

## Guideline for Overt or Suspected Cardiac Disease in Pregnancy

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### General Statement

Cardiac disease remains the leading cause of maternal death overall<sup>1</sup>. Deaths due to indirect causes still remain the major proportion (56%) of maternal deaths in the UK. As in previous reports, cardiac disease remains the largest single cause of indirect maternal deaths.

MBBRACE-UK Report 2019: **“Heart disease can occur for the first time in pregnancy – severe chest pain is a red flag. Breathlessness when resting and especially when lying flat is not normal in pregnancy” “Persistent sinus tachycardia is a red flag”**

**Cardiac disease accounted for 23% of causes of Womens deaths.**

The leading cardiac causes of maternal death are now myocardial infarction, mostly related to ischaemic heart disease (a 3-4 fold increase), and dissection of the thoracic aorta. Maternal deaths from pulmonary hypertension and from congenital heart disease were less common than in previous triennia. Rheumatic mitral stenosis has re-emerged as a cause of maternal death<sup>1</sup>.

The symptoms associated with pregnancy can mimic unsuspected cardiac disease or can be difficult to differentiate from deteriorating cardiac disease. Also, the impact of an immigrant population, rising obesity levels, rising maternal age and smoking are also contributing to the impact of cardiac disease in pregnancy.

This guideline is not meant to be comprehensive, as the subtleties of presentation are numerous. It is intended to alert health care professionals to the issues and to suggest some guidance in the assessment, investigation and referral of these women.

**Section A.**

**Women with symptoms suggestive of cardiac disease who may require investigation**

In pregnancy the heart rate, cardiac output and respiratory rate increase in line with a hyperdynamic circulation. In addition there is the enlarging uterus and reduced gastric motility to consider. These can lead to symptoms similar to those of a cardiac problem:

Normal Physiology	Suspect cardiac disease
Fatigue, chest discomfort, dyspnoea, s	Sudden onset/Severe/progressive dyspnea, orthopnea, paroxysmal nocturnal dyspnea  (Waking up due to shortness of breath)  Associated with fatigue vomiting, agitation  Substernal pain radiating to jaw, shoulder or back.
Palpitations, Ectopic beats can be common	Tachycardia significant if persistently >120bpm ( >15% above baseline)  Sustained arrhythmias  Syncope with exertion or chest pain
Pulsation along left sternal border	Parasternal lift
Prominent neck vein pulsation	Persistent neck vein distention
Systolic murmur <3/6	Systolic murmur >3/6, diastolic murmur
	cyanosis

**Paraesthesia of Hands:** This is a common feature of carpal tunnel syndrome in pregnancy, but can be suspicious if unilateral and associated with other symptoms as above.

**Pre-tibial Oedema:** A common feature of pregnancy, especially in the presence of pre-eclampsia. It can be a feature of cardiac failure along with hepato-splenomegaly and findings or symptoms suggestive of pulmonary oedema.

### Investigations

- Ensure that a complete **history** as well as a **general and cardiac examination** is undertaken.

Points to consider in history taking-

- Type of cardiac anomaly
  - Severity of symptoms ( NYHA classification) **Appendix I**
  - Previous surgery/ treatment
  - Genetic considerations in hereditary conditions
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- There is a higher incidence of **rheumatic heart disease** in certain immigrant populations and the index of suspicion must be high in these cases with a low threshold for investigation. These women should have a cardiac assessment at her obstetric consultant visit if not previously performed by her GP.
  - If at her midwifery booking visit the woman is identified as a migrant, ensure that she has a GP appointment made for cardiac assessment.
  - Women who are older (>35), are obese, diabetic, hypertensive or are smokers are also considered high risk, particularly for **ischaemic heart disease**. A family history of cardiac disease can be significant.

**Cardiac specific baseline investigations** should be considered when acute or ongoing cardiac disease is suspected:

- ECG/Holter Monitor- Both require expert interpretation and if there is any doubt , should be reviewed by a specialist competent in reading ECGs/Holter
- Cardiac Echocardiogram
- CXR
- Blood gases (consider troponin if acute MI suspected)
- CTPA

Usually an ECG +/- an ECHO is all that is required to investigate or exclude a newly suspected cardiac problem. Further investigation, especially if considered urgent, should be discussed with a cardiologist. A full diagnosis of the cardiac condition is required.

### **Management –**

**The acute management of women with proven cardiac disease is out-with the scope of this guideline, but should be undertaken with the assistance of cardiologists with an interest or expertise in this area. This may mean transfer to a tertiary centre in severe cases such as the combined clinic at the QEUH**

**The acute management unit is based at the Golden Jubilee Hospital. However specialists are also based at the Queen Elizabeth University Hospital (QEUH). It is essential that direct communication to these hospitals/specialists be made before referral either as routine or acute cases to avoid delay.<sup>3</sup>**

## **Section B.**

### **Women with known Cardiac Disease or risks**

There is a wide spectrum of cardiac conditions and severity. Depending on the type of cardiac problem the effect of pregnancy can vary from minimal to life threatening. Detailed discussions of these are out-with the remit of this guideline.

