Section 1 Pregnancy Counseling and Contraception

Chapter 1

Preconception counseling for women with cardiac disease

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Practical practice points

1. All women of reproductive age with congenital or acquired heart disease should have access to specialized multidisciplinary preconception counseling with regular reevaluation so as to empower them to make choices about pregnancy.
2. Preconception counseling should include assessment and optimization of the woman's cardiac condition to minimize the risk of pregnancy.
3. Preconception counseling should include a discussion of contraceptive choices, and should be tailored to the woman's individual medical and social circumstances.

Introduction

The majority of women want to have children, and women with heart disease are no exception. Complex heart disease is no bar to sexual activity. Most women with heart disease do have some awareness of the risks of pregnancy but their ideas are often inaccurate, ranging from overly optimistic to overly pessimistic.[1] They may be equally poorly informed about the prognosis of their heart condition, even in the absence of pregnancy. Many doctors do not have a good understanding of the risks of pregnancy in women with heart disease and thus such women may be deprived of appropriate advice and counseling unless a specialist referral is made. In the 2011 UK maternal mortality report, there was some degree of substandard care in 51% of deaths from cardiac causes: lack of preconception care was one aspect identified as substandard.[2] Better provision of preconception care was one of the "top ten recommendations" from this report.[2] Discussions with a cardiologist and/or an obstetric physician with a specialist interest in pregnancy and heart disease should begin in adolescence. These discussions should cover future pregnancies and their prevention, both to prevent accidental and possibly dangerous pregnancies and to allow patients to come to terms with their future childbearing potential. They also need to be able to plan their families in the knowledge of their likely future health and life expectancy.

In the UK, the majority of women seen preconception by cardiologists and/or obstetricians will be women with congenital heart disease (CHD). This is because the incidence of CHD (0.8%) in pregnant women in the UK is higher than the incidence of acquired heart disease (0.1%). Furthermore, most women with CHD are already known to cardiac services, while women with acquired heart disease may be unaware of their condition, or the condition itself may only present during pregnancy or in the postnatal period.

Components of preconception counseling

Preconception counseling should ideally [3]:

- display attitudes and practices that value pregnant women, children and families and respect the diversity of people's lives and experiences
- incorporate informed choice, thus encouraging women and men to understand health issues that may affect conception and pregnancy
- encourage women and men to prepare actively for pregnancy, and enable them to be as healthy as possible
- attempt to identify couples who are at increased risk of having babies with a congenital

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abnormality and provide them with sufficient knowledge to make informed decisions.

These four components will be discussed below in relation to cardiac disease in pregnancy.

Valuing the cultural background of the woman and her family, and respecting diversity

Preconception counseling should display attitudes and practices that value pregnant women, children and families and respect the diversity of people's lives and experiences. All women have a cultural context within a multicultural society. For some women, issues related to culture may need specific attention, including:

- their religious beliefs (particularly in relation to contraception and termination of pregnancy)
- the role of the partner and extended family in pregnancy decisions
- communication, where English is not the first language.

Assumptions are often made about the anticipated views of certain racial, cultural, or religious groups and this may consciously or subconsciously affect the way in which doctors counsel women. Addressing these overtly helps one to compensate for any unintentional bias.

All people have a social and emotional context, and when women and their partners seek advice this context must be considered. Their attitudes and expectations are likely to have been influenced by their previous experiences and those of their family. These may include the anxieties of overprotective parents or worries relating to their inability to embark on, or continue, a meaningful relationship if pregnancy is contraindicated.

While it is important to explore and respect the context of a woman's cultural background, preconception counseling should promote the autonomy of the woman. It should enable her to determine her own personal priorities and support her decision-making.

Informed choice and understanding

Preconception counseling should provide information in a frank, honest and understandable way so as to give the woman a realistic estimate of both maternal and fetal risk and allow her to make an informed decision as to whether to embark on a pregnancy or not. The counseling should include information on:

- the effects of cardiac disease on pregnancy, in terms of both maternal and fetal risks
- the effects of pregnancy on cardiac disease, including the risk of dying or long-term deterioration
- whether these effects will change with time or treatment
- the other options that may be available, such as contraception, surrogacy or adoption
- the long-term outlook—a woman with a short life expectancy may feel that pregnancy, surrogacy, or adoption is not appropriate, as a child may then have to deal with the terminal illness and death of the mother.

The difficulty for the cardiologist and obstetrician is to provide an accurate assessment of risk. For some complex conditions, there is little or no information available, either because of the rarity of the woman's disease or because they represent a new cohort of survivors to adulthood with a surgically modified disease.

Scoring systems, such as CARPREG ("CARdiac disease in PREGnancy") and ZAHARA ("Zwangerschap bij Aangeboren HARtAfwijkingen I"), have been devised to predict the chance of maternal cardiac or neonatal complications during pregnancy.[4,5] However, such scoring systems do not predict complications that are specific to certain conditions, e.g. aortic dissection in Marfan syndrome. Perhaps the most important message to take from these scoring systems is which risk factors can be useful in predicting poor outcome. The European Society for Cardiology (ESC) guidelines on cardiovascular diseases in pregnancy provide an overall classification of the risk of maternal mortality and morbidity.[6]

For specific conditions, data can be obtained from the literature. However, studies are frequently small, retrospective and derived from women managed in a single center. A literature review of papers relating to pregnancy outcomes in women with structural CHD was published by Drenthen *et al.*, and informed the ESC guidelines.[6,7]

Cardiopulmonary exercise testing has been studied to determine whether the increase in cardiac output during exercise would act as a surrogate for that seen in pregnancy and, therefore, whether it could be used to predict pregnancy outcome. Impaired maximal oxygen uptake and chronotropic response (failure to raise heart rate adequately) during exercise correlate with poor pregnancy outcome,[8] and, therefore, may be included in the preconception assessment.

A woman should be informed that the main risks to her include:

- maternal death—the highest risk is in women with pulmonary arterial hypertension; those with poor systemic ventricular function, severe left-sided obstruction and severe aortopathy are also at high risk
- arrhythmias (particularly in women with Fontan circulation or atrial repair of transposition of the great arteries), heart failure (particularly in women with pre-existing ventricular impairment with or without coexistent valve disease, ischemic heart disease, cyanotic CHD, a systemic right ventricle or a Fontan circulation), including progression of ventricular dysfunction and permanent deterioration following pregnancy
- acute coronary syndrome in women with known pre-existing coronary disease
- aortic dissection in women with inherited aortopathies (particularly Marfan and Loeys-Dietz syndromes, but also with bicuspid aortopathy)
- thromboembolism (particularly in women with cyanotic CHD, prosthetic valves or a Fontan circulation)
- the potential need for earlier intervention for valve disease as a result of pregnancy.

The risks to the fetus include the following:

- fetal growth restriction, particularly in women taking beta-blockers or with cyanotic heart disease or a Fontan circulation
- iatrogenic or spontaneous preterm delivery, which may result in long-term disability in the child
- recurrence of CHD (typical risk of 3–5%, but this varies with the type of maternal lesion, and is also related to paternal lesions) or a genetically inherited cardiac condition
- teratogenesis or fetotoxicity from drugs, for example from warfarin or angiotensin-converting-enzyme (ACE) inhibitors
- fetal loss resulting from invasive prenatal testing.

One successful pregnancy should not engender complacency. Some conditions, such as peripartum cardiomyopathy, have a high recurrence risk and preconception counseling before embarking on a subsequent pregnancy is recommended.[2,9] Other conditions can worsen with age and the risks will be higher in each subsequent pregnancy.

Information about contraception and termination

Facilitating informed choice also means that doctors must provide information relating to the choice of not being pregnant. This includes advice about appropriate contraception and information about termination of pregnancy services. The assurance that clinicians will be nonjudgmental and supportive of a decision to terminate a pregnancy is important. Open discussion of these options and provision of contact numbers to facilitate access to these services reinforces that these are options available to the woman.[10] Termination of pregnancy in women with heart disease is not without risks, and it should be performed in a center with appropriate anesthetic and cardiac facilities. Specialist advice on contraception may need to be obtained from specialist sexual health services.

Information about clinical management

During the preconception appointment the proposed plan of care for the pregnancy should be outlined. Women with significant cardiac disease should be managed in a center with appropriate expertise, preferably in a joint obstetric–cardiac clinic, even though for some women this may mean traveling long distances. Women should be made aware of how likely, or not, it would be that they would need admission antenatally, iatrogenic preterm delivery, lower segment cesarean section (LSCS) or high dependency care in a hospital that may be many miles from home.

Information in an appropriate language

If the woman and her doctor do not speak the same language, a professional interpreter should be employed. Interpreters from within the family, including the husband, should be avoided as in the family's desire to help the woman have a successful pregnancy the risks may not be accurately relayed to her. This has been a recommendation from three UK maternal mortality reports.[2,10,11]

Preparing for pregnancy

The preconception consultation provides the ideal opportunity to minimize risks and optimize cardiac function before pregnancy [12]:

- valvotomy, valve repair or replacement before pregnancy—if valve replacement is performed, the choice of the type of valve used may be influenced by the desire for future pregnancy. Risks should be balanced between the use of tissue valves, obviating the need for anticoagulation during pregnancy but carrying the risk of inevitable reoperation, and the use of mechanical valves,

mandating the use of anticoagulation during pregnancy, but (potentially) obviating the need for future surgery
- treatment of arrhythmias (interventional or medical)
- treatment of underlying medical conditions, such as hypertension or diabetes
- avoidance of teratogens—medication may need to be changed before pregnancy
- discussion about anticoagulation—women using warfarin need to be aware of its teratogenic potential and the risk of fetal intracranial hemorrhage, and should understand the advisability in most cases for conversion to heparin once pregnancy is confirmed. Contact numbers should be provided to facilitate this as early as possible in pregnancy. For women with mechanical valves, the risks of warfarin vs the risks of low-molecular-weight heparin should be discussed to enable them to make an informed choice about which anticoagulant regime should be used during pregnancy
- dental treatment—women with complex heart disease may need to be referred to a tertiary dental hospital for dental care. It is preferable for any dental problems to be addressed and resolved before pregnancy
- timing of pregnancy—for those with progressive disease (e.g. a systemic right ventricle or univentricular heart), pregnancy is likely to be tolerated better when the woman is younger. Such women should be discouraged from purposely delaying pregnancy because of other considerations such as a career
- contraception—until the above cardiac problems have been appropriately addressed, the provision of appropriate contraception is paramount
- general prepregnancy advice should not be forgotten, for example taking folic acid to reduce the risk of neural tube defect in the baby, smoking cessation, weight management etc.
- provision of phone numbers to facilitate prompt contact and reassessment once pregnancy is confirmed.

Women undergoing assisted conception often have additional risk factors such as increased age and the risk of ovarian hyperstimulation and multiple pregnancy, with a concomitant increase in the risk of preeclampsia. These conditions can compound the risk of heart disease, and ovarian hyperstimulation may be fatal in women with impaired ventricular function or a Fontan circulation. In women undergoing assisted conception, it is important that precautions should be taken to avoid hyperstimulated cycles and to minimize the chance of multiple pregnancy by carrying out single-embryo replacements during *in vitro* fertilization (IVF) cycles.

Risk of congenital abnormality

Many couples have worries about the risk of CHD in their unborn baby. For the majority of women with CHD (with no family history and no chromosomal abnormality), the risk of recurrence of CHD in the fetus is around 3–5%. Prenatal fetal echocardiography should be arranged and couples can be reassured that the most likely outcome is a healthy baby.

For women known to have, or suspected of having, a genetically inherited cardiac condition, the preconception appointment offers the opportunity to refer a woman to a clinical geneticist. Tetralogy of Fallot, when associated with underlying genetic disorders such as 22q11.2 deletion (DiGeorge syndrome), carries a much higher recurrence risk than when tetralogy of Fallot occurs in the absence of an underlying genetic syndrome.

It can be difficult for most clinicians to recognize rare genetic syndromes, so doctors should have a low threshold to make a genetics referral, especially if there is a family history of CHD. Although a woman may have previously been seen by a geneticist, she may welcome the opportunity to discuss the risks to the fetus again once she begins to contemplate pregnancy.

Preconception care should also include a discussion of the various prenatal tests available for the detection of fetal abnormality, their risks and limitations, the timing of the tests, and the way in which they are performed. Information about how to access these tests, including contact numbers, should be provided. Discussion should include the options available, including termination, if the fetus is found to be abnormal. Women should be encouraged to carefully consider the implications of testing, and whether they would terminate the pregnancy if the baby is found to be abnormal, prior to embarking on testing (the choice may vary according to the nature of the fetal abnormality).

For women with conditions such as Marfan syndrome, the preconception appointment offers the opportunity to discuss the risk that their baby will be affected (which is 50% as it is a single dominant gene abnormality, assuming the father is unaffected) and whether they would like early screening, for example preimplantation diagnosis (which requires IVF), or no screening at all. If a decision for no screening is made, the infant needs to be followed up postnatally to establish a diagnosis. If Marfan syndrome is diagnosed, long-term surveillance needs to be implemented.

Conclusion

Successful preconception counseling will empower a woman with cardiac disease to make informed choices relating to pregnancy by providing nondirective counseling and access to the appropriate multidisciplinary specialized services. Optimizing her health before pregnancy will improve the likelihood of a successful pregnancy outcome.

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Section 1 Pregnancy Counseling and Contraception

Chapter 2

Contraception in women with heart disease

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Practical practice points

1. A key requirement for contraception in women with severe heart disease is maximum efficacy because the consequences of contraceptive failure can be fatal.
2. Subdermal progestogen implants (such as Nexplanon®) and progestogen-loaded intrauterine devices (such as Mirena®) are the most efficacious forms of contraception and are also safe methods for most women with significant heart disease.
3. In the event of unprotected sexual intercourse, women with heart disease should be aware that emergency contraception, known to be safe for women with heart disease, is available.
4. Urgent access to termination of pregnancy should be readily available within a hospital equipped to deal with the woman's cardiac condition.

Introduction

Cardiac disease is the main cause of maternal mortality in the UK, being responsible for 20% of maternal deaths.[1] The major pathologies causing mortality are cardiomyopathy (mainly peripartum cardiomyopathy), ischemic heart disease, sudden adult death syndrome, and dissection of the thoracic aorta.

There are a handful of cardiac conditions in which pregnancy is not advisable because of mortality rates approaching 25%. It is imperative that women with these conditions have the most reliable methods of contraception available. However, contraceptive agents may themselves influence heart disease or may interact with medications used by such women. The World Health Organization (WHO) has classified contraceptive agents into four classes depending on their suitability for use in medical conditions (WHO Medical Eligibility Criteria [WHOMEC]).[2] This classification has been incorporated into the subsequently developed UK Medical Eligibility Criteria (UKMEC) shown in Table 2.1.[3]

The UKMEC classification for an individual agent will vary according to circumstance and concomitant medical illnesses such as cardiac disease, hypertension, and diabetes. For example, a woman starting the combined oral contraceptive (COC) pill will be classified as:

- UKMEC 1 if she is aged under 40 years
- UKMEC 2 if she is aged 40 years or older
- UKMEC 3 if she has adequately controlled hypertension
- UKMEC 4 if she is hypertensive with systolic blood pressure ≥160 mmHg or diastolic blood pressure ≥95 mmHg.

Counseling patients on the risks of pregnancy

Adolescents with congenital heart disease (CHD) should have the issue of pregnancy and contraception discussed with them at age 12–15 years (depending on the individual's maturity). This will usually take place in the pediatric cardiology clinic. Transition from pediatric to adult services should include information about the individual's cardiac disease, her risks from pregnancy, and her risks from contraceptive use, specifically of venous thrombosis, severe vasovagal reaction, and endocarditis.[4]

Suitable contraception should be offered to all women with heart disease who are sexually active and who either do not yet wish to conceive or for whom pregnancy is not advisable. Any competent young person in the UK can consent to medical treatment. If they are under 16 years old their parents or carers should be informed, although if it is judged that providing contraception is in the best interest of an adolescent who

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Table 2.1 WHOMEC and UKMEC classification and interpretation of medical eligibility for contraceptives

WHOMEC/UKMEC class	Eligibility for contraceptives with medical conditions	"ABCD" classification
1	No restriction for use	**A**lways usable
2	Advantages of method generally outweigh theoretical or proven risk	**B**roadly usable
3	Theoretical or proven risks generally outweigh advantages	**C**aution/counseling
4	Unacceptable health risk	**D**o not use

UKMEC = UK Medical Eligibility Criteria; WHOMEC = World Health Organization Medical Eligibility Criteria
Adapted from World Health Organization and Faculty of Sexual & Reproductive Healthcare [2,3]

Table 2.2 Classification of medical illness (e.g. heart disease) according to risk to maternal health if pregnant

Class	Risk of maternal morbidity and mortality resulting from pregnancy with medical illness	Counseling required if pregnancy considered
1	No detectable increased risk	No contraindication to pregnancy
2	Slightly increased risk	Can consider pregnancy
3	Significantly increased risk	If pregnancy still desired after counseling, intensive specialist cardiac and obstetric monitoring will be required antenatally, in labor and postnatally
4	Unacceptably high risk	Pregnancy not advisable; offer emergency contraception or termination if pregnancy occurs; if declined care for as class 3

Adapted from Thorne *et al.* [5]

understands the information given then parental (or carer) consent is not required.

All women with heart disease considering pregnancy should be offered preconception counseling. In women with CHD, counseling should be provided by a specialist in adult CHD in tandem with an appropriately experienced obstetrician. A risk assessment should be carried out to specifically ascertain cardiovascular and cerebrovascular risk factors, history of hypertension, thrombosis, and migraines, smoking status, and personal or family history of thrombophilia, hyperlipidemia, stroke, and diabetes. A similarly thorough assessment is necessary before prescribing contraception.

The WHO classification for contraceptives can be extended and adapted to cover the risk of maternal morbidity and mortality resulting from pregnancy in women with specific medical conditions, such as heart disease (Table 2.2).[5]

Fetal consequences should also be taken into consideration when discussing whether pregnancy is advisable. Heart disease causing cyanosis can result in chronic fetal hypoxia that significantly reduces the chances of a live birth. A prepregnancy resting arterial oxygen saturation of 85–90% is associated with a 45% chance of a live birth, but this drops to only 12% with oxygen saturation <85%.[6] Moreover, such a low oxygen saturation is also associated with a high maternal hemoglobin concentration, poor placental perfusion, and fetal growth restriction. A growth-restricted baby often needs to be delivered preterm, thus increasing the risk of neonatal morbidity and mortality.

Classification of cardiac conditions

In general, only the most efficacious contraceptives are suitable for women with severe heart disease because the consequences of contraceptive failure are far greater for them than for women with a less severe disorder. Table 2.3 shows various cardiac diseases under each class. Class 2 and 3 cardiac conditions are those with a slightly or significantly increased risk of maternal morbidity and mortality.[5] Individual specialist assessment is required to establish to which class of risk these conditions should be allocated. Combinations of abnormalities or the presence of additional risk factors may further increase the risks of pregnancy.

Preconception counseling is imperative for women with class 4 cardiac conditions. It is inevitable that some women will decide to go ahead with a pregnancy despite the risks to their own health, and their right to do so must be respected and supported. However, when women decide they do not want to become pregnant, it is essential that the most effective appropriate

Table 2.3 Risk of maternal morbidity and mortality from pregnancy in various cardiac conditions

Class 1: No concerns for pregnancy	Class 3[a]: Pregnancy has significantly increased risk
Uncomplicated, small or mild lesions e.g. • mitral valve prolapse • patent ductus arteriosus • ventricular septal defect • pulmonary stenosis Successfully repaired simple lesions e.g. • patent ductus arteriosus • ventricular septal defect • ostium secundum atrial septal defect • anomalous pulmonary venous drainage • isolated ventricular extrasystoles and atrial ectopic beats	Mechanical valve Systemic right ventricle[b] Following Fontan operation (for tricuspid atresia) Cyanotic heart disease (unrepaired) Other complex congenital heart disease Aorta 40–45 mm in Marfan syndrome Aortic disease associated with bicuspid aortic valve
Class 2 if otherwise well and uncomplicated: Can consider pregnancy (slight risk)	**Class 4: Pregnancy not advisable**
Unoperated atrial or ventricular septal defect Repaired tetralogy of Fallot Most arrhythmias	Pulmonary arterial hypertension of any cause Severe systemic ventricular dysfunction with • NYHA class III–IV or • left ventricular ejection fraction <30% Previous peripartum cardiomyopathy with any residual impairment of left ventricular function Severe mitral stenosis or severe symptomatic aortic stenosis (valve areas <1 cm^2) Aorta dilated >45 mm in Marfan syndrome Aortic dilatation >50 mm in aortic disease associated with bicuspid aortic valve Native severe aortic coarctation
Class 2–3 depending on individual: Slight/significant risk in pregnancy	
Mild left ventricular impairment Hypertrophic cardiomyopathy Native or tissue valvar heart disease not considered class 1 or 4 Marfan syndrome without aortic dilatation[c] Aorta <45 mm in aortic disease associated with bicuspid aortic valve Repaired aortic coarctation Heart transplantation	

[a] If there are other risk factors, pregnancy may carry a class 4 risk
[b] Congenital heart disease in which the right ventricle supports the systemic circulation
[c] With or without a family history of aortic dissection
NYHA = New York Heart Association
Adapted from Faculty of Sexual and Reproductive Healthcare and Thorne *et al.* [4,5]

contraceptive agents are recommended and supplied. If there is failure of regular contraception, then emergency contraception should be provided promptly. Failing this, termination of pregnancy should be available without delay.

Contraceptive agents

There are a range of contraceptive agents suitable for each cardiac condition. The one recommended for use should be tailored according to the individual's particular circumstances. The following points should be considered when deciding on the most appropriate contraceptive agent:

- patient choice
- thrombotic risks of estrogen-containing contraceptives
- hypertensive risks of estrogen-containing contraceptives
- vagal stimulation and bradycardia can occur with insertion of an intrauterine device (IUD)
- infective risks with insertion of an IUD
- bleeding risks for patients on warfarin (copper intrauterine devices [Cu-IUDs], intramuscular injections)
- effects of anesthesia
- noncontraceptive benefits (e.g. reduction in menstrual bleeding)
- drug interactions
- degree of efficacy of the method (especially if pregnancy is not advisable).

Efficacy of use of contraceptive agents

Very few women use a contraceptive agent perfectly in accordance with the product instructions. Most women fall into the category of "typical user,"

Table 2.4 Efficacy of contraceptive methods with typical and perfect use

	Women experiencing an unintended pregnancy within first year of use (%)	
Contraceptive method	**Typical use**	**Perfect use**
No method	85	85
Spermicides	28	18
Withdrawal	22	4
Fertility awareness-based methods	24	
Standard days method[a]		5
Two-day method[b]		4
Ovulation method[b]		3
Cap		
Parous women	32	26
Nulliparous women	16	9
Sponge		
Parous women	24	20
Nulliparous women	12	9
Diaphragm	16	6
Condom		
Female	21	5
Male	18	2
COC and POP	9	0.3
Combined hormonal patch (Evra®)	9	0.3
Combined hormonal ring (NuvaRing®)	9	0.3
Depo-Provera®	6	0.2
Combined injectable (Lunelle™)	3	0.05
IUD		
Copper T	0.8	0.6
LNG-IUS (Mirena®)	0.2	0.2
Progestogen implant (Implanon®)	0.05	0.05
Female sterilization	0.5	0.5
Male sterilization	0.15	0.1

Only hormonal, IUD and sterilisation methods are sufficiently reliable for women with heart disease in classes 2–4
[a] Avoids intercourse on cycle days 8–19
[b] Based on evaluation of cervical mucus
COC = combined oral contraceptive; IUD = intrauterine device; LNG-IUS = levonorgestrel intrauterine system; POP = progestogen-only pill
Adapted from World Health Organization (2010) [2]

where they occasionally use the method incorrectly. [2] Pregnancy rates for typical users are therefore a better reflection of the efficacy that can be expected from a contraceptive (Table 2.4). There is a paucity of data on pregnancy rates with typical use in the UK; most data are obtained from studies in the USA. [2] Only the most reliable contraceptive methods should be recommended for those with class 3 or 4 risk.

The contraceptive methods that will be considered in detail below are those for which fewer than 10% of women conceive in the first year of typical use.

Table 2.5 shows the relative advisability of various contraceptive methods in several cardiac conditions.

Table 2.5 UKMEC classification of contraceptive for different personal characteristics and cardiac conditions

		Progestogen-only contraceptives				
Condition/disease	**CHC**	**POP**	**Injectables**	**Implant**	**LNG-IUS**	**Cu-IUD**
Age						
Menarche to <18 years	1	1	2	1	1	1
18–20 years	1	1	1	1	1	1
20 to <40 years	1	1	1	1	1	1
40 to 45 years	2	1	1	1	1	1
>45 years	2	1	2	1	1	1
Smoking						
Age <35 years	2	1	1	1	1	1
Age ≥35 years	3	1	1	1	1	1
<15 cigarettes/day	3	1	1	1	1	1
≥15 cigarettes/day	4	1	1	1	1	1
Stopped smoking <1 year ago	3	1	1	1	1	1
Stopped smoking ≥1 year ago	2	1	1	1	1	1
Obesity (body mass index)						
≥30–34 kg/m^2	2	1	1	1	1	1
≥35 kg/m^2	3	1	1	1	1	1
Multiple risk factors for cardiovascular disease (e.g. age, smoker, obese, diabetes, hypertension)	3–4	2	3	2	2	1
Hypertension[a] (blood pressure)						
Adequately controlled	3	1	2	1	1	1
Consistently elevated						
SBP >140–159 mmHg or DBP >90–94 mmHg	3	1	1	1	1	1
SBP >160 mmHg or DBP >95 mmHg	4	1	2	1	1	1
Hypertension + vascular disease	4	2	3	2	2	1
Current & history of ischemic heart disease	4	I, 2; C, 3	3	I, 2; C, 3	I, 2; C, 3	1
Stroke (cerebrovascular attack/transient ischemic attack)	4	I, 2; C, 3	3	I, 2; C, 3	I, 2; C, 3	1
Known hyperlipidemias	2/3	2	2	2	2	1
Valvar and congenital heart disease						
Uncomplicated	2	1	1	1	1	1
Complicated[b]	4	1	1	1	2	2

[a] Assuming no other risk factors for cardiovascular disease exist
[b] For example, with pulmonary hypertension, atrial fibrillation, history of infective endocarditis
C = continuation of contraception; CHC = combined hormonal contraceptives; Cu-IUD = copper intrauterine device; DBP = diastolic blood pressure; I = initiation of contraception; LNG-IUS = levonorgestrel intrauterine system; POP = progesterone-only pill; SBP = systolic blood pressure; UKMEC = UK Medical Eligibility Criteria
Adapted from Faculty of Sexual & Reproductive Healthcare (2009) [3]