

pregnancy in tetralogy of fallot

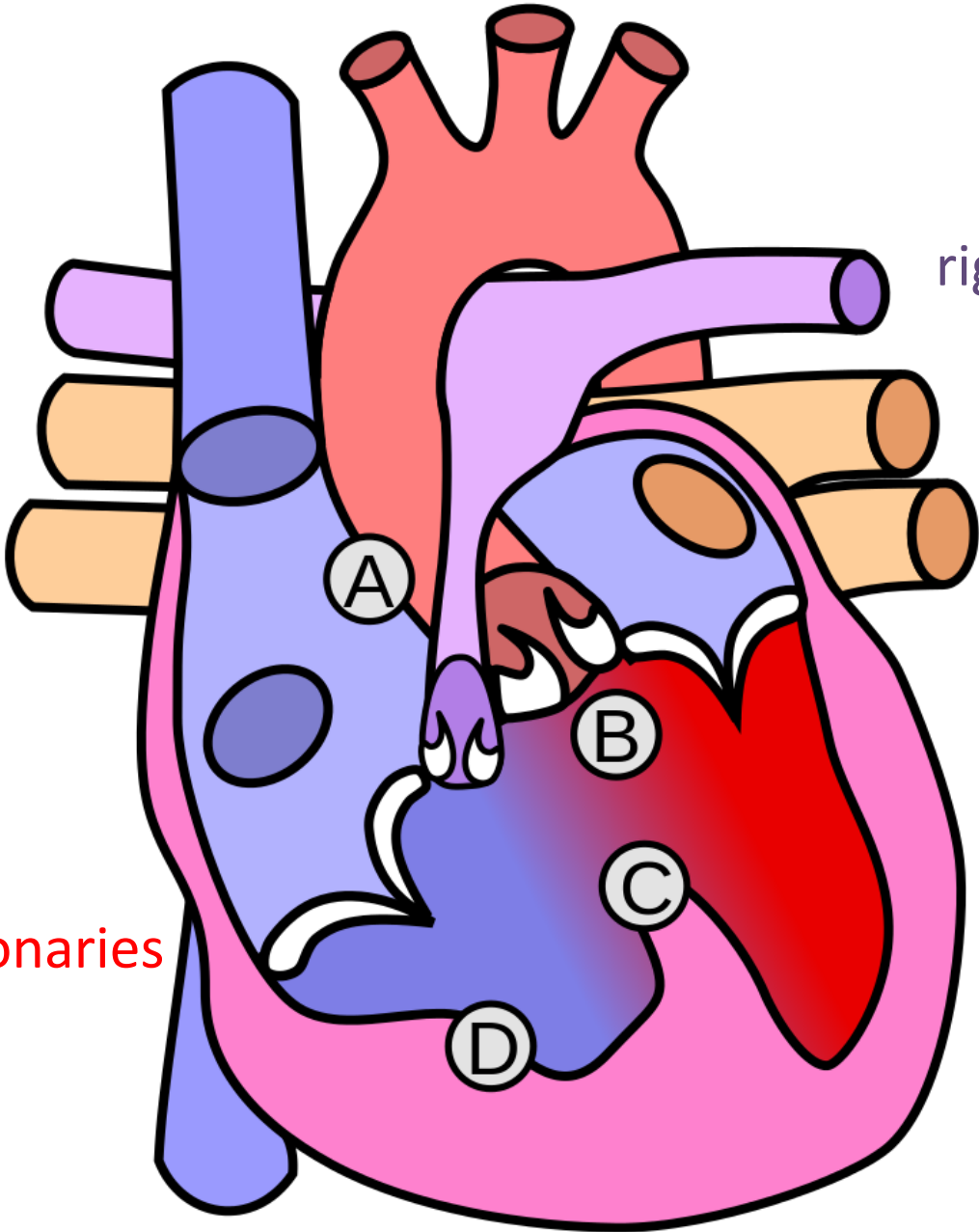
dr stephanie curtis
consultant cardiologist
university hospitals bristol

fallot is the commonest cyanotic congenital heart condition



branch PA
stenosis

right aortic arch

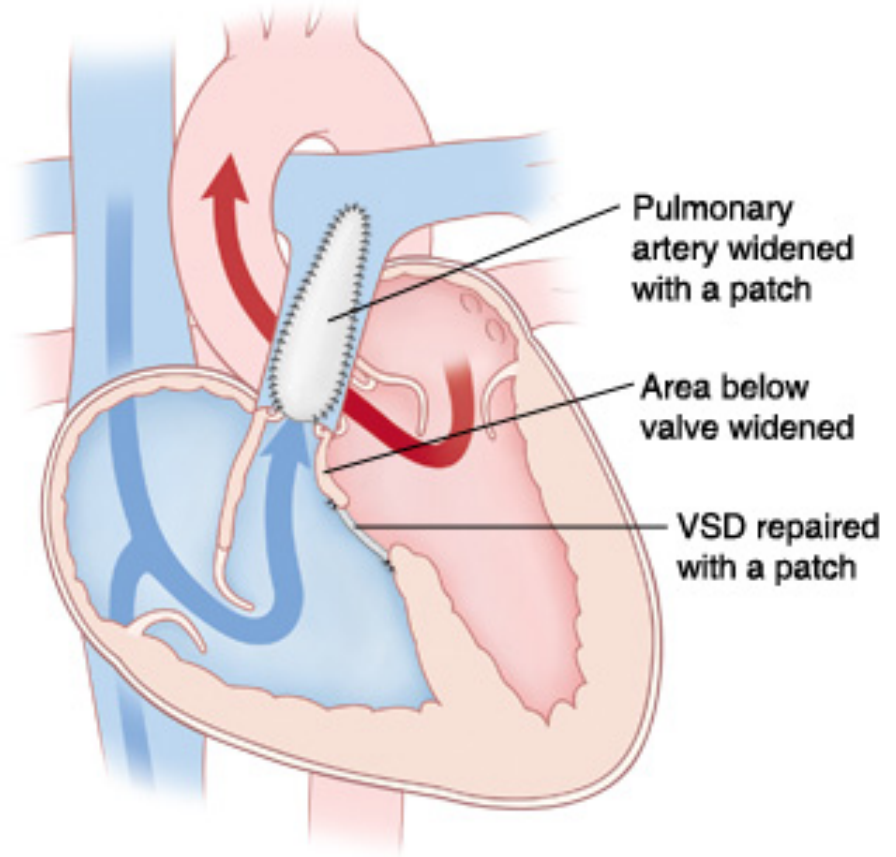
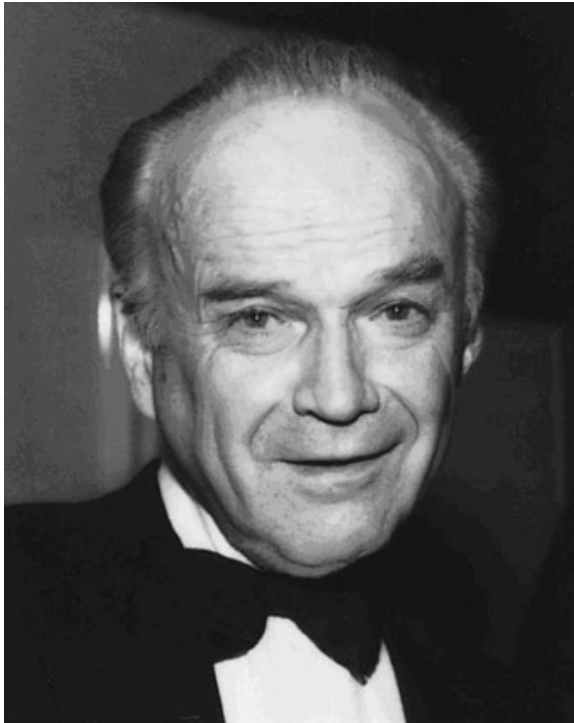


