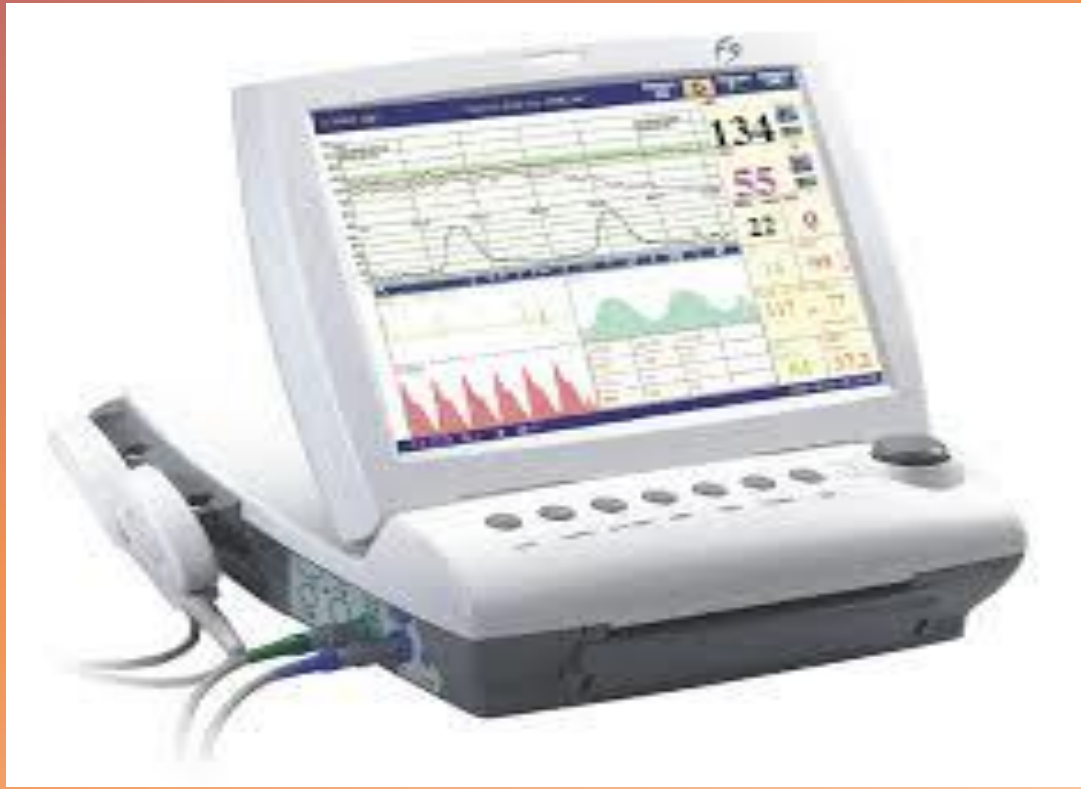
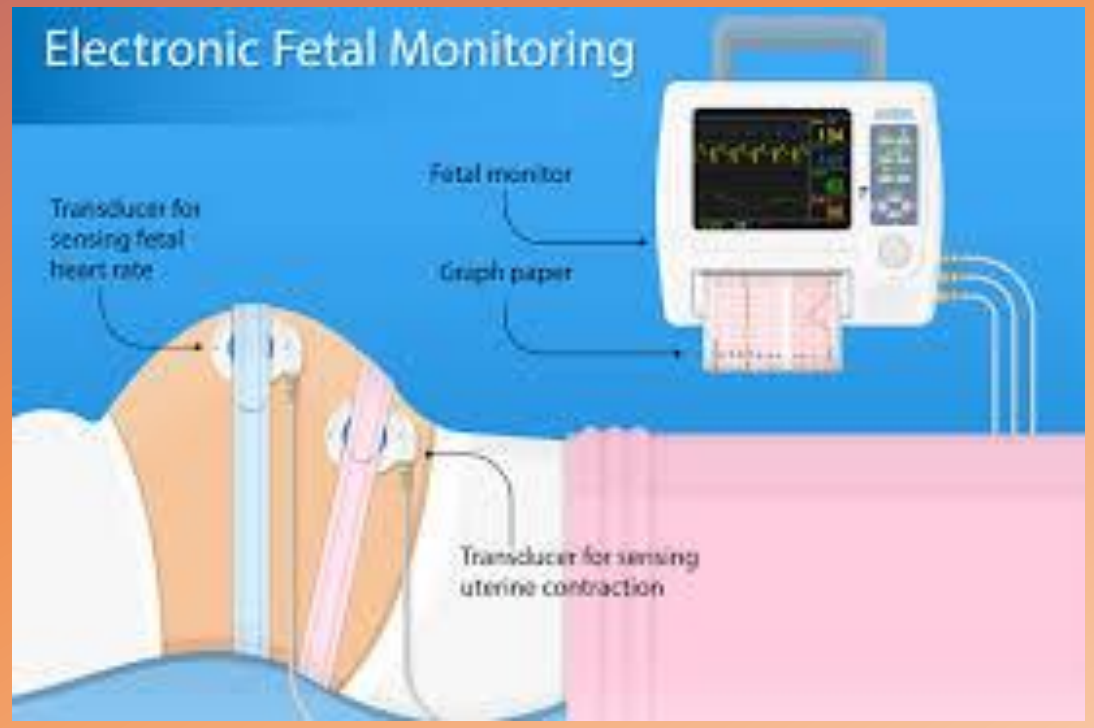


