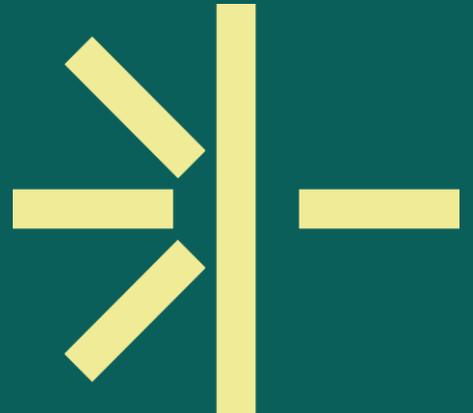


Behandlung kardiovaskulärer Erkrankungen in der Schwangerschaft: Fokus Herzinsuffizienz

28.02.2026

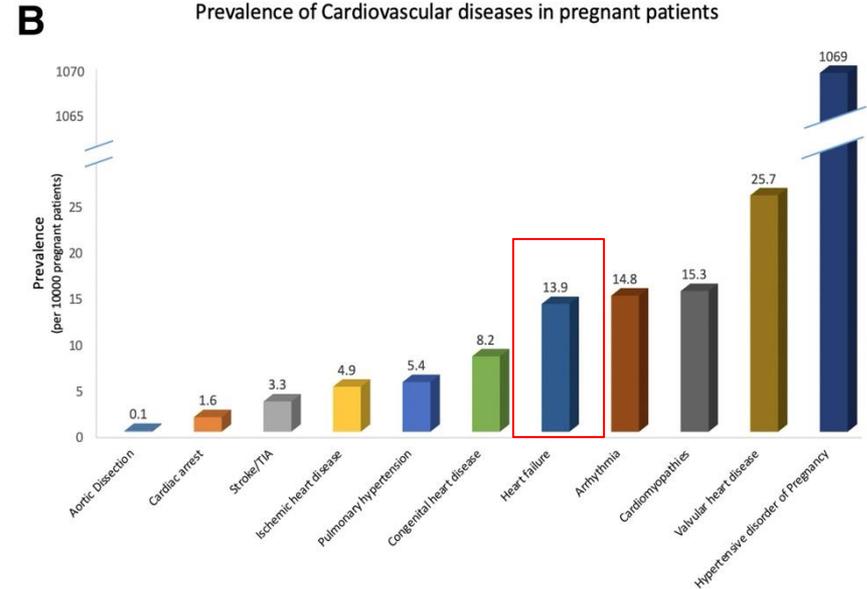
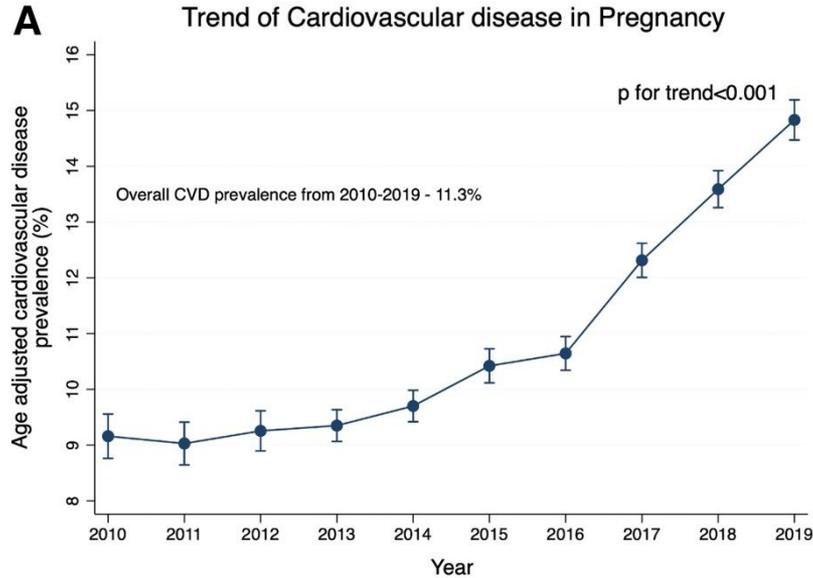
Prof. Dr. Christine Meyer-Zürn
Leiterin Frauenherzsprechstunde
Universitäres Herzzentrum, Kardiologie
Universitätsspital Basel



Persönliche Interessenskonflikte

Keine (Sämtliche externe Drittmittel fließen in den Wissenschaftsfonds des USB)

