Management of a fetal cardiac arrhythmia

Author/Owner	**Consultant Obstetrician / Practice Educator Midwife / Maternity Guideline Group**	
Equality Impact Assessment	N/A if clinical guideline or procedure	Date:
Version	5	
Status	Approved	
Publication date	02/11/2021	
Review date	27/10/2024	
Approval recommended by	Maternity guideline group	Date: 09/07/2021
	Women's Business and Governance Meeting	Date:13/07/2021
Approved by	CBU 3 Overarching Governance Meeting	Date: 27/10/2021
Distribution	Barnsley Hospital NHS Foundation Trust – intranet Please note that the intranet version of this document is the only version that is maintained. Any printed copies must therefore be viewed as "uncontrolled" and as such, may not necessarily contain the latest updates and amendments	

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1.0 Introduction

The fetal heart rate should be regular, usually between 110 and 180 bpm and has a beat to beat variation of 5-15bpm.
Fetal rhythm abnormalities i.e. irregular rate, tachycardia or bradycardia occur in 2% of pregnancies. The most common arrhythmia is caused by isolated premature atrial contractions which in 90% of cases resolve spontaneously. However, this can progress to supraventricular tachycardia in 0.5-2% of cases.
Fewer than 10% of referrals to Fetomaternal units of a sustained tachyarrhythmia or bradyarrhythmia are due to underlying systemic disease or fetal compromise.
The mother will feel some anxiety following the discovery of an irregular heartbeat and will require reassurance and support.

2.0 Objective

This guideline has been developed to ensure the timely management and appropriate referral of pregnant women when an irregular fetal heart rate is discovered.

3.0 Scope

This guideline applies to all medical and midwifery staff working on the maternity unit.

4.0 Main body of the document

4.1 Detection

In community
The woman will be referred to the Antenatal Day Unit (ANDU) by telephone if an irregular fetal heart rate is heard or suspected by the community midwife.
An appointment to attend will be made for the earliest opportunity
If the irregularity is discovered out of hours, the woman will be referred to Labour Ward triage.

In ultrasound scan
The woman will be referred to either Antenatal clinic or the ANDU (whichever is most appropriate) for immediate obstetric review.

4.2 Initial management

- Review:
  - The antenatal notes
  - Scan results, in particular any anatomy scans
- Check for any suspected/diagnosed fetal disorders
- Check for any family history of cardiac problems
- Check maternal history for drug intake, prescribed or other e.g. Beta agonist such as salbutamol, or Beta blockers
- Check maternal consumption of stimulants such as caffeine
- Check maternal medical history for Systemic Lupus Erythematosus (SLE) and thyrotoxicosis
- Perform maternal observations in particular pulse rate, temperature, blood pressure

- Perform an abdominal palpation
- If the woman is more than 28 weeks gestation (discretion can be used between 26-28 weeks) perform a CTG after auscultation of the fetal heart rate with a Pinards or hand-held Doppler. Assess and classify the CTG tracing in accordance with the guideline for fetal auscultation. In addition, comment upon the fetal heart rate and pattern
- If booked under Midwifery led care, transfer to Consultant led care
- Arrange review by the Obstetric registrar on call
- Obtain and send a Full Blood Count (FBC), Thyroid function, Anti Ro and Anti La antibodies.
- Complete a Paediatric Alert Form
- Arrange an ultrasound scan within a week to check fetal heart anatomy, growth and liquor volume
- Give the woman a patient information leaflet and discuss caffeine intake
- The fetal heart rate will need to be auscultated once a week until delivery to exclude the development of supraventricular tachycardia. This can be performed by either the community midwife or on the Maternity Unit

4.3 Ongoing management

Following scan, the woman will be reviewed in ANDU on the same day and then arrange for the woman to be reviewed by a Consultant in the next available Antenatal Clinic with the results. At this appointment, a management plan and where applicable referral for fetal echocardiogram will be made. The woman will need to be reviewed by her own Consultant if she is reviewed by another team on the ANDU.
Each case should be reviewed on an individual basis, and an individual care plan outlined in the woman's hospital and hand-held records. If the arrhythmia is caused by premature atrial contractions (PAC) this can be managed locally. Otherwise the woman should be referred to the local fetal clinic to consider referral to Leeds for appropriate management.
The baby will require a paediatric review following delivery.

