**Agreed standards for care of mothers with cardiac conditions in pregnancy for Wessex Region.**

These standards are proposed following the MBRRACE-UK report on “*Saving Lives, Improving Mothers’ Care”* published in 2016 which had a topic focus on cardiovascular disease in pregnancy.

The lessons on cardiovascular disease listed in the report included:

* Lack of co-location of obstetric and cardiac services jeopardises interdisciplinary working and communication. Measures such as joint obstetric cardiac clinics, multidisciplinary care plans, copying letters to the woman and all clinicians involved in her care, as well as staff from all specialties writing in the woman’s hand-held notes may mitigate against the inherent risk of inadequate communication between specialists.
* Early involvement of senior clinicians from the obstetric and cardiology multidisciplinary team is important, wherever a pregnant or postpartum woman presents with suspected cardiac disease, but particularly if she presents to the Emergency Department.
* A raised respiratory rate, chest pain, persistent tachycardia and orthopnoea are important signs and symptoms which should always be fully investigated. The emphasis should be on making a diagnosis, not simply excluding a diagnosis.
* A normal ECG and/or a negative Troponin does not exclude the diagnosis of an acute coronary syndrome.
* New onset of cardiorespiratory symptoms and/or absence of valve clicks in women with prosthetic heart valves should prompt careful echocardiography and early review by a senior cardiologist to exclude the possibility of valve thrombosis.

Following this report, the Royal College of Physicians and Surgeons of Glasgow published recommended standards of care, which have been supported in subsequent MBBRACE reports. These standards are proposed in the 2016 document *“Addressing the Heart of the Issue: Good clinical practice in the shared obstetric and cardiology care of women of childbearing age”.* From these we have taken the following standards for care in the Wessex region.

A: Organisation of Care

1. Each local unit should have a designated team who lead the care of women with cardiac disease. This should consist of an identified lead obstetrician, cardiologist and anaesthetist.
2. Ideally, women with heart disease who are pregnant should be seen jointly by the cardiologist and obstetrician together. This may not be possible or practical at all visits but may be particularly valuable in planning care at the beginning of pregnancy or in planning delivery at around 28 to 32 weeks. If it is not possible to meet jointly there should be prompt telephone or email contact.
3. There should be clear referral criteria for referral to Southampton regional service (Appendix 1). For women where there is uncertainty about the need for referral there should be discussion with the regional service or the mother could be referred for a consultation and opinion.
4. A delivery plan, including post partum care, should be available and accessible for all pregnant women with heart disease. This includes those with WHO class I heart disease.
5. Pregnant women with WHO class III or IV heart disease should be referred to a regional obstetric service with cardiologist support within 4 weeks of presentation to antenatal services.
6. For women with predicted high risk pregnancy due to heart disease, the delivery location is provisionally determined between 28 to 32 weeks of gestation, with agreement from the MDT (which must include local and tertiary obstetricians, cardiologists and anaesthetists). The place of delivery may be clear earlier in pregnancy for mothers with either minor or complex disease where it is clear they could deliver locally or will need to deliver in the regional centre. The planned place of delivery may need to be changed later in pregnancy if there is a late change in maternal condition.
7. Specialist advice should be taken from the Southampton regional centre if any new triggers develop during pregnancy. Triggers for consideration of a change in location of delivery include:
8. new cardiac symptoms
9. deterioration in echo findings during pregnancy
10. deterioration in WHO class
11. deterioration in New York Heart Association (NYHA) class
12. concern from a member of the MDT.
13. For women with heart disease who are pregnant, a pathway should exist for the provision of care within office hours, and also out-with office hours.
14. Contact details for key persons are widely available for referring health professionals. Provisions are made for when that person/ team are on leave.