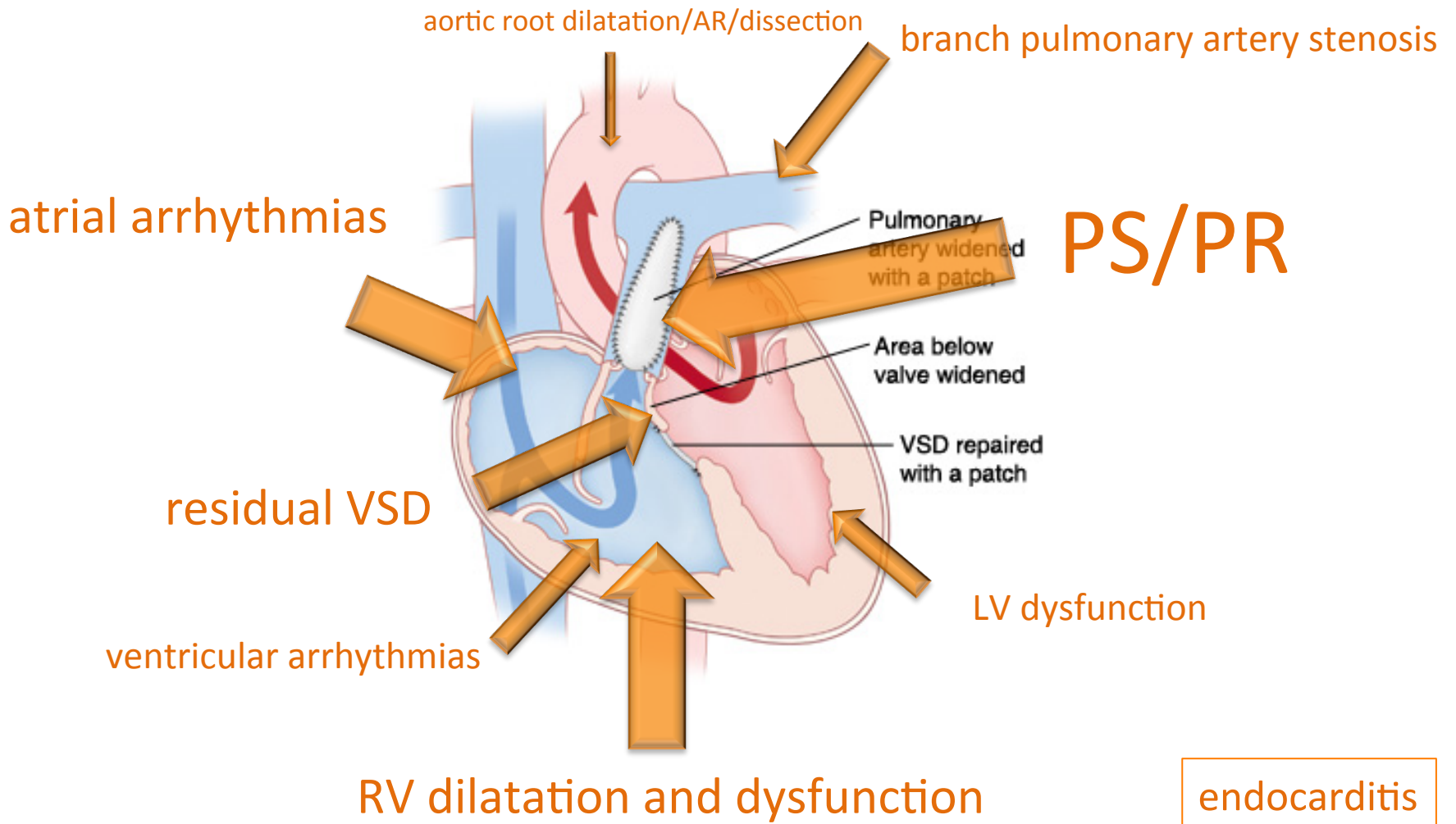
ASD

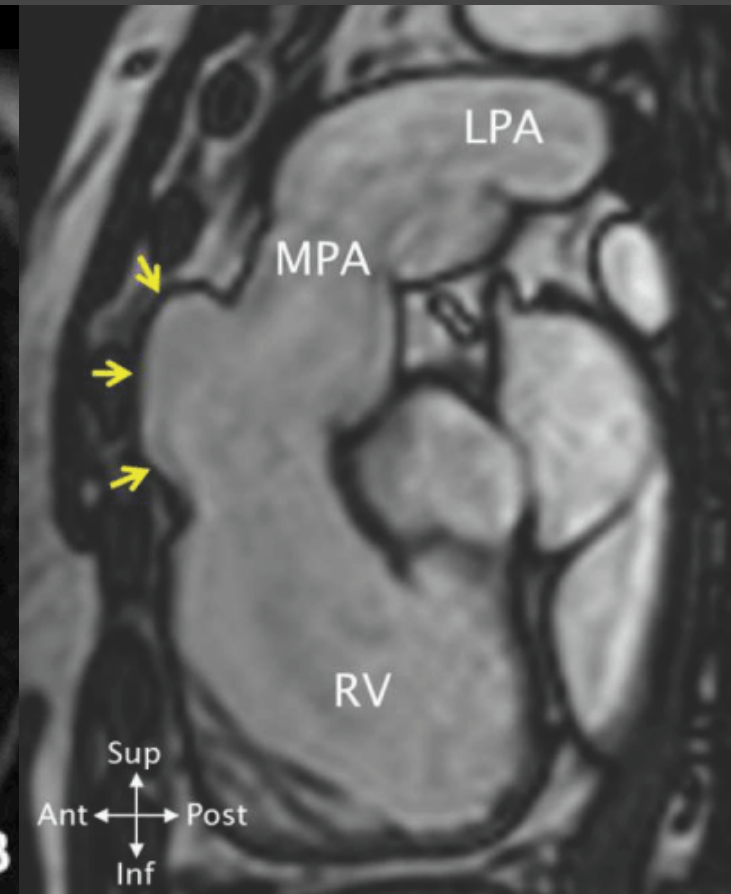
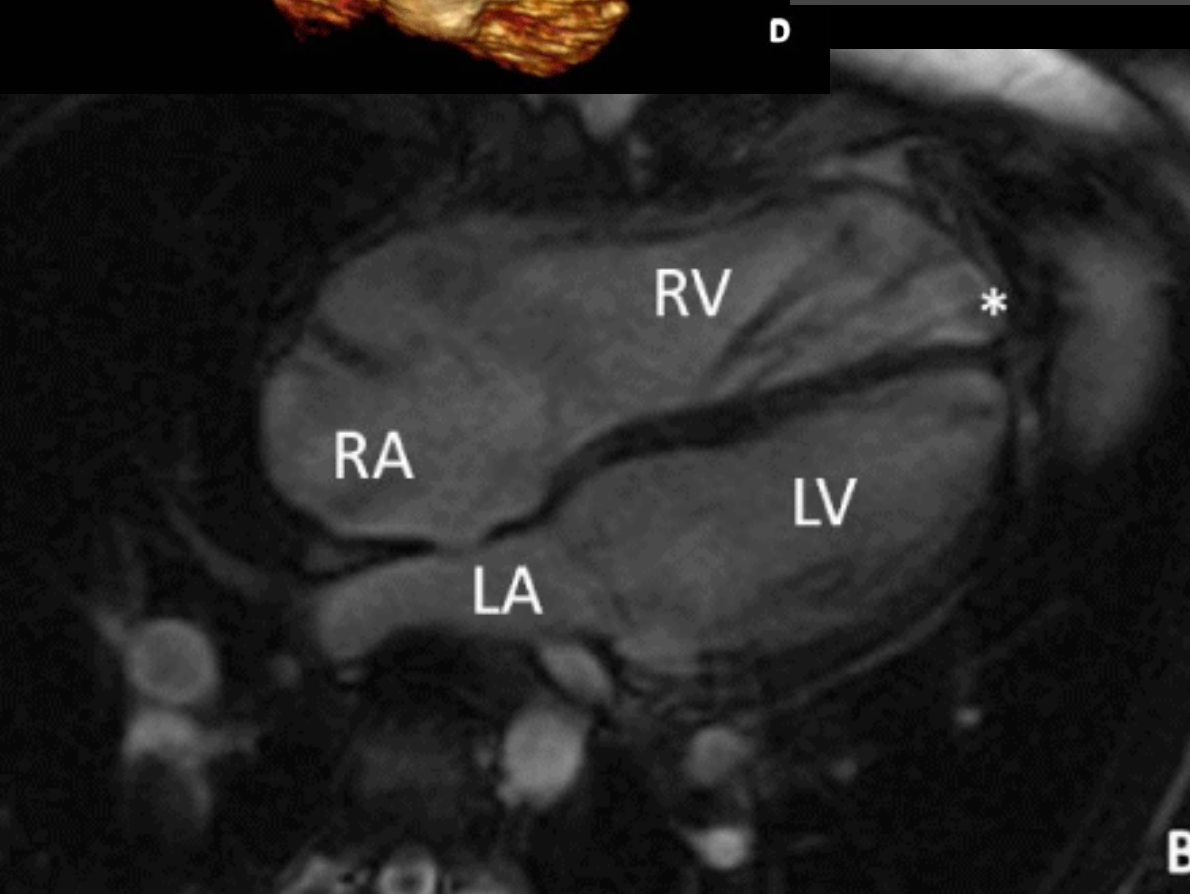
