# TREATMENT OF ACUTE FETAL BRADYCARDIA

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| **TARGET AUDIENCE** | All Midwifery and Medical Staff providing maternity care in NHS Lanarkshire. |
| **PATIENT GROUP** | All pregnant women booked for maternity care within NHS Lanarkshire |

## Clinical Guidelines Summary

Bradycardia

| Time | Action |
|---|---|
| 0-3 mins | Differentiate between maternal and fetal heart rate |
| 3-6 mins | • Call for help (2222 and ask for 'obstetric emergency' call<br>• Assess for underlying causes (see box 1)<br>• If acute event (see box 2), perform immediate emergency birth<br>• ABCDE assessment and calculate MEOWS score<br>• Start conservative measures (see box 3)<br>• Consider terbutaline |
| 6-9 mins | • IV access<br>• Send bloods including group and save<br>• Consider IV fluids if evidence of maternal hypotension or sepsis |
| Over 9 mins | • Perform emergency birth<br>• Consider neonatal emergency call |

Box 1 (underlying causes):

- Maternal position
- Maternal hypotension
- Epidural/local anaesthtic/other drugs
- Uterine tachysystole

Box 2 (acute events):

- Placental abruption
- Cord prolapse
- Uterine rupture

Box 3 (conservative measures):

- Left lateral position
- IV fluids
- Stop epidural infusion/causative drugs
- Stop syntocinon
- Consider terbutaline
- Do not routinely administer oxygen unless evidence of maternal hypoxia or prior to general anaesthetic

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# Introduction

Acute fetal bradycardia (deceleration lasting 3 mins or more) is a disorder requiring prompt treatment and immediate obstetric review. The entire clinical picture needs considered including assessment of the fetus's physiological reserve. Although this guideline suggests performing an emergency birth if the acute fetal bradycardia persists for 9 minutes, it may be appropriate to do so earlier of there are significant antenatal or intrapartum risk factors for fetal compromise. Fetal hypoxia, fetal acidosis and perinatal morbidity can occur quicker in cases of thick meconium, fetal growth restriction, intrauterine infection, placental pathology, the maternal hypertensive spectrum and pre- and post-term fetuses.

Bradycardia noted at the onset of commencing a CTG is a difficult situation and urgent senior obstetric review is mandatory in such cases. It is paramount that these patients are not transferred between departments/wards mid-bradycardia (unless an obstetrician has made the decision to perform an emergency birth). If a bradycardia is noted in the outpatient settings (for example daybed or triage) or in the inpatient antenatal ward, the patient should only be transferred to labour ward upon cessation of the bradycardia if ongoing 1:1 care is required.

If a bradycardia is suspected or diagnosed outwith Univeristy Hospital Wishaw (such as in the community clinics or in Hairmyres/Airdrie), an assessment should be made by staff in those locations regarding suitability for transfer to Univeristy Hospital decision. If transfer is required, a blue-light ambulance should be requested immediately and staff should ensure that the Unit Co-ordinator and the on-call obstetric team is aware of the patient.

An emergency caesarean section under general anaesthetic should only ever be performed as a last resort. This is a stressful situation for the mother, her family and staff and should be avoided where possible.

## Immediate management summary (see appendix 1):

- **3 minutes**
  - call for help/immediate obstetric review
  - assess for underlying causes (see section below)
  - start one or more conservative measures based on the above assessment (see section below)
- **6 minutes** - await signs of recovery (this will occur in >90% of cases by 6 minutes if there is no pathology)
- **9 minutes** - 95% should show signs of recovery. If not, expedite emergency birth.
- **12 minutes** – perform emergency birth

## Assessment of underlying cause(s):

The cause of acute fetal bradycardia is usually acute fetal hypoxia. Aetiologies of fetal hypoxia include (but are not limited to):