B: Aspects of pregnancy care

1. All women of child-bearing age who have heart disease, including those pursuing assisted conception, should be offered pre-pregnancy counselling and contraceptive advice by an appropriately trained healthcare professional including those based in primary care.
	1. Women with WHO class II heart disease pre-pregnancy counselling should be assessed by a cardiologist OR obstetrician.
	2. Women who are considered to have WHO class III or IV heart disease should be offered counselling with a cardiologist with expertise in the care of cardiac obstetrics and an obstetrician with a specialist interest in cardiac obstetrics.
	3. Women who are felt to be of uncertain risk category should be discussed further with the appropriate specialist team to establish the appropriate pre-pregnancy advice
2. For women with heart disease considering termination of pregnancy:
3. Women with heart disease considering termination of pregnancy should be assessed for their WHO class.
4. For women in WHO class III or IV heart disease, the best method and location of the procedure should be discussed with appropriate specialists in cardiology, obstetrics, anaesthetics and termination of pregnancy services.
5. For women with heart disease presenting acutely to the obstetric service or to other hospital services (e.g. cardiology or Emergency Department):
6. There should be involvement of senior clinicians from the obstetric and cardiology multidisciplinary team particularly for those with WHO class III or Iv disease.
7. A raised respiratory rate, chest pain, persistent tachycardia and orthopnoea are important signs and symptoms which should always be investigated. Key investigations must not be delayed because of the pregnancy. The emphasis should be on making a diagnosis, not simply excluding a diagnosis. Traditional referral mechanisms may be too slow in pregnancy. *NB: One in five women who die from a cardiac cause die in an ambulance or Emergency Department*.
8. During acute admissions all women with cardiac disease admitted during pregnancy are discussed with the admitting consultant and on call obstetric consultant within the time set out in their delivery plan. Women with newly diagnosed cardiac conditions may need urgent discussion.
9. Postnatal care:
	1. All women with heart disease have a postnatal follow up arranged with the cardiology or obstetric team.
	2. Appropriate contraceptive advice should be given prior to discharge.

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Appendix 1: Referral criteria:

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| **WHO classification Maternal Cardiac Risk** | **Conditions** | **Risk of Pregnancy by Medical Condition** | **Recommended level of counselling and action** |
| I | Uncomplicated small or mild• pulmonary stenosis• patent ductus arteriosus• mitral valve prolapseSuccessfully repaired simple lesions (atrial or ventricular septa defect, patent ductus arteriosis, anomalous pulmonary venous drainage)Atrial or ventricular ectopic beats isolated | No detectable increased risk of maternal mortality and no/mild increase in morbidity | Primary Care |
| II (if well and uncomplicated) | Unoperated atrial or ventricular septal defect Repaired tetralogy of Fallot Most arrhythmias  | Small increased risk of maternal mortality or moderate increase in morbidity | Cardiologist ORObstetrician |
| II or III depending on individual | Mild Left ventricular impairmentHypertrophic cardiomyopathyNative or valvular heart disease not consid­ered WHO I0r IVMarfan syndrome without aortic dilationAorta <45mm in aortic disease associated with bicuspid aortic valveRepaired coarctactionIschaemic heart disease | Needs to be determined | Discussion must take place with health professional with adequate experience or? Cardiologist with expertise in the care of women with cardiac obstetricsANDObstetrician with a specialist interest in cardiac obstetrics |
| III | Mechanical valveSystemic right ventricleFontan circulationCyanotic heart disease (unrepaired)Other complex congenital heart diseaseAortic dilatation 40-45mm in Marfan syndromeAortic dilatation 45-50mm in aortic disease associated with bicuspid aortic valve | Significantly increased risk of maternal mortality or severe morbidity. Expert counselling required. If pregnancy decided upon, intensive specialist cardiac and obstetric monitoring needed throughout pregnancy, birth and the puerperium. | Cardiologist with expertise in the care of women with cardiac obstetricsANDObstetrician with a specialist interest in cardiac obstetrics |
| IV | Pulmonary arterial hypertension of any causeSevere systemic ventricular dysfunction (LVEF <30%, NYHA III-IV)Previous peripartum cardiomyopathy with any residual impairment of left ventricular functionSevere mitral stenosisSevere symptomatic aortic stenosisMarfan syndrome with aorta dilated >45mmAortic dilatation > 50 mm in aortic disease associated with bicuspid aortic valveNative Severe coarctation | Extremely high risk of maternal mortality or severe morbidity. Pregnancy contraindicated. If pregnancy occurs termination should be discussed. If pregnancy continues care as per class III | Cardiologist with expertise in the care of women with cardiac obstetricsANDObstetrician with a specialist interest in cardiac obstetrics |