

Grossesse et Maladie cardiovasculaire

COMMENTAIRES

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My ESC

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NO DISCLOSURE

Pendant la Grossesse

- modifications cardio circulatoires + + + aggravant cardiopathie s/s jacente.
- au début : ↗ Vol sang atteignant 50% (32 SA)
↘ + + Resistances vasc périph liées dues à circulation pulm et à activation hormonale associée à ↗ FC .

- **Morbimortalité maternelle et périnatale importante.**
- **Modifications Physiologiques peuvent induire des complications type :**
 - **Mort subite ,**
 - **insuffisance cardiaque,**
 - **Arythmie faisant engageant ptc maternel et fœtal.**
- **D'où nécessité PEC ttt précoce .**

General recommendations

Pre-pregnancy risk assessment and counselling is indicated in all women with known or suspected congenital or acquired cardiovascular and aortic disease. ³⁹	I	C
It is recommended to perform risk assessment in all women with cardiac diseases of childbearing age before and after conception, using the mWHO classification of maternal risk. ¹¹	I	C
Foetal echocardiography by experienced specialists is recommended when there is an elevated risk of foetal abnormalities. ^{7,6-80}	I	C
Echocardiography is recommended in any pregnant patient with unexplained or new cardiovascular signs or symptoms.	I	C
Vaginal delivery is recommended as the first choice in most patients; for most important exceptions see below. ⁷⁸	I	C
Induction of labour should be considered at 40 weeks of gestation in all women with cardiac disease.	IIa	C
Genetic counselling should be considered in women with congenital heart disease or congenital arrhythmia, cardiomyopathies, aortic disease, or genetic malformations associated with CVD. ^{64,71}	IIa	C
MRI (without gadolinium) should be considered if echocardiography is insufficient for a definite diagnosis.	IIa	C
In patients with severe hypertension, vaginal delivery with epidural analgesia and elective instrumental delivery should be considered.	IIa	C
Delivery before necessary surgery should be considered when gestational age is ≥ 26 weeks. ^{86-88,125}	IIa	C
Caesarean delivery should be considered for obstetrical indications or for patients with dilatation of the ascending aorta >45 mm, severe aortic stenosis, pre-term labour while on oral anticoagulants, Eisenmenger's syndrome, or severe heart failure.	IIa	C
A chest radiograph may be considered if other methods are not successful in clarifying the cause of dyspnoea.	IIIb	C
Cardiac catheterization may be considered with very strict indications.	IIIb	C
CT and electrophysiological studies may be considered in selected patients for vital indications.	IIIb	C
Coronary bypass surgery or valvular surgery may be considered during pregnancy when conservative and medical therapy has failed, and in situations that threaten the mother's life or that are not amenable to percutaneous treatment.	IIIb	C
Prophylactic antibiotic therapy to prevent endocarditis during delivery is not recommended. ¹¹²	III	C

World Health Association – risque maternel

Table 3 Modified World Health Organization classification of maternal cardiovascular risk

