ESC European Society of Cardiology

European Heart Journal (2018) **39**, 3269–3280
doi:10.1093/eurheartj/ehy478

CARDIOPULSE

'Ten Commandments' of the 2018 ESC Guidelines for the management of cardiovascular diseases during pregnancy

The current ESC Guidelines for the Management of Cardiovascular Diseases (CVD) during pregnancy have been chaired, as were the previous ones, by Vera Regitz-Zagrosek, Berlin, Germany, together with Jolien Roos Hesselink, Rotterdam, The Netherlands. They are based on the previous version, published in 2012 together with a systematic literature search from 2011 to 2017, by the ESC Task force nominated for this purpose.

Pregnancy is complicated by maternal disease in 1–4% of cases. Sudden adult death syndrome, peripartum cardiomyopathy, aortic dissection, and myocardial infarction are the most common causes of maternal death in Europe. Knowledge of the risks associated with CVDs during pregnancy and their management in pregnant women, who suffer from serious pre-existing conditions, is of pivotal importance for advising patients before pregnancy.

Since the previous version of the guidelines was published in 2012, new evidence has accumulated, particularly on diagnostic techniques, risk assessment, and use of cardiovascular drugs. New concepts include enforcing the 'modified World health Organisation' classification of maternal risk, introduction of the 'Pregnancy heart team', more attention for assisted reproductive therapy, separate recommendations for anticoagulation in women with low- and high-dose vitamin K antagonist need and the potential use of Bromocriptine in peripartum cardiomyopathy. FDA categories A to X are replaced in new drugs by detailed information on the risk for mother and foetus in animal models and the human. Also, the advice is to prevent women with heart disease to continue the pregnancy beyond 40 weeks.

The new guidelines have been adapted to facilitate their use in clinical practice and to meet readers' demands by focusing on condensed, clearly presented recommendations. At the end of each section, *Key messages* summarize the essentials. *Gaps in evidence* are listed to propose topics for future research. The guideline document is harmonized with the simultaneously published chapter on the management of CVDs in pregnancy of the *ESC Textbook of Cardiology*.

(1) Pre-pregnancy risk assessment and counselling is indicated in all women with known or suspected congenital or acquired cardiovascular and aortic disease or pulmonary hypertension. Echocardiography is recommended in any pregnant patient with unexplained or new cardiovascular signs or symptoms.
(2) New, Women in mWHO 2–3 or higher are 'high risk' and management should be discussed in specialized centres by a multidisciplinary team: the Pregnancy Heart Team.
(3) Vaginal delivery is recommended as first choice in most patients; except for patients presenting in labour on oral anticoagulants, with aggressive aortic pathology, in acute intractable heart failure (HF), or with severe pulmonary hypertension.
(4) Pregnancy is not recommended in patients with pulmonary arterial hypertension, in patients with a systemic right ventricle and moderate or severely decreased ventricular function, after Fontan operation and any associated complication, in patients with vascular Ehlers–Danlos syndrome, in patients with dilated aorta, in patients with severe mitral stenosis or with severely decreased left ventricular ejection fraction (LVEF).
(5) Women with mechanical valves are at high risk of complications (valve thrombosis, bleeding, obstetric, and foetal complications) and should be counselled before pregnancy and managed during their pregnancies in specialized centres by a Pregnancy Heart Team.
(6) It is recommended to treat women with HF during pregnancy according to current guidelines for non-pregnant patients, respecting contraindications for some drugs in pregnancy.
(7) Immediate electrical cardioversion is recommended for any tachycardia with haemodynamic instability and for pre-excited atrial fibrillation (AF), for sustained both unstable and stable ventricular tachycardia (VT).
(8) In all women with gestational hypertension or with hypertension and subclinical organ damage or symptoms, initiation of drug treatment is recommended at systolic blood pressure (SBP) $>$ 140 mmHg or diastolic blood pressure (DBP) $>$ 90 mmHg. In other cases, initiation of drug treatment is recommended at SBP $\geq$ 150 mmHg or DBP $\geq$ 95 mmHg. SBP $\geq$ 170 mmHg or DBP $\geq$ 110 mmHg in a pregnant woman is an emergency, and hospitalization is recommended.
(9) Low molecular weight heparin (LMWH) is recommended for the prevention and treatment of venous thrombo-embolism (VTE) in pregnant patients and therapeutic doses of LMWH should be based on body weight.
(10) Before pharmacological treatment in pregnancy is started, it is recommended to check drugs and safety data (see *Table 7* or web addendum of full Guideline document) and www.safefetus.com.

Prof. Dr. med. Dr. h.c.Vera Regitz-Zagrosek, MD
Charité - Universitaetsmedizin Berlin,
Institute for Gender in Medicine, CCR, DZHK,
partner site Berlin, Hessische Str 3-4, 10115
Berlin, Germany
Tel: +49 30 450 525 288
Fax: +49 30 450 7 525 288
Email: vera.regitz-zagrosek@charite.de

Conflict of interest: none declared.