Trend und Prävalenz CV Erkrankungen bei Schwangeren

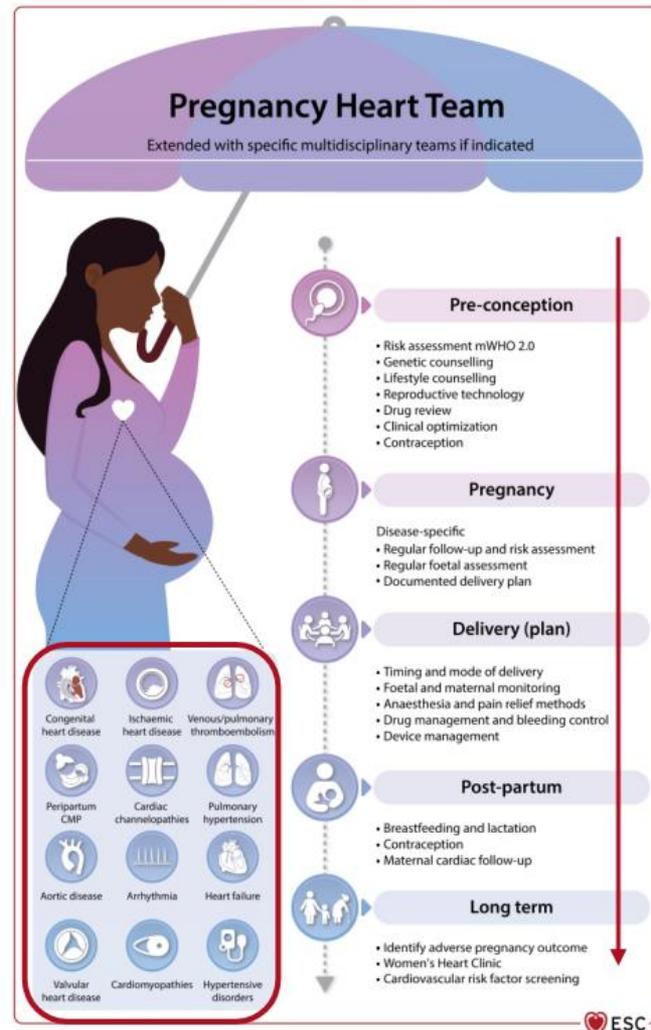


Pregnancy Heart Team

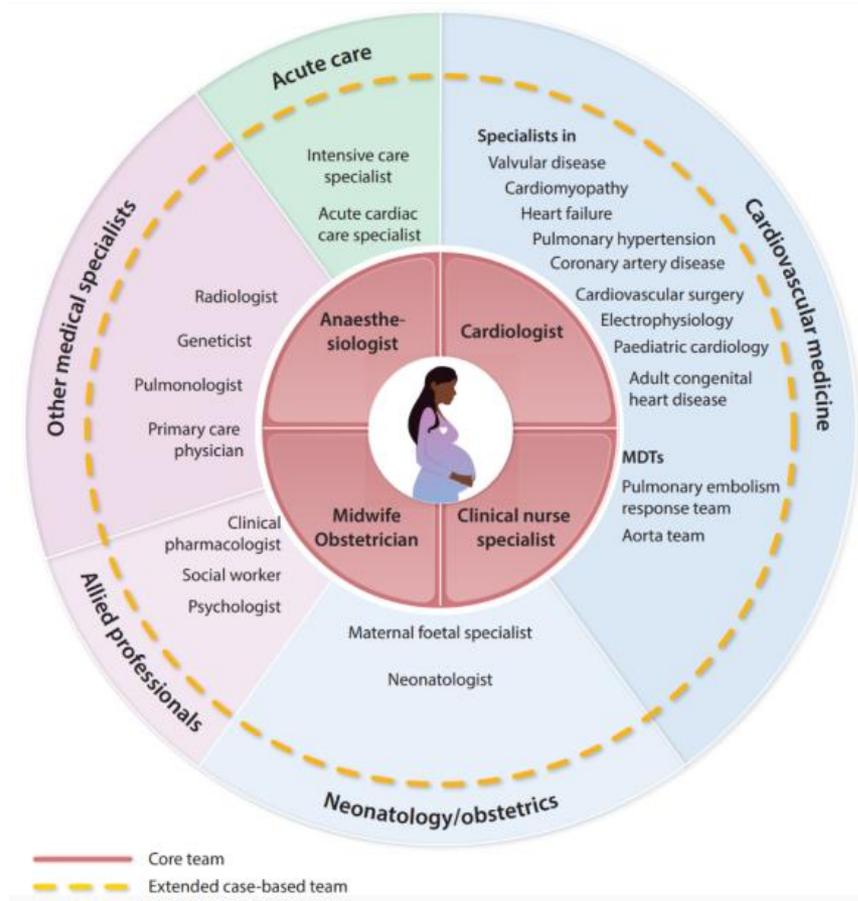
2025 ESC Guidelines for the management of cardiovascular disease and pregnancy

Developed by the task force on the management of cardiovascular disease and pregnancy of the European Society of Cardiology (ESC)

Endorsed by the European Society of Gynecology (ESG)



Pregnancy Heart Team



Risikostratifizierung

ESC 2025	mWHO 2.0 I	mWHO 2.0 II	mWHO 2.0 II-III	mWHO 2.0 III	mWHO 2.0 IV
 Congenital heart disease	 Ischaemic heart disease	 Venous/pulmonary thromboembolism	Congenital heart disease		
 Peripartum CMP	 Cardiac channelopathies	 Pulmonary hypertension	Ventricular function/Pulmonary hypertension		
 Aortic disease	 Arrhythmia	 Heart failure	Arrhythmias (Pacemakers)		
 Valvular heart disease	 Cardiomyopathies	 Hypertensive disorders	Cardiomyopathies (genetic)		
			Valvular heart disease		
			Aortopathy		
			Acquired heart disease/coronary disease		

<i>Involvement of the Pregnancy Heart Team</i>					
No	No	Yes (IC)	Yes (IC)	Yes (IC)	Yes (IC)

Risikostratifizierung bei Herzinsuffizienz

mWHO 2.0 I	mWHO 2.0 II	mWHO 2.0 II–III	mWHO 2.0 III	mWHO 2.0 IV
Ventricular (dys)function + pulmonary hypertension				
		Mild left ventricular impairment: EF >45%. Significantly impaired RV (subpulmonary) function.	Moderate left ventricular impairment: EF 30%–45%. Previous PPCM with not more than mild residual left ventricular impairment.	Severe left ventricular impairment: EF <30% or NYHA class III/IV. Previous PPCM with more than mild left ventricular impairment. PAH.

Risikostratifizierung

Individualize each maternal risk with the modifiers below^b (derived from CARPREG II)⁵²

