

Acquired heart disease and pregnancy



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Acquired heart disease and pregnancy

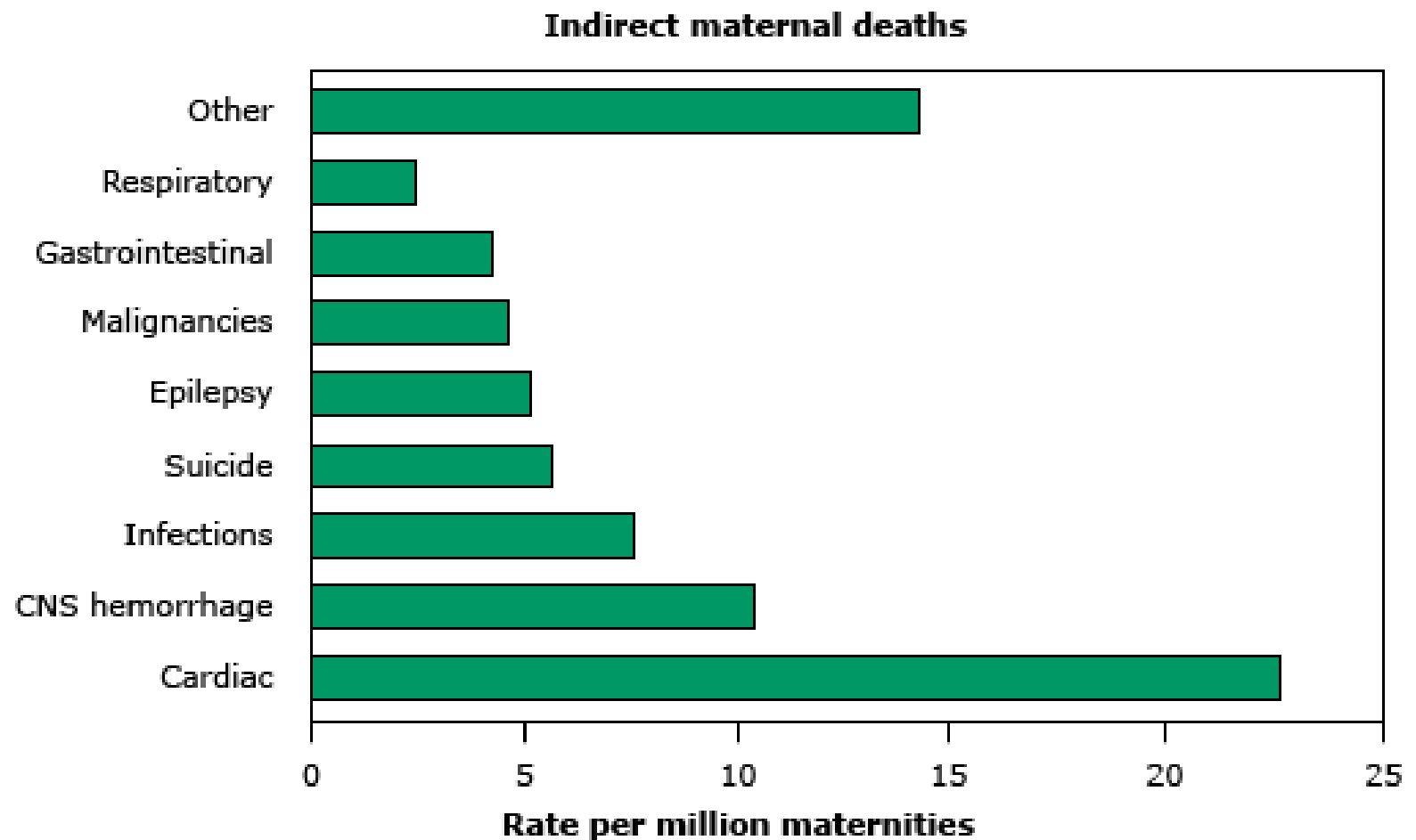
learning objectives:



- Recognize the contraindications to pregnancy for patients with heart disease
- Outcome of pregnancies with acquired heart disease
- Select the appropriate treatment strategies for patients with acquired heart disease in pregnancy



Causes of maternal death in the UK



PREGNANCY & HEART DISEASE

Problems

- **Symptoms and signs of a normal pregnancy may suggest presence of cardiac disease**
- **Pregnancy may exacerbate pre - existing cardiac disease**
- **Cardiac disease may manifest for the first time in pregnancy**

Acquired heart disease and pregnancy



- Rheumatic heart disease still predominates in developing countries
- Congenital heart disease is now the most common form of heart disease complicating pregnancy in the United States
- Many women are postponing childbearing until the 4-5 decades of life / HTN, DM, and hypercholesterolemia become more common and increase the incidence of acquired heart disease complicating pregnancy.

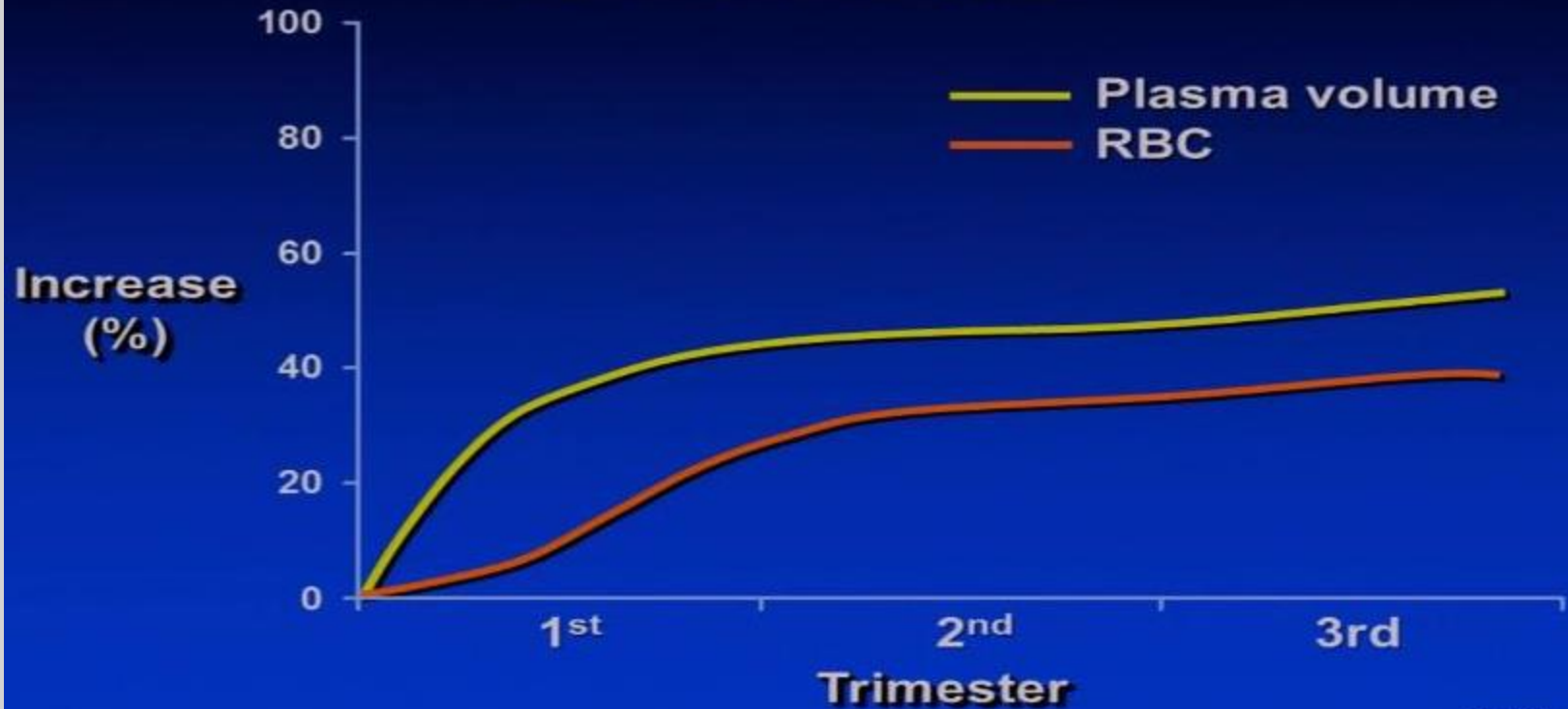
PRE – CONCEPTION COUNSELING

- Provide accurate a prognosis as possible for mother & baby ; give account of potl hazards
Whether risks will change with time or Rx
- Risk stratification – organize ante-partum care
outline principles CV follow-up & plan
- Intro to high risk OB & discuss **location, timing & mode of delivery**
- Alternative options : adoption, surrogacy
- Contraception *

PHYSIOLOGY OF NORMAL PREGNANCY



PREGNANCY AND THE HEART Volume Changes



PREGNANCY & HT DISEASE : Drugs

Relatively safe

Digoxin

Propafenone

Flecainide

Ca channel blockers

β blockers

Sotalol

Adenosine

Hydralazine

Not safe

Amiodarone

ACE inhibitors, ARB's

Spironolactone

Coumadin *

Apixaban

Statins

Folic acid antagonists

Bosentan, Ambrisentan

PHYSIOLOGY OF NORMAL PREGNANCY



PREGNANCY AND THE HEART **Hemodynamics During Pregnancy**

Peripheral resistance ↓
↑ uterine blood flow

Blood volume ↑ 40- 45%