- Be aware that for women at low risk of complications there is insufficient evidence about whether cardiotocography as part of the initial assessment either improves outcomes or results in harm for women and their babies, compared with intermittent auscultation alone.



Measuring fetal heart rate as part of initial assessment

- Use either a Pinard stethoscope or doppler ultrasound.
- Carry out intermittent auscultation immediately after a contraction for at least 1 minute, at least every 15 minutes, and record it as a single rate.
- Record accelerations and decelerations if heard.
- Palpate the maternal pulse hourly, or more often if there are any concerns, to differentiate between the maternal and fetal heartbeats

If there is a rising baseline fetal heart rate or decelerations are suspected on intermittent auscultation, actions should include

- carrying out intermittent auscultation more frequently, for example after 3 consecutive contractions initially
- thinking about the whole clinical picture, including the woman's position and hydration, the strength and frequency of contractions and maternal observations.

If a rising baseline or decelerations are confirmed, further actions should include:

- continuous cardiotocography, and explaining to the woman and her birth companion(s) why it is needed

Advise continuous cardiotocography if any of the following risk factors are present at initial assessment or arise during labor:

- maternal pulse over 120 beats/minute on 2 occasions 30 minutes apart
- temperature of 38°C or above on a single reading, or 37.5°C or above on 2 consecutive occasions 1 hour apart
- suspected chorioamnionitis or sepsis
- pain reported by the woman that differs from the pain normally associated with contractions
- the presence of significant meconium
- fresh vaginal bleeding that develops in labor

- severe hypertension: measured between contractions
- hypertension: either systolic blood pressure of 140 mmHg or more or diastolic blood pressure of 90 mmHg or more on 2 consecutive readings taken 30 minutes apart, measured between contractions
- a reading of 2+ of protein on urinalysis and a single reading of either raised systolic blood pressure or raised diastolic blood pressure
- confirmed delay in the first or second stage of labour
- contractions that last longer than 60 seconds (hypertonus), or more than 5 contractions in 10 minutes (tachysystole)
- oxytocin use

- Do not offer continuous cardiotocography to women who have nonsignificant meconium if there are no other risk factors.

- If continuous cardiotocography has been started because of concerns arising from intermittent auscultation, but the trace is normal after 20 minutes, return to intermittent auscultation unless the woman asks to stay on continuous cardiotocography

Overall care

- Make a documented systematic assessment of the condition of the woman and unborn baby (including CTG findings) every hour, or more frequently if there are concerns.
- Do not make any decision about a woman's care in labor on the basis of CTG findings alone.
- When reviewing the CTG trace, assess and document contractions and all 4 features of fetal heart rate.
- If it is difficult to categorize or interpret a CTG trace, obtain a review by a senior midwife or a senior obstetrician.

Baseline fetal heart rate

- **reassuring:**

110 to 160 beats/minute

- **non-reassuring:**

100 to 109 beats/minute

161 to 180 beats/minute

- **abnormal:**

below 100 beats/minute

above 180 beats/minute

Take the following into account when assessing baseline fetal heart rate:

- differentiate between fetal and maternal heartbeats
- a baseline fetal heart rate between 100 and 109 beats/minute is a non-reassuring feature, continue usual care if there is normal baseline variability and no variable or late decelerations.

