

Congenital Heart Disease and Pregnancy



Matthias Greutmann, MD

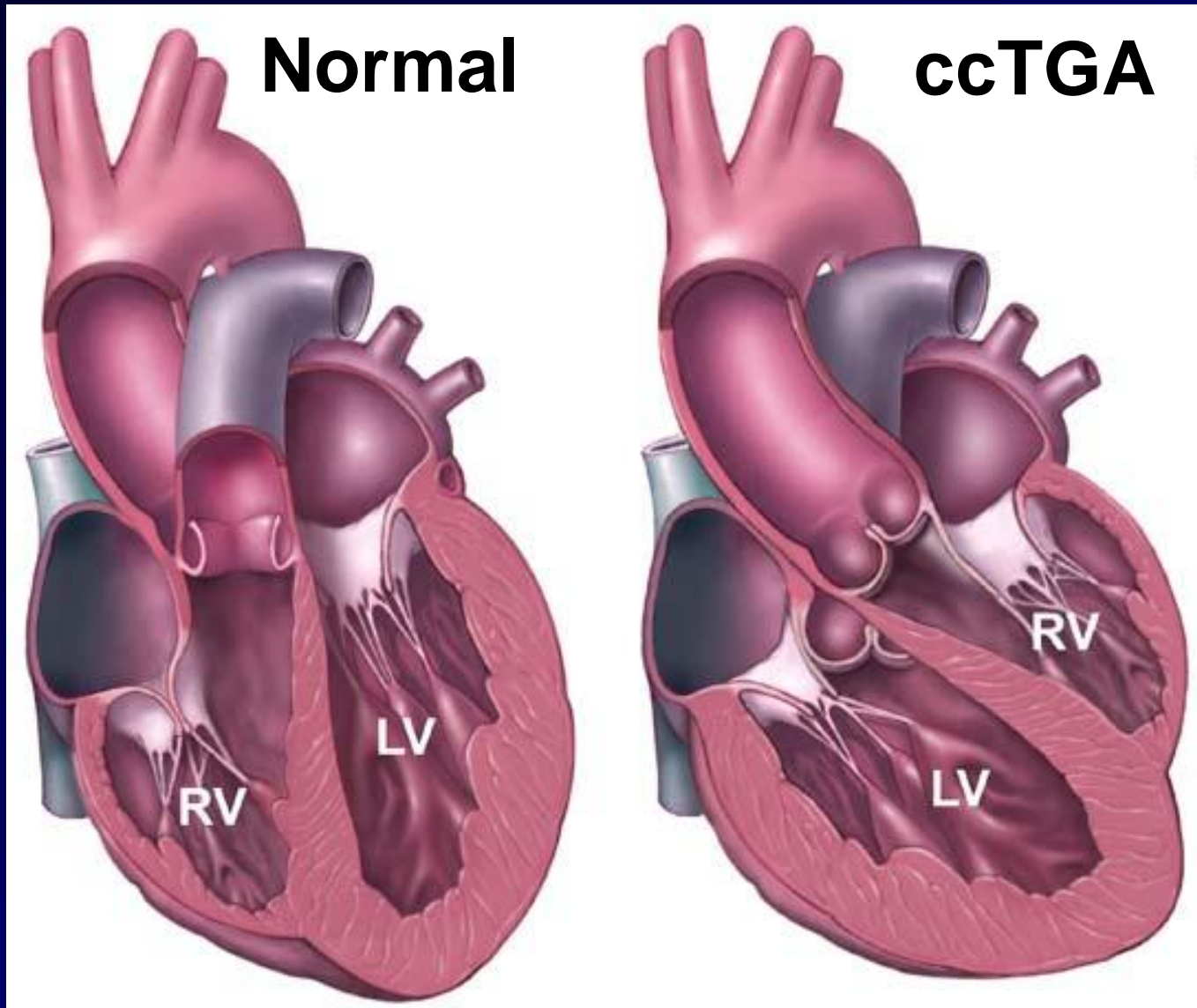
Adult Congenital Heart Disease Program

University Hospital Zurich, Switzerland

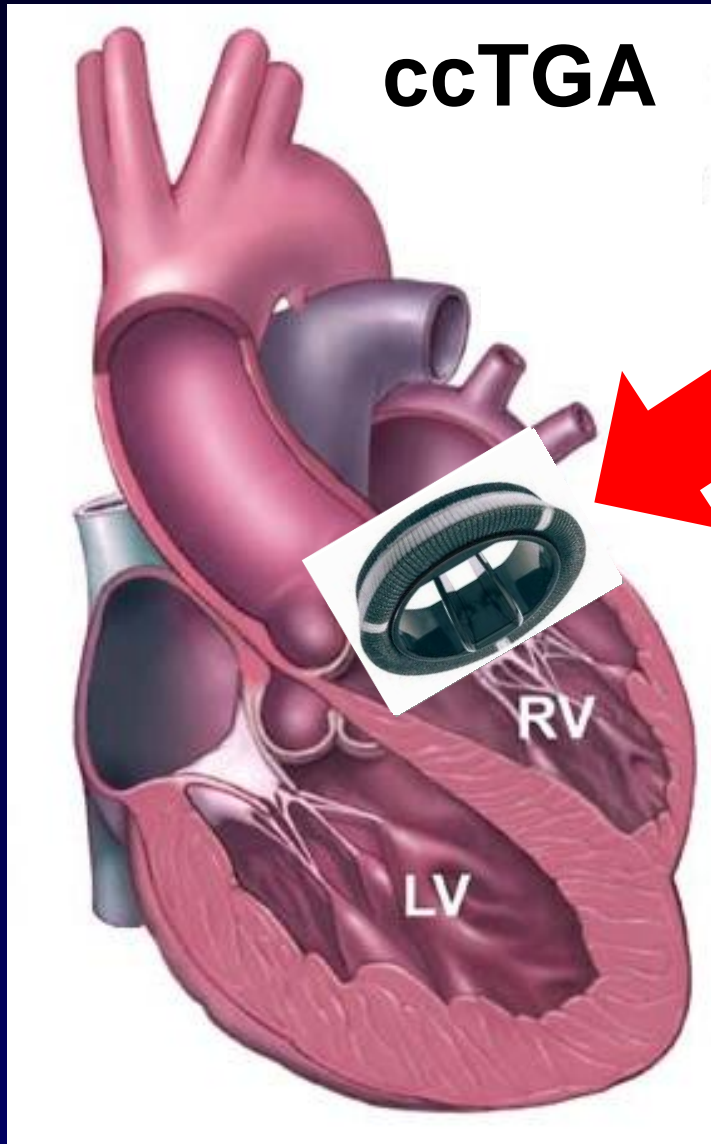
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Case: 25 year old



Case: 25 year old



ccTGA

Age 9: Mechanical tricuspid
valve replacement

Postop AV-block
→ Pacemaker

Case: 25 year old



Age 25: Planned pregnancy

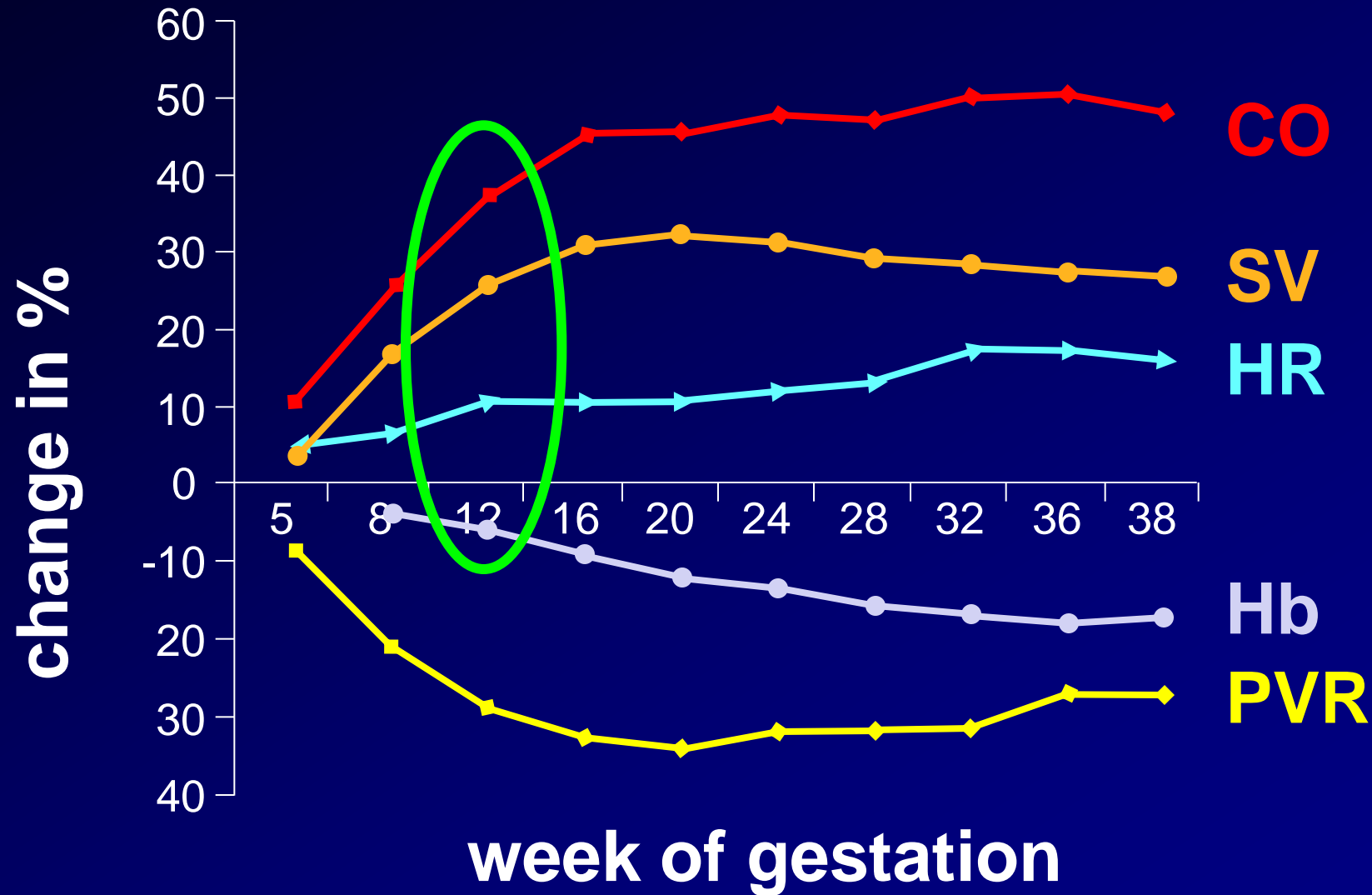
- Warfarin → LMWH
Dalteparin fixed dose
200U/kg = 10,000 U s.c. OD