	mWHO I	mWHO II	mWHO II-III	mWHO III	mWHO IV
Diagnosis (if otherwise well and uncomplicated)	Small or mild – pulmonary stenosis – patent ductus arteriosus – mitral valve prolapse Successfully repaired simple lesions (atrial or ventricular septal defect, patent ductus arteriosus, anomalous pulmonary venous drainage) Atrial or ventricular ectopic beats, isolated	Unoperated atrial or ventricular septal defect Repaired tetralogy of Fallot Most arrhythmias (supraventricular arrhythmias) Turner syndrome without aortic dilatation	Mild left ventricular impairment Hypertrophic cardiomyopathy Native or tissue valve disease not considered WHO I or M (mild mitral stenosis, moderate aortic stenosis) Marfan or other HTAD syndrome without aortic dilatation Aorta <45 mm in bicuspid aortic valve pathology Repaired coarctation Atrioventricular septal defect	Moderate left ventricular impairment (EF 30–45%) Various peripartum cardiomyopathy without any residual left ventricular impairment Mechanical valve Systemic right ventricle with good or mildly decreased ventricular function Fontan circulation, if otherwise the patient is well and the cardiac condition uncomplicated Unrepaired cyanotic heart disease Other complex heart disease Moderate mitral stenosis Severe asymptomatic aortic stenosis Moderate aortic dilatation (40–45 mm in Marfan syndrome or other HTAD; 45–50 mm in bicuspid aortic valve, Turner syndrome ASI 20–25 mm ² , tetralogy of Fallot <50 mm) Ventricular tachycardia	Pulmonary arterial hypertension Severe systemic ventricular dysfunction (EF <30% or NYHA class III–IV) Previous peripartum cardiomyopathy with any residual left ventricular impairment Severe mitral stenosis Severe symptomatic aortic stenosis Systemic right ventricle with moderate or severely decreased ventricular function Severe aortic dilatation (>45 mm in Marfan syndrome or other HTAD, >50 mm in bicuspid aortic valve, Turner syndrome ASI >25 mm ² , tetralogy of Fallot >50 mm) Vascular Ehlers–Danlos Severe (re)coarctation Fontan with any complication
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
Maternal cardiac event rate	2.5–5%	5.7–10.5%	10–19%	19–27%	40–100%
Counselling	Yes	Yes	Yes	Yes: expert counselling required	Yes: pregnancy contraindicated; if pregnancy occurs, termination should be discussed
Care during pregnancy	Local hospital	Local hospital	Referral hospital	Expert centre for pregnancy and cardiac disease	Expert centre for pregnancy and cardiac disease
Minimal follow-up visits during pregnancy	Once or twice	Once per trimester	Bimonthly	Monthly or bimonthly	Monthly
Location of delivery	Local hospital	Local hospital	Referral hospital	Expert centre for pregnancy and cardiac disease	Expert centre for pregnancy and cardiac disease

Parametres maternel et fetal de mauvais pronostic



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Table 4 Predictors of maternal and neonatal events

Predictors of maternal cardiovascular events	Predictors of neonatal events
Prior cardiac event (heart failure, transient ischaemic attack, stroke, arrhythmia) ^{42,43,47,48}	NYHA class III/IV or cyanosis during baseline pre-natal visit
NYHA class III/IV ^{29,42,43,48,49}	Maternal left heart obstruction
Left heart obstruction (moderate to severe) ^{29,42}	Smoking during pregnancy
Reduced systemic ventricular systolic function (ejection fraction <40%) ^{29,43,49}	Low maternal oxygen saturation (<90%)
Reduced subpulmonary ventricular function ^{47,50} (TAPSE <16 mm) ^{49,51}	Multiple gestations Use of anticoagulants throughout pregnancy
Systemic atrioventricular valve regurgitation (moderate to severe) ⁴²	Cardiac medication before pregnancy 'At birth' cyanotic heart disease
Pulmonary atrioventricular valve regurgitation (moderate to severe) ⁴²	Mechanical valve prosthesis
Pulmonary arterial hypertension ^{41,48,49}	Maternal cardiac event during pregnancy
Cardiac medication before pregnancy ^{42,46}	Maternal decline in cardiac output during pregnancy
Cyanosis (O ₂ saturation <90%) ^{29,49}	Abnormal uteroplacental Doppler flow
Natriuretic peptide levels (NT-proBNP >128 pg/mL at 20 weeks predictive of event later in pregnancy) ^{42,46}	
Smoking history ⁵¹	
Mechanical valve prosthesis ^{42,47}	
Repaired or unrepaired cyanotic heart disease ⁴²	

Grossesse
Apparition d une Dyspnée



Cardiopathie connue
Apparition de SF nouveau
examen clinique

ECG
échocardiographie



Milieu
cardiologique en
urgence

Conseil .. Genetique

Risk	of maternal mortality or moderate to severe increase in morbidity
Maternal cardiac event rate	10-19%
Counselling	Yes

Grossesse en cours 22SA

Options thérapeutiques:

- Traiter les symptômes..... C'est clair !
- Evaluer le risque :
 - maternel - Cardiopathie .
 - foetal .
 - mort subite .Quel traitement ?
- Suivi de la grossesse et planification de l'accouchement?
- Quel bilan pour le bébé?