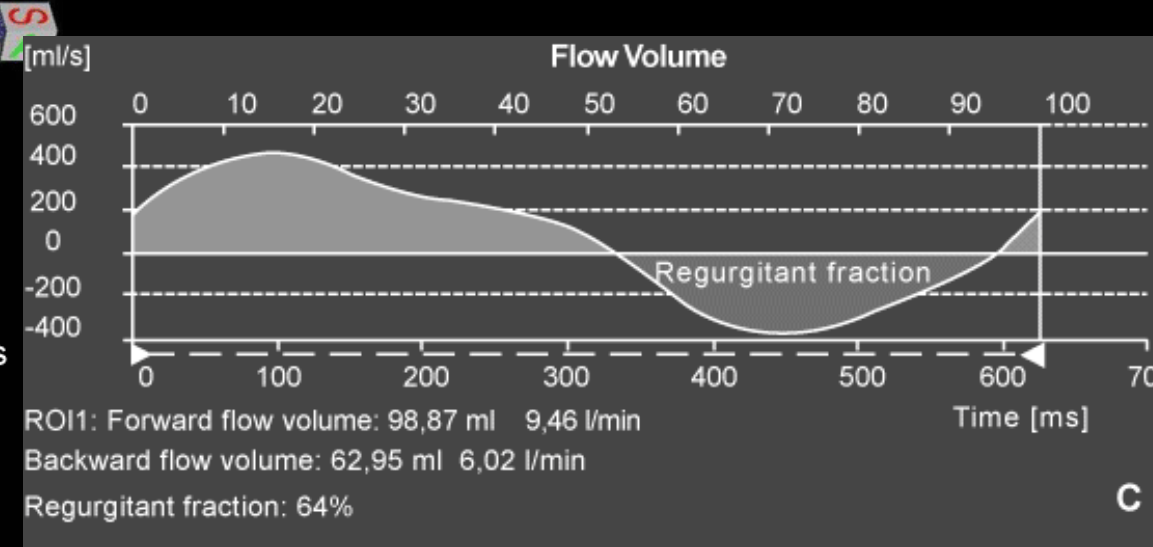
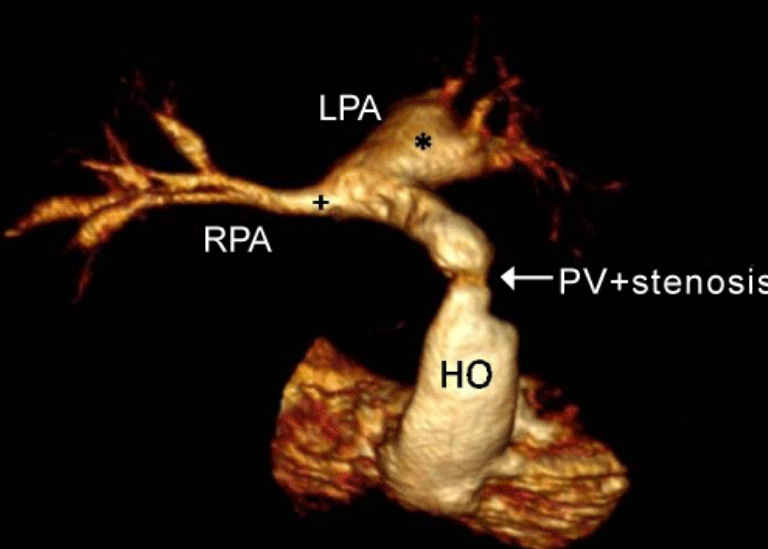
VSD