Baseline variability
Use the following categorizations:

- **reassuring:**

5 to 25 beats/minute

- **non-reassuring:** less than 5 beats/minute for 30 to 50 minutes

more than 25 beats/minute for 15 to 25 minutes

- **abnormal:** less than 5 beats/minute for more than 50 minutes

more than 25 beats/minute for more than 25 minutes, sinusoidal.

- Take the following into account when assessing fetal heart rate baseline variability:

**intermittent periods of reduced baseline variability are normal, especially during periods of quiescence

When describing decelerations in fetal heart rate, specify:

- their timing in relation to the peaks of the contractions
- the duration of the individual decelerations
- whether or not the fetal heart rate returns to baseline
- how long they have been present for
- whether they occur with over 50% of contractions
- the presence or absence of a biphasic (W) shape
- the presence or absence of shouldering
- the presence or absence of reduced variability within the deceleration.

Use the following categorizations for decelerations in fetal heart rate:

Reassuring:

- no decelerations
- early decelerations
- variable decelerations with no concerning characteristics for less than 90 minutes

non-reassuring:

- variable decelerations with no concerning characteristics for 90 minutes or more
- variable decelerations with any concerning characteristics in up to 50% of contractions for 30 minutes or more
- variable decelerations with any concerning characteristics in over 50% of contractions for less than 30 minutes
- late decelerations in over 50% of contractions for less than 30 minutes, with no maternal or fetal clinical risk factors such as vaginal bleeding or significant meconium

abnormal:

- variable decelerations with any concerning characteristics in over 50% of contractions for 30 minutes (or less if there are any maternal or fetal clinical risk factors)
- late decelerations for 30 minutes (or less if there are any maternal or fetal clinical risk factors)
- acute bradycardia, or a single prolonged deceleration lasting 3 minutes or more.

Regard the following as concerning characteristics of variable decelerations:

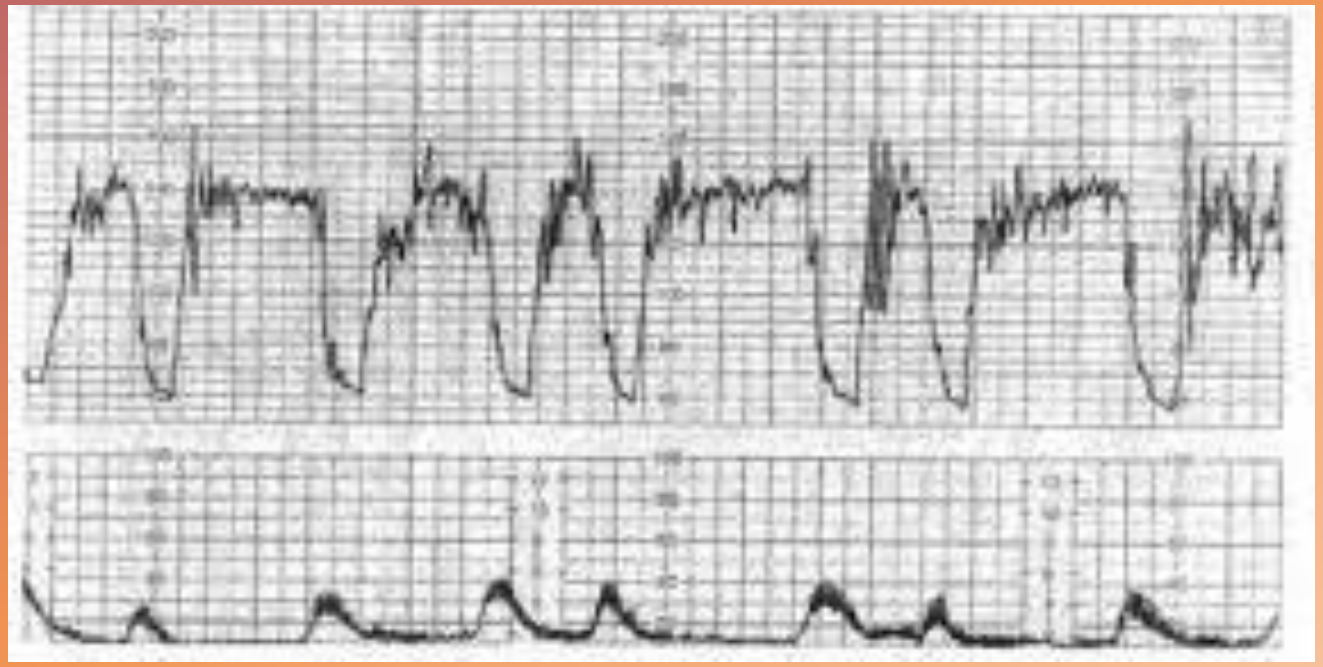
*lasting more than 60 seconds

* reduced baseline variability within the deceleration

* failure to return to baseline

*biphasic (W) shape

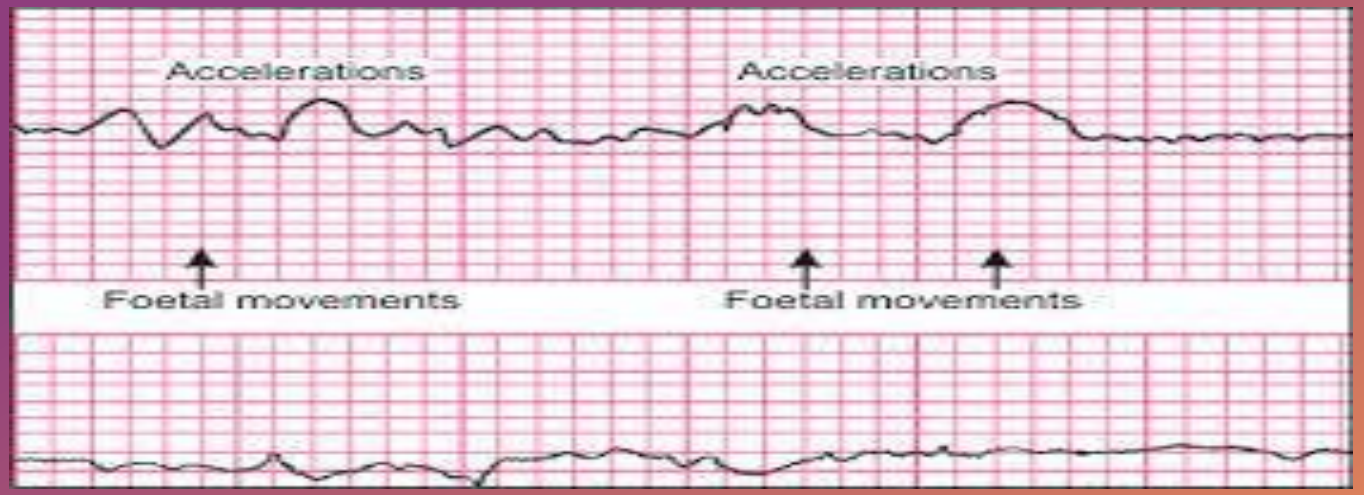
* no shouldering.



Take the following into account when assessing decelerations in fetal heart rate

- early decelerations are uncommon, benign and usually associated with head compression
- early decelerations with no non-reassuring or abnormal features on the cardiotocograph trace should not prompt further action.

Take into account that the longer and later the individual decelerations, the higher the risk of fetal acidosis (particularly if the decelerations are accompanied by tachycardia or reduced baseline variability).



- **the presence of fetal heart rate accelerations, even with reduced baseline variability, is generally a sign that the baby is healthy**

the absence of accelerations on an otherwise normal cardiotocograph trace does not indicate fetal acidosis.

Categorise cardiotocography traces as follows:

normal: all features are reassuring

suspicious: 1 non-reassuring feature and 2 reassuring features (but note that if accelerations are present, fetal acidosis is unlikely)

pathological: 1 abnormal feature or 2 non-reassuring features.

- **Need for urgent intervention :** Acute bradycardia, or a single prolonged deceleration for 3 minutes or more

If the cardiotocograph trace is categorized as pathological

- obtain a review by an obstetrician and a senior

exclude acute events (for example, cord prolapse, suspected placental abruption or suspected uterine rupture)

- correct any underlying causes, such as hypotension or uterine hyperstimulation
- start one or more conservative measures
- talk to the woman and her birth companion(s) about what is happening and take her preferences into account.

- **If the cardiotocograph trace is still pathological after implementing conservative measures:**

obtain a further review by an obstetrician

offer digital fetal scalp stimulation and document the outcome.

If the cardiotocograph trace is still pathological after fetal scalp stimulation, consider:

fetal blood sampling

or

expediting the birth.