Voyons voir ... la Maman

ciety



Apparition d'une dyspnee classe III

Tachycardie à 140/mn

Souffle sytolique

Rythme sinusal



CONTROLE RYTHME ++
Debiter BB-
CEE si risk mat ou foet
AC

9.5 Atrial fibrillation and atrial flutter

Electrical cardioversion is recommended whenever ongoing AF is haemodynamically unstable or a considerable risk for the mother or the foetus.³⁰⁶ Delivery of i.v. butilide or flecainide may be considered for the termination of atrial flutter and AF in stable patients with structurally normal hearts.^{12,329} Cardioversion should generally be preceded by anticoagulation (see below).³⁰⁶ The use of i.v. beta-blockers is recommended for rate control.

Rhythm control should be considered as the preferred treatment strategy during pregnancy, starting with a beta-blocker as the first option.³⁰⁶ In the case of a rate control strategy, an oral beta-blocker is recommended (see Table 7).

Recommendations for the management of arrhythmias

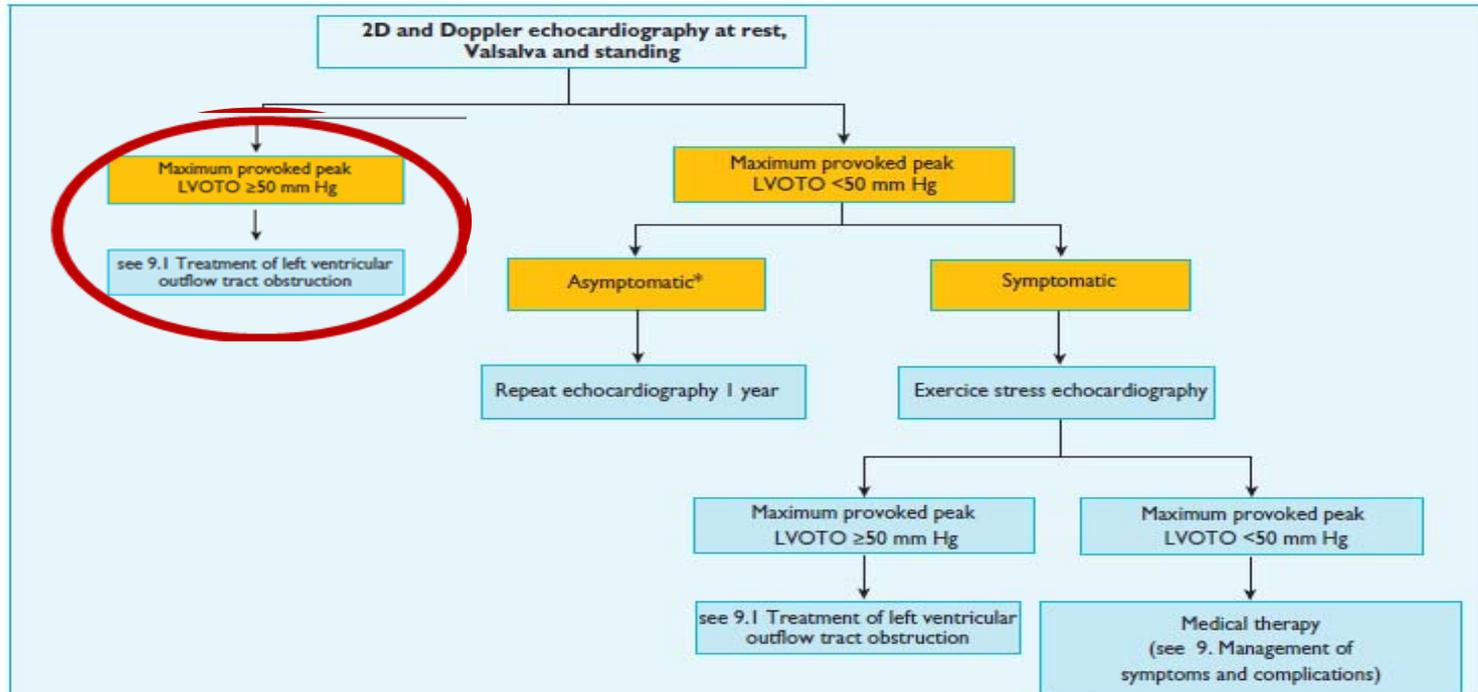
Recommendations	Class ^a	Level ^b
Acute management (intravenous administration of drugs) of SVT and AF		
Vagal manoeuvres and if these fails, adenosine are recommended for acute conversion of PSVT. ^{12,326,327}	I	C
Immediate electrical cardioversion is recommended for any tachycardia with haemodynamic instability and for pre-excited AF. ^{12,306,326,336-338}	I	C
Beta-1-selective blockers should be considered for acute conversion of PSVT. ^{12,326}	IIa	C
Ibutilide or flecainide may be considered for termination of atrial flutter and AF in stable patients with structurally normal hearts. ^{c 12,329}	IIb	C