anomalous coronaries

'total correction', Lillehei, 1954







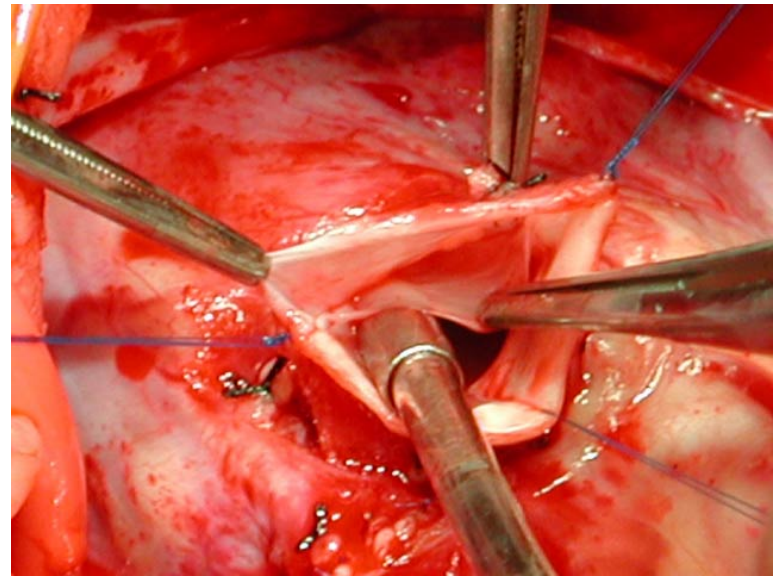
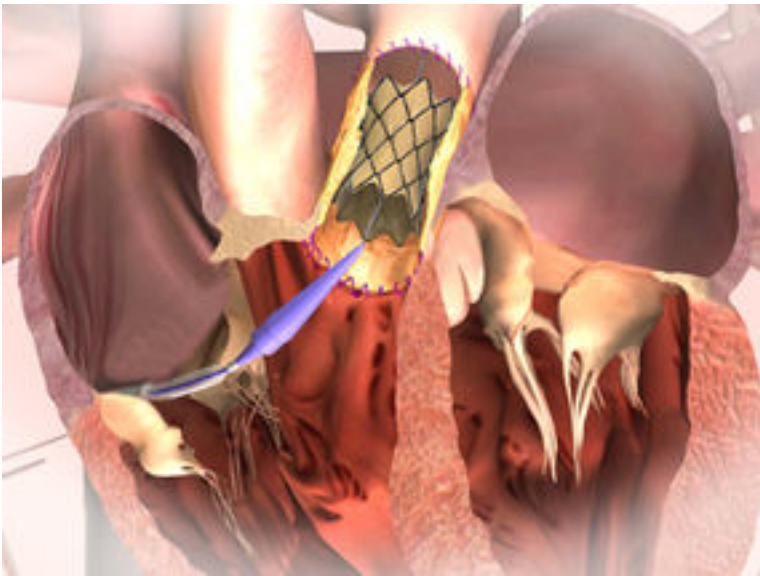
when should you replace the pulmonary valve?

severe PR with

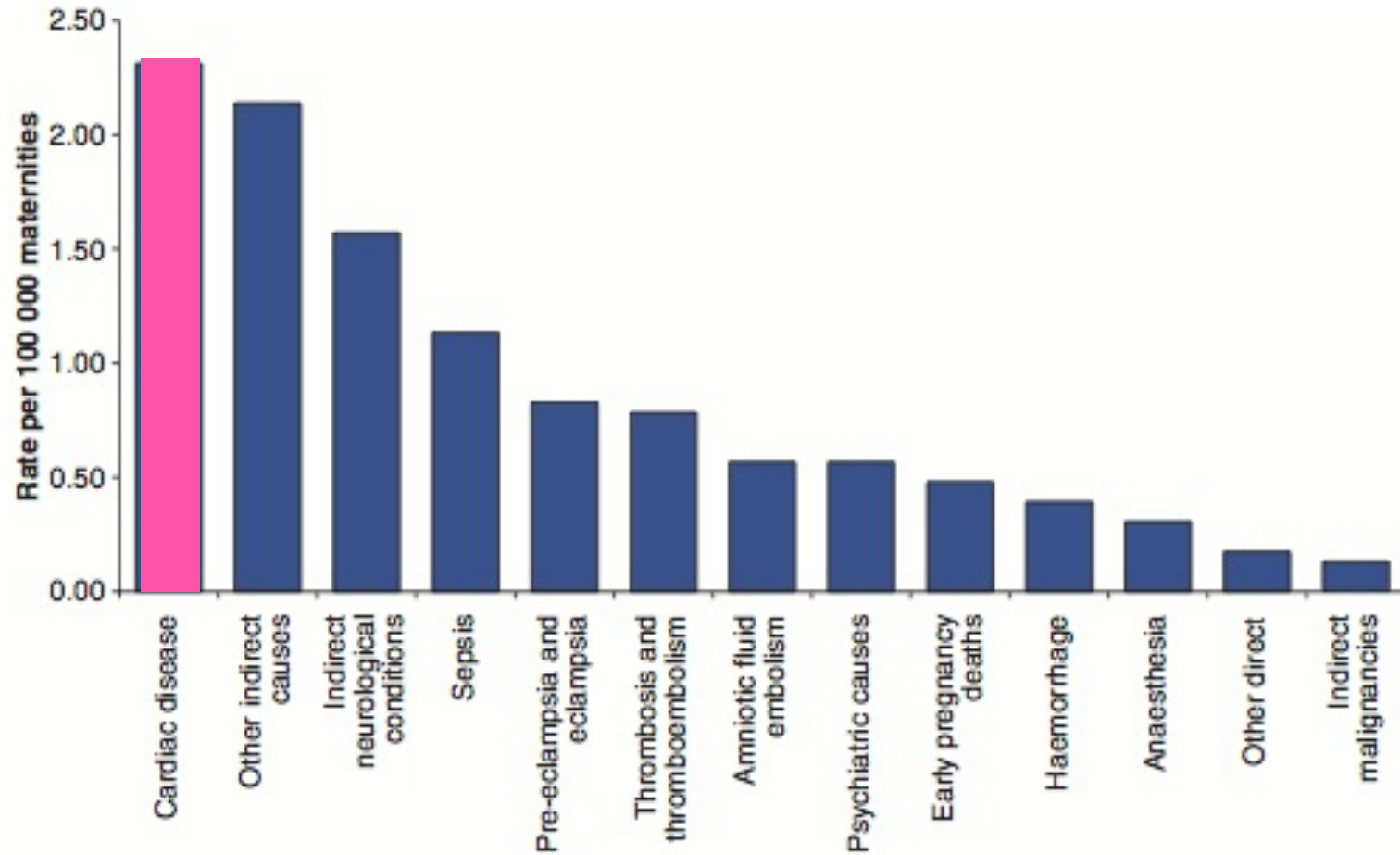
- symptoms
- deteriorating CPET
- RVEDV >150-170 mls/m²
- RVESV >82-90mls/m²
- decreasing RV function



pulmonary valve replacement



heart disease is the **leading** cause of death in pregnancy.....