Take the woman's preferences into account.

If the cardiotocograph trace is categorized as suspicious

- correct any underlying causes, such as hypotension or uterine hyperstimulation
- perform a full set of maternal observations
- start one or more conservative measures
- inform an obstetrician or a senior
- document a plan for reviewing the whole clinical picture and the cardiotocography findings

If the cardiotocograph trace is categorized as normal

- continue cardiotocography (unless it was started because of concerns arising from intermittent auscultation and there are no ongoing risk factors;
- talk to the woman and her birth companion(s) about what is happening.

Conservative measures

encourage the woman to mobilize or adopt an alternative position (and to avoid being supine)

- offer intravenous fluids if the woman is hypotensive
- reduce contraction frequency by: reducing or stopping oxytocin if it is being used and/or offering a tocolytic drug (a suggested regimen is subcutaneous terbutaline 0.25 mg)

Inform a senior midwife or an obstetrician whenever conservative measures are implemented.

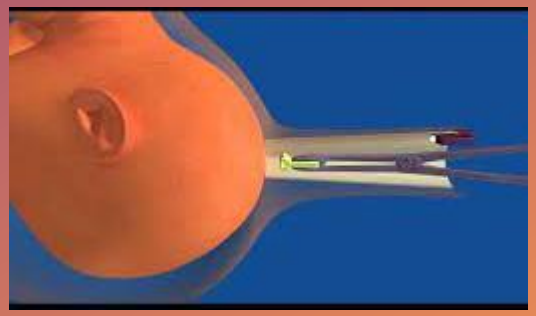
Intrauterine resuscitation

- Do not use maternal facial oxygen therapy for intrauterine fetal resuscitation, because it may harm the baby (but it can be used where it is administered for maternal indications such as hypoxia or as part of preoxygenation before a potential anaesthetic).
- Do not offer amnioinfusion for intrauterine fetal resuscitation.

Fetal scalp stimulation

- If the cardiotocograph trace is pathological offer digital fetal scalp stimulation.
- If digital fetal scalp stimulation (during vaginal examination) leads to an acceleration in fetal heart rate, regard this as a sign that the baby is healthy.
- Take this into account when reviewing the whole clinical picture.

Fetal blood sampling



Do not carry out fetal blood sampling if:

- there is an acute event (for example, cord prolapse, suspected placental abruption or suspected uterine rupture) or
- contraindications are present, including risk of maternal-to-fetal transmission of infection or risk of fetal bleeding disorders.

Be aware that for women with sepsis or significant meconium fetal blood sample results may be falsely reassuring, and always discuss with a consultant obstetrician:

whether fetal blood sampling is appropriate

any results from the procedure if carried out.

Before carrying out or repeating fetal blood sampling, start conservative measures and offer digital fetal scalp stimulation

Only continue with fetal blood sampling if the cardiotocograph trace remains pathological

- pH:

normal: 7.25 or above

borderline: 7.21 to 7.24

abnormal: 7.20 or below or

- lactate: normal: 4.1 mmol/l or below

borderline: 4.2 to 4.8 mmol/l

abnormal: 4.9 mmol/l or above.

Interpret fetal blood sample results taking into account:

- any previous pH or lactate measurement
- the clinical features of the woman and baby, such as rate of progress in labour.

If the fetal blood sample result is abnormal:

- expedite the birth

If the fetal blood sample result is borderline

- and there are no accelerations in response to fetal scalp stimulation,

consider taking a second fetal blood sample no more than 30 minutes later if this is still indicated by the cardiotocograph trace.

If the fetal blood sample result is normal

- and there are no accelerations in response to fetal scalp stimulation,

consider taking a second fetal blood sample no more than 1 hour later if this is still indicated by the cardiotocograph trace.

- Discuss with a consultant obstetrician if a third fetal blood sample is thought to be needed.