12 weeks gestation:

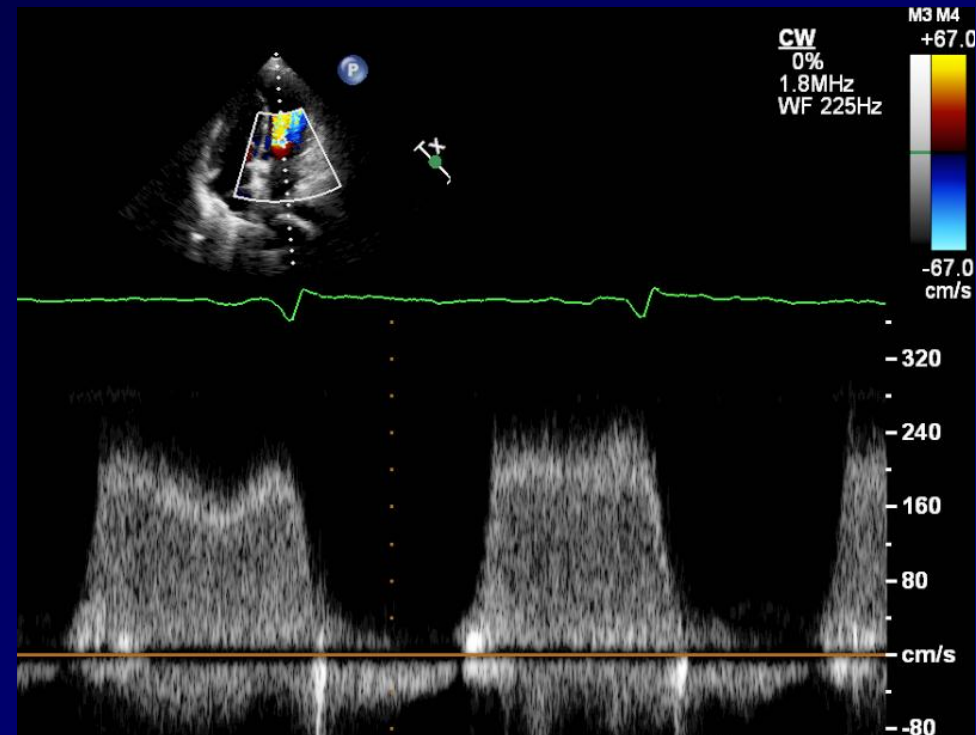
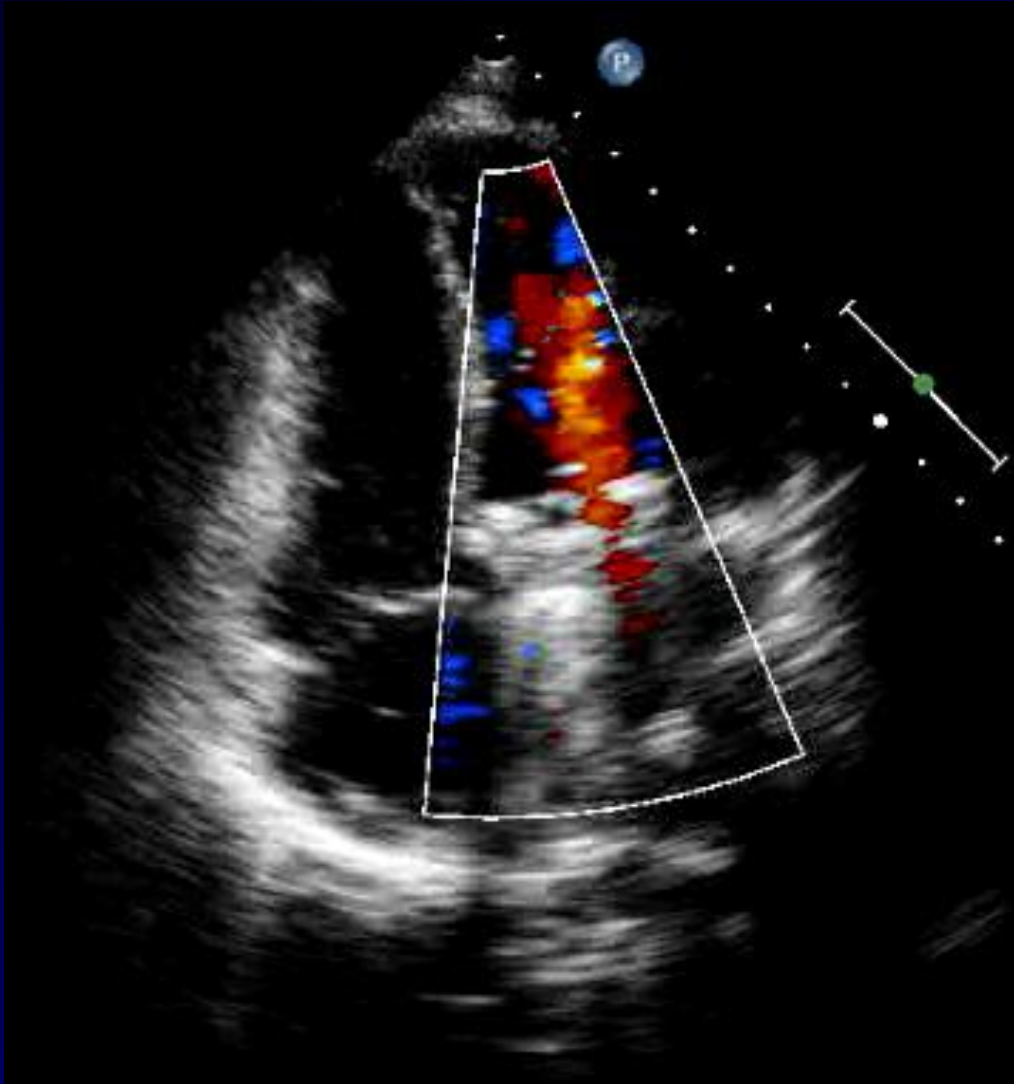
Mean Δp across valve:

10 → 16 mmHg

Hemodynamic changes

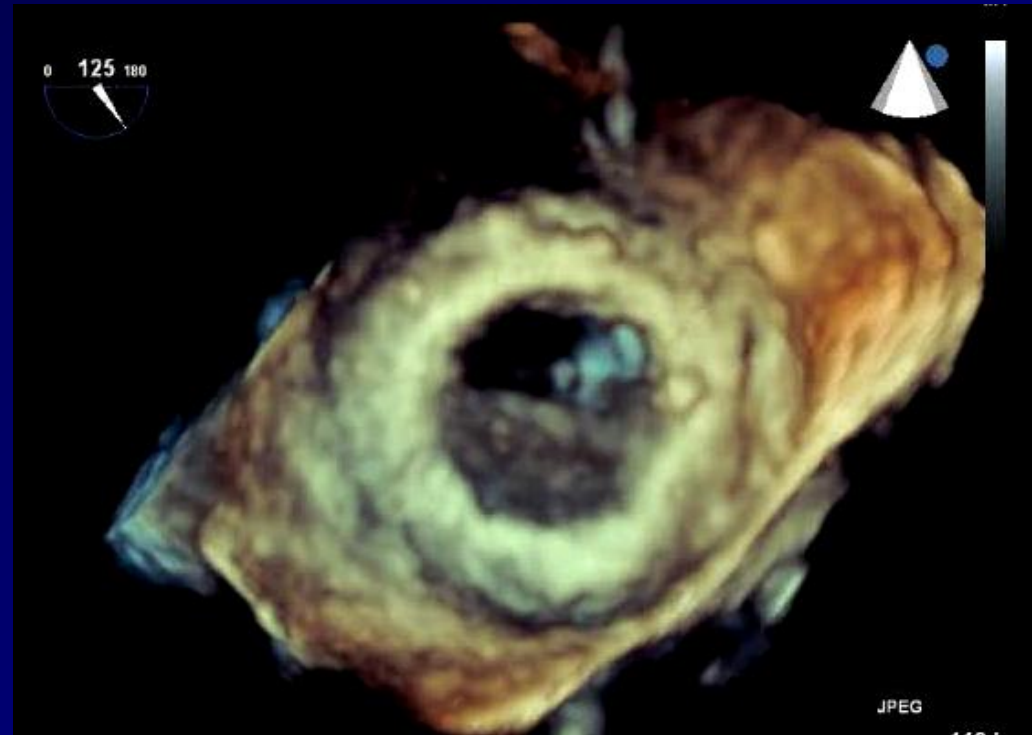
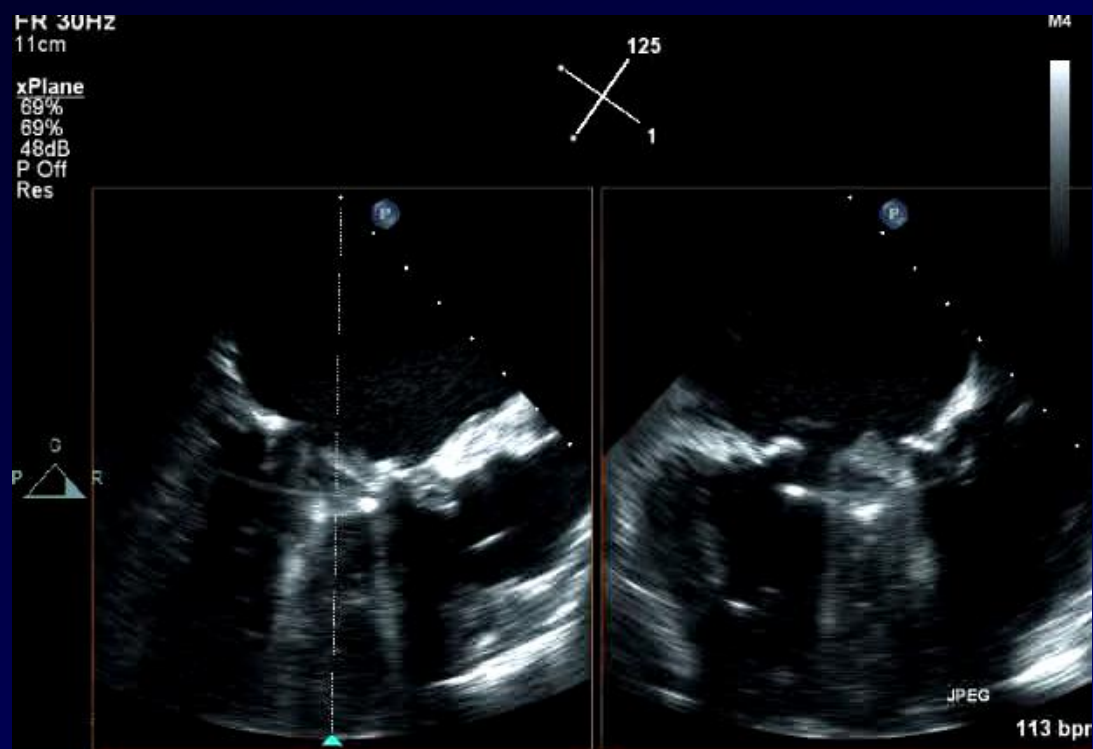