MBRRACE-UK

Mothers and Babies: Reducing Risk through
Audits and Confidential Enquiries across the UK

MBRRACE-UK Mothers and Babies: Reducing Risk through Audits and Confidential Enquiries in the UK

Table 9.2. Causes of maternal death from cardiac disease; UK: 1994–2008

Type and cause of death	1994–96	1997–99	2000–02	2003–05	2006–08
Acquired					
Aortic dissection	7	5	7	9	7
Myocardial infarction (MI)	6	5	8	12	6
Ischaemic heart disease (no MI)	0	0	0	4	5
Sudden adult death syndrome (SADS)	0	0	4	3	10
Peripartum cardiomyopathy	4	7	4	0*	9**
Other cardiomyopathy	2	3	4	1	4
Myocarditis or myocardial fibrosis	3	2	3	5	4
Mitral stenosis or valve disease	0	0	3	3	0
Thrombosed aortic or tricuspid valve	1	0	0	0	2
Infective endocarditis	0	2	1	2	2
Right or left ventricular hypertrophy or hypertensive heart disease	1	2	2	2	1
Congenital					
Pulmonary hypertension (PHT)	7	7	4	3	2
Congenital heart disease (not PHT or thrombosed aortic valve)	3	2	2	3	1
Other	5	0	2	0	6
Total	39	35	44	48***	53

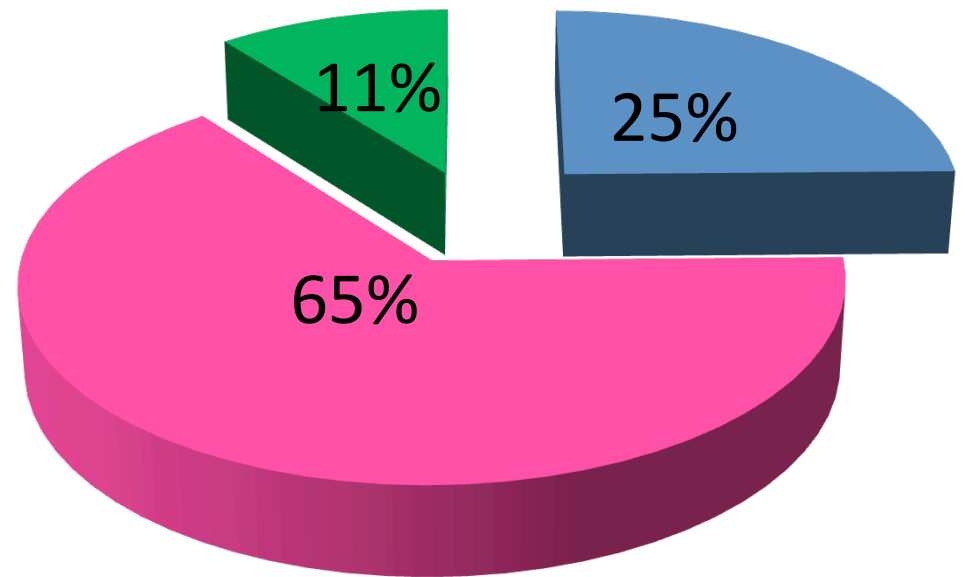
*Twelve Late deaths reported in 2003–05.

**Two Late deaths reported in 2006–08.

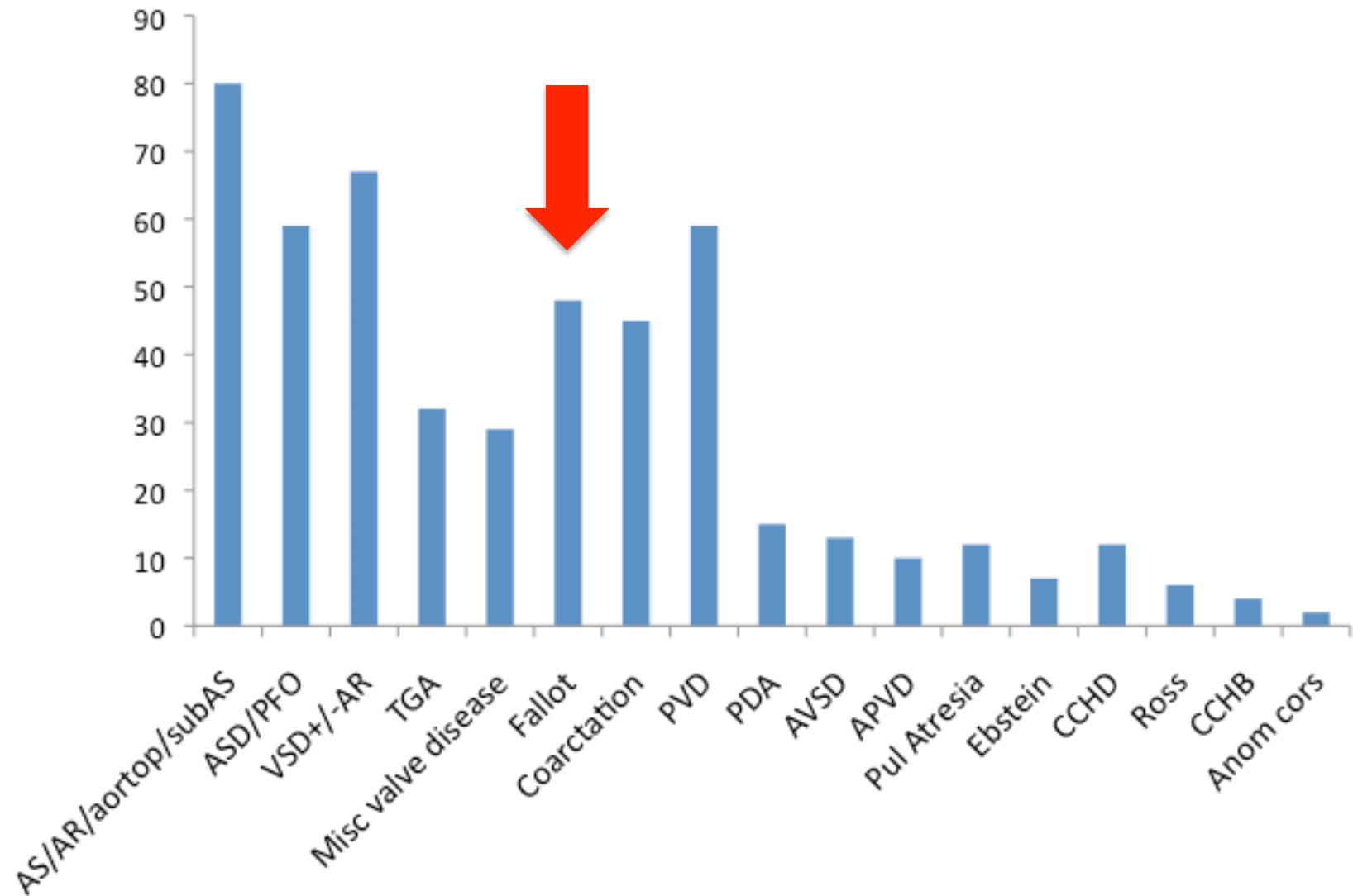
***Includes one woman for whom information on cause was not available.