Heart rate ↑ 10- 20%

Blood pressure → or ↓

Pulmonary vascular resistance ↓

Venous pressure in lower extremities ↑

**Cardiac
output ↑ 30%**

MODIFIED WHO CLASSIFICATION

Risk class

Risk by medical condition

I

No ↑ risk maternal mortality & no/mild ↑ morbidity

II

Small ↑ risk maternal mortality or mod ↑ morbidity

III

Sig ↑ risk maternal mortality or severe morbidity
Expert counseling required. If pgy – expert care

IV

Extremely high risk maternal mortality, morbidity
Pgy contraindicated. If pgy , discuss termination

PREGNANCY RISK WHO IV

- PAH of any cause
- Severe systemic ventricular dysfunction
LVEF < 30% , NYHA III – IV
- Prior peripartum CM & residual ↓ LV function
- Severe MS, severe symptomatic AS
- Marfan with aorta > 45 mm
- Aorta > 50 mm + bicuspid aortic valve
- Native severe coarctation

Valve disease



PREGNANCY & HEART DISEASE

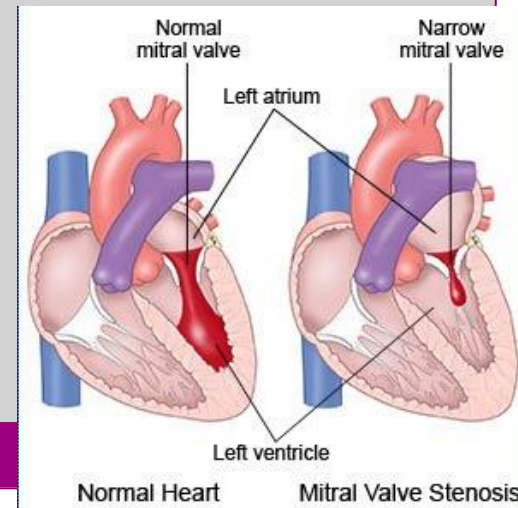
- **Because of the hemodynamic changes, regurgitant lesions are much better tolerated than stenotic lesions**



Mitral stenosis



- The most common cause of MS among women of childbearing age is rheumatic heart disease
- moderate to severe MS, the increased cardiac output and heart rate (decreased diastolic filling time) associated with pregnancy can result in increases in LA pressure leading to complications, including AF & pulmonary edema



Mitral stenosis



Valvular heart disease

Original research

Pregnancy outcomes in women with significant valve disease: a systematic review and meta-analysis

 Robin Alexandra Ducas^{1, 2}, David A Javier²,  Rohan D'Souza³, Candice K Silversides^{2, 4},  Wendy Tsang²

Correspondence to Wendy Tsang, Cardiology, University of Toronto, Toronto, ON M5G 2C4, Canada; wendy.tsang@uhn.ca

- Rates of pulmonary edema and new or recurrent arrhythmias were 37 and 16 % for women with severe MS & 18 and 5 % for women with moderate aortic stenosis.