Case: 25 year old



Mean Δp : 15 mmHg

Case: 25-year old



What went wrong

- Risk stratification
- Counselling
- Pregnancy management
- Early detection of complications 

Objectives

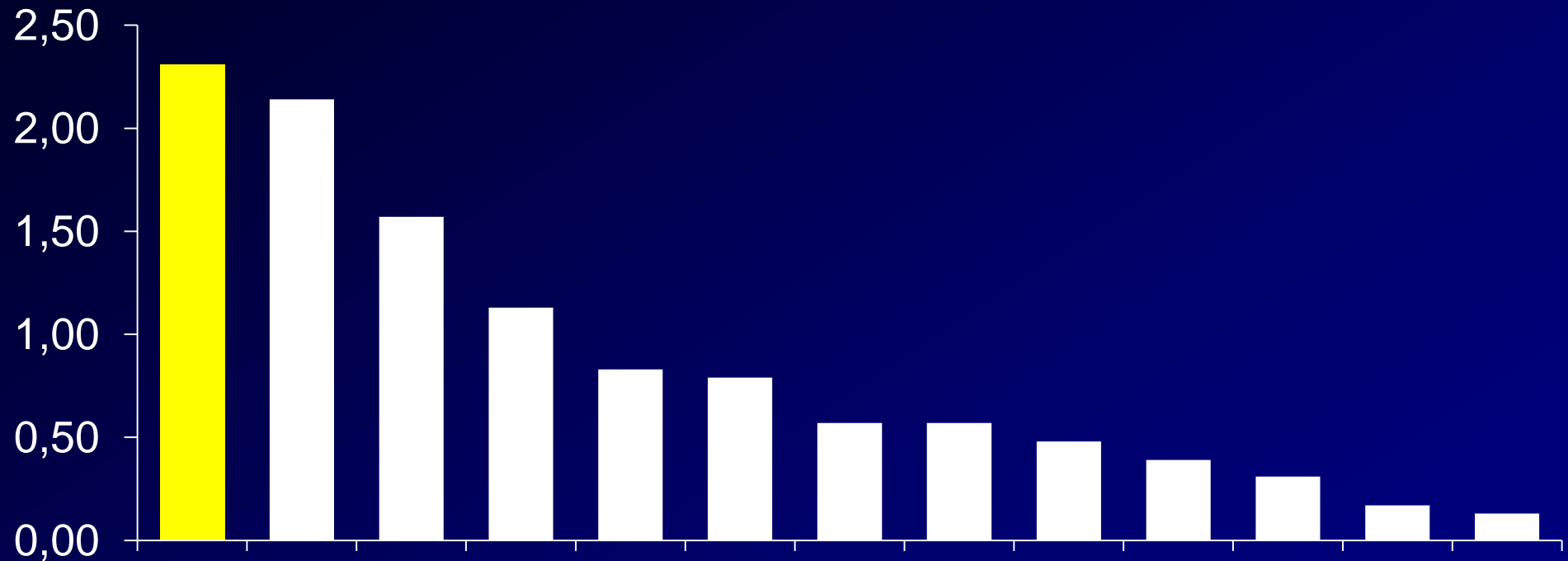
- Scope of the problem
- Risk stratification
- Counselling
- Management & Care