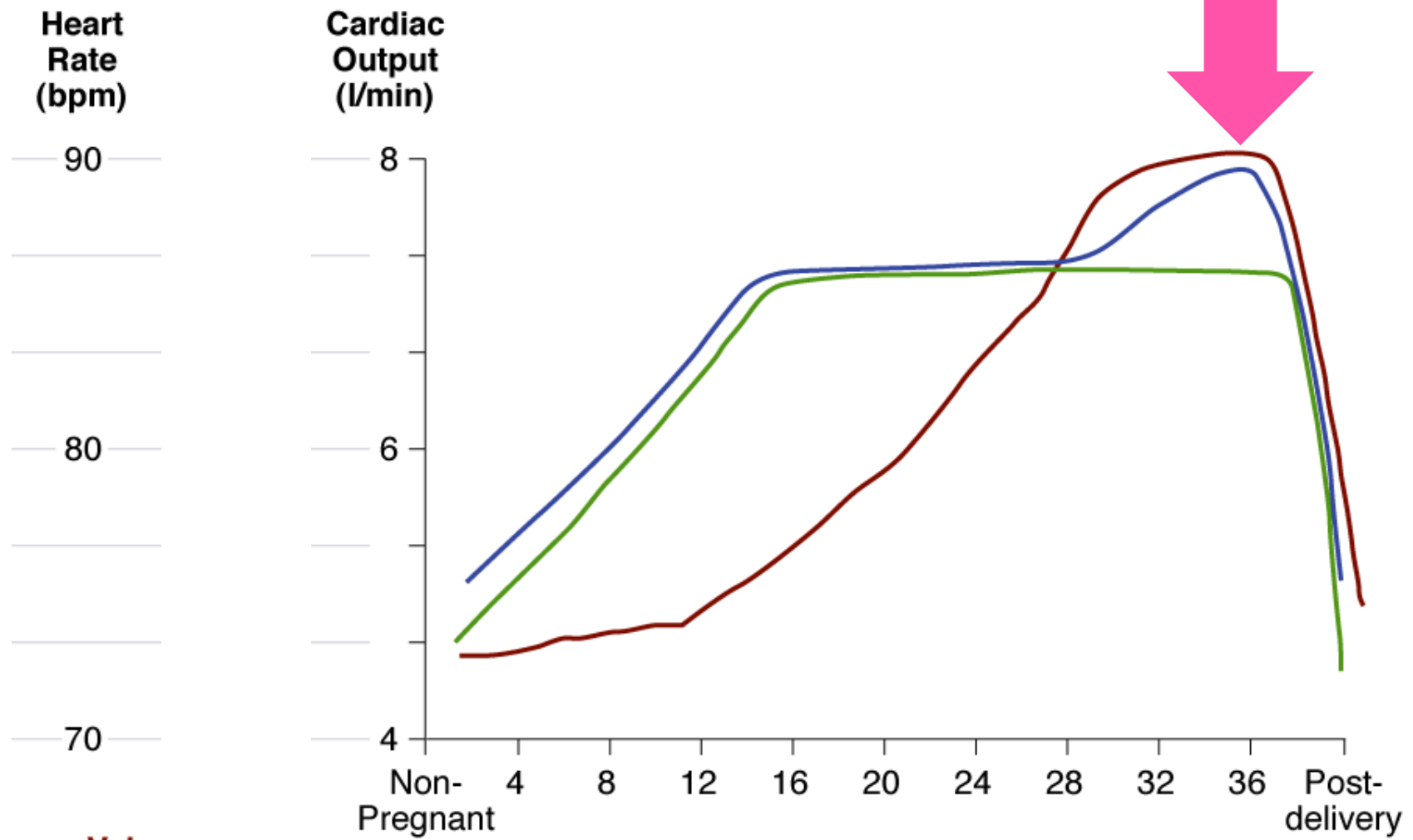
2/3 patients have

**congenital heart
disease**



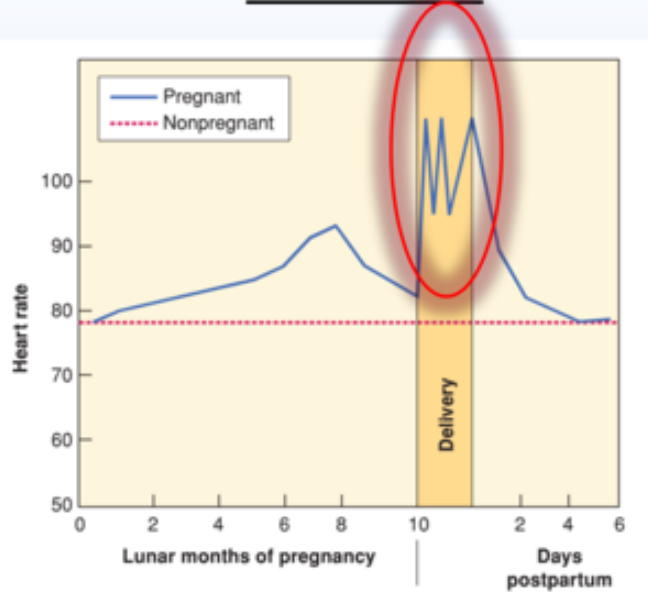
lots of women with CHD get **pregnant**



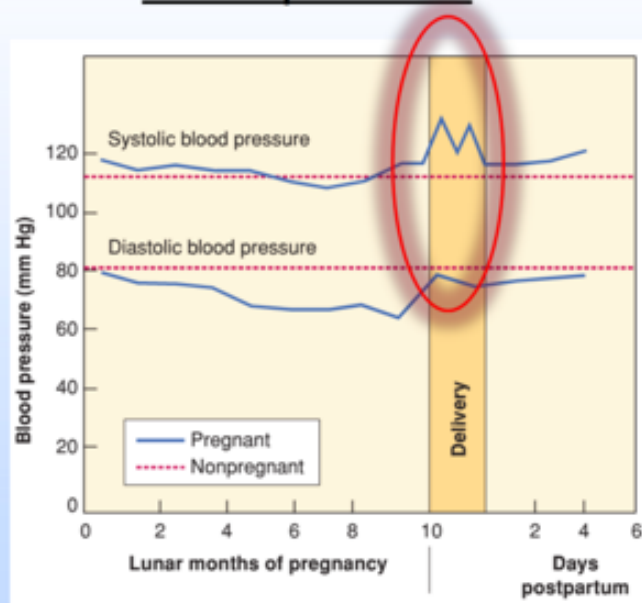


- Plasma Volume
- Heart Rate
- Cardiac Output and Stroke Volume

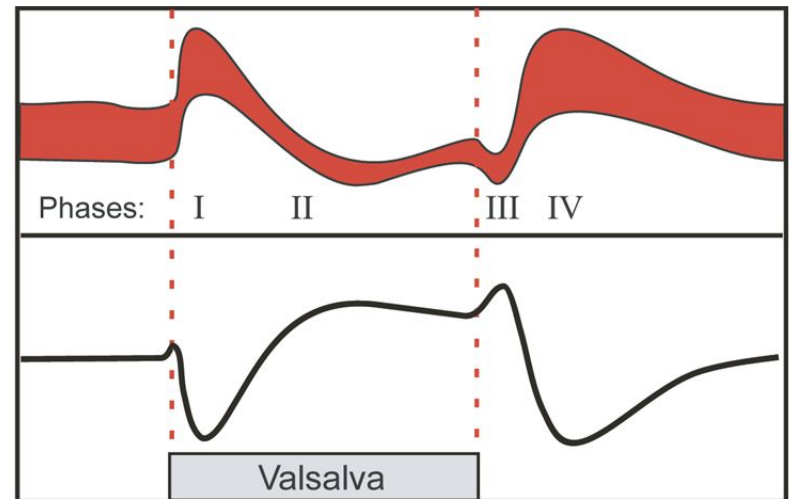
Heart Rate



Blood pressure



Aortic Pressure



predictors of maternal events in pregnancy

NYHA Class > II

cyanosis

previous cardiac event

left heart obstruction (mitral/aortic stenosis)
impaired systemic ventricular function (EF < 40%)

