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Pregnancy and VHD
maternal and fetal risk

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Pregnancy and VHD

- Nothing to disclose regarding this lecture

Pregnancy and VHD

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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)

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Pregnancy and VHD

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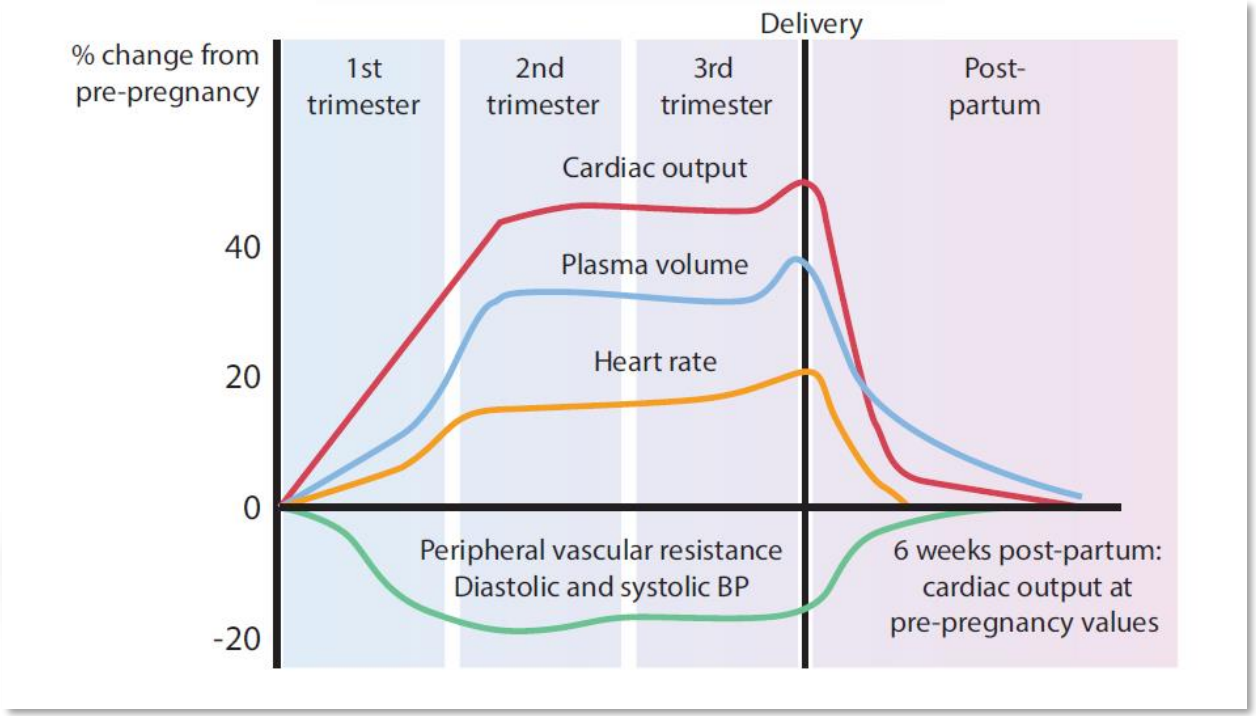
Pregnancy is a long-distance athletic event for the heart!



2025 ESC Guidelines for the management of cardiovascular disease and pregnancy
(European Heart Journal; 2025 – doi: 10.1093/eurheartj/ehaf193)

Pregnancy and VHD

- What about valve disease ?

➢ Native valve

➢ Prosthetic valve

Pregnancy and VHD

- Native valve

➢ Pregnancy is usually well tolerated

if:

➢ Valvular lesion is mild (stenosis), > severe (regurgitation)

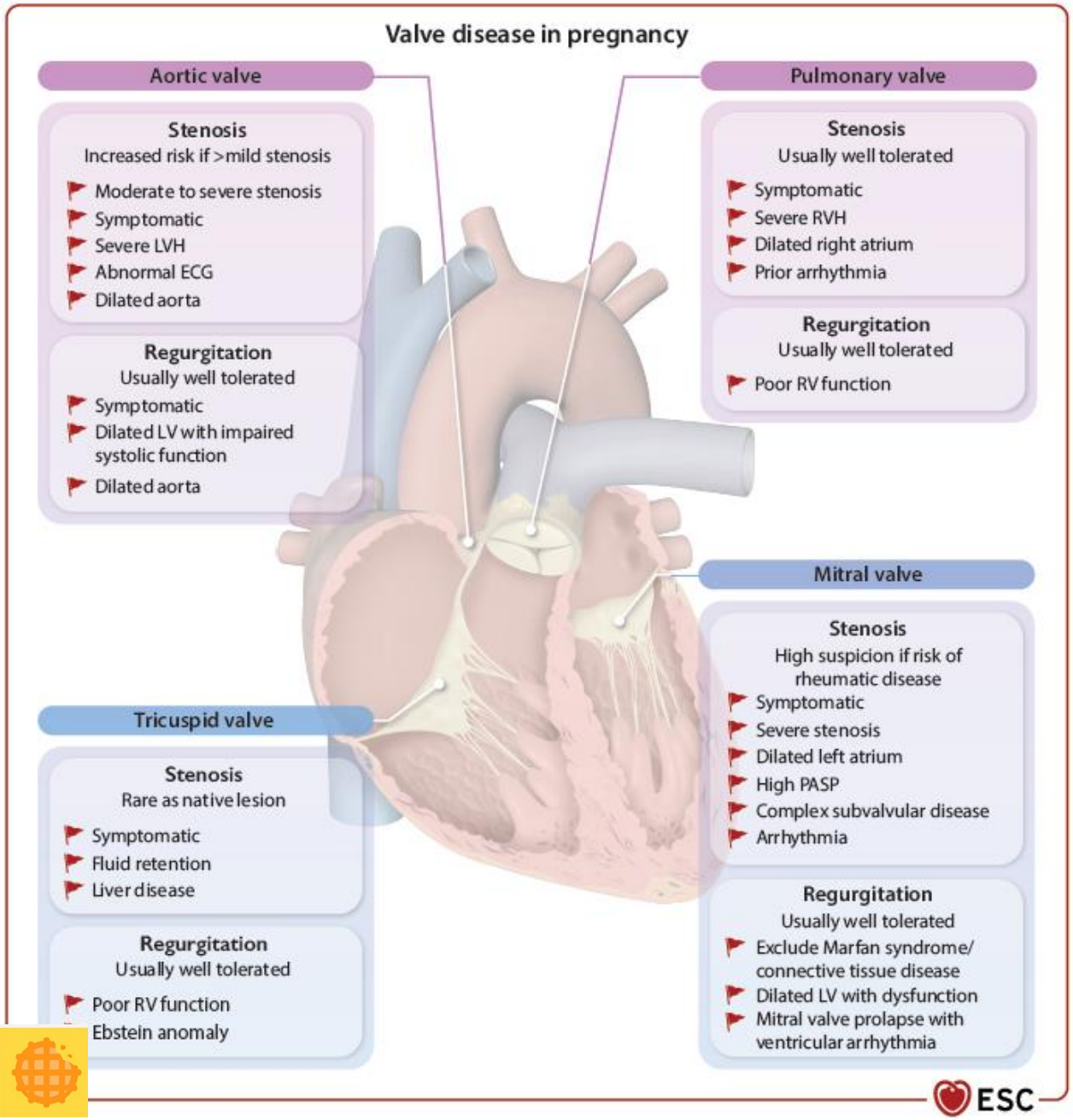
➢ Asymptomatic

➢ Preserved LV/ RV function

➢ No aortic root dilatation

Pregnancy and VHD

- Native valve



2025 ESC Guidelines for the management of cardiovascular disease and pregnancy (European Heart Journal; 2025 – doi: 10.1093/eurheartj/ehaf193)

Pregnancy and VHD

- Native valve disease: recommendations :

Recommendations	Class[a]	Level[b]
Intervention is recommended before pregnancy in symptomatic patients with severe aortic stenosis.[698]	I	C
Intervention is recommended before pregnancy in women with mitral stenosis and a valve area <1.5 cm^2. [698,701,714]	I	C
In pregnant women with symptomatic mitral stenosis or pulmonary hypertension, restricted activities and beta-blockers are recommended.[20]	I	C
In pregnant women with mitral stenosis, diuretics are recommended when congestive symptoms persist despite beta-blockers.[20]	I	C
Full therapeutic-dose anticoagulation is recommended in women with mitral stenosis complicated by AF, left atrial thrombus, or prior embolism.	I	C
Surgical treatment is recommended before pregnancy in women with severe aortic or mitral regurgitation with symptoms, impaired ventricular function, or marked ventricular dilatation.[698,715]	I	C
Diuretics are recommended in pregnant women with regurgitant lesions when symptoms or signs of congestion occur.	I	C
Intervention should be considered before pregnancy in those with asymptomatic severe aortic stenosis after counselling on the risks and benefits.[698]	IIa	C
Percutaneous mitral commissurotomy for mitral stenosis should be considered in pregnant women with severe symptoms or systolic pulmonary artery pressure >50 mmHg despite medical therapy.[698]	IIa	C
Valve surgery during pregnancy should only be considered when there is a maternal mortality risk and other treatment options have failed.[421]	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.[716]	IIb	C

Revised

Revised

2025 ESC Guidelines for the management of cardiovascular disease and pregnancy (European Heart Journal; 2025 – doi: 10.1093/eurheartj/ehaf193)

Pregnancy and VHD

- Prosthetic heart valve:

➢ *Prevention is always better* !

➢ The choice of the prosthesis must be discussed with woman in childbearing age at the time of the surgery :

➢ Possible alternative to mechanical valve:

- Valve repair
- Ross surgery : no risk increase
- Bioprosthesis: no argument for deterioration with pregnancy
- Valve in valve for failing bioprosthesis

Pregnancy and VHD

- Prosthetic heart valve:

➢ *Prevention is always better* !

➢ The choice of the prosthesis must be discussed with woman in childbearing age at the time of the surgery :

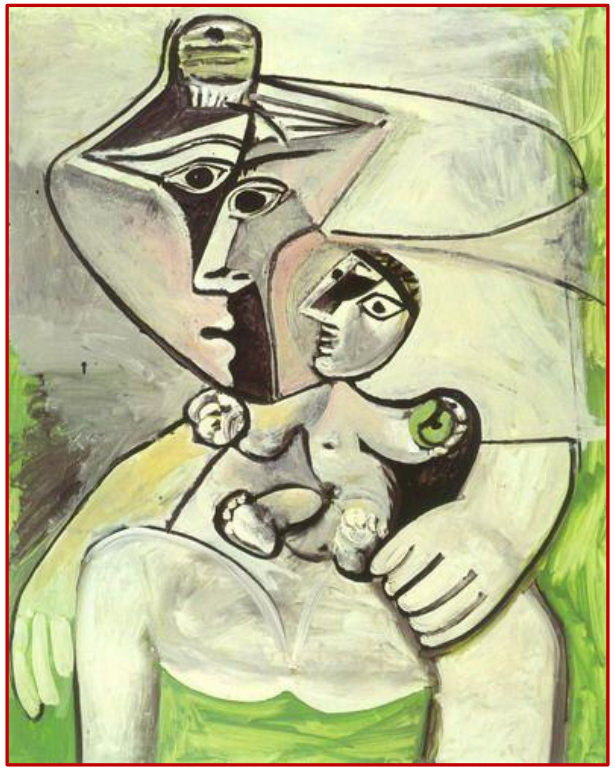
➢ Possible alternative to mechanical valve:

- Valve repair
- Ross surgery : no risk increase
- Bioprosthesis: no argument for deterioration with pregnancy
- Valve in valve for failing bioprosthesis

Ropac III : the chance of an uncomplicated pregnancy with a live birth in women with a Mechanical heart valve was 54%, compared to 79% in women with a tissue valve.

Pregnancy and VHD

- Mechanical heart valve



- VKA is associated with the lowest risk of adverse maternal outcome (valve thrombosis) but concern about fetal outcome: more miscarriage (ROPAC III), embryopathy (ossification, CNS, hemorrhage…)
- LMWH is associated with the lowest risk of adverse fetal outcome
- Doacs are prohibited

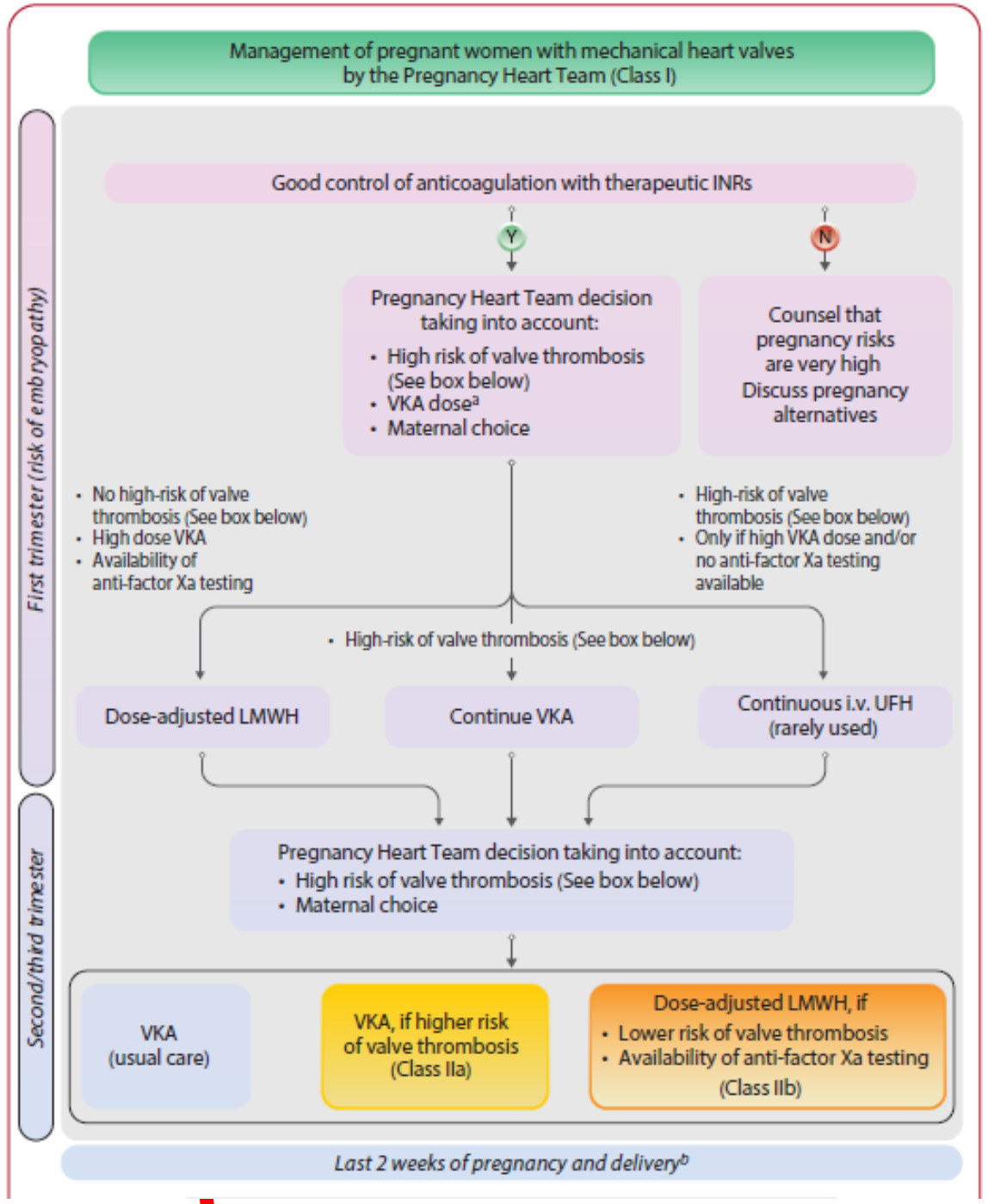
Pregnancy and VHD

- Mechanical valve

High risk of valve thrombosis

Right sided valves	Previous thrombotic events
Mitral valve replacement	Valve dysfunction especially stenosis
Atrial fibrillation	Other clotting risks (smoker)
Poor LV function	Older generation valves

INR : unchanged !



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Pregnancy and VHD

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- Anticoagulant ?

	Anticoagulant	Dosing	Timing
First Trimester			
Low VKA dose for INR ≤5 mg warfarin, ≤2 mg/day acenocoumarol, ≤3 mg/day phenprocoumon	VKA or LMWH	INR weekly to 1 every 2 W	
		LMWH dose adjusted anti Xa	b.i.d
High VKA dose for INR	Switch to LMWH	LMWH dose adjusted anti Xa (weekly, every 2-4 W after)	b.i.d
From week 13: shared decision Continue/switch to VKA with weekly to every 2 weeks INR Continue LMWH with dose adjustement			

	Enoxaparin	Daltaparin	Tinzaparin	Target
Therapeutic LMWH	125 IU/kg bid (starting dose) Then 100 IU/kg b.i.d	125 IU/kg bid (starting dose) Then 100 IU/kg b.i.d	250 IU/kg bid (starting dose) Then 175 IU/kg o.d	0.8-1.2 U/ml anti-factor Xa (4-6h post administration)

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Pregnancy and VHD

- Risk for the mother ? : WHO 2.0

Table 6 **Modified World Health Organiza**

		mWHO 2.0 I
		Valvular heart disease
		Small or mild • pulmonary stenosis • mitral valve prolapse without significant regurgitation.
Risk		No detectable increased risk of maternal mortality and no/mild increased risk in morbidity.
Average maternal cardiac event rates[a]	Van Hagen et al. (2016)[51]	9.9%
	Silversides et al. (2018)[52]	3.1%

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Pregnancy and VHD

- Risk for the mother ? : WHO 2.0

Table 6 **Modified World Health Organization 2.0 classificat**

		mWHO 2.0 I	mWHO 2.0 II
		Valvular heart disease	
		Small or mild • pulmonary stenosis • mitral valve prolapse without significant regurgitation.	
Risk		No detectable increased risk of maternal mortality and no/mild increased risk in morbidity.	Small increased risk of maternal mortality or moderate increase in morbidity.
Average maternal cardiac event rates[a]	Van Hagen et al. (2016)[51]	9.9%	7.7%
	Silversides et al. (2018)[52]	3.1%	21.7%

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Pregnancy and VHD

- Risk for the mother ? : WHO 2.0

Table 6 **Modified World Health Organization 2.0 classification of maternal carc**

		mWHO 2.0 I	mWHO 2.0 II	mWHO 2.0 II–III
		Valvular heart disease		
		Small or mild • pulmonary stenosis • mitral valve prolapse without significant regurgitation.		Native, homograft or tissue valve disease not considered mWHO 2.0 I or IV: mild mitral stenosis, moderate aortic stenosis. Moderate valvular regurgitation.
Risk		No detectable increased risk of maternal mortality and no/mild increased risk in morbidity.	Small increased risk of maternal mortality or moderate increase in morbidity.	Intermediate increased risk of maternal mortality or moderate to severe increase in morbidity.
Average maternal cardiac event rates[a]	Van Hagen et al. (2016)[51]	9.9%	7.7%	17.7%
	Silversides et al. (2018)[52]	3.1%	21.7%	12.8%

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Pregnancy and VHD

- Risk for the mother ? : WHO 2.0

Table 6 **Modified World Health Organization 2.0 classification of maternal cardiovascular risk**

		mWHO 2.0 I	mWHO 2.0 II	mWHO 2.0 II–III	mWHO 2.0 III
		Valvular heart disease			
		Small or mild • pulmonary stenosis • mitral valve prolapse without significant regurgitation.		Native, homograft or tissue valve disease not considered mWHO 2.0 I or IV: mild mitral stenosis, moderate aortic stenosis. Moderate valvular regurgitation.	Uncomplicated mechanical valve with stable well controlled INRs. Moderate mitral stenosis. Severe asymptomatic aortic stenosis. Severe left-sided valvular regurgitation.
Risk		No detectable increased risk of maternal mortality and no/mild increased risk in morbidity.	Small increased risk of maternal mortality or moderate increase in morbidity.	Intermediate increased risk of maternal mortality or moderate to severe increase in morbidity.	Significantly increased risk of maternal mortality or severe morbidity.
Average maternal cardiac event rates[a]	Van Hagen et al. (2016)[51]	9.9%	7.7%	17.7%	28.9%
	Silversides et al. (2018)[52]	3.1%	21.7%	12.8%	21.1%

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Pregnancy and VHD

- Risk for the mother ? : WHO 2.0

Table 6 **Modified World Health Organization 2.0 classification of maternal cardiovascular risk**

		mWHO 2.0 I	mWHO 2.0 II	mWHO 2.0 II–III	mWHO 2.0 III	mWHO 2.0 IV
		Valvular heart disease				
		Small or mild • pulmonary stenosis • mitral valve prolapse without significant regurgitation.		Native, homograft or tissue valve disease not considered mWHO 2.0 I or IV: mild mitral stenosis, moderate aortic stenosis. Moderate valvular regurgitation.	Uncomplicated mechanical valve with stable well controlled INRs. Moderate mitral stenosis. Severe asymptomatic aortic stenosis. Severe left-sided valvular regurgitation.	Severe mitral stenosis. Severe symptomatic aortic stenosis.
Risk		No detectable increased risk of maternal mortality and no/mild increased risk in morbidity.	Small increased risk of maternal mortality or moderate increase in morbidity.	Intermediate increased risk of maternal mortality or moderate to severe increase in morbidity.	Significantly increased risk of maternal mortality or severe morbidity.	Extremely high risk of maternal mortality or severe morbidity.
Average maternal cardiac event rates[a]	Van Hagen et al. (2016)[51]	9.9%	7.7%	17.7%	28.9%	50.3%
	Silversides et al. (2018)[52]	3.1%	21.7%	12.8%	21.1%	35.6%

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- Risk for the mother ?

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

CARPREG II score: 1 point	CARPREG II score: 2 points	CARPREG II score: 3 points
• No prior cardiac intervention indicated • Late pregnancy assessment	• Ventricular dysfunction • High-risk left-sided valve disease or outflow tract obstruction • Pulmonary hypertension • Coronary artery disease • High-risk aortopathy	• Prior cardiac event or arrhythmias • Baseline NYHA III/IV or cyanosis • Mechanical valve

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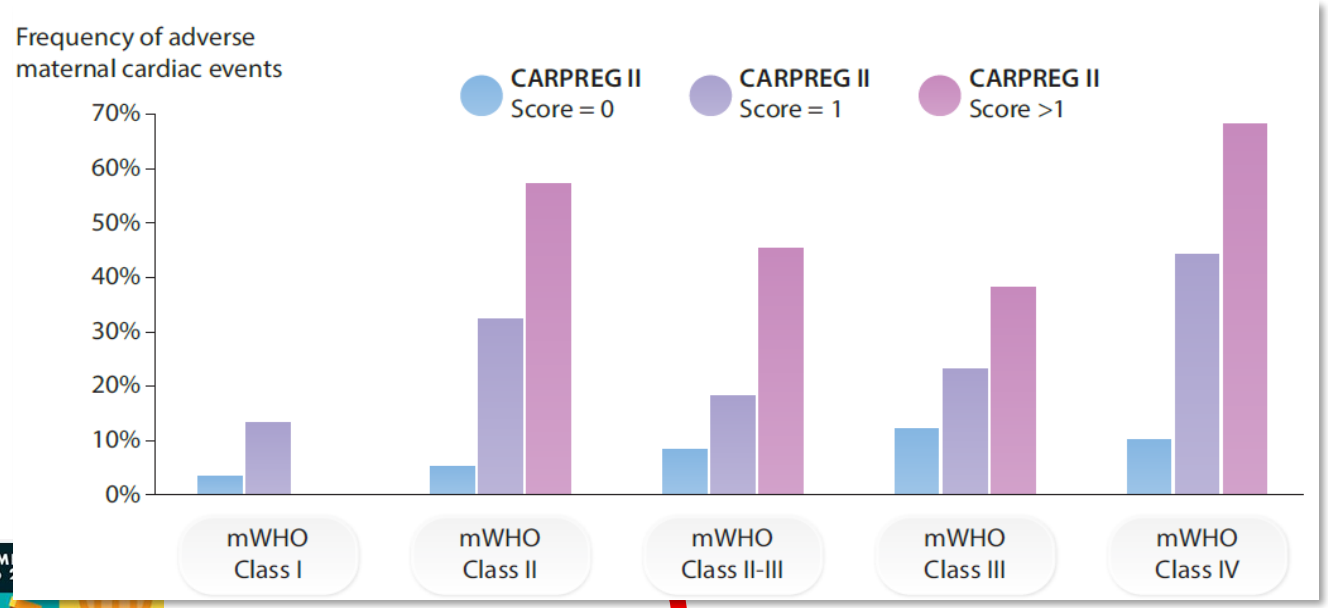

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Pregnancy and VHD

- Predictors of neonatal events in pregnancies of woman with cardiovascular disease

- severity of obstetric and foetal outcomes varies with the maternal risk as defined in the mWHO 2.0 classification.
- Adverse outcomes are more frequent in women > mWHO 2.0 classification,

Predictors of neonatal events
NYHA class III/IV or cyanosis during baseline pre-natal visit
Maternal left heart obstruction
Low maternal oxygen saturation (<90%)
Multiple gestations
Use of anticoagulants
Cardiac medication before pregnancy
Mechanical valve prosthesis
Maternal cardiac event during pregnancy
Maternal decline in CO during pregnancy

Derived from the 2018 ESC Guidelines for the management of cardiovascular diseases during pregnancy.[43]
CO, cardiac output; NYHA, New York Heart Association.

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- Take home message :

- Pregnancy with moderate valve disease in asymptomatic patient could be carried.
- For severe valve lesions or symptomatic patient, situation must be discussed and frequently surgery will be proposed.
- Possible pregnancy must be discussed with woman in childbearing age before valve surgery, alternative to mechanical heart valve must be discussed.
- Pregnancy in women with MHV is associated with a high risk of maternal or fetal complication and must be discussed.
- Risk related to pregnancy could be assessed using mWHO 2.0 score with Carpreg
- Moderate to high risk pregnancy should be followed in specialized structure with all neonatal and surgical capabilities.

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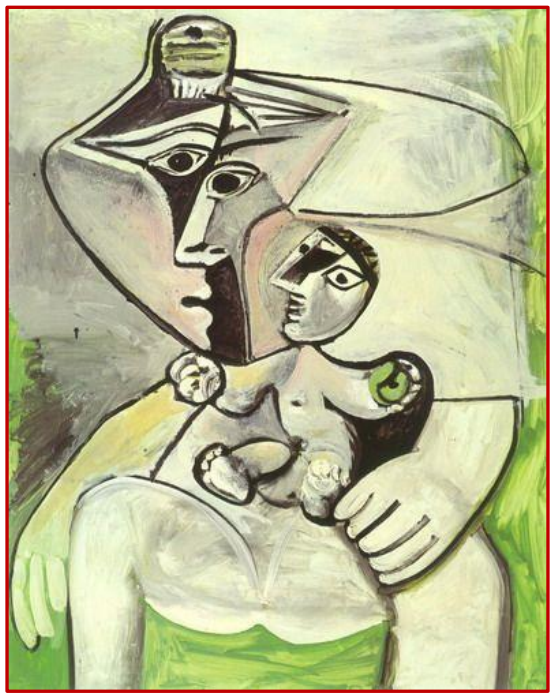
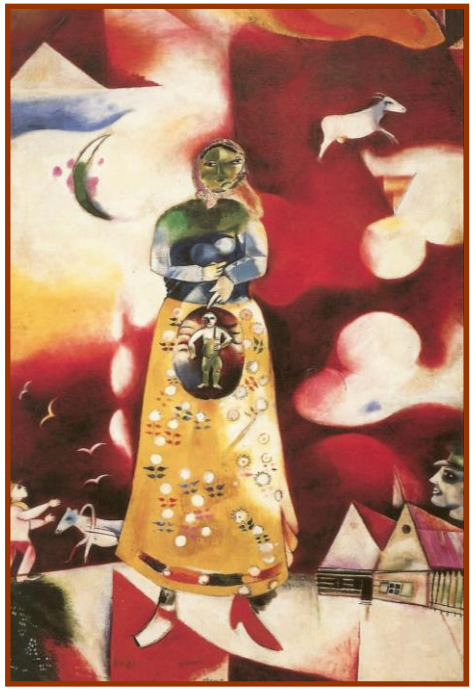
Thank you for your attention





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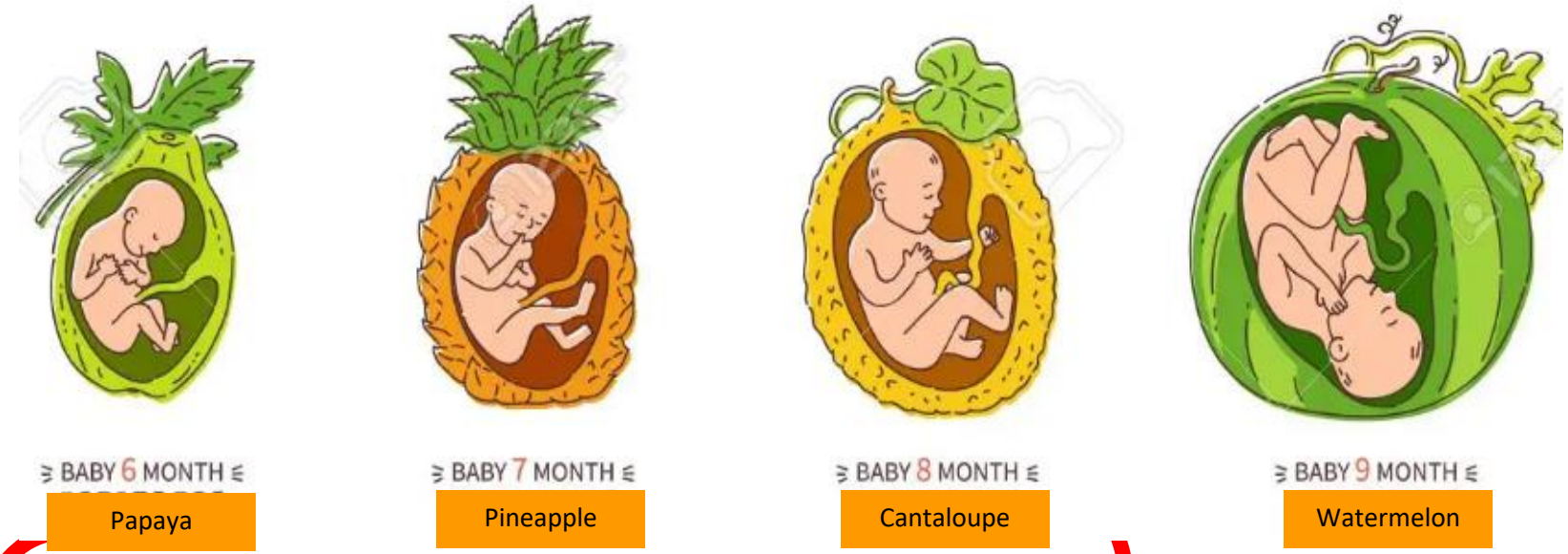
- Pregnancy ?



- *Growth +++++*
- « Supply » transported by maternal circulation, bought trough placenta

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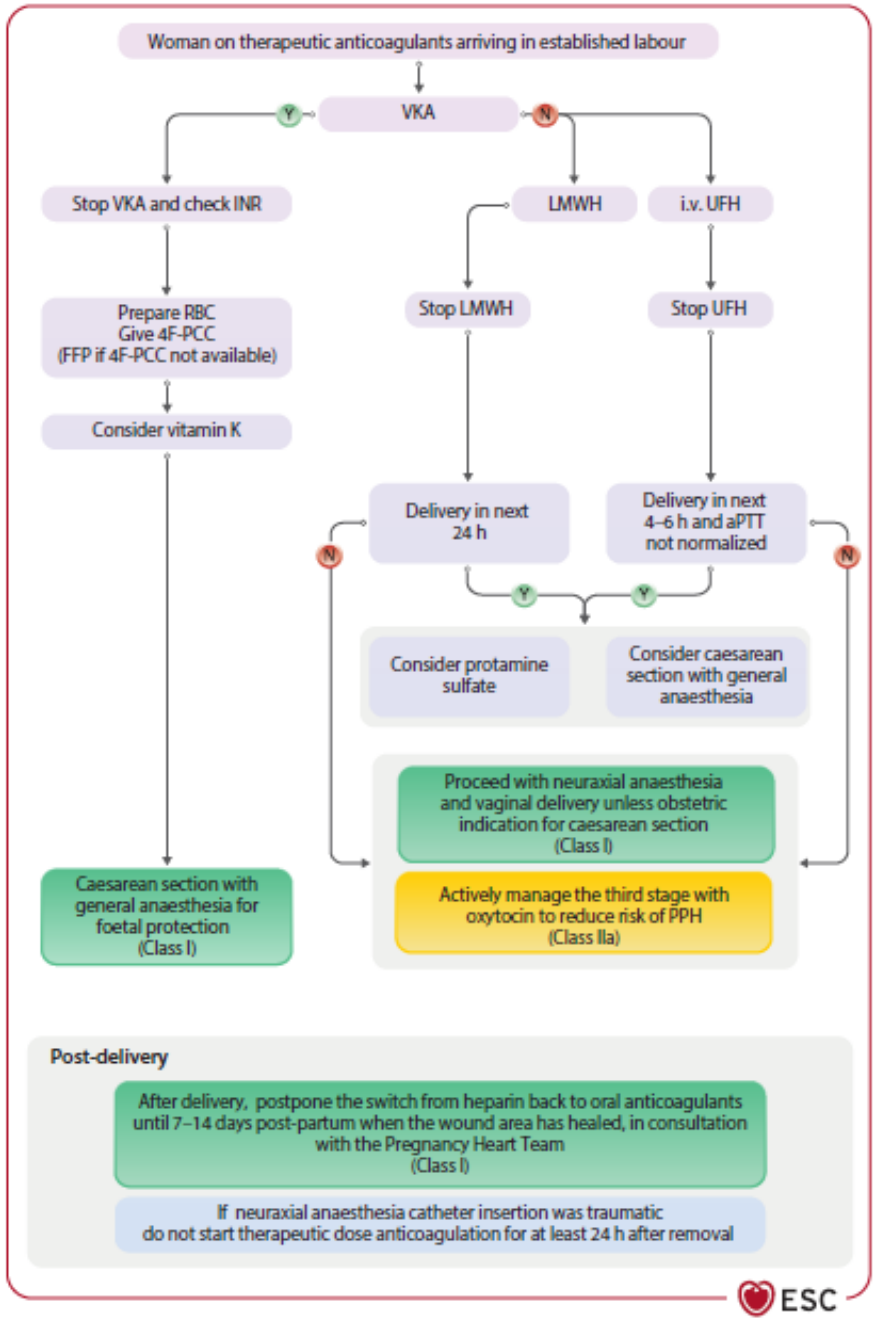
- Anticoagulation and Delivery



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