Objectives

- Scope of the problem
- Risk stratification
- Counselling
- Management & Care

Deaths / 100,000 maternities

2006-2008



Cardiac disease

Other Indirect cause

Indirect neurological conditions

Sepsis

Pre-eclampsia & eclampsia

Thromboembolism

Amniotic fluid embolism

Psychiatric causes

Early pregnancy deaths

Haemorrhage

Anaesthesia

Other direct

Indirect malignancies

Volume 118, Supplement 1, March 2011

BJOG

An International Journal of
Obstetrics and Gynaecology

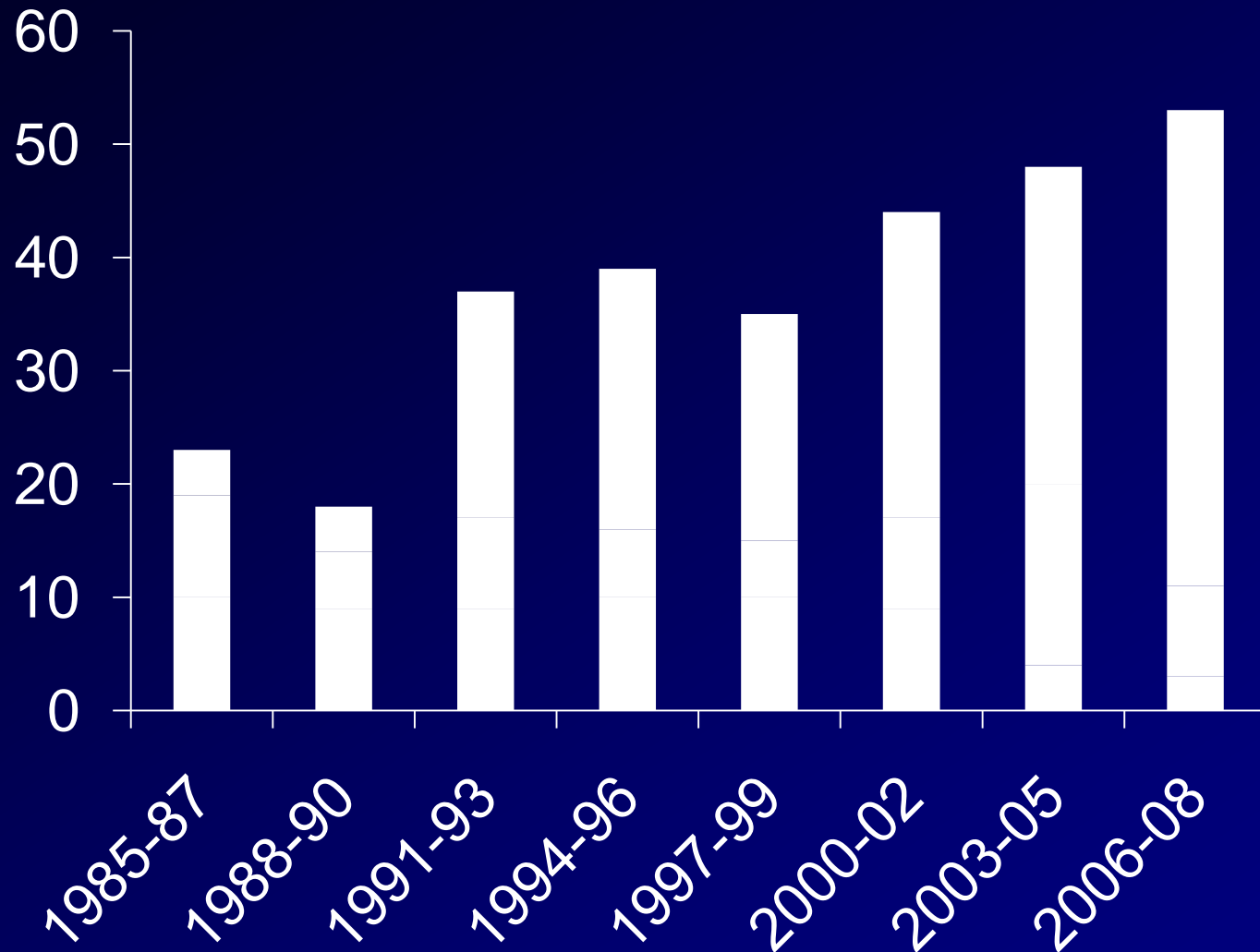
Saving Mothers' Lives

Reviewing maternal deaths to make
motherhood safer: 2006-2008



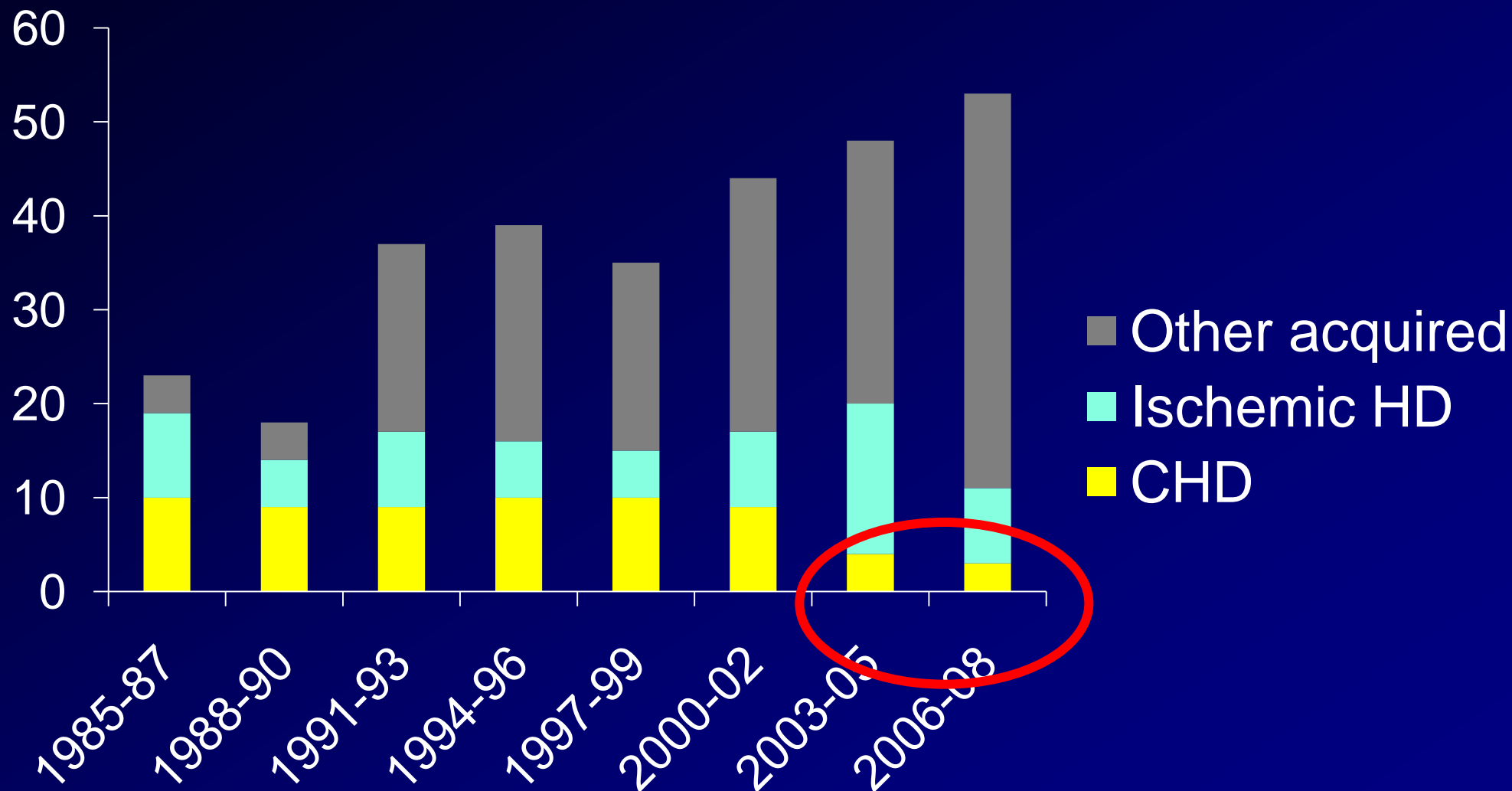
Cardiac deaths

1985 - 2008

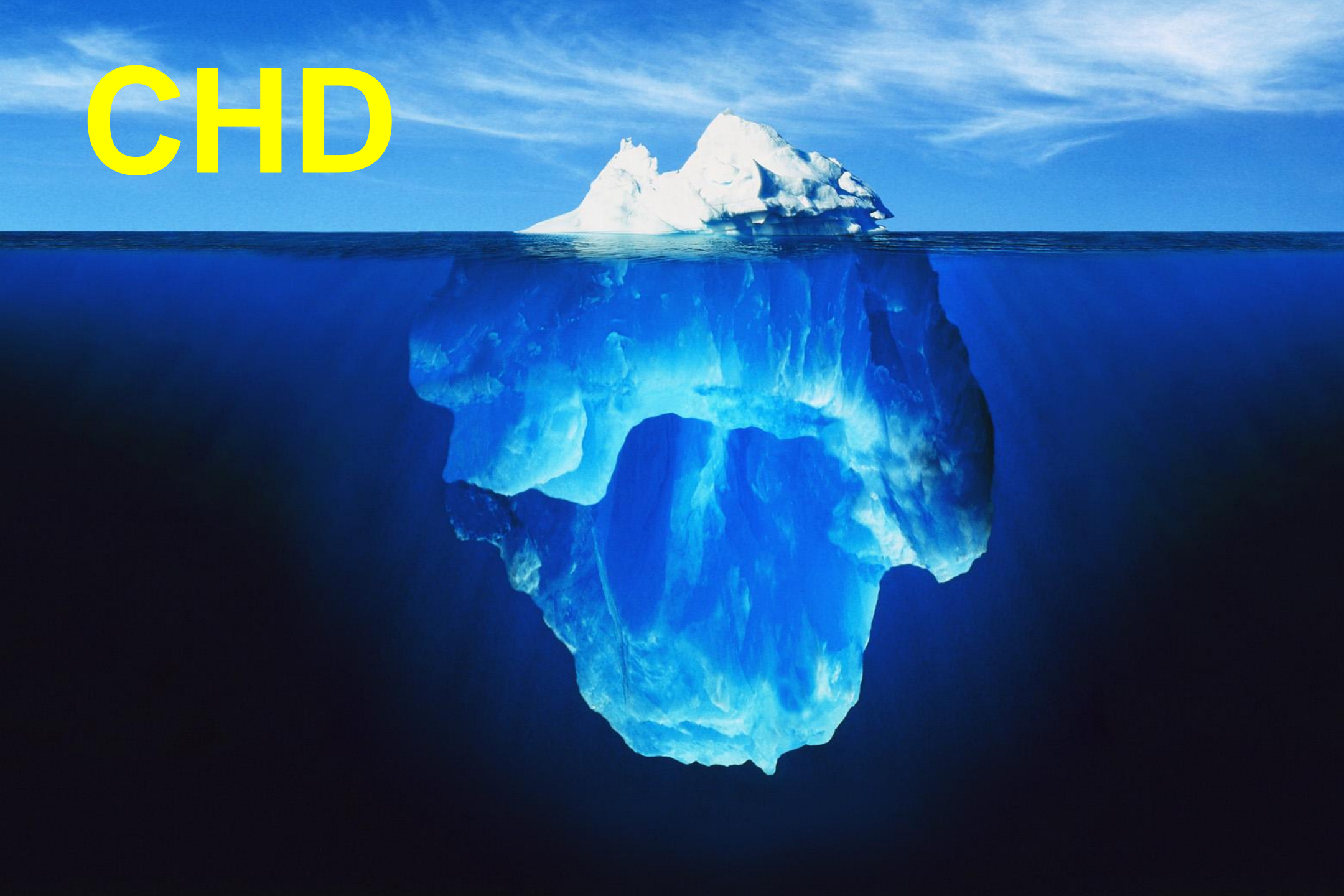


Cardiac deaths

1985 - 2008

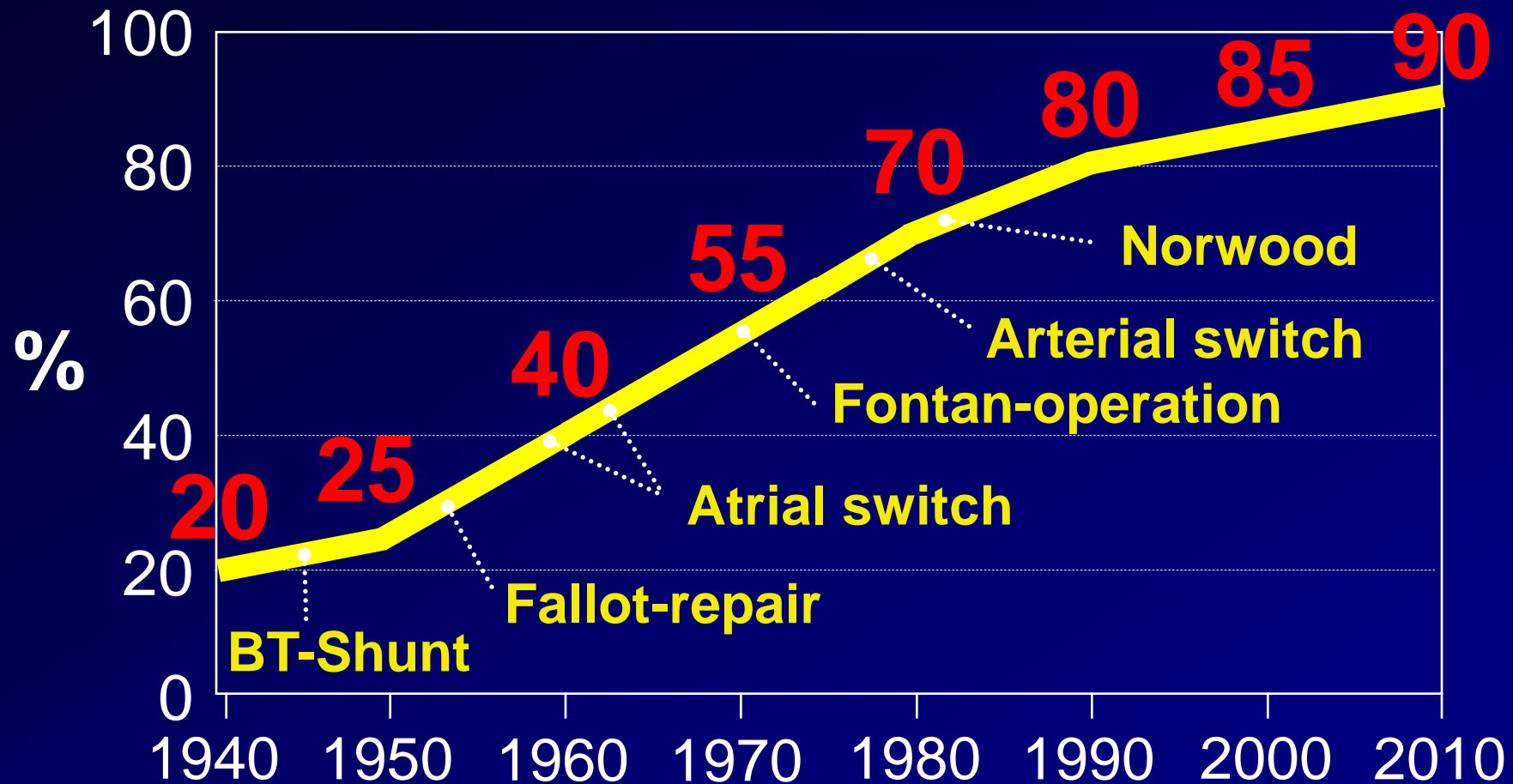


CHD

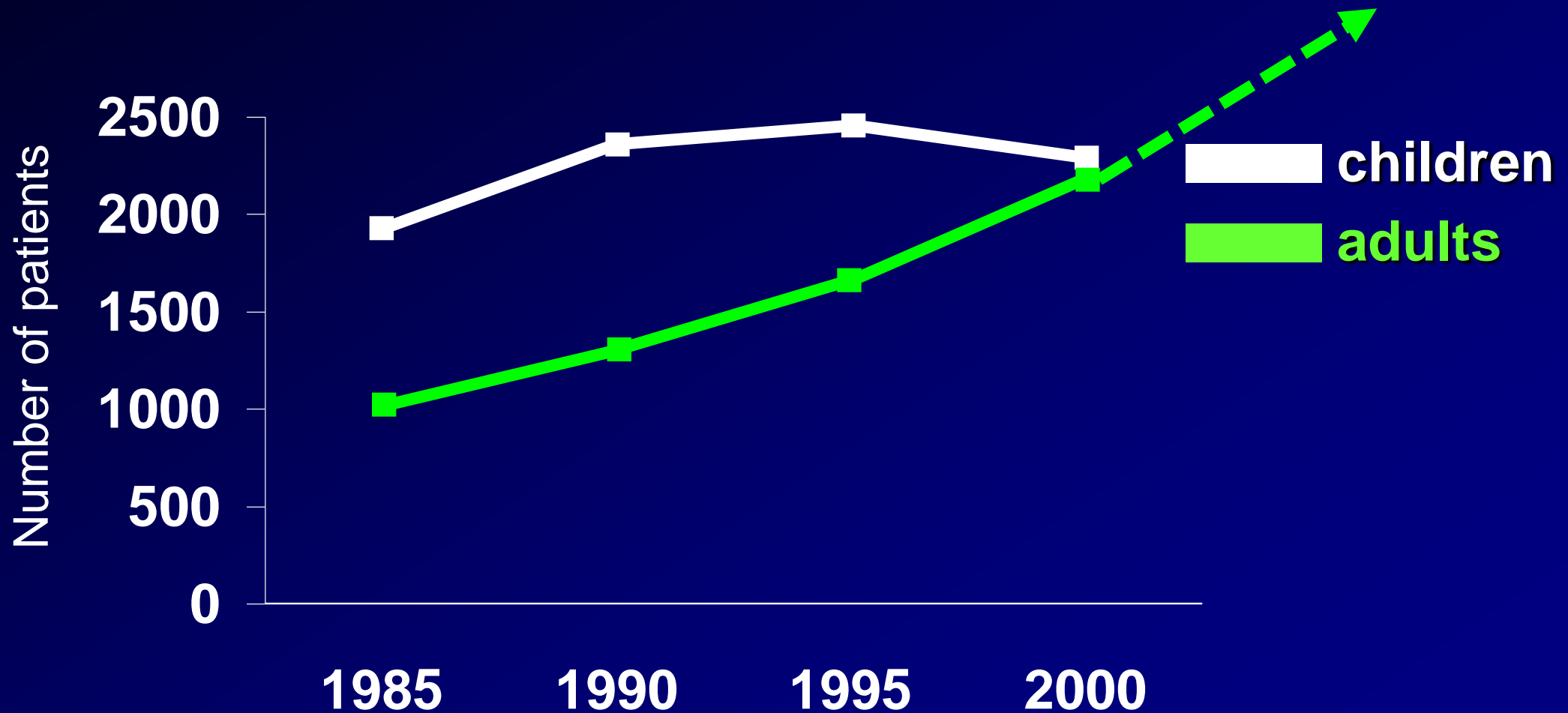


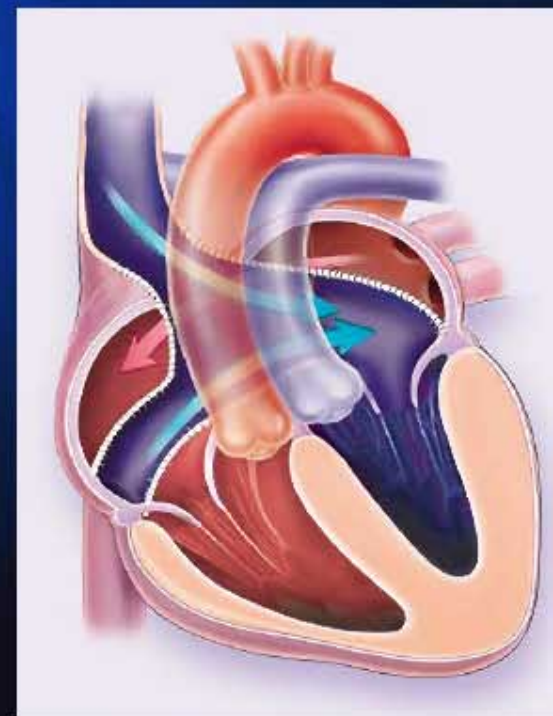
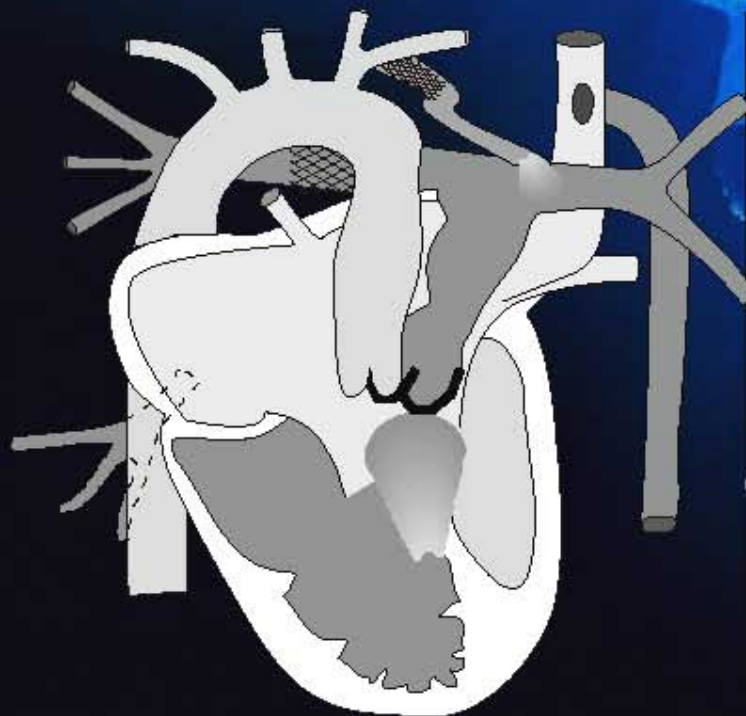
Improved Survival