Mitral stenosis



MS AND PREGNANCY

- **↑ heart rate ↓ diastolic filling time**
- **Elevates LA_p further**
- **↓ SV causes further reflex ↑ heart rate**
- **AF may → acute pulmonary edema**

Mitral stenosis



MS AND PREGNANCY

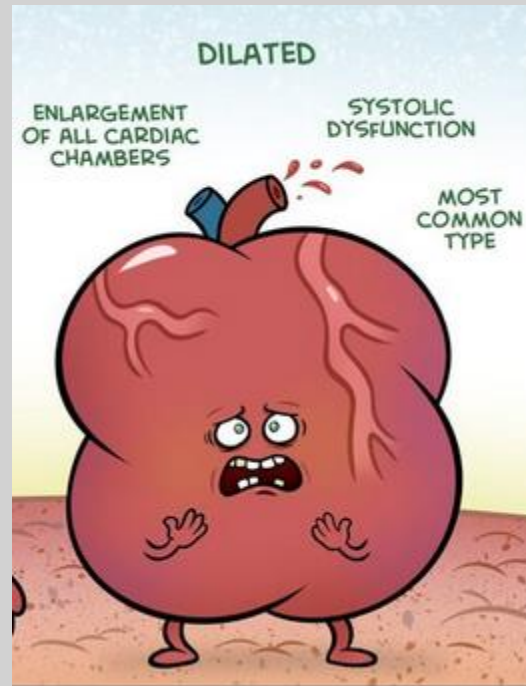
Beta-blockers mainstay of therapy

Anticoagulation ?

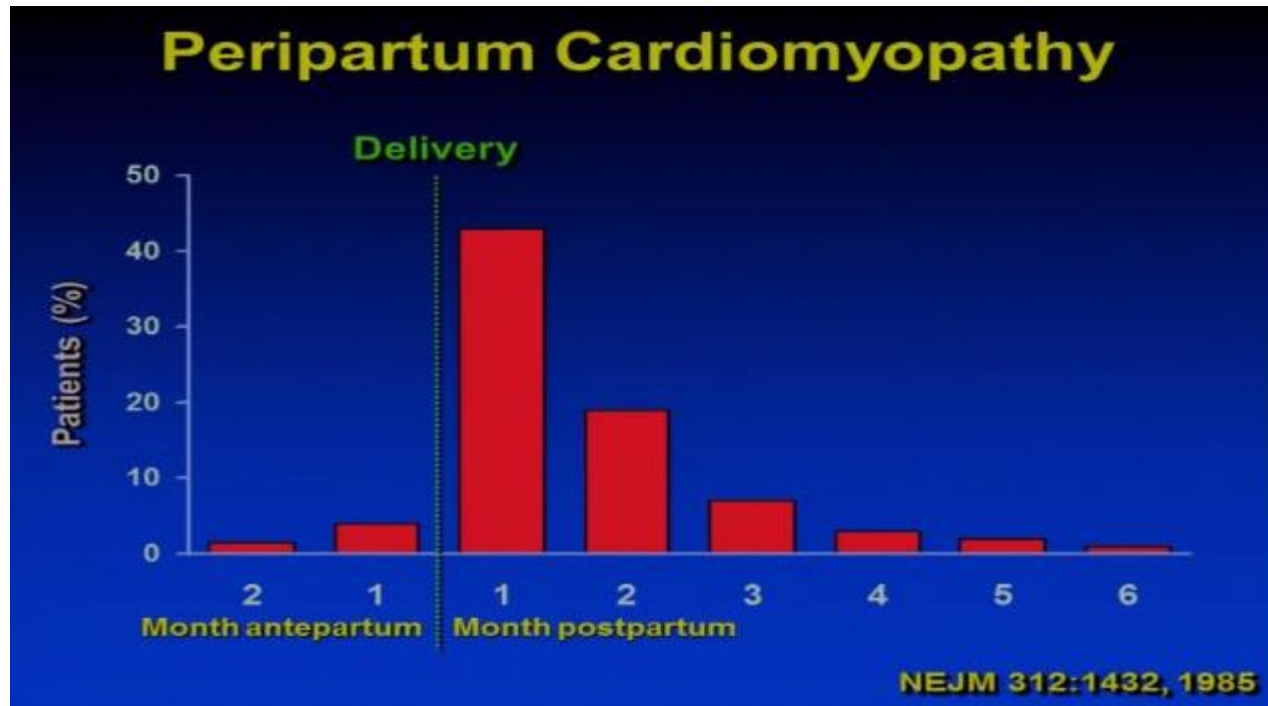
- AF, LA thrombus, embolism
- Spontaneous echo contrast in LA, large LA (> 40 ml/m²), ↓ CO or CHF.

Regitz-Zagrosek V, Eur Ht J 2011

Peripartum cardiomyopathy



CARDIOMYOPATHY



Cardiomyopathy



Peripartum Cardiomyopathy

- **New diagnosis of HF due to LV dysfunction**
Last trimester → 6 mos postpartum
Diagnosis of exclusion
- **Incidence varies**

U.S.	1 in 3200 deliveries (1350/yr)
South Africa	1 in 1000
Haiti	1 in 300
- **↑ frequency**

Age > 30 yr	Tocolytic
Multifetal pregnancy	Black women
Multiparity	HTN, DM, smoking

Cardiomyopathy



PPCM : Prognosis IPAC study (n=100 pt)

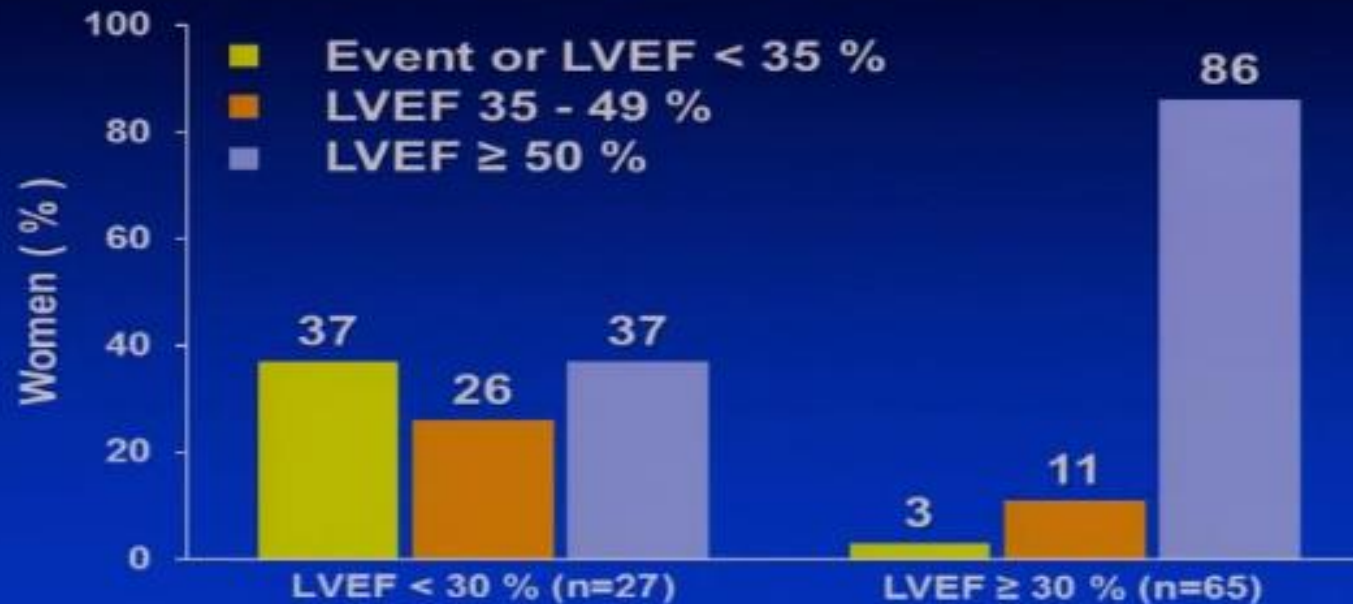
- 72% women recovered (EF > 50% at 12 mos)
- 13% - major events,
or persistent severe ↓ LVEF
- Black women : more LV dysfn at presentation
and 6 & 12 mos post partum
- **Prognostic markers ?**

McNamara DM , JACC 2015

Cardiomyopathy



PROGNOSIS PERIPARTUM CM Final status based on initial EF



McNamara DM, JACC '15

Cardiomyopathy

PERIPARTUM CARDIOMYOPATHY

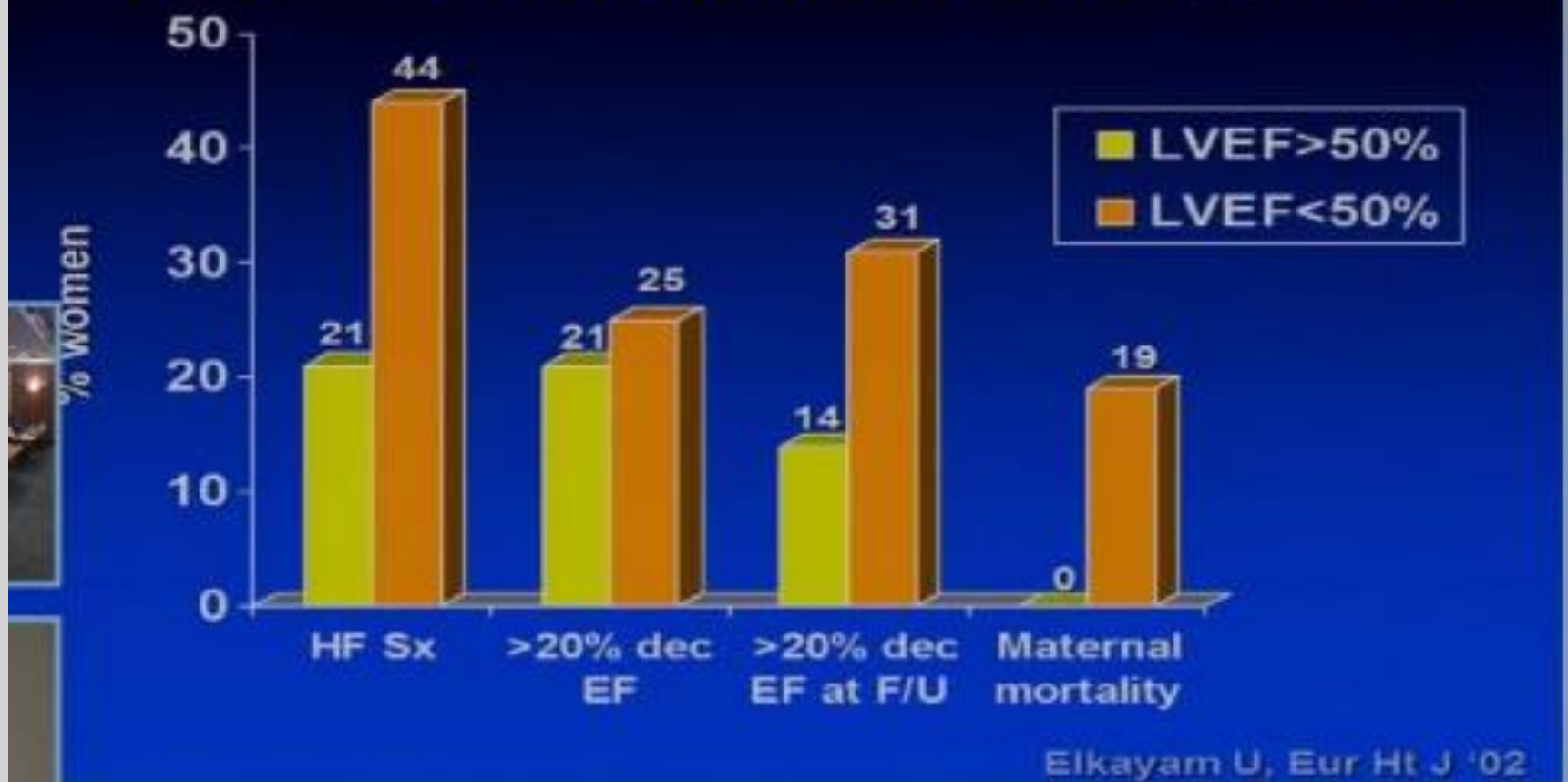
Subsequent pregnancies ?

Does it matter whether LV normalized ?

Cardiomyopathy



PPCM : Subsequent pregnancy (n=60)



Cardiomyopathy

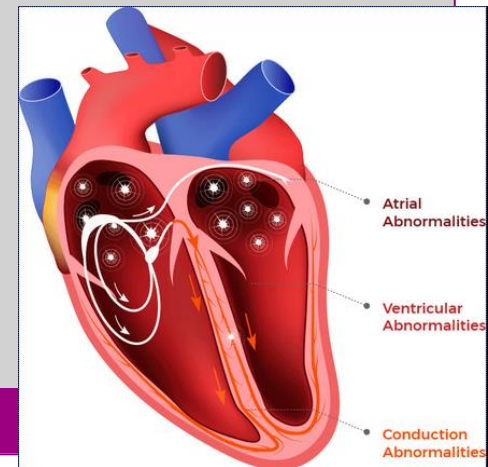


- An echocardiogram before conception, or as soon as possible after pregnancy is confirmed, to determine baseline ventricular function.
- Pregnancy should be discouraged if there is a significant reduction in ventricular function ($EF < 45\%$).
- Of concern, women with prior peripartum cardiomyopathy in whom LV function has returned to normal ($\geq 50\%$) still remain at significant risk for morbidity during subsequent pregnancies

ARRHYTHMIAS



- Arrhythmias and conduction disturbances can antedate or originate during pregnancy and may be exacerbated by it.



Recurrence Rates of Arrhythmias During Pregnancy in Women With Previous Tachyarrhythmia and Impact on Fetal and Neonatal Outcomes

Candice K. Silversides, MD, SM^{a,b,*}, Louise Harris, MD^b, Kym Haberer, BArtSc, MA^a, Mathew Sermer, MD^{a,c}, Jack M. Colman, MD^{a,b}, and Samuel C. Siu, MD, SM^{a,b}

- Women with preexisting cardiac rhythm disorders, exacerbation of arrhythmia during pregnancy is common.
- Recurrence of arrhythmia during the antepartum period increases the risk of adverse fetal complications, independent of other maternal and fetal risk factors.



MANAGEMENT OF LABOR AND DELIVERY



- Anesthesia/analgesia:
- Opiates to relieve pain but not highly effective
- Lumbar epidural anesthesia is highly effective

MANAGEMENT OF LABOR AND DELIVERY



- Hemodynamic monitoring —
- Systemic arterial pressure and heart rate are routinely monitored during labor;
- Pulse oximetry and continuous (ECG) monitoring are utilized as required by the patient's condition

MANAGEMENT OF LABOR AND DELIVERY



- Mode and timing of delivery
- For nearly all cardiac disease, vaginal delivery is preferred
- Cesarean delivery is suggested for advanced heart failure and hemodynamic instability despite treatment
- Spontaneous onset of labor is preferred to induced labor in patients with functionally normal or well-controlled