CARPREG II score: 1 point

- No prior cardiac intervention indicated
- Late pregnancy assessment

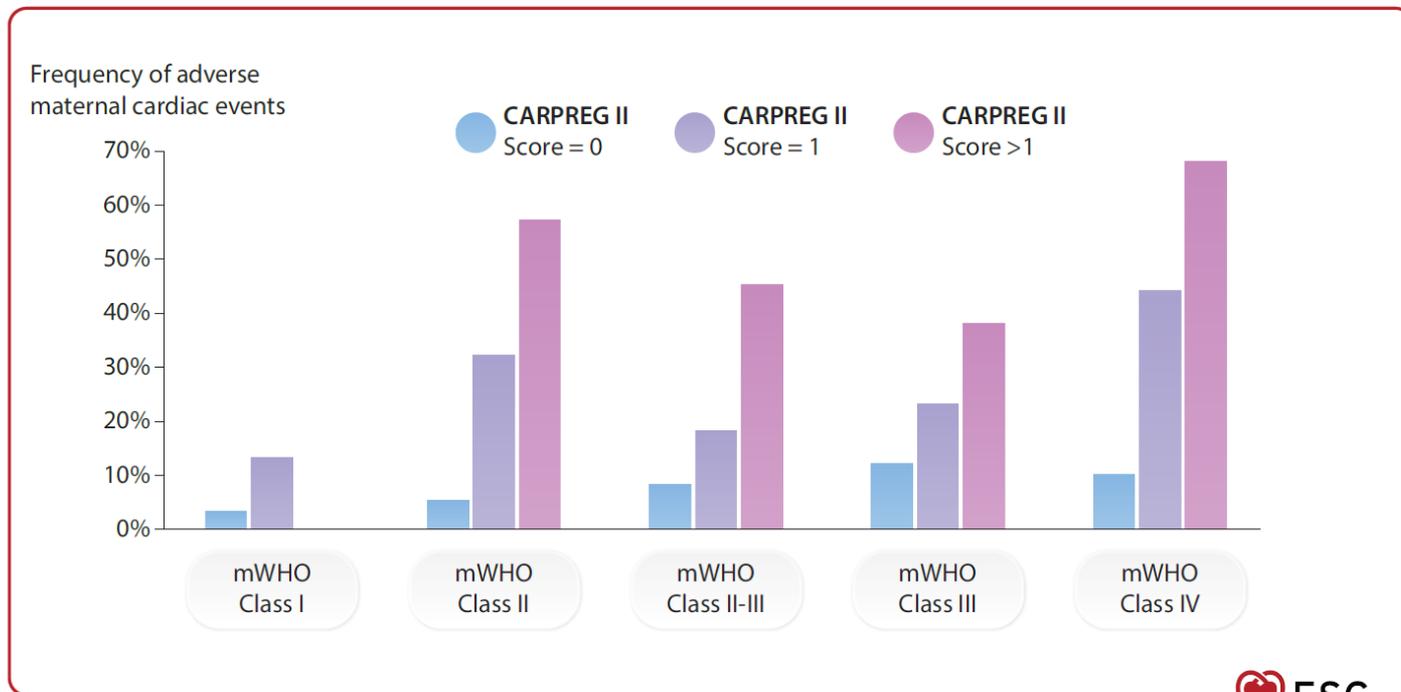
CARPREG II score: 2 points

- Ventricular dysfunction
- High-risk left-sided valve disease or outflow tract obstruction
- Pulmonary hypertension
- Coronary artery disease
- High-risk aortopathy

CARPREG II score: 3 points

- ~~Prior cardiac event or arrhythmias~~
- Baseline NYHA III/IV or cyanosis
- Mechanical valve

mWHO & CARPEG II



Herzinsuffizienzmedikation in der Schwangerschaft



Heart failure



- ++ Metoprolol, propranolol, carvedilol, labetalol, furosemide
- +/- Bisoprolol, hydralazine, isosorbide dinitrate, glycerin trinitrate
- x ACE-I, ARB, ARNI, MRA, SGLT2-I, ivabradine, aliskiren, atenolol, Amiodaron

- ++ Metoprolol, propranolol, carvedilol, labetalol, furosemide, ACE-I, spironolactone
- +/- Bisoprolol, candesartan
- x Ivabradine, aliskiren, ARB^a, ARNI, SGLT2-I



- HFrEF: Aufklärung das LVEF sich verschlechtern kann
- LMWH bei LVEF <35%
- Nach Geburt Abstillen erwägen, um Herzinsuffizienztherapie wieder aufzunehmen

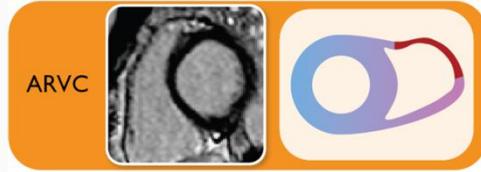
DCM



Dilated Cardiomyopathy

- Genetische Beratung
- Risiko abhängig von LVEF, NYHA, RV-Funktion, Arrhythmien, MI
- Vor der Schwangerschaft Medikation modifizieren (ACEi, ARB, MRA, Sacubtril/Valsartan, SGLT2 sind kontraindiziert)
- Risikostratifizierung: stufenweises Absetzen kontraindizierter Medikation

Recommendation	Class	Level
▶ In women with DCM and worsening of EF during pregnancy, counselling on the risk of recurrence during a subsequent pregnancy is recommended in all cases, even after recovery of LV function.	I	C



Arrhythmogenic Right Ventricular Cardiomyopathy

- Genetische Beratung
- Beobachtungsstudien zeigen akzeptable Outcomes für Frauen und Fötus bei guter Überwachung und optimaler Therapie
- Betablocker sollten weitergeführt werden bzw. begonnen werden

Recommendation	Class	Level
Flecainide, in addition to beta-blockers, should be considered as the antiarrhythmic drug of choice in pregnant women with ARVC.	IIa	C
Sotalol may be considered as an antiarrhythmic drug in pregnant women with ARVC, with careful evaluation of QTc and while monitoring for foetal bradycardia and foetal growth and neonate hypoglycaemia.	IIb	C



Hypertrophic Cardiomyopathy

- Genetische Beratung
- Evaluation des Gradienten in Ruhe, unter Belastung und unter Valsalva vor Schwangerschaft
- Betablocker weiterführen
- Myosin-Inhibitoren kontraindiziert

Recommendations	Class	Level
It is recommended to start beta-blockers in women with HCM who develop symptoms due to outflow tract obstruction or arrhythmia during pregnancy.	I	C
It is recommended that women with HCM with symptomatic LV dysfunction (EF <50%) and or severe LVOTO (≥ 50 mmHg) wishing to become pregnant are counselled by the Pregnancy Heart Team regarding the high risk of pregnancy-related adverse events.	I	C
Cardioversion for AF should be considered in pregnant women with HCM.	IIa	C
Disopyramide may be considered in pregnant women with HCM only when the potential benefits outweigh the risk of uterine contractions.	IIb	C
Myosin inhibitors are not recommended in women during pregnancy due to lack of safety data.	III	C