severe pulmonary regurgitation and poor RV

mechanical valve

dilated aorta

Drenthen W et al, ZAHARA. Eur Heart J. 2010 Sep;31(17):2124-32

Siu SC, Circulation. 2001 Jul 31;104(5):515-21

Khairy P et al. Circ 2006;113(4):517-24



and in fallot?

cardiac events 7-12%

arrhythmias (SVT)

RV impairment

heart failure

previous arrhythmia x9 risk

use of cardiac meds x12 risk

Veldtman GR et al. JACC 2004, 44 (1)

Meijer JM et al. Heart. 2005;91(6):801-5

Pedersen LM et al. Cardiol Young. 2008;18(4):423-9

Balci A et al. Am Heart J. 2011 Feb;161(2):307-13



predictors of fetal events in pregnancy

NYHA Class > II

cyanosis

left heart obstruction (mitral/aortic stenosis)

smoking

anticoagulants

severe pulmonary regurgitation and poor RV

mechanical valve

dilated aorta



Drenthen W et al, ZAHARA Investigators. Eur Heart J. 2010 Sep;31(17):2124-32.

Siu SC, Circulation. 2001 Jul 31;104(5):515-21

Khairy P et al. Circ 2006;113(4):517-24

and in Fallot?

mortality	≈6%
prematurity	≈6%
SGA	≈9%
recurrence	2-10%

unrepaired and \geq mod PR predict low birthweight

use of cardiac meds x8 risk



E Gelson et al. BJOG 2008. 115 (3):398–402
Pedersen LM et al. Cardiol Young. 2008 Aug;18(4):423-9
Meijer JM et al. Heart. 2005;91(6):801-5
Veldtman GR et al. JACC 2004, 44 (1)
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think 22q11



digeorge syndrome/catch 22/velocardiofacial syndrome/schprintzen syndrome

Cardiac abnormalities (congenital heart defects - 75%)

Abnormal facies

Thymic aplasia

Cleft palate (70%)

Hypocalcemia

22q11.2 microdeletion



uncorrected fallot is **high risk**

	uncorrected	corrected
cardiac complications	40%	0
obstetric complications	70%	40%
spontaneous abortion	37.5%	0
preterm birth	25%	0

unrepaired

previous event

RV dysfunction

≥ moderate PR

cardiac medication



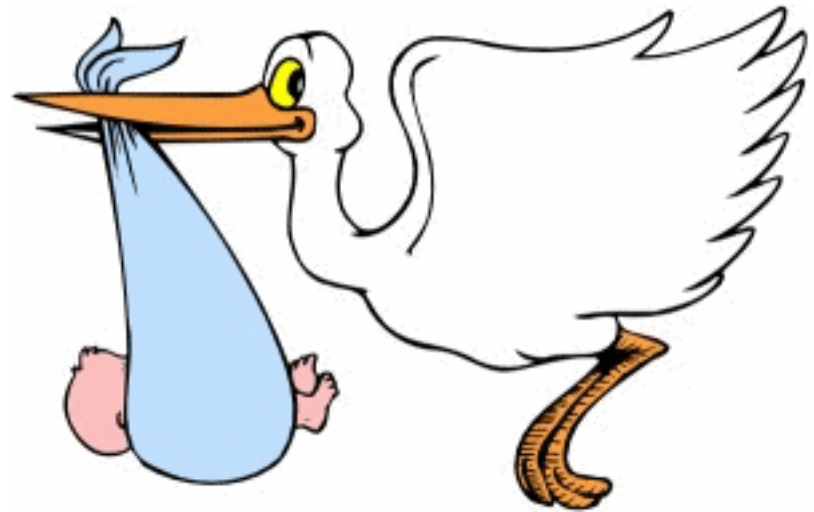
fetal echo

see once per trimester (more if RV dysfunction)

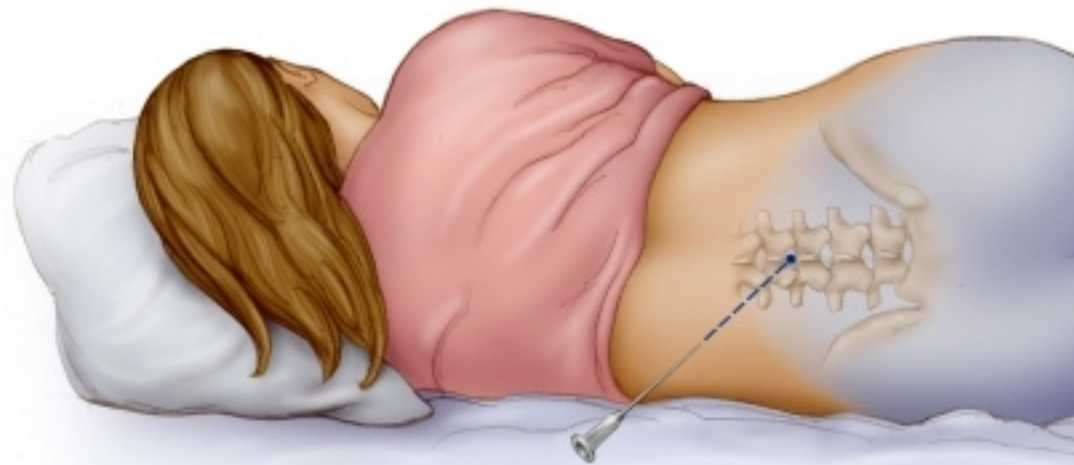
local delivery if possible

low threshold for epidural

short active 2nd stage



epidural anaesthesia higher
shorter active 2nd stage



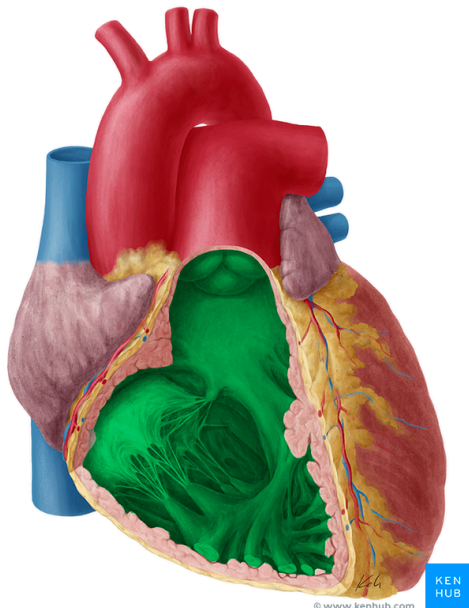
is the **heart** affected by the pregnancy?