Echocardiographie

- L'hypertrophie pariétale
- Les anomalies mitrales avec
 - La fuite mitrale
- PRVG élevées E latérale à 7-6 donc < 10
 - le gradient à 48 mmHg
 - OG $> 34\text{ml/m}^2$
- IT Vmax mesurée à 2.9 donc $> 2.8\text{m/s}$
 - Strain altéré
 - FE conservée

Stratification du risque

Le gradient



*exercise echocardiography may be considered in individual patients when the presence of a LVOT gradient is relevant to lifestyle advice and decisions on medical treatment.

Ce qui se passe pendant la grossesse ...

-  Q c atteignant 50% 20me SA (**22SA**)
-  Gdt VG-Ao aggrave obstruction.
- evaluation prospective des complications et de leurs incidences au cours de la grossesse avec cardiopathie / avec risque d'OAP, de tr du rythme soutenu symptomatiue d'AVC et de décès cardiaque lors de grossesse (13%), le plus souvent en prépartum(55%).

Ces symptômes

- Les Symptômes sont Extrêmement variables.
- Mais ni les symptômes , ni l'aspect échocardiographiques ne sont corrélés aux événements au cours de la grossesse.

Caractéristiques cliniques et échocardiographiques



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Table 3

Clinical and echocardiographic characteristics of women for whom data were unavailable before pregnancy but were collected at first presentation to St George's Hospital

	Before pregnancy	During or between pregnancies	After pregnancy
Number of patients	7	42	38
Mean age at first pregnancy (years)	24 (2) (19–27)	26 (4) (18–33)	24 (4) (16–36)
Mean age at review (years)	29 (6) (29–44)	33 (7) (31–41)	34 (3) (27–53)
Angina	2 (28.6%)	10 (23.8%)	10 (26.3%)
Dyspnoea (NYHA ≥II)	1 (14.5%)	9 (21.4%)	11 (28.9%)
Syncope	0 (0%)	4 (9.5%)	5 (13.1%)
Palpitations	1 (14.3%)	7 (16.7%)	6 (15.8%)
Ventricular tachycardia	0 (0%)	0 (0%)	1 (2.6%)
Non-sustained ventricular tachycardia	0 (0%)	6 (14.3%)	4 (10.5%)
Paroxysmal atrial fibrillation	1 (14.3%)	3 (7.1%)	6 (15.8%)
Atrial fibrillation	0 (0%)	1 (2.4%)	4 (10.5%)
FHSCD	1 (14.3%)	6 (14.3%)	6 (15.8%)
ABPR	1 (14.3%)	6 (14.3%)	3 (7.9%)
Mean %Vo ₂ max	78 (16) (54–111)	73 (9) (63–105)	77 (12) (59–100)
Mean MLVWT (mm)	21 (4) (15–26)	23 (5) (15–31)	19 (3) (14–30)
Mean LVED (mm)	42 (3) (35–49)	44 (4) (30–49)	46 (5) (34–54)
Mean LVES (mm)	29 (3) (21–34)	28 (5) (16–41)	30 (6) (17–42)
Mean fractional shortening (%)	32 (7) (29–47)	36 (6) (28–52)	35 (4) (23–54)
Mean LVOTG (mmHg)	25 (5) (1–39)	21 (4) (1–36)	22 (5) (1–112)
Mean left atrium (mm)	43 (2) (33–49)	45 (4) (36–67)	46 (4) (32–63)
Implantable cardioverter-defibrillator	0 (0%)	0 (0%)	0 (0%)
Myectomy	0 (0%)	1 (2.4%)	0 (0%)
Pacemaker	1 (14.3%)	1 (2.4%)	0 (0%)