- **Maternal position** (can affect uterine blood flow and cord compression)
- **Maternal hypotension** (including hypovolaemia)
- **Epidural/local anaesthetic/other analgesic drugs**
- **Uterine tachysystole** (prostaglandins or synthetic oxytocin)
- **Placental abruption** – clinical diagnosis and usually requires emergency birth
- **Cord prolapse** – clinical diagnosis requiring emergency birth
- **Uterine rupture** – clinical diagnosis requiring emergency birth

## Conservative measures:

Management of acute fetal bradycardia depends on an assessment of the underlying cause(s):

- **Maternal position** – turn patient on to the left lateral position (to prevent aortocaval compression)
- **Maternal hypotension** – administer IV fluids if the woman is hypotensive or has signs of sepsis
- **Epidural** – start IV fluids and call for immediate anaesthetic review
- **Uterine tachysystole**
  - stop synthetic oxytocin (if applicable)
  - administer terbutaline (if no contraindications)
- Do not offer maternal facial oxygen therapy unless there is maternal hypoxia or as part of preoxygenation before potential anaesthetic.

## Full algorithm for the management of acute fetal bradycardia:

The aim of tocolysis is to temporarily stop uterine contractions, restore the abnormal fetal heart rate pattern and to return fetal acid base physiology to normal. First line treatment in NHS Lanarkshire is via the bolus injection of a beta-adrenergic drug called terbutaline. The procedure is as follows:

1. **0-3 minutes**

- ***Ensure the CTG is picking up the FETAL heart rate***
  Fetal bradycardias do not exhibit variability whereas maternal heart rate patterns do. Always simultaneously compare the maternal pulse rate with the fetal heart rate. Turn up the volume of the ultrasound transducer and listen for the characteristic “lub – dup” of the fetal heart.

2. **3-6 minutes**

- Call for help – dial 2222 and put out an obstetric emergency call. This will alert the obstetric team to attend immediately for urgent review. Remember to state the ward number and room number.
- Assess for underlying causes (see above) and evaluate the whole clinical picture.
- If there has been an acute event (for example cord prolapse, suspected placental abruption or suspected uterine rupture), expedite the emergency birth.
- Perform full ABCDE clinical assessment and document findings on MEOWS chart.
- Start one or more conservative measures based on the above assessment (see section above)
- If the fetal bradycardia persists, administer terbutaline:
  - Draw 0.5mg terbutaline into a syringe (terbutaline comes in a 1ml vial with concentration of 0.5mg/ml. The trade name is “bricanyl”).
  - Administer this subcutaneously (this should act within 1-3 minutes). Please note that midwives are not allowed to administer this medication without prescription but they can do so on verbal advice from an obstetrician. In this case, the written prescription should be made as soon afterwards as is possible.

3. **6-9 minutes**

- If the bradycardia persists, continue assessing for possible causes and administer other conservative measures.
- Site at least one venflon.
- Obtain maternal blood samples to be sent to labs urgently.
- Administer IV fluids if evidence of maternal hypotension or sepsis.
- Await obstetric team decision about further management – this may be to

expedite emergency birth prior to 9 minutes if there are significant risk factors for fetal compromise.

- If the fetal heart rate recovers at any time up to 9 minutes, reassess any decision to expedite the birth whilst taking into account other antenatal and intrapartum risk factors.

4. **9-12 minutes**

- Expedite and perform emergency birth.
- Consider declaring a 'Neonatal Emergency' (call 2222 and ask switchboard to put out a neonatal emergency call).
- Note that terbutaline will start to wear off in 15-20 minutes.
- Terbutaline usually has no side effects in the mother though it can cause a maternal tachycardia which usually resolves in 15-20 minutes.

## Contraindications to terbutaline:

1. Significant antepartum haemorrhage or suspected placental abruption.
2. Hypotension following epidural analgesia top-up.
3. Known maternal cardiac disease.
4. Known maternal allergy.

# References

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6. Tejani NA, Verma UL, Chatterjee S et al. Terbutaline in the management of acute intrapartum fetal acidosis. *J Reprod Med* 1983; 28: 857 – 61.