4.4 Types of fetal arrhythmia

4.4.1 Irregular rhythm:

Irregular sinus rhythm at normal heart rate occurs with premature atrial contractions, or less frequently, with premature ventricular contractions. These are clinically benign if brief and isolated and are commonly identified during the third trimester. If an extra systole follows every sinus beat, it is bigeminy. If it occurs every third beat it is termed trigeminy and if it occurs every fourth beat the rhythm is quadrigeminy.
Most of the above resolve spontaneously before delivery, however 0.5-2% can progress to supraventricular tachycardia (SVT). Weekly fetal auscultation is recommended until delivery or resolution of the arrhythmia.

4.4.2 Tachyarrhythmia:

This is where the fetal heart rate is 180bpm or more. It can either be sustained, when present >5% of the time; or intermittent when there are alternate periods of normal heart rate.

Types of tachyarrhythmia:

- Sinus tachycardia
- SVT (70%)
- Ventricular tachycardia
- Atrial flutter

Persistent fast heart rate can cause heart failure, non-immune hydrops and polyhydramnios. Furthermore, maternal complications may occur with sustained fetal tachycardia such as Ballantyne syndrome.

Sinus tachycardia:

- Usually >180 bpm but <200 bpm with 1:1 AV conduction
- Can be caused by fetal distress, maternal thyrotoxicosis, anaemia, maternal medication and infection such as chorioamnionitis.
- Treat the cause. Usually doesn't require treatment with antiarrhythmic drugs.

SVT:

- Heart rate usually ranges 220-300 bpm with 1:1 AV conduction.

Atrial flutter:

- Only observed in the third trimester
- Atrial rate: 350-500 bpm with a fixed or varying 2:1, 3:1, or 4:1 AV block, leading to slower ventricular rate

Ventricular tachycardia:

- Extremely rare
- Ventricular rates range from 180-300 bpm.

4.4.3 Bradyarrhythmia:

- This is defined as a Fetal heart rate <110 bpm

Sinus/atrial bradycardia:

- Can be caused by: maternal medications e.g. Beta blockers or sedatives; or maternal Anti-Ro or Anti-La antibodies)

Long QT Syndrome

Atrial bigeminy

- SVT can develop in 10% of cases
- Can resolve spontaneously

Fetal atrioventricular block

5.0 Roles and responsibilities

Midwives

To refer appropriately when an irregular heartbeat is discovered on auscultation.
To provide information and reassurance to the woman and her family.

Obstetricians

To review the woman and refer accordingly.

Paediatricians

Where applicable to discuss findings and possible outcomes and care plans with the woman and her family

6.0 Associated documents and references

Copel.J. Irregular Fetal Heartbeat Indicates Serious Problem in a Small number of cases. Yale Bulletin and Calendar. April 28. 2000. Vol28 No 30. https://news.yale.edu/2000/04/25/irregular-fetal-heartbeat-indicates-serious-problem-small-number-cases

Lisa K Homberger, David J Sahn. Rhythm abnormalities of the fetus. Heart 2007 Oct; 93(10) 1294-1300BMJ Publishing group and British Cardiovascular Society (2007) [online] www.ncbi.nlm.nih.gov/pmc/articles/PMC2000955

N Valenzuela, L Rocha, L Nardozza: ‘ fetal cardiac arrythmia: Current evidence’; Ann Pediatr Cardiol 2018 May-Aug;11(2):148-163

R Webe et al. Journal of Saudi Heart Association. Diagnosis and management of Common fetal arrhythmias. April 2011. Vol. 23 pages 61-66 [online] http://www.sciencedirect.com/science/article/pii/S1016731511000108

7.0 Training and resources

Training will be delivered as outlines in the Maternity Training Needs Analysis. This is updated on an annual basis**.**

8.0 Monitoring and audit

Any adverse incidents relating to irregular fetal heartbeat will be monitored via the incident reporting system.