127 CMH 27.5% symptomatiques : DE 20.5% DT: 9.4% palpit :7.1%

Tahman R § all Pregnancy related complications in women with MCH juil 2003;89(7):752-6



Survenue d' OAP

- Le traitement pharmacologique est indiqué chez les Ptes symptomatiques d'angor ou de DE.
- Les BB- grâce à leur action I- sont recommandées en première intention
- Le disopyramide à utiliser que si bénéfique > risque car pouvant => effet ocytocique
- L Amiodarone à éviter car risque
 - toxicité de la thyroïde fœtale,
 - du retard de croissance
 - et des effets indésirables neurologiques.
- **en cas d'apparition de signes congestifs, les diurétiques peuvent être utilisés * ***

Béta Bloquants - 1ere intention

Effet inotrope negatif

Effets secondaires nouveau né : retard de croissance, bradycardie et hypoglycémie.

- **Carvedilol, Metoprolol** (Lopressor®, Seloken®, Selokot®).
- **Propranolol** (compatible avec l'allaitement).
- **l'acébutolol** (Sectral®).

- **Atenolol** (Ténormine®, Bétatop®), **donne bcp plus retard de croissance.**

- **Le vérapamil et le diltiazem:**
classe C, leurs avantages potentiels justifier leur utilisation chez les femmes enceintes en dépit de leurs risques potentiels.
 1. **vérapamil : Préférable de ne pas utiliser pdt 1 et 2 trimestre grossesse.**
Pdt 3-trimestre grossesse, nombre limité de grossesses n'a pas révélé d'effet foetotoxique particulier à ce jour.
 2. **Diltiazem :Pas de données en nb suffisant pour éventuel effet malformatif ou foetotoxique .**
d'où utilisation déconseillée pendant la grossesse .

Diurétiques et grossesse

ciety

Medical Management of Chronic Heart Failure in Pregnancy

Drug/Class	Purpose	Comment
DIURETICS		
Furosemide	Generally reserved for treatment of pulmonary oedema <u>Use of lowest possible dose</u>	Can result in uteroplacental hypoperfusion, oligohydramnion, milk production can be reduced. FDA class C*
Hydrochlorothiazide	Diuretic	Oligohydramnion, FDA class B
VASODILATORS		
Hydralazine	Commonly used oral antihypertensive agent in pregnancy Can be substituted for ACE inhibitor during pregnancy	Demonstrated efficacy in hypertension Risk of hypotension; FDA class C

*U.S. Food and Drug Administration (FDA) class: A (controlled studies show no risk), B (no evidence of human risk in controlled studies), C (risk cannot be ruled out), D (positive evidence of risk), X (contraindicated in pregnancy). ACE angiotensin converting enzyme; ARB angiotensin receptor blocker; IUGR intrauterine growth retardation; SVR systemic vascular resistance

Stratification du risque maternel

HCM

In patients with HCM, the same risk stratifications as for non-pregnant women are recommended.³¹³

I

C

In patients with HCM, it is recommended that beta-blockers are continued in women who used them before pregnancy.³¹³

I

C

In patients with HCM, beta-blockers should be started in women who develop symptoms due to outflow tract obstruction or arrhythmia during pregnancy.