However certain basic principles apply when a patient with a known cardiac condition or cardiac predisposition attends in pregnancy:

#### **Pre conception-**

- Optimisation of cardiac disease is ideally done pre- pregnancy
- Early referral to a cardiologist or specialist centre should be considered
- A baseline ECG and ECHO should ideally be done in liaison with a cardiologist.
- Pre-conception counselling should be arranged MBRRACE-UK
- Women with cardiac risk factors should have a cardiac assessment prior to receiving assisted reproductive technology or other infertility treatment

#### **Antenatal**

- Multidisciplinary input involving Obstetrician, cardiologist, anaesthetist and paediatrician
  - Early referral to High Risk Consultant Obstetric clinic: 12 weeks or earlier
- Smoking cessation can reduce associated risk of SGA and pre-term labour
- A family history of sudden death of a young relative (aged less than 40) is important and may be an indication of inherited cardiac conditions
- Avoid anaemia as it can increase cardiac load- regular screening and treatment is recommended.
- Thyroxine replacement in patients with cardiac conditions done with caution and medical input
- Avoid constipation/ straining, stress and excessive physical exertion
- Thromboprophylaxis review – if need to switch warfarin to heparin in early pregnancy (should be done before 6 weeks gestation) - consult MOT clinic /Haematologist
- Arrange detailed anomaly scan with fetal ECHO at 20+ weeks especially in hereditary conditions
- Serial growth scans as per consultant opinion
- The need for ECG/ECHO/Holter during pregnancy should be considered depending on condition
- A clear antenatal, intrapartum and postpartum management should be discussed and documented

## Labour

- Anaesthetic review for optimal analgesia
- Left lateral position
- Avoid fluid overload- input output monitoring
- Consider passive second stage
- Consider a short active second stage (30 minutes) and if good progress continue with medical supervision
- If no significant progress after active second stage , offer elective operative vaginal delivery if appropriate
- Observe for signs of pulmonary oedema ( SOB, low O2 sats, tachycardia, wheeze, productive cough or haemoptysis)
- Avoid ergometrine
- Perimortem caesarean section is an important part of the resuscitation of a pregnant woman. Ambulance crews should not delay this by prolonged attempts at resuscitation in the community before transferring the woman to hospital.

Think **Aortic Dissection**/Think **Myocardial Infarction** for sudden severe unexplained pain

## Resources

1. The Med Obs Clinic and MOT Clinic are useful resources for the management of these patients.
  - a. Contact : 01698 36 6340/6426
2. Med Obs Clinic: Weekly on Monday/Thursday morning at Wishaw General Hospital
3. MOT Clinic: Weekly on Wednesday Morning at Wishaw General Hospital

## New York Heart Association (NYHA) Functional Classification

The cardiac status of the patient should be continually assessed during pregnancy using the New York Heart Association (NYHA) Functional Classification. See **Appendix I**.  
Class I-II: Mild disease. Class III-IV: Severe Disease

The nature and severity of the condition dictates the type of advice and care offered.

## Section C.

### Summary of Cardiac Conditions that impact on pregnancy

#### High Mortality

- Pulmonary hypertension/ Eisenmenger's syndrome
- Severe left ventricular outflow tract obstruction
- Cyanotic heart disease
- Cardiomyopathy

#### Moderate Disease

- Severe stenotic outflow tract or valvular stenosis
- Tetralogy of Fallots (corrected)
- Co-arcuation of Aorta (corrected)
- Transposition of Great Vessels (corrected)
- Risk of Aortic Dissection
- Marfans syndrome
- Ehlers–Danlos syndrome
- Prosthetic valve with some compromise

#### Low Risk

- Mild or moderate valvular regurgitation
- Mild or moderate left ventricular outflow tract obstruction
- Uncompromised prosthetic valves

**Also consider the WHO table for assessment of cardiac disease in pregnancy as mentioned in this guideline:**

**2018 ESC Guidelines for the management of cardiovascular diseases during pregnancy: The Task Force for the Management of Cardiovascular Diseases during Pregnancy of the European Society of Cardiology (ESC).** Vera Regitz-Zagrosek Jolien W Roos-Hesselink Johann Bauersachs Carina Blomström-  
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*European Heart Journal*, Volume 39, Issue 34, 7 September 2018, Pages 3165–3241, <https://doi.org/10.1093/eurheartj/ehy340>

## Other

### **Acquired Heart Disease-** Depends on severity

- Ischemic heart disease
- Rheumatic valvular heart Disease
- Arrhythmias

## References

1. MBRRACE –UK Saving Lives, Improving Mothers' Care Lessons learned to inform maternity care from the UK and Ireland Confidential Enquiries into Maternal Deaths and Morbidity 2015-17
2. Tan J, de Swiet M; Prevalence of heart disease diagnosed de novo in pregnancy in a WestLondon population. Br J Obstet Gynaecol. 1998 Nov; 105(11):1185-8. [abstract]
3. Expert consensus document on management of cardiovascular diseases during pregnancy
4. The Task Force on the Management of Cardiovascular Diseases during Pregnancy of the European Society of Cardiology. European Heart Journal (2003) 24, 761–781

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## APPENDIX 1

**New York Heart Association (NYHA) Functional Classification** New York Heart Association (NYHA) Functional Classification is a nomenclature to identify the severity of heart failure from class I to IV.

Patients: Heart disease must be present.

Parameters:

- (1) Limitations on physical activity
- (2) Symptoms (undue fatigue, palpitations, dyspnea and/or anginal pain) with ordinary physical activity
- (3) Status at rest

**Class I** - No symptoms and no limitation in ordinary physical activity.

**Class II** - Mild symptoms and slight limitation during ordinary activity and Comfortable at rest. **Class III** - Marked limitation in activity due to symptoms, even during less-than-ordinary activity. Comfortable only at rest.

**Class IV** - Severe limitations. Experiences symptoms even while at rest.