When a fetal blood sample cannot be obtained

- If fetal blood sampling is attempted and a sample cannot be obtained, but the associated fetal scalp stimulation results in a fetal heart rate acceleration, decide whether to continue the labour or expedite the birth in light of the clinical circumstances and in discussion with the woman and a senior obstetrician.
- If fetal blood sampling is attempted but a sample cannot be obtained and there has been no improvement in the cardiotocograph trace, expedite the birth

Need for urgent intervention

- Urgently seek obstetric help
- If there has been an acute event (for example, cord prolapse, suspected placental abruption or suspected uterine rupture), expedite the birth
- Correct any underlying causes, such as hypotension or uterine hyperstimulation
- Start 1 or more conservative measures
- Make preparations for an urgent birth
- Talk to the woman and her birth companion(s) about what is happening and take her preferences into account
- **Expedite the birth if the acute bradycardia persists for 9 minutes**
- **If the fetal heart rate recovers at any time up to 9 minutes, reassess any decision to expedite the birth, in discussion with the woman**
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Description of cardiotocograph trace features

Description	Baseline (beats/ minute)	Baseline variability (beats/ minute)	Deceleration
Reassuring	110 to 160	5 to 25	None or early Variable decelerations with no concerning characteristics* for less than 90 minutes
Non-reassuring	100 to 109** **or** 161 to 180	Less than 5 for 30 to 50 minutes **or** More than 25 for 15 to 25 minutes	Variable decelerations with no concerning characteristics* for 90 minutes or more **or** Variable decelerations with any concerning characteristics* in up to 50% of contractions for 30 minutes or more **or** Variable decelerations with any concerning characteristics* in over 50% of contractions for less than 30 minutes **or** Late decelerations in over 50% of contractions for less than 30 minutes, with no maternal or fetal clinical risk factors such as vaginal bleeding or significant meconium

Description	Baseline (beats/ minute)	Baseline variability (beats/ minute)	Deceleration
Abnormal	Below 100 **or** Above 180	Less than 5 for more than 50 minutes **or** More than 25 for more than 25 minutes **or** Sinusoidal	Variable decelerations with any concerning characteristics* in over 50% of contractions for 30 minutes (or less if any maternal or fetal clinical risk factors [see above]) **or** Late decelerations for 30 minutes (or less if any maternal or fetal clinical risk factors) **or** Acute bradycardia, or a single prolonged deceleration lasting 3 minutes or more

* Regard the following as concerning characteristics of variable decelerations: lasting more than 60 seconds; reduced baseline variability within the deceleration; failure to return to baseline; biphasic (W) shape; no shouldering.

** Although a baseline fetal heart rate between 100 and 109 beats/minute is a non-reassuring feature, continue usual care if there is normal baseline variability and no variable or late decelerations.

Management based on interpretation of cardiotocograph traces

Category	Definition	Management
Normal	All features are reassuring	• Continue CTG (unless it was started because of concerns arising from intermittent auscultation and there are no ongoing risk factors; see recommendation 1.10.8) and usual care • Talk to the woman and her birth companion(s) about what is happening
Suspicious	1 non-reassuring feature **and** 2 reassuring features	• Correct any underlying causes, such as hypotension or uterine hyperstimulation • Perform a full set of maternal observations • Start 1 or more conservative measures* • Inform an obstetrician **or** a senior midwife • Document a plan for reviewing the whole clinical picture and the CTG findings • Talk to the woman and her birth companion(s) about what is happening and take her preferences into account

Category	Definition	Management
Pathological	1 abnormal feature **or** 2 non-reassuring features	• Obtain a review by an obstetrician **and** a senior midwife • Exclude acute events (for example, cord prolapse, suspected placental abruption or suspected uterine rupture) • Correct any underlying causes, such as hypotension or uterine hyperstimulation • Start 1 or more conservative measures* • Talk to the woman and her birth companion(s) about what is happening and take her preferences into account • If the cardiotocograph trace is still pathological after implementing conservative measures: • obtain a further review by an obstetrician **and** a senior midwife • offer digital fetal scalp stimulation (see recommendation 1.10.38) and document the outcome • If the cardiotocograph trace is still pathological after fetal scalp stimulation: • consider fetal blood sampling • consider expediting the birth • take the woman's preferences into account

Category	Definition	Management
Need for urgent intervention	Acute bradycardia, or a single prolonged deceleration for 3 minutes or more	• Urgently seek obstetric help • If there has been an acute event (for example, cord prolapse, suspected placental abruption or suspected uterine rupture), expedite the birth • Correct any underlying causes, such as hypotension or uterine hyperstimulation • Start 1 or more conservative measures* • Make preparations for an urgent birth • Talk to the woman and her birth companion(s) about what is happening and take her preferences into account • Expedite the birth if the acute bradycardia persists for 9 minutes • If the fetal heart rate recovers at any time up to 9 minutes, reassess any decision to expedite the birth, in discussion with the woman

Thank you all