Planung der Geburt bei Kardiomyopathien

Recommendations	Class	Level
Vaginal delivery is recommended in most women with CMPs, unless there are obstetric indications for caesarean section, severe HF (EF <30% and/or NYHA class III/IV), uncontrolled arrhythmias, or severe outflow obstruction (≥ 50 mmHg) in women with HCM, or in women presenting in labour on VKAs.	I	C
Continuation of beta-blockers should be considered during pregnancy in women with CMPs, with close follow-up of foetal growth.	IIa	C

Peripartum Kardiomyopathie

Peripartum cardiomyopathy (PPCM)

Definition

Symptoms and signs of heart failure with reduced LVEF <45% without any other explainable cause that occur during the peripartum period or in the months following delivery, termination or miscarriage

Risk factors

- Malnutrition
- Family history
- Genetic P/LP variants in DCM genes
- Previous PPCM
- Age <20 or >40 years
- Ethnicity
- Geographical region
- Multiparity, multiple pregnancies
- Fertility-assisted treatments
- Smoking
- Diabetes, hypertension, pre-eclampsia
- Prolonged use of tocolytic beta-agonists

«multiple hit»

Investigations


Physical exam


Electrocardiogram


Natriuretic peptide


X-ray


Echocardiography


CMR^a

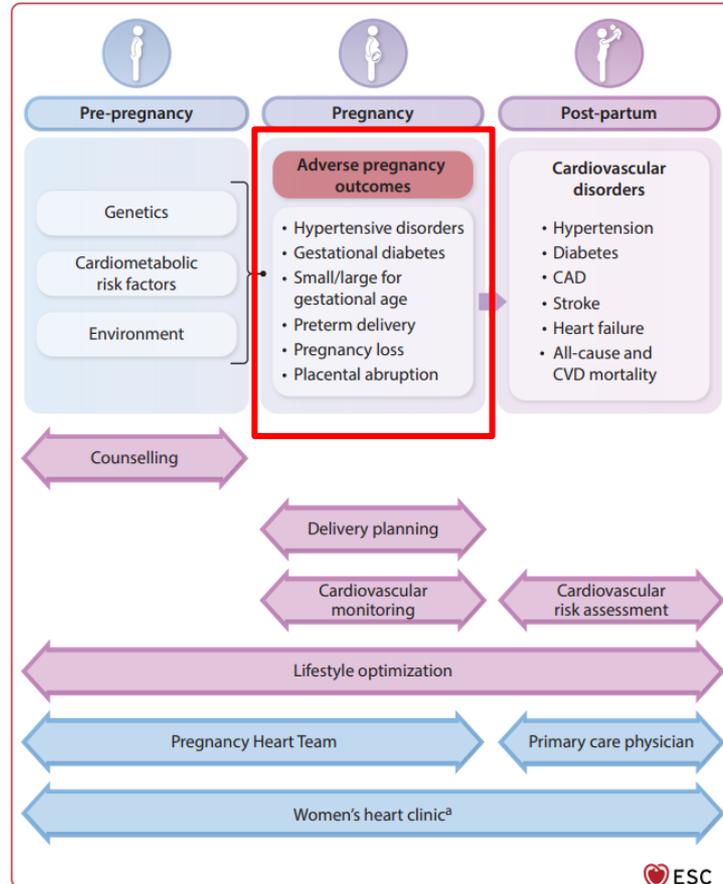
mWHO 2.0 I	mWHO 2.0 II	mWHO 2.0 II–III	mWHO 2.0 III	mWHO 2.0 IV
Ventricular (dys)function				
		Mild left ventricular impairment: EF >45% Significantly impaired RV (sub-pulmonary) function	Moderate left ventricular impairment: EF 30%–45% Previous PPCM with not more than mild residual left ventricular impairment	Severe left ventricular impairment: EF <30% or NYHA class III/IV Previous PPCM with more than mild left ventricular impairment PAH

HTX und Schwangerschaft

Recommendations for heart transplantation and pregnancy

Recommendations	Class	Level
It is recommended to postpone pregnancy until at least 1 year after heart transplantation , taking individual risk factors into account.	I	C
In women with a heart transplant, it is recommended that immunosuppression serum drug levels are monitored during pregnancy every 4 weeks until the 32nd week, then every 2 weeks until the 36th week, then weekly until delivery, and for 6–12 months after delivery to guide dosing.	I	C
Mycophenolic acid therapy is not recommended in pregnancy and should be discontinued 6 weeks before conception.	III	C

Adverse pregnancy outcomes



Adverse pregnancy outcomes

High risk factors for pre-eclampsia

Hypertensive disorders during a previous pregnancy

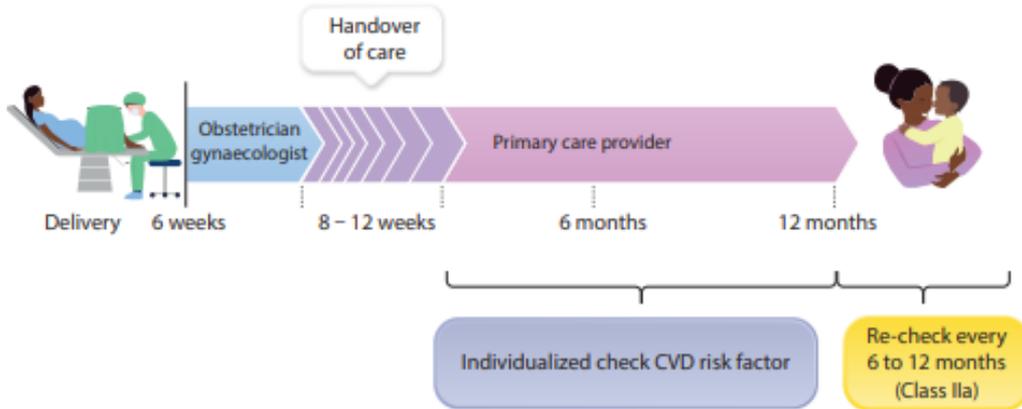
Chronic hypertension

Chronic kidney disease

Type 1 or type 2 diabetes mellitus

Autoimmune diseases such as systemic lupus erythematosus or antiphospholipid syndrome