IIa

C

In HCM, cardioversion should be considered for persistent atrial fibrillation.³⁰⁶

IIa

C



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European Heart Journal (2018) 39, 3165–3241
doi:10.1093/eurheartj/ehy340

ESC GUIDELINES

2018 ESC Guidelines for the management of cardiovascular diseases during pregnancy

Taux des complications CVx dans CMH est majoré si

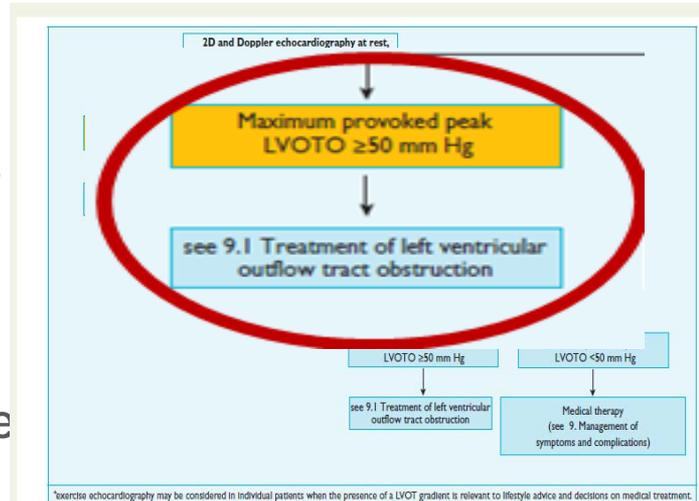
- ATCD événements CVx , DE III ou IV.
- Dysfonction systolique majeure ou Gdt intraVG > 50mmHg
- Plus le Gdt est élevé en début de grossesse plus le risque d'aggravation des symptômes par la suite est grand.*

Risque Rythmique



Holter-ECG peut montrer ... Gradient...

- Hyperexcitabilité supra ventriculaire (ESSV avec pls salves et FA parox 30 sec).
- Hyperexcitabilité ventriculaire avec de ESV , polymorphes , TVNS.



HCM Risk-SCD Calculator

 EUROPEAN SOCIETY OF CARDIOLOGY*

Age	30	Years	Age at evaluation
Maximum LV wall thickness	27	mm	Trans-thoracic Echocardiographic measurement
Left atrial size	42	mm	Left atrial diameter determined by M-Mode or 2D echocardiography in the parasternal long axis plane at time of evaluation
Max LVOT gradient	50	mmHg	The maximum LV outflow gradient determined at rest and with Valsalva provocation (irrespective of concurrent medical treatment) using pulsed and continuous wave Doppler from the apical three and five chamber views. Peak outflow tract gradients should be determined using the modified Bernoulli equation: $\text{Gradient} = 4V^2$, where V is the peak aortic outflow velocity
Family History of SCD	<input type="radio"/> No <input type="radio"/> Yes		History of sudden cardiac death in 1 or more first degree relatives under 40 years of age or SCD in a first degree relative with confirmed HCM at any age (post or ante-mortem diagnosis)
Non-sustained VT	<input type="radio"/> No <input type="radio"/> Yes		3 consecutive ventricular beats at a rate of 120 beats per minute and <30s in duration on Holter monitoring (minimum duration 24 hours) at or prior to evaluation
Unexplained syncope	<input type="radio"/> No <input type="radio"/> Yes		History of unexplained syncope at or prior to evaluation