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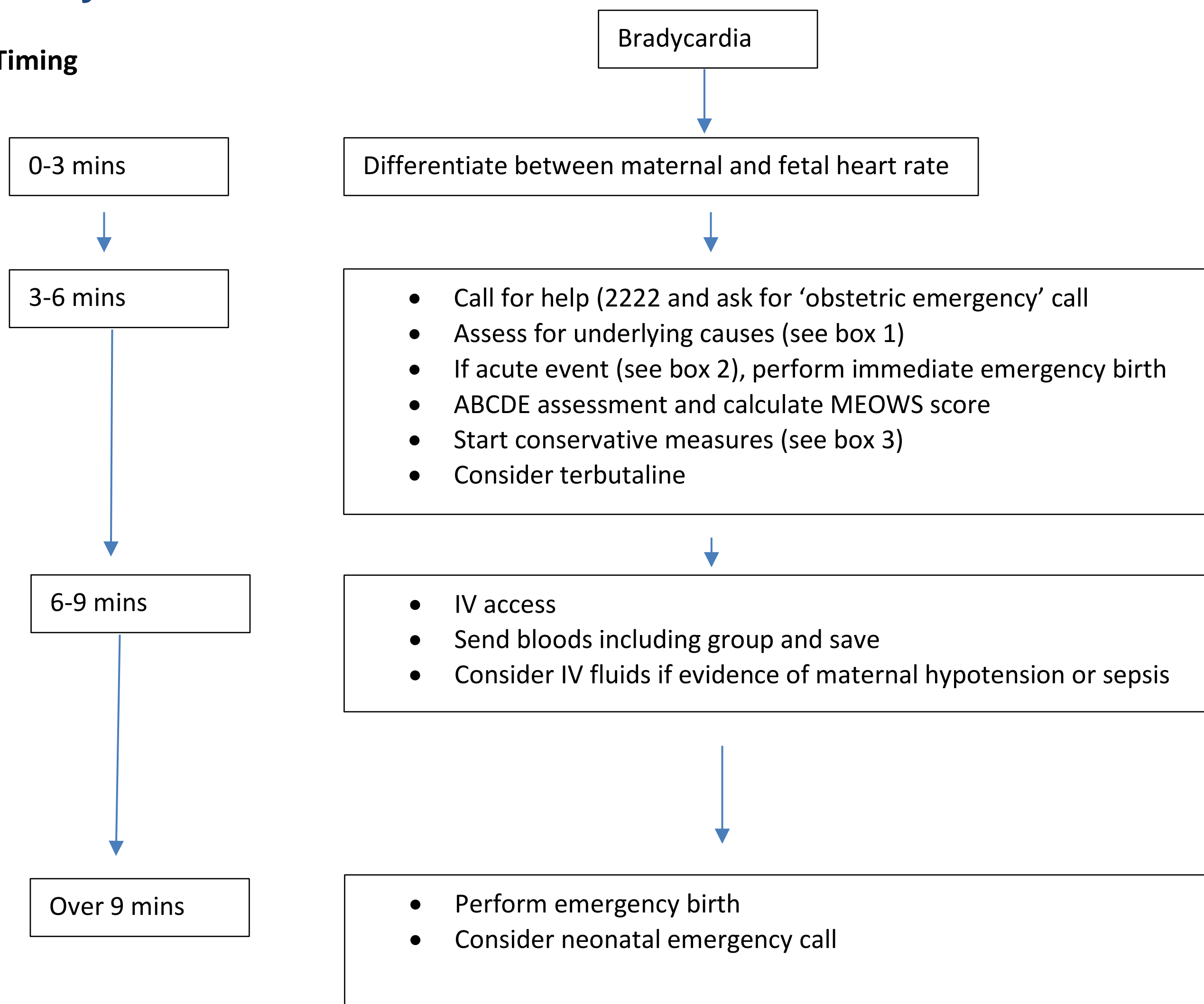
9. National Institute for Health and Care Excellence, Fetal monitoring in labour, 2022.

# Appendix 1: Flowchart for the management of acute fetal bradycardia

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