- complex congenital heart disease -



Complex CHD



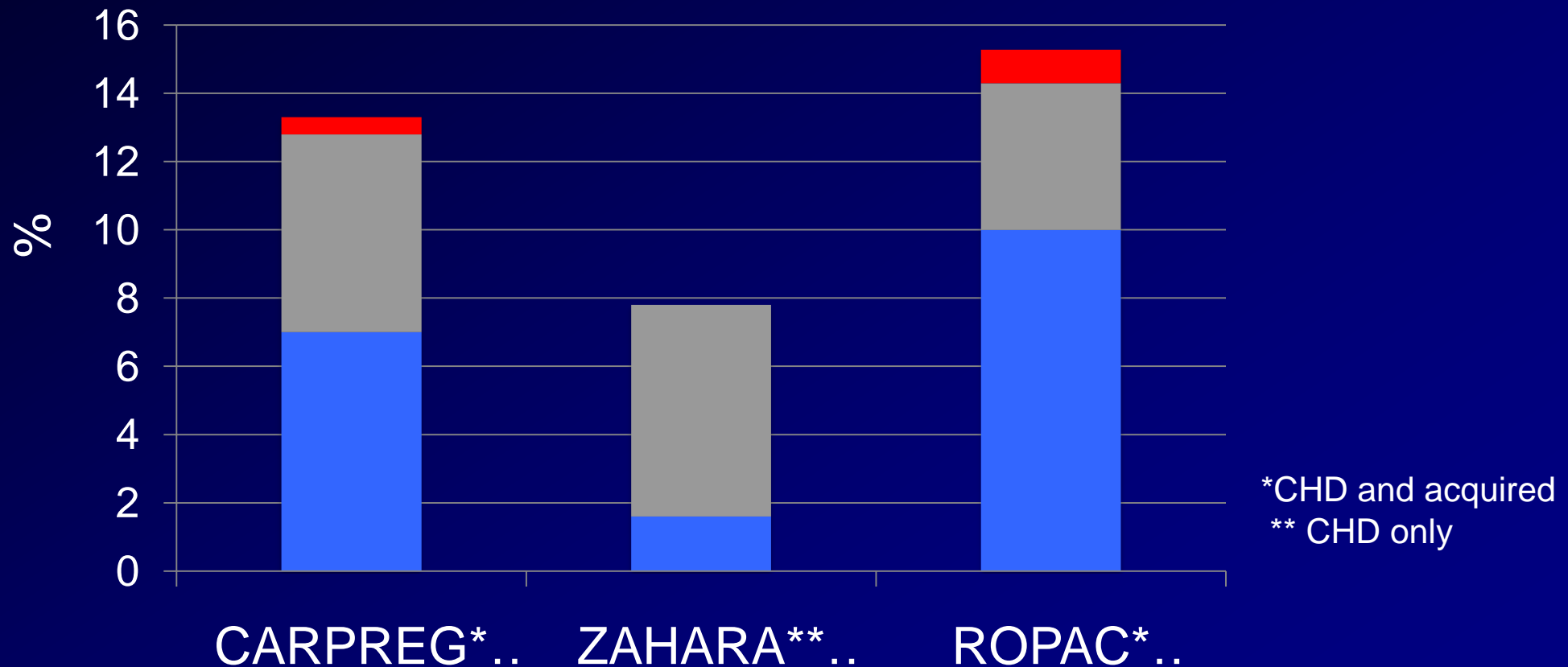


Objectives

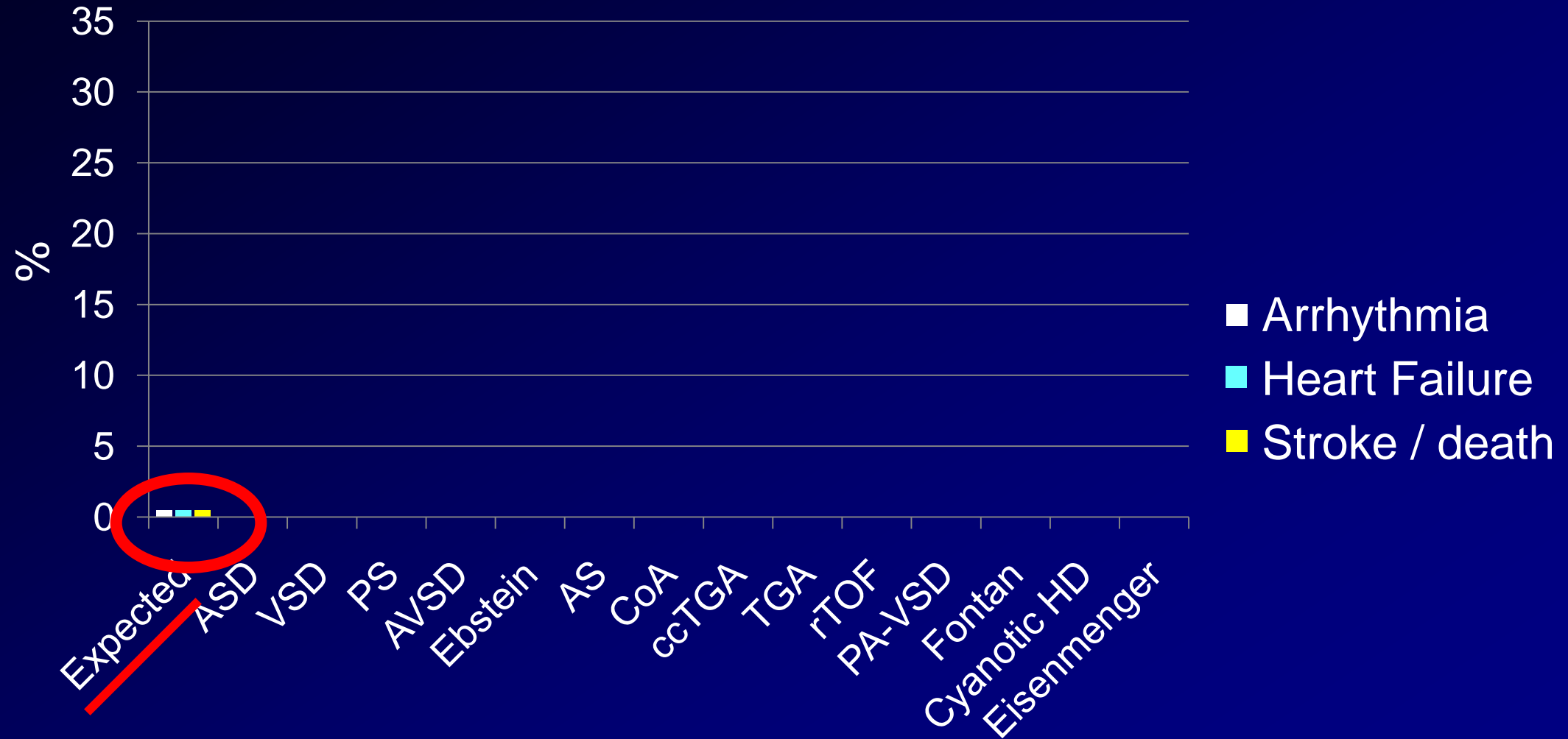
- Scope of the problem
- Risk stratification
- Counselling
- Management & Care

Risk stratification - global

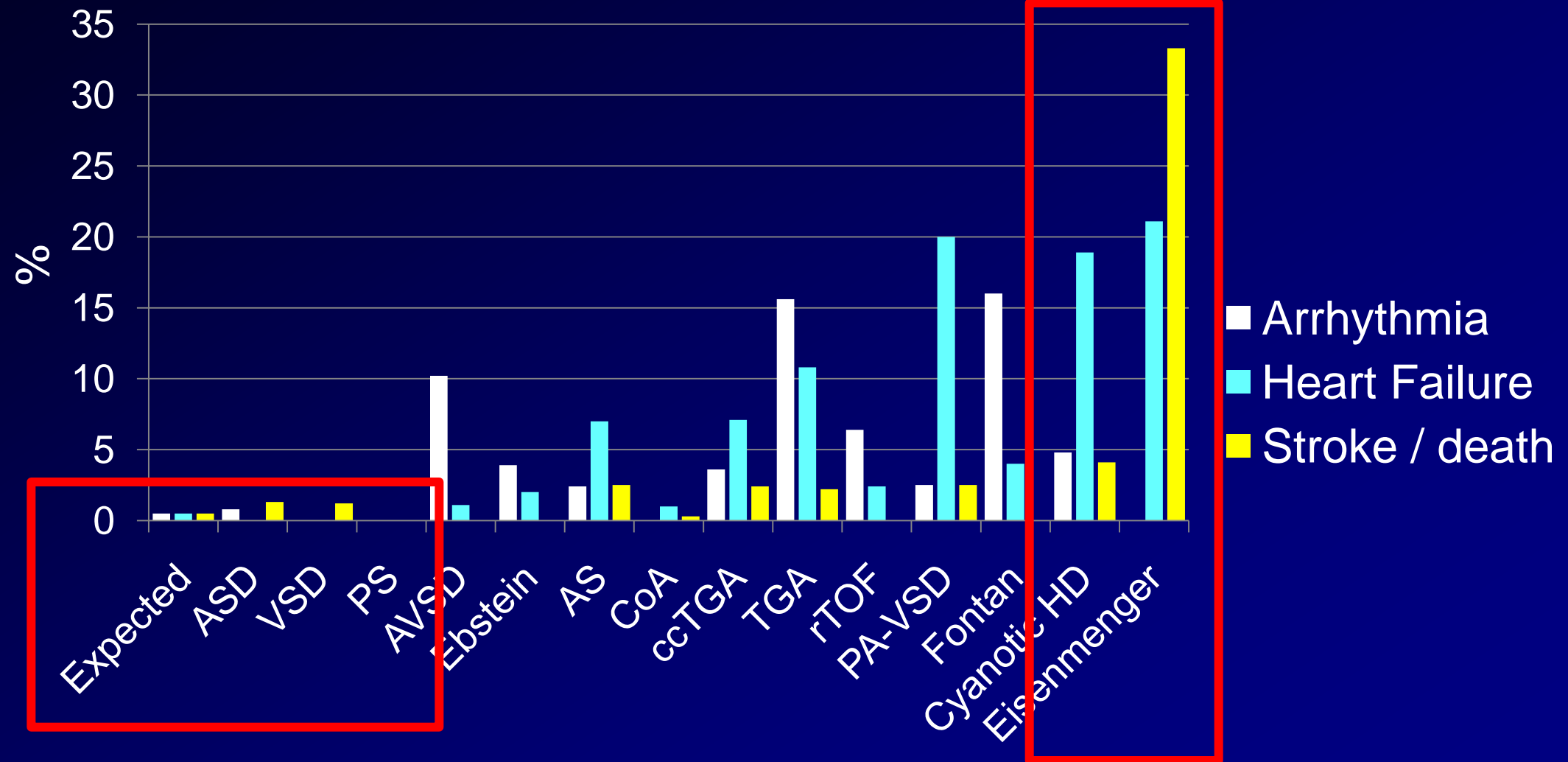
- Heart failure
- Other non-fatal cardiovascular complications
- Death



Risks – lesion specific



Risks – lesion specific



Risk stratification

Modified WHO classification

WHO I

WHO II

WHO III

WHO IV

No Risk

Small Risk

Signifcant Risk

Contraindicat.

Risk stratification

Modified WHO classification

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No Risk

Small Risk

Signifcant Risk

Contraindicat.

-
- Mild PS
 - Small VSD
 - ...

Risk stratification

Modified WHO classification

WHO I

No Risk

- Mild PS
- Small VSD
- ...

WHO II

Small Risk

WHO III

Signifcant Risk

WHO IV



- Severe AS, MS
- PHT
- Marfan – root > 45
- LVEF < 30
- NYHA III or IV
- S/p PpCMP & LVEF < 55%

Risk stratification

Modified WHO classification

WHO I

No Risk

- Mild PS
- Small VSD
- ...

WHO II

Small Risk

- ASD
- Mild LVEF↓
- ...

WHO III

Signifcant Risk

- Mechanical valve
- Fontan
- Systemic RV
- ...

WHO IV



- Severe AS, MS
- PHT
- Marfan – root > 45
- LVEF < 30
- NYHA III or IV
- S/p PpCMP & LVEF < 55%

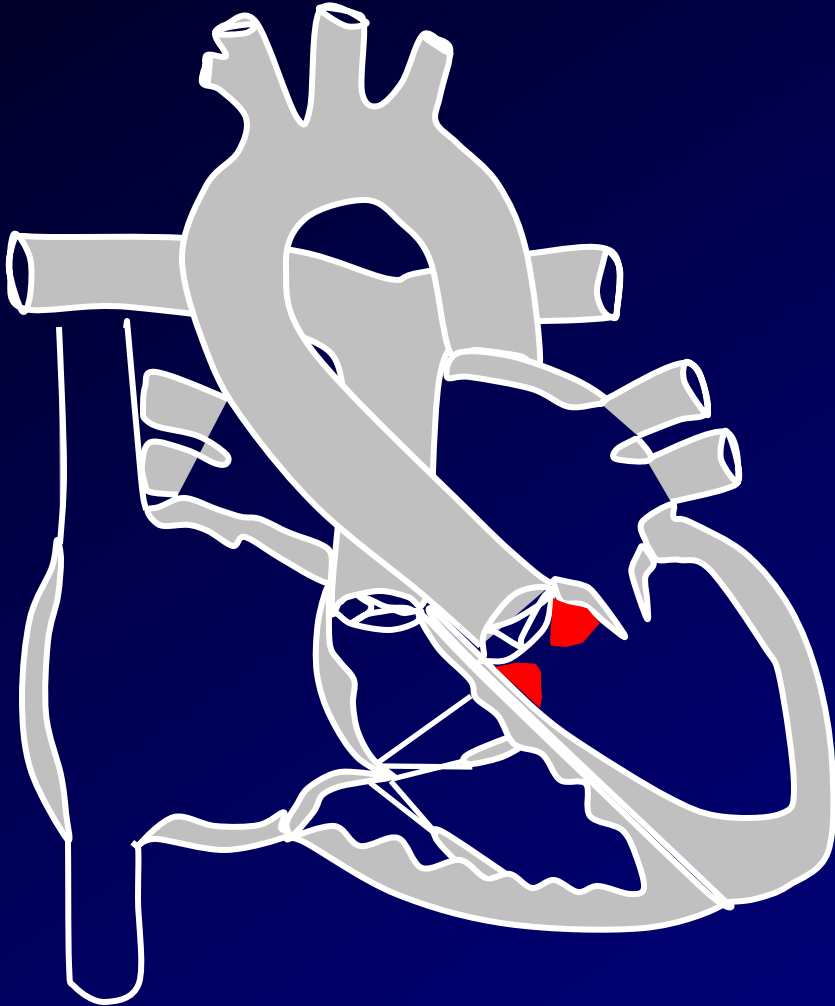
Individual risk
stratification!