Any problems will be actioned via the case review and root cause analysis action plans. The action plans are monitored by the risk midwife to ensure that improvements in care are made. The trends and any root cause analyses are discussed at the monthly risk meetings to ensure that appropriate action has been taken to maintain safety.

The guideline will be audited as and when determined a priority for the service or in response to concern and/or data intelligence e.g. dashboard figure or for assurance purposes.

9.0 Equality and Diversity

The Trust is committed to an environment that promotes equality and embraces diversity in its performance as an employer and service provider.

It will adhere to legal and performance requirements and will mainstream equality, diversity and inclusion principles through its policies, procedures and processes. This guideline should be implemented with due regard to this commitment.

To ensure that the implementation of this guideline does not have an adverse impact in response to the requirements of the Equality Act 2010 this policy has been screened for relevance during the policy development process and a full equality impact assessment is conducted where necessary prior to consultation. The Trust will take remedial action when necessary to address any unexpected or unwarranted disparities and monitor practice to ensure that this policy is fairly implemented.

This guideline can be made available in alternative formats on request including large print, Braille, moon, audio, and different languages. To arrange this please refer to the Trust translation and interpretation policy in the first instance.

The Trust will endeavor to make reasonable adjustments to accommodate any employee/patient with particular equality, diversity and inclusion requirements in implementing this guideline. This may include accessibility of meeting/appointment venues, providing translation, arranging an interpreter to attend appointments/meetings, extending policy timeframes to enable translation to be undertaken, or assistance with formulating any written statements.

9.1 Recording and Monitoring of Equality & Diversity

The Trust understands the business case for equality, diversity and inclusion and will make sure that this is translated into practice. Accordingly, all guidelines will be monitored to ensure their effectiveness.

Monitoring information will be collated, analysed and published on an annual basis as part of Equality Delivery System. The monitoring will cover the nine protected characteristics and will meet statutory employment duties under the Equality Act 2010. Where adverse impact is identified through the monitoring process the Trust will investigate and take corrective action to mitigate and prevent any negative impact.

Appendix 1
Glossary of terms

ANDU	Antenatal Day Unit
CTG	Cardiotocography
FBC	Full Blood Count
PAC	Premature Atrial Contractions
SLE	Systemic Lupus Erythematosus
SVT	Supraventricular tachycardia

Appendix 2 (must always be the last appendix)
Maintain a record of the document history, reviews and key changes made (including versions and dates)

Version	Date	Comments	Author
1			Maternity guideline group
2			Maternity guideline group
3			Maternity guideline group

Review Process Prior to Ratification:

Name of Group/Department/Committee	Date
Reviewed by Maternity Guideline Group	09/07/2021
Reviewed at Women's Business and Governance meeting	13/07/2021
Approved by CBU 3 Overarching Governance Meeting	27/10/2024

Trust Approved Documents (policies, clinical guidelines and procedures)

Approval Form

Please complete the following information and attach to your document when submitting a policy, clinical guideline or procedure for approval.

Document type (policy, clinical guideline or procedure)	Guideline
Document title	Management of a fetal cardiac arrhythmia
Document author (Job title and team)	Consultant Obstetrician
New or reviewed document	Reviewed
List staff groups/departments consulted with during document development	Consultant obstetricians, senior midwives
Approval recommended by (meeting and dates):	Maternity guideline group — Date: 09/07/2021 Women's Business and Governance Meeting — Date:13/07/2021 CBU 3 Overarching Governance Meeting — Date: 27/10/2021
Date of next review (maximum 3 years)	27/10/2024
Key words for search criteria on intranet (max 10 words)	Irregular fetal heart rate, fetal cardiac arrhythmia
Key messages for staff (consider changes from previous versions and any impact on patient safety)	
I confirm that this is the <u>FINAL</u> version of this document	Name: Charlotte Cole Designation: Practice Educator Midwife

FOR COMPLETION BY THE CLINICAL GOVERNANCE TEAM

Approved by (group/committee):	**CBU3 Overarching Governance**
Date approved: 27/10/2021	
Date Clinical Governance Administrator informed of approval: 29/10/2021	
Date uploaded to Trust Approved Documents page: 02/11/2021	