NO

19 repaired TOF v 38 controls
no effects on RV volumes,
aortic dimensions, or exercise
data

YES

13 repaired TOF v 26 controls
increase of RVEDV higher v controls
(4.1 vs. 1.6 ml/m²/year, p=0.07).
no change in EF

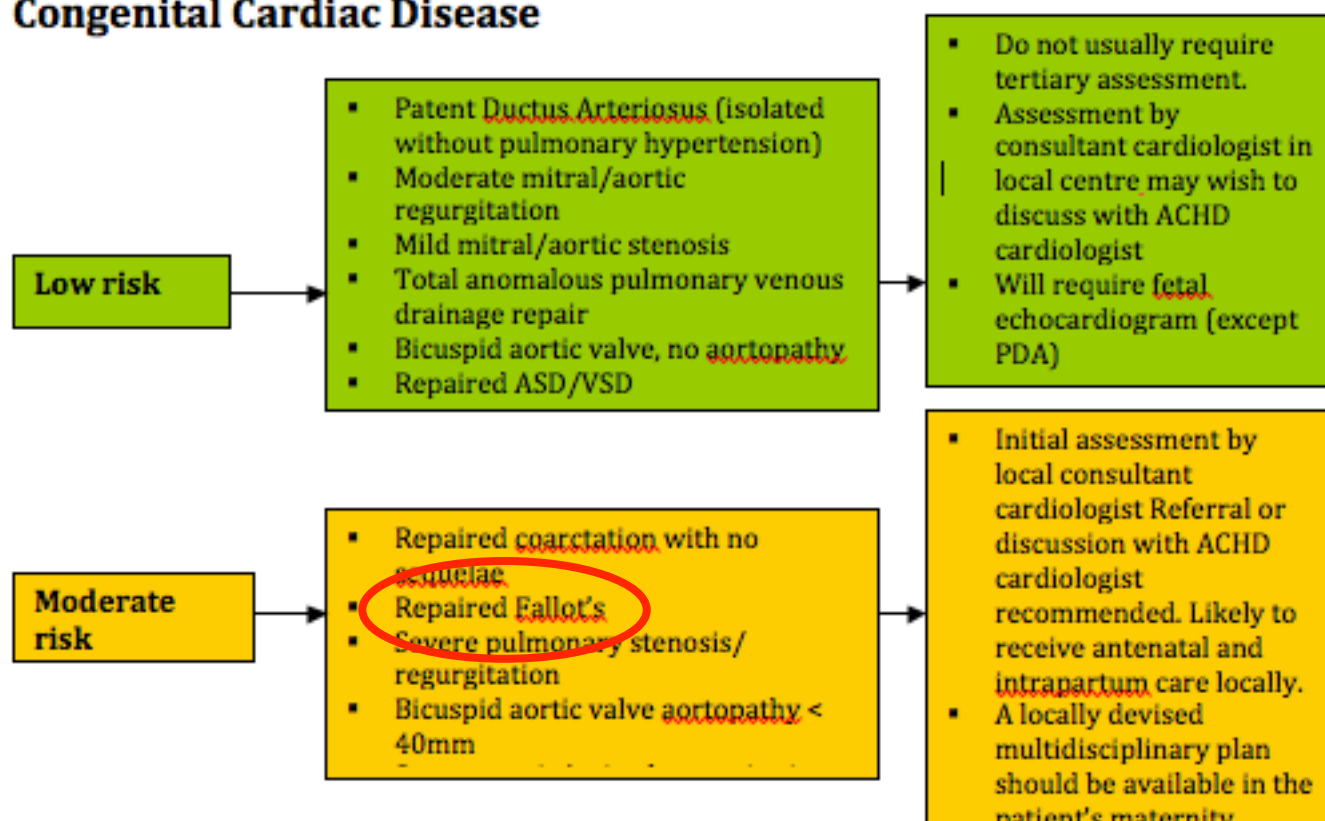


Egidy Assenza G et al..Int J Cardiol. 2013;168(3):1847-52
Cauldwell M et al. JAHA 2017, 6 (7)

Regional referral pathway for pregnant women with known cardiac disease

- All women with known cardiac disease should have received pre-conception counselling by a cardiologist (ACHD Cardiologist in the case of congenital cardiac disease).
- For further information on specific management, please refer to the ESC Pregnancy Guidelines

Congenital Cardiac Disease



involve **senior clinicians** from
the **multidisciplinary team**





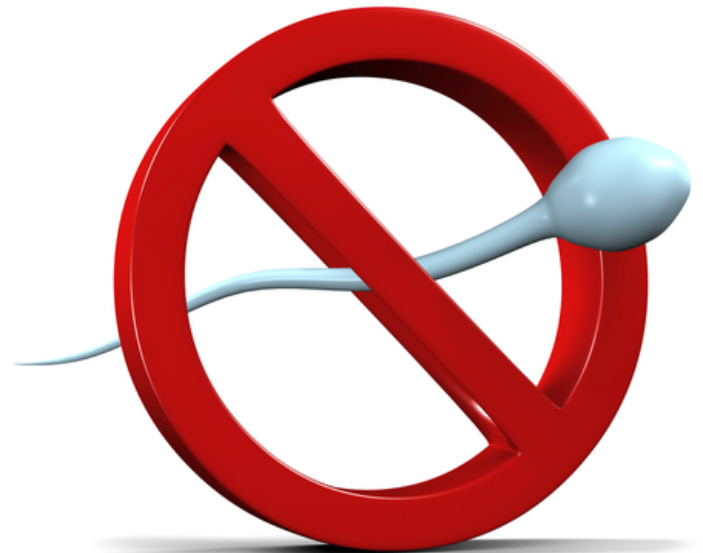
symptoms?
medication?
family history?

echo
CPET
MRI

do they need a PVR pre-pregnancy?

maternal and fetal risks?

progesterone methods
are safe



ESC Guidelines on the management of cardiovascular diseases during pregnancy

The Task Force on the Management of Cardiovascular Diseases during Pregnancy of the European Society of Cardiology (ESC)

Endorsed by the European Society of Gynecology (ESG), the Association for European Paediatric Cardiology (AEPC), and the German Society for Gender Medicine (DGesGM)

WHO II
small increased risk of maternal mortality
or
moderate increase in morbidity

HEART DISEASE & PREGNANCY



Physician Information

Patient Information

Links

Resources

Contributors

Home



ARE YOU A PHYSICIAN SEARCHING FOR INFO?

[CLICK HERE](#)

ARE YOU A PATIENT SEARCHING FOR INFO?

[CLICK HERE](#)

Overview

The Heart Disease and Pregnancy website provides information for patients and physicians about the risks associated with pregnancy and management strategies for pregnant women with heart disease trying to have a baby. Included are educational materials on heart conditions