Individual risk stratification



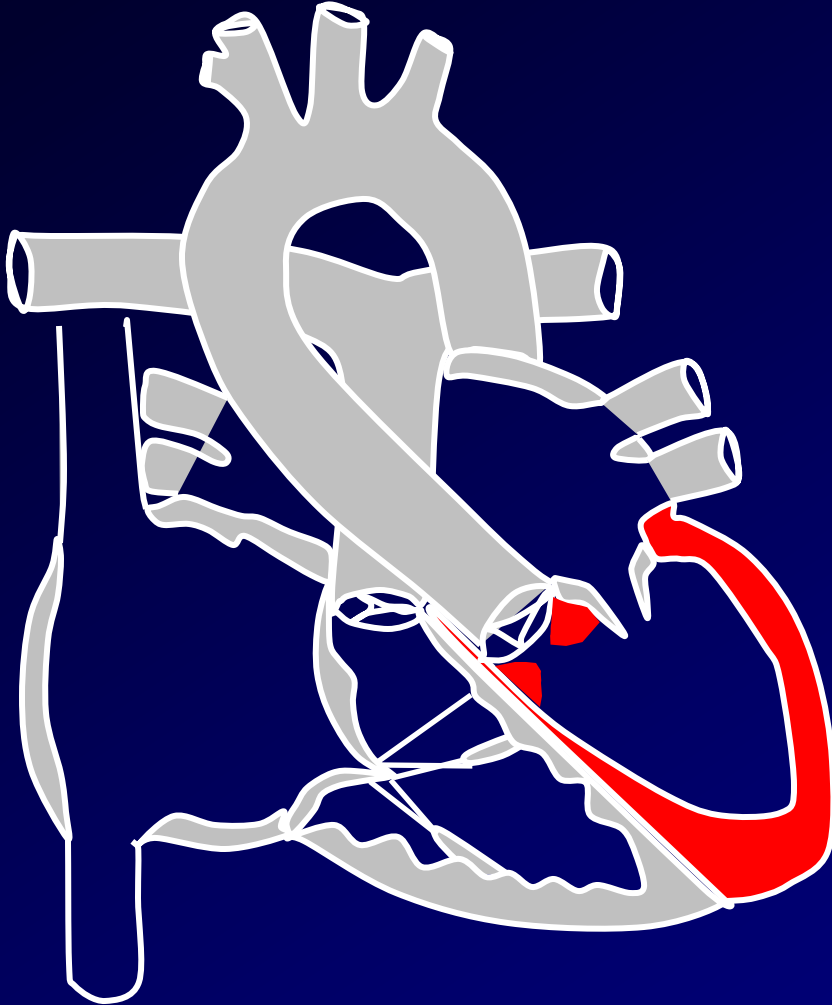
- Pre-Pregnancy!

Individual risk stratification



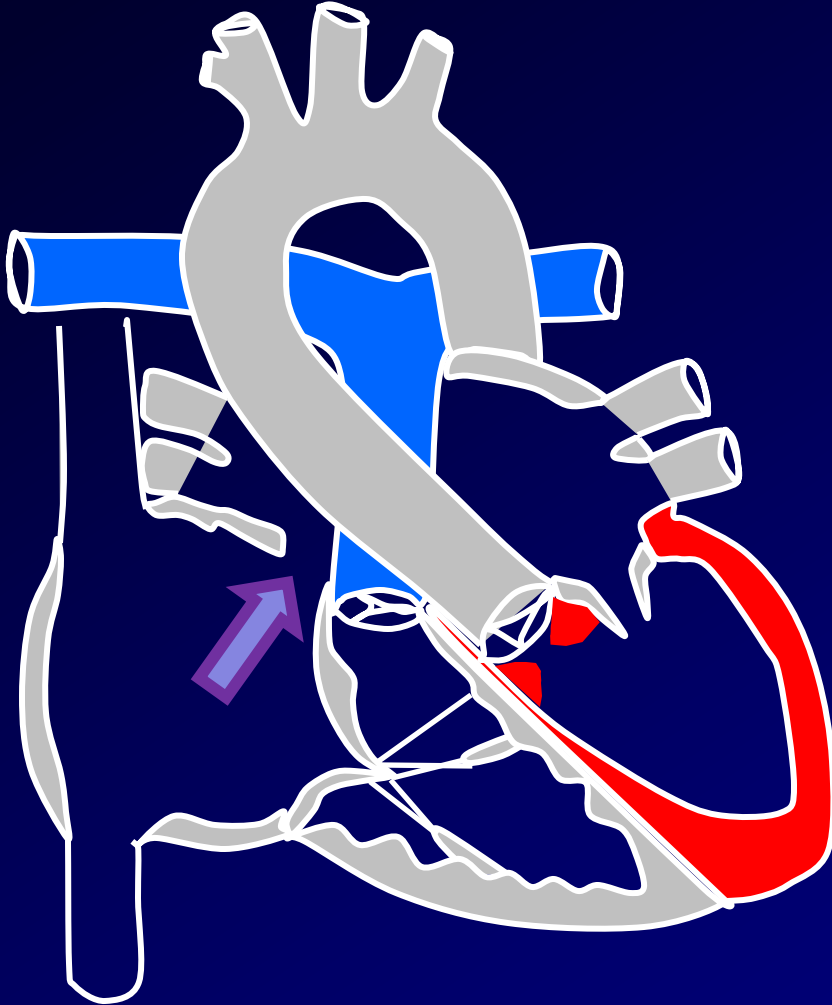
- Type of CHD
 - Severity
 - Associated lesions

Individual risk stratification



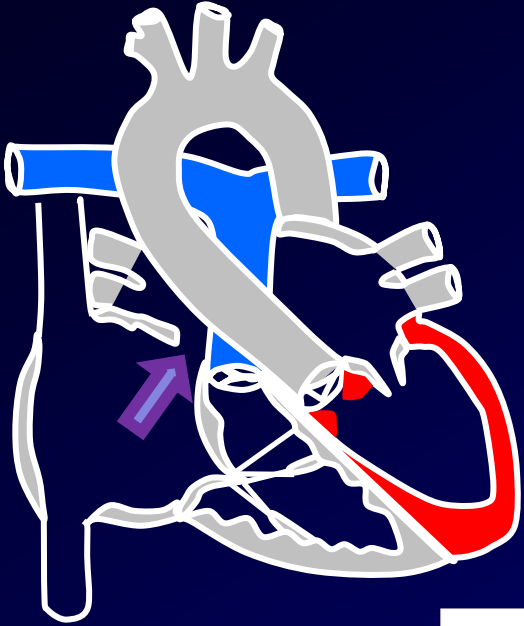
- Type of CHD
 - Severity
 - Associated lesions
- Cardiac function

Individual risk stratification



- Type of CHD
 - Severity
 - Associated lesions
- Cardiac function
- Hemodynamics
 - i.e. pulmonary HTN
 - Residual shunts

Individual risk stratification



- Exercise capacity
- Comorbidities
- Previous complications
- Risk for twin pregnancy (IVF!)
- Risk for preeclampsia
- ...



Fetal risk: Risk factors

- NYHA class >II or cyanosis
- Left heart obstruction
- Smoking during pregnancy
- Multiple gestation
- Oral anticoagulants
- Mechanical valve prosthesis

Siu, Circ 2001

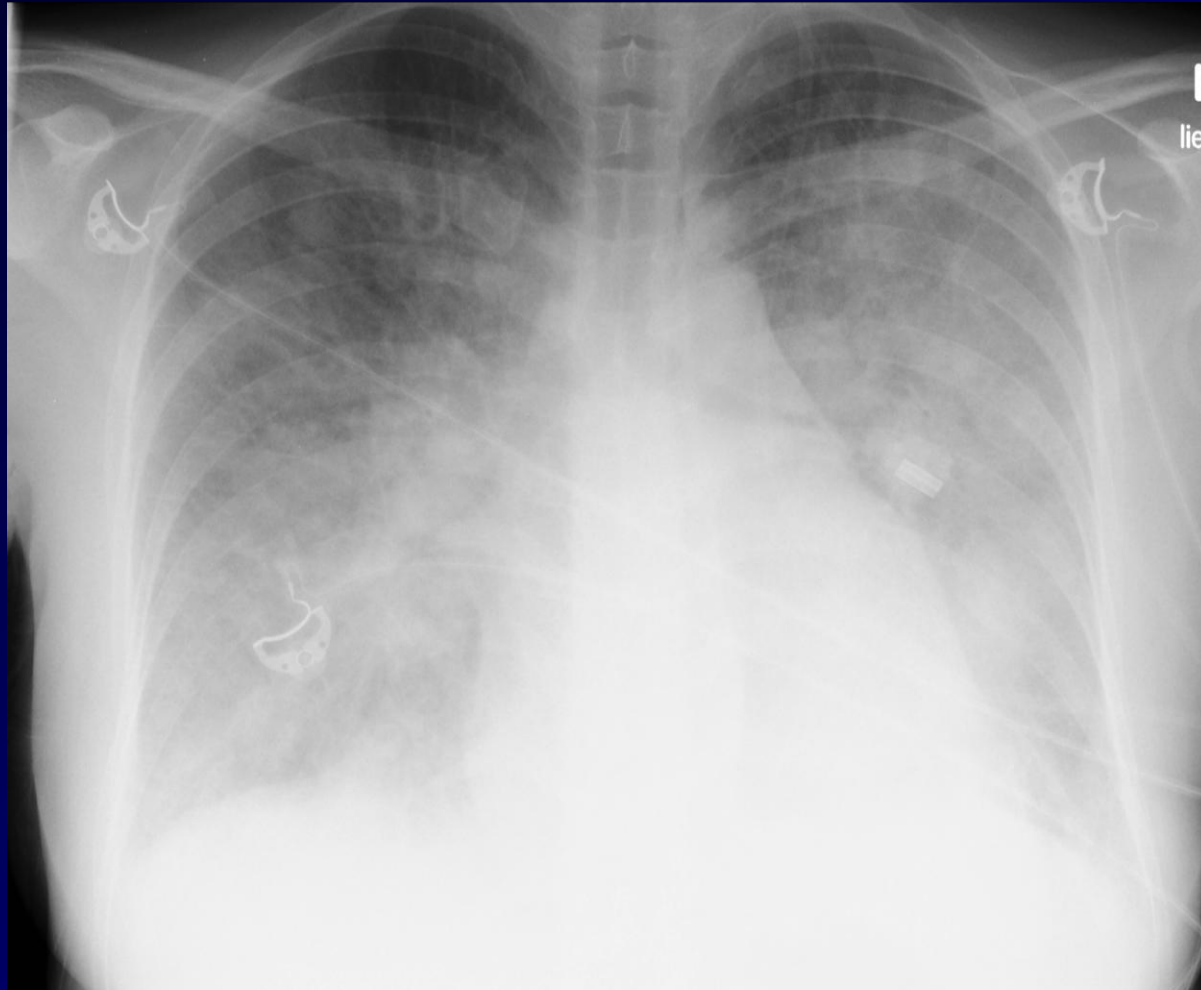
Khairy, Circ 2006

Drenthen, EHJ 2010

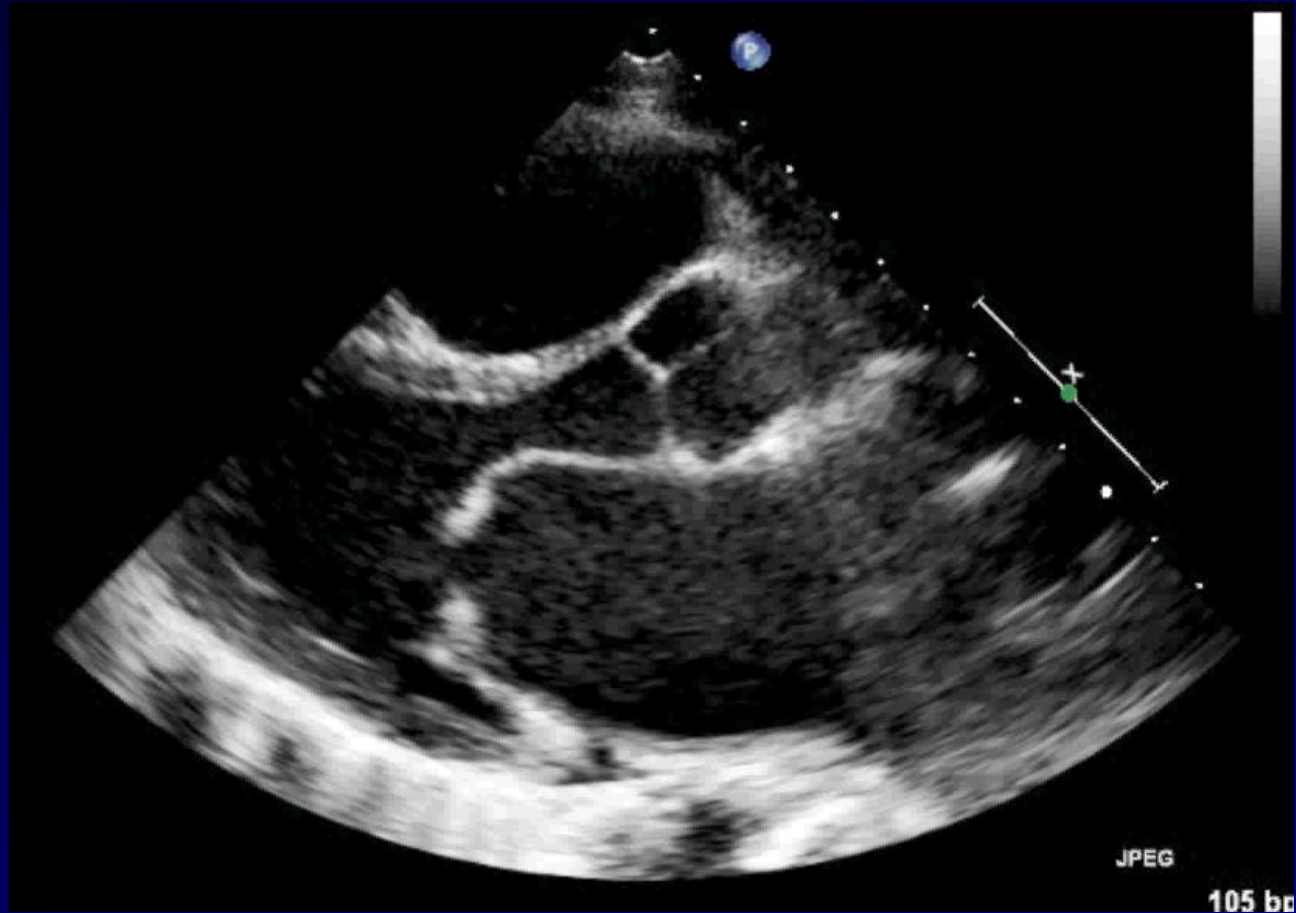
Fetal risk: Medication

- ACE-inhibitors, ARB
- Statins
- ...

Case: 34 years



Case: 34 years



Most dangerous – unknown HD!

Objectives

- Scope of the problem
- Risk stratification
- Counselling
- Management & Care

Counselling

		Contraindication to pregnancy	
		No	Yes
Patient being told to avoid pregnancy	No		
	Yes		

Counselling

		Contraindication to pregnancy	
		No	Yes
Patient being told to avoid pregnancy	No	69%	
	Yes		8%

Counselling

		Contraindication to pregnancy	
		No	Yes
Patient being told to avoid pregnancy	No	69%	8%
	Yes	16%	8%

Counselling

- Maternal risks
 - During pregnancy
 - Long-term
- Fetal risks
 - Recurrence
 - Preterm delivery

Type of complications

- Managable
- Avoidable
- Fatal / irreversible

Objectives

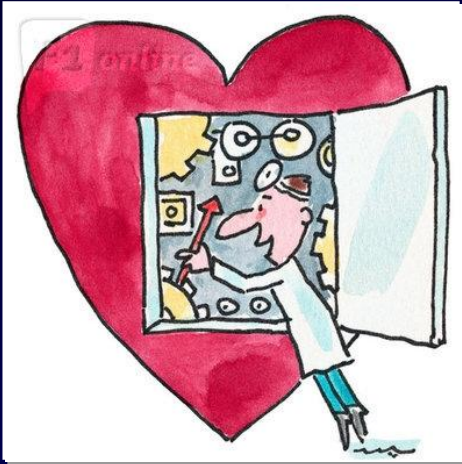
- Scope of the problem
- Risk stratification
- Counselling
- Management & Care

Management & Care: Team!

Obstetrician



Cardiologist



Anesthetist

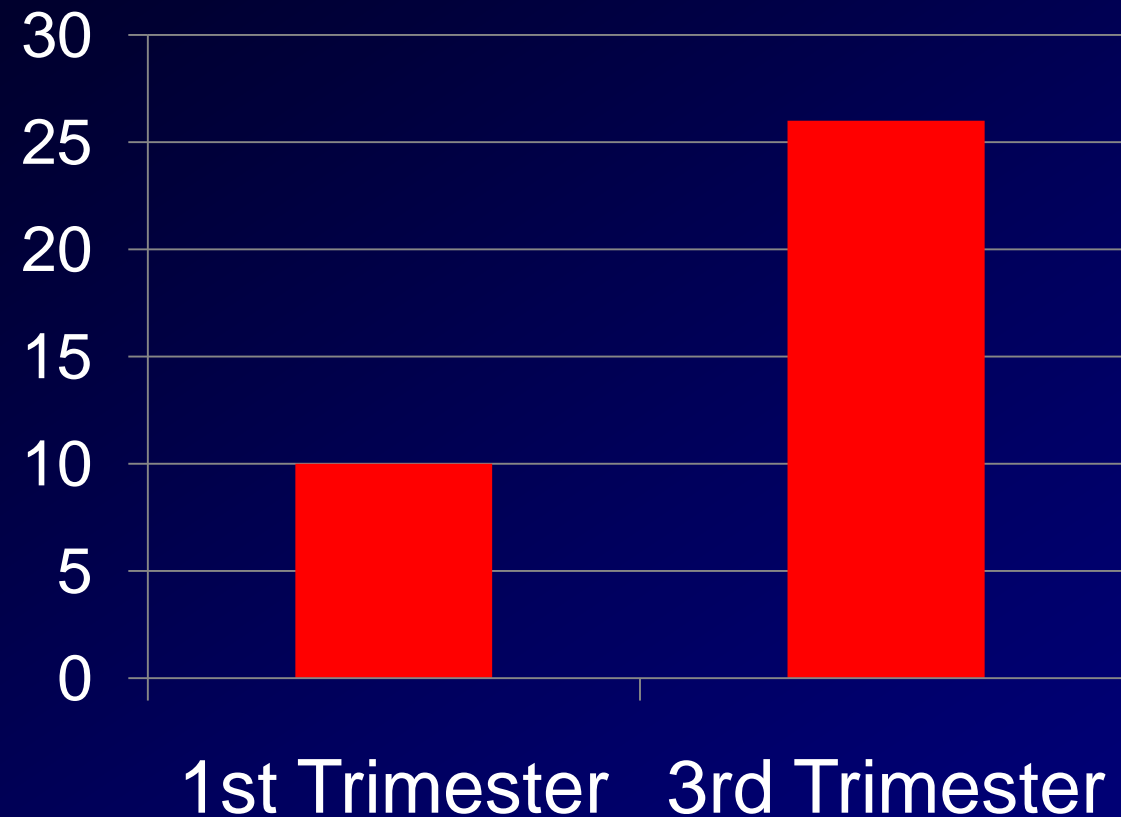


**Pregnant
woman**

Hematologist, ICU-specialists, ...

Management & Care: Serial BNP

BNP > 100 pg/ml (%)



Controls:

→ 0% BNP > 100