Assisted reproductive therapy in the current pregnancy

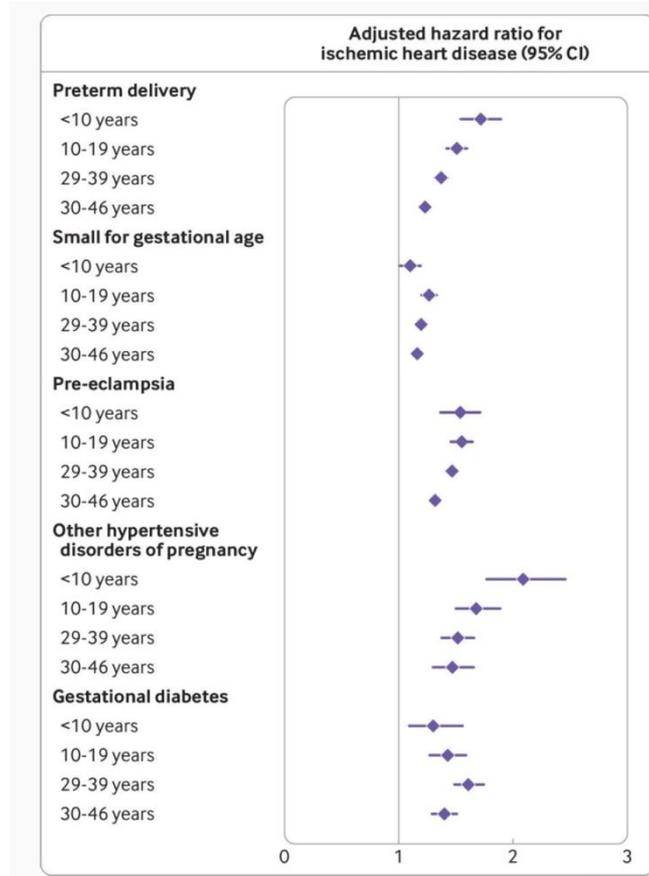


Recommendations

It is recommended to undertake a **cardiovascular risk assessment in women with APOs**, to recognize and **document APOs** when CVD risk is evaluated in women, and to provide counselling on the importance of healthy lifestyle choices that optimize cardiovascular health.

Class	Level
I	B

Adverse pregnancy outcomes und Langzeitrisiko für KHK

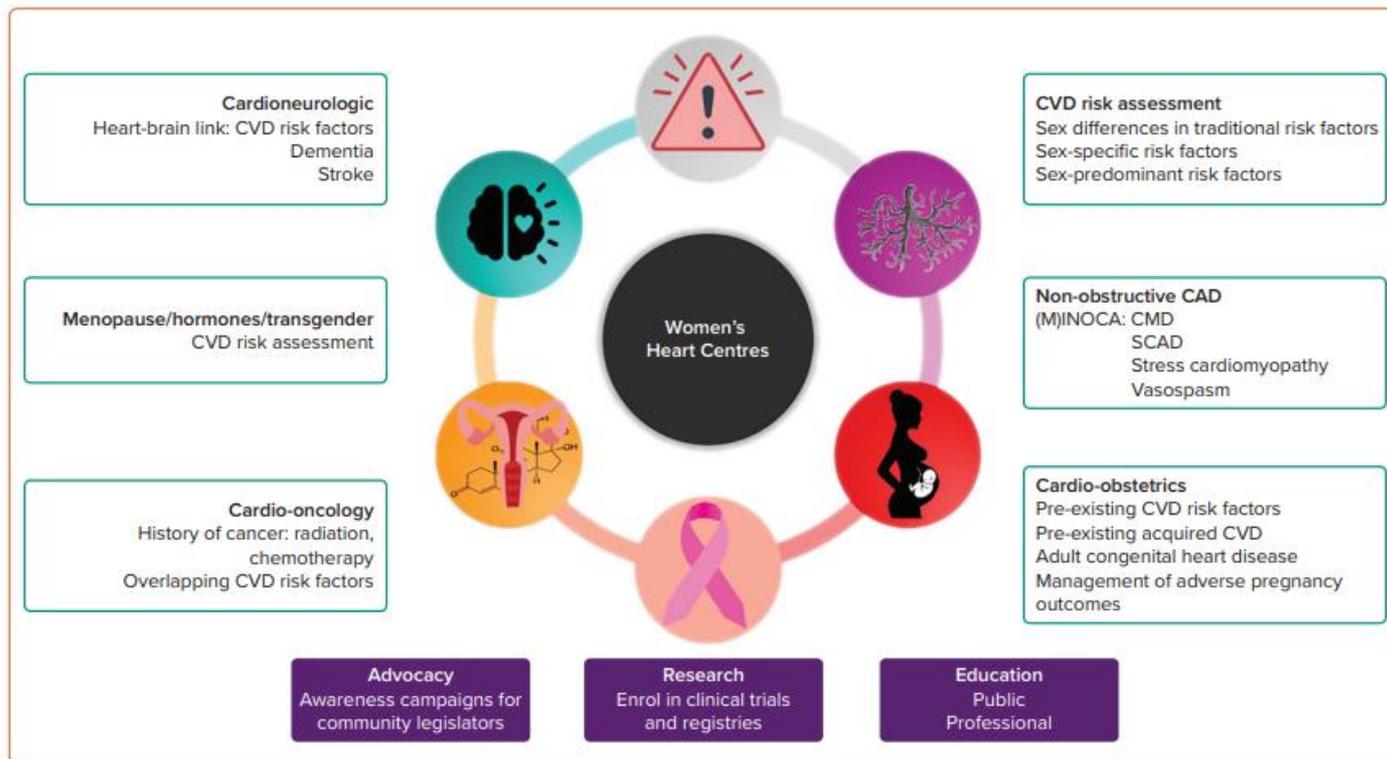


Women's Heart Clinics

13.3. Women's Heart Clinics

Post-partum care is often segmented and only carried out by obstetricians. A longer duration of post-partum care, including cardiovascular risk assessment and counselling on CVD risk prevention, is likely to lower the long-term risk of CVD in women with an APO (Figure 25).^{762,795} Pregnancy Heart Teams and the potential

establishment of Women's Heart Clinics focusing on women of all ages with CVD are necessary to span the care up to post-partum.⁷⁹⁵ Seamless communication between the various healthcare providers (e.g. obstetrician, cardiologist, internist, family physician) and multi-disciplinary management of APOs is critical for long-term care and the woman's future health.^{761,796,797}



CAD = coronary artery disease; CMD = coronary microvascular dysfunction; CVD = cardiovascular disease; INOCA = ischaemia with no obstructive coronary artery disease; MINOCA = MI with no obstructive coronary artery disease; SCAD = spontaneous coronary artery dissection.

Women's Heart Health Program Basel

Frauenherzsprechstunde (Women's Heart Health)



Die Frauenherzsprechstunde ist auf die Prävention und Behandlung von Herzerkrankungen bei Frauen fokussiert. Herz-Kreislauf-Erkrankungen äussern sich bei Frauen oftmals anders als bei Männern. Es gibt bedeutsame Unterschiede in Pathophysiologie, Diagnose, Therapie und Krankheitsverlauf. Zum Beispiel ist die koronare mikrovaskuläre Dysfunktion, welche die kleinen Gefässe des Herzens betrifft, bei Frauen deutlich häufiger.

Frauen sind zusätzlich, oft weniger bekannten Risikofaktoren für Herzerkrankungen ausgesetzt, wie hormonellen Veränderungen, chronisch entzündliche Erkrankungen (Autoimmunerkrankungen) und schwangerschaftsbedingten Komplikationen. Zudem leiden Frauen mit Herzerkrankungen oft an weniger typischen Symptomen, was zu einer Verzögerung der Diagnostik führen kann.

In unserer Sprechstunde bieten wir individuelle Frauen-spezifische Diagnostik- und Therapiekonzepte an und gehen dabei auf die besonderen Bedürfnisse von Frauen ein.

Wir arbeiten eng mit verschiedenen Kliniken des Universitätsspitals zusammen, um eine optimale Behandlung unserer Patientinnen nach modernsten Standards und Empfehlungen sicherzustellen.



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CRIB-MISSION

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Women's Heart Health

Co-Leiterinnen: Dr. Emel (Eliza) Kaplan & Prof. Christine Meyer-Zürn

Die im CRIB angesiedelte Forschungsgruppe des «Women's Heart Health» Programms des USB hat zum Ziel, geschlechtsspezifische Unterschiede im Bereich der kardiovaskulären Medizin systematisch zu untersuchen und dadurch die geschlechtersensible Prävention, Diagnostik und Therapie kardiovaskulärer Erkrankungen zu verbessern und so den «gender health gap» zu schliessen.

Der Fokus unserer wissenschaftlichen Arbeit liegt auf Erkrankungsbildern, die bei Frauen häufiger oder anders verlaufen und deren adäquate Behandlung bislang oft zu spät oder gar nicht erfolgt, sowie auf speziellen Risikoprofilen von Frauen. Dazu gehören insbesondere

- Nicht-obstruktive koronare Erkrankungen (ANOCA/INOCA/MINOCA)
- HFpEF
- Hormonelle Dysbalancen, z.B. Perimenopause
- Autonome Dysfunktion bei Frauen

Angesichts der anhaltenden Unterrepräsentation von Frauen in kardiovaskulären Studien ist der Aufbau einer gut dokumentierten und umfassend charakterisierten «Basel Women's Heart Cohort» ein zentrales Anliegen der Forschungsgruppe. Diese Kohorte bildet die Grundlage für klinische und translationale Studien und unterstützt den universitären Auftrag für exzellente, geschlechtergerechte Forschung.



Vielen Dank für die Aufmerksamkeit



Section 6. Pregnancy in women with cardiomyopathies and primary arrhythmia syndromes

This section has been expanded since 2018 for advice in specific cardiomyopathies and primary arrhythmias.

Vaginal delivery is recommended in most women with CMPs, unless there are obstetric indications for caesarean section, severe HF (EF <30% and/or NYHA class III/IV), uncontrolled arrhythmias, or severe outflow obstruction (≥ 50 mmHg) in women with HCM, or in women presenting in labour on VKAs.	I	C
In women with DCM and worsening of EF during pregnancy, counselling on the risk of recurrence during a subsequent pregnancy is recommended in all cases, even after recovery of LV function.	I	C
It is recommended that women with HCM with symptomatic LV dysfunction (EF <50%) and or severe LVOTO (≥ 50 mmHg) wishing to become pregnant are counselled by the Pregnancy Heart Team regarding the high risk of pregnancy-related adverse events.	I	C
Myosin inhibitors are not recommended in women during pregnancy due to lack of safety data.	III	C

Recommendations for chronic and acute heart failure and pregnancy

Inotropes and/or vasopressors are recommended in pregnant women with cardiogenic shock with levosimendan, dobutamine, and milrinone as recommended agents.	I	C
ACE-Is, ARBs, ARNIs, MRAs, ivabradine, and SGLT2 inhibitors are not recommended during pregnancy due to adverse foetal effects.	III	C

Section 13. Long-term effects of adverse pregnancy outcomes

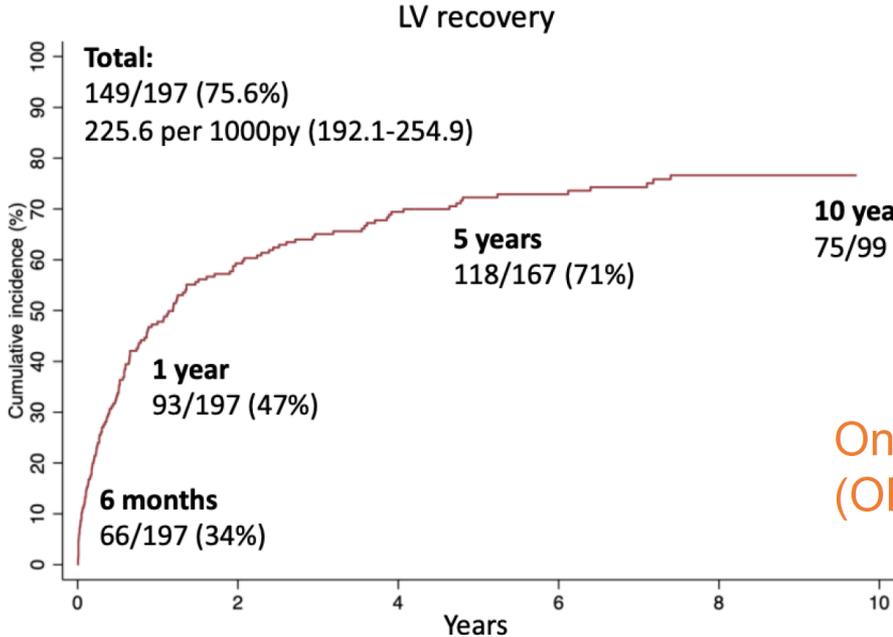
This is a completely new section in the guidelines, reflecting the growing recognition of the importance of APOs.

It is recommended to undertake a cardiovascular risk assessment in women with APOs, to recognize and document APOs when CVD risk is evaluated in women, and to provide counselling on the importance of healthy lifestyle choices that optimize cardiovascular health.	I	B
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Akute Herzinsuffizienz & Schwangerschaft

- 1) Peripartum-Kardiomyopathie: bei Frauen ohne kardiale Vorerkrankungen
- 2) Sekundär bei Frauen mit vorbekannter Herzerkrankung (Kardiomyopathien, KHK, ACHD, valvuläre Herzerkrankung.....)
 - Dringende Hospitalisierung in spezialisiertem Zentrum

PPCM: Erholung der LVEF

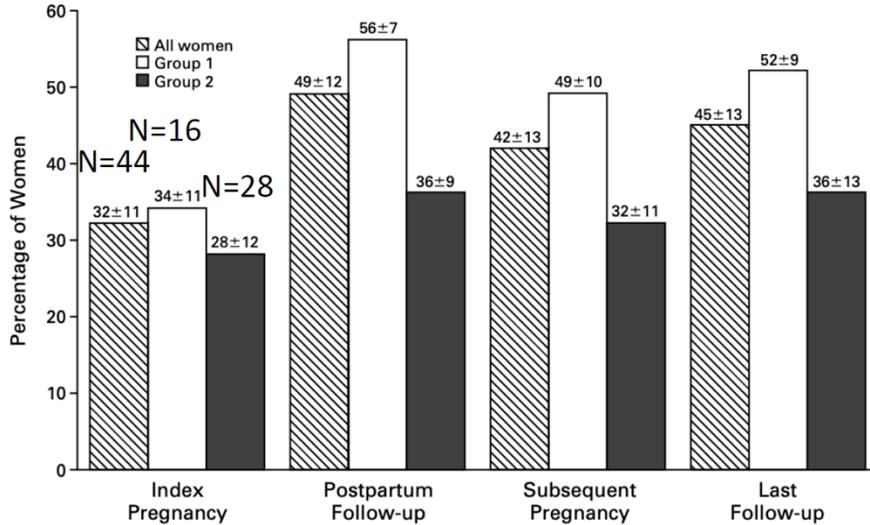


Definition recovery:

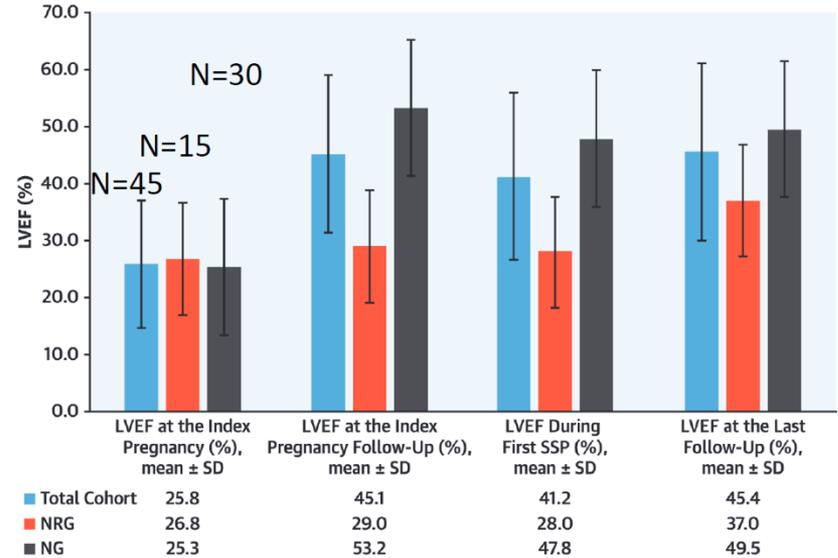
- LVEF \geq 55%

Only LVEDD was associated with LV recovery (OR 0.94, 95% CI 0.89–0.98).

PPCM: Weitere Schwangerschaften

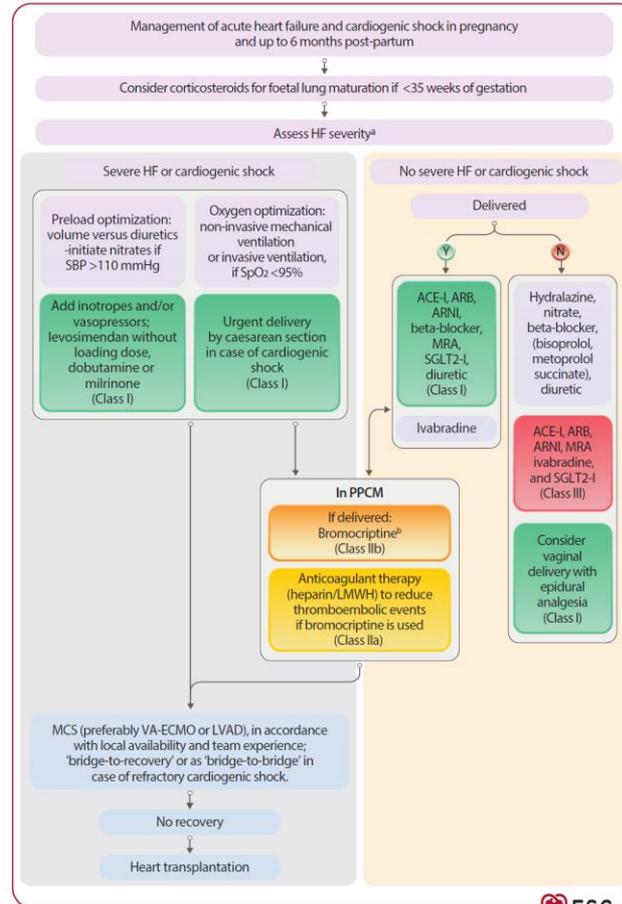


Mortality 3 vs 0



At 8 years (median FU)
20% mortality in both groups

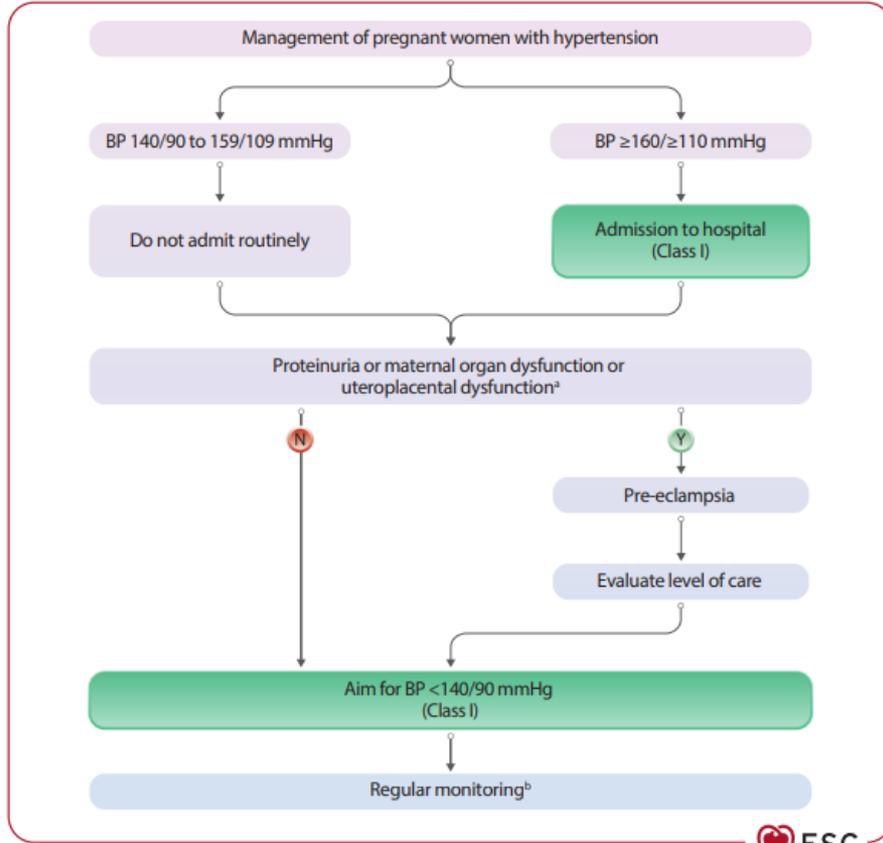
Akute Herzinsuffizienz & Schwangerschaft



Empfehlungen Hypertonie und Präeklampsie

Low-dose aspirin (75–150 mg daily) is recommended in women at moderate or high risk of pre-eclampsia (i.e. at least one high risk factor or two moderate risk factors for pre-eclampsia) from weeks 12–36/37.	I	A
In women with gestational hypertension, initiation of drug treatment is recommended at systolic BP \geq 140 mmHg or diastolic BP \geq 90 mmHg.	I	B
Methyldopa is recommended for the treatment of hypertension in pregnancy.	I	B
Labetalol, metoprolol, and dihydropyridine calcium channel blockers are recommended for the treatment of hypertension in pregnancy.	I	C

Management der Hypertonie und Präeklampsie



Systolischer Blutdruck ≥ 160 oder diastolischer ≥ 110 mmHg ist ein Notfall

Ziel systolischer Blutdruck < 140 und diastolischer < 90 mmHg

Kardiomyopathien

mWHO 2.0 I	mWHO 2.0 II	mWHO 2.0 II–III	mWHO 2.0 III	mWHO 2.0 IV
Cardiomyopathy				
HCM: genotype-positive + phenotype-negative		Low-risk ARVC : genotype-positive + no or mild phenotype HCM without complications DCM/NDLVC with normal or mild left ventricular impairment: EF >45%	ARVC with moderate/severe disease HCM with arrhythmic and/or moderate haemodynamic complications DCM/NDLVC with moderate left ventricular impairment: EF 30%–45%	DCM/NDLVC with severe left ventricular impairment: EF <30% or NYHA class III/IV HCM with symptomatic severe outflow tract obstruction: ≥50 mmHg HCM with severely symptomatic LV dysfunction (EF <50%)

It is recommended that women with **HCM** with symptomatic LV dysfunction (EF <50%) and or severe LVOTO (≥50 mmHg) wishing to become pregnant are counselled by the Pregnancy Heart Team regarding the high risk of pregnancy-related adverse events.

I

C

Myosin inhibitors are not recommended in women during pregnancy due to lack of safety data.

III

C