Risk of SCD at 5 years (%): 3.68

ESC recommendation: ICD generally not indicated **

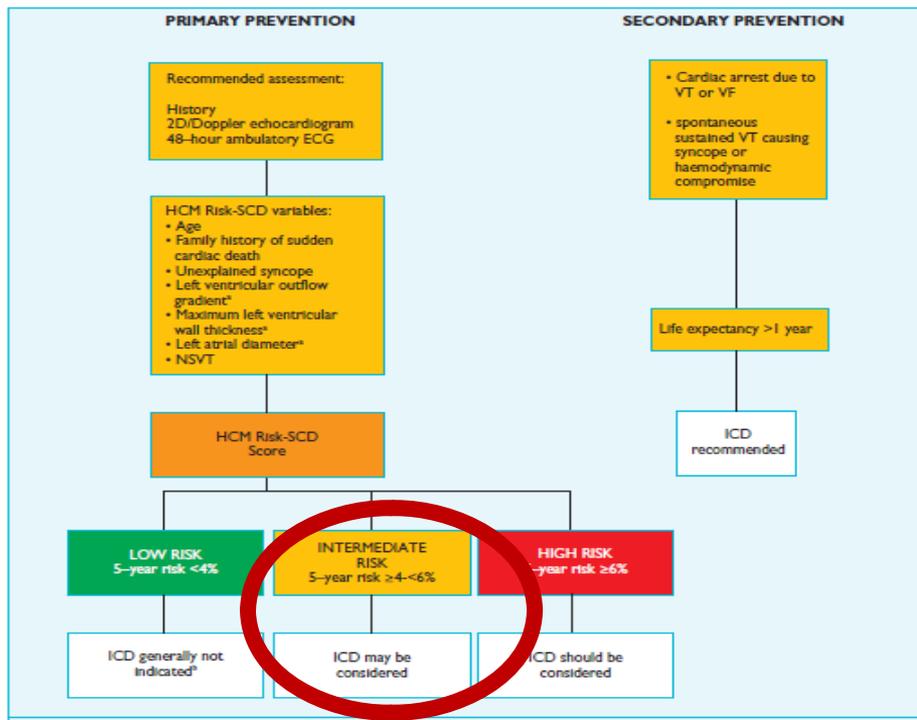
Risk of SCD at 5 years (%): 3.68

ESC recommendation: ICD generally not indicated **

Stratification du risque de MS et indication du DAI



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- Age = 30 ans
- SIV max = 27 mm
- Diamètre OG = 52 mm
- Gradient max intra-VG = 49 mmHg
- Pas d'ATCD de MS dans la famille
- TVNS : non
- Pas de Syncope

Risk of SCD at 5 years 4-6%
= Intermediate risk

Lorsque le DAI est indiqué pendant la grossesse, il doit être effectuée, si possible avec contrôle échocardiographique.

Le suivi pendant la grossesse:

- **Risk classe III**
- Consultation mensuelle ou bi mensuelle dans un centre spécialisé
- L'évaluation sera basée sur la symptomatologie, gradient intra-VG, TRV, FEVG.
- Contrôle écho trimestriel ou si symptômes.

les modalités de l'accouchement:

- Un accouchement par voie basse:
 - Prédéféré si asymptomatiques avec une maladie non sévère pouvant passer en travail spontanément.
- Une césarienne:
 - Si indications obstétriques.
 - A envisager si CMHO sévère à terme avant de passer en travail **(Risk classe III)**
- Lors de l'accouchement,
 - Maintenir la volémie en cours de travail et en post-partum, disposer de voies veineuses de bon calibre, compenser les pertes sanguines si besoin.

Quel bilan pour le bébé?

- **NN: risque de prématurité iatrogène, hypoglycémie, retard de croissance.**
- **Chez l'enfant le bilan doit être débuté au plus tard à l'âge de 10 ans.**
- **Par ailleurs l'évolution de la maladie dans le temps et l'apparition de symptômes peuvent être retardée donc le bilan doit être répété régulièrement (tous les 2 à 5 ans).**



MERCI

DJERBA - TUNISIE