

Section 8. Recommendations for aortopathies, cardiac surgery, and pregnancy

Pregnancy is not recommended in patients with vascular Ehlers–Danlos syndrome.	III	C	It is recommended that women with vascular Ehlers–Danlos syndrome wishing to become pregnant are counselled regarding the very high risk of pregnancy-related adverse events by a multidisciplinary team, considering family history, genetic variant, and previous vascular events.	I	C
Beta-blocker therapy throughout pregnancy should be considered in women with Marfan syndrome and other heritable thoracic aortic diseases.	IIa	C	Beta-blocker therapy throughout pregnancy and in the post-partum period is recommended in women with MFS and other HTADs.	I	C

Section 9. Recommendations for congenital heart disease and pregnancy

Patients with a systemic right ventricle (Mustard/Senning or congenitally corrected TGA), in NYHA class III/IV, systemic ventricular dysfunction (EF <40%), or severe TR should be advised against pregnancy.	IIa	C	It is recommended that women with a systemic RV (Mustard/Senning or congenitally corrected TGA), in NYHA class III/IV, systemic ventricular dysfunction (EF <40%), or severe TR wishing to become pregnant are counselled by the Pregnancy Heart Team regarding the high risk of pregnancy-related adverse events.	I	C
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Section 12. Recommendations for acquired heart disease and pregnancy

An invasive management strategy should be considered for NSTEMI ACS with high-risk criteria.	IIa	C	It is recommended to manage pregnant women with ACS in the same way as non-pregnant women, including diagnostic investigations and interventions.	I	C
Catheter ablation with electro-anatomical systems should be considered in experienced centres in cases of drug-refractory and poorly tolerated SVT.	IIa	C	Catheter ablation may be considered in pregnant women with recurrent, long symptomatic SVT or with contraindications to pharmacological therapies.	IIb	C
Balloon aortic valvuloplasty should be considered during pregnancy in patients with severe aortic stenosis and severe symptoms.	IIa	C	In very selected symptomatic pregnant women with severe aortic stenosis not responding to medical therapy, non-surgical options such as balloon valvuloplasty or TAVI may be considered.	IIb	C
A bioprosthesis should be considered in young women contemplating pregnancy.	IIa	C	A bioprosthetic valve is recommended (over a mechanical valve) in young women contemplating pregnancy requiring a valve prosthesis.	I	B
During the second and third trimesters, LMWH with anti-factor Xa level monitoring and dose adjustment (see separate recommendations) may be considered in women who need a high dose of VKA after patient information and consent.	IIb	C	During the second and third trimesters until the 36th week, continuing VKAs should be considered in women with prosthetic heart valves at higher risk of thrombosis.	IIa	C

ACS, acute coronary syndrome; CMP, cardiomyopathy; EF, ejection fraction; HCM, hypertrophic cardiomyopathy; HTAD, heritable thoracic aortic disease; LMWH, low-molecular-weight heparin; MFS, Marfan syndrome; NSTEMI ACS, non-ST-elevation myocardial infarction; NYHA, New York Heart Association; RV, right ventricle; SVT, supraventricular tachycardia; TAVI, transcatheter aortic valve implantation; TGA, transposition of the great arteries; TR, tricuspid regurgitation; VKA, vitamin K antagonist.

^aClass of recommendation.

^bLevel of evidence.

3. General considerations

3.1. Epidemiology

Within high-income countries the number of pregnancies and deliveries in women with acquired, congenital, or inherited CVD is growing significantly.^{19–21} This trend originates from several factors: higher maternal age at first pregnancy, a growing number of women with congenital heart disease reaching childbearing age, and a rising prevalence of cardiovascular comorbidities.^{19–21} Globally, up to 4% of pregnancies are complicated by CVD, rising to 10% when including hypertensive disorders.^{22–25} Maternal CVD is now the leading cause of non-obstetric mortality in pregnant women^{24,26}, accounting for 33% of pregnancy-related deaths worldwide.^{25,27,28} In women with pre-existing CVD, up to 16% of pregnancies are complicated by CVD.^{29–32} Notably, 68% of pregnancy-related deaths

caused by CVD are preventable.³³ Women with CVD during pregnancy face higher risk of cardiac events later in life, making secondary prevention crucial.²⁵ Adverse neonatal outcomes occur in ~25% of these pregnancies in women with CVD^{34,35} with high rates of obstetric complications (17%) and maternal mortality/morbidity (11%).^{34,35} Of note, recent research indicates that pre-existing CVD in the mother is associated with an increased risk of CVD in her children, and this association is unlikely to be explained by unmeasured familial or genetic factors.³⁶

3.2. Physiology of pregnancy

Pregnancy induces physiological changes in the cardiovascular system to meet the increased metabolic needs of the mother and foetus (Figure 1). These changes occur from the early stages of pregnancy onward. Starting at 6 weeks of gestation, stroke volume and cardiac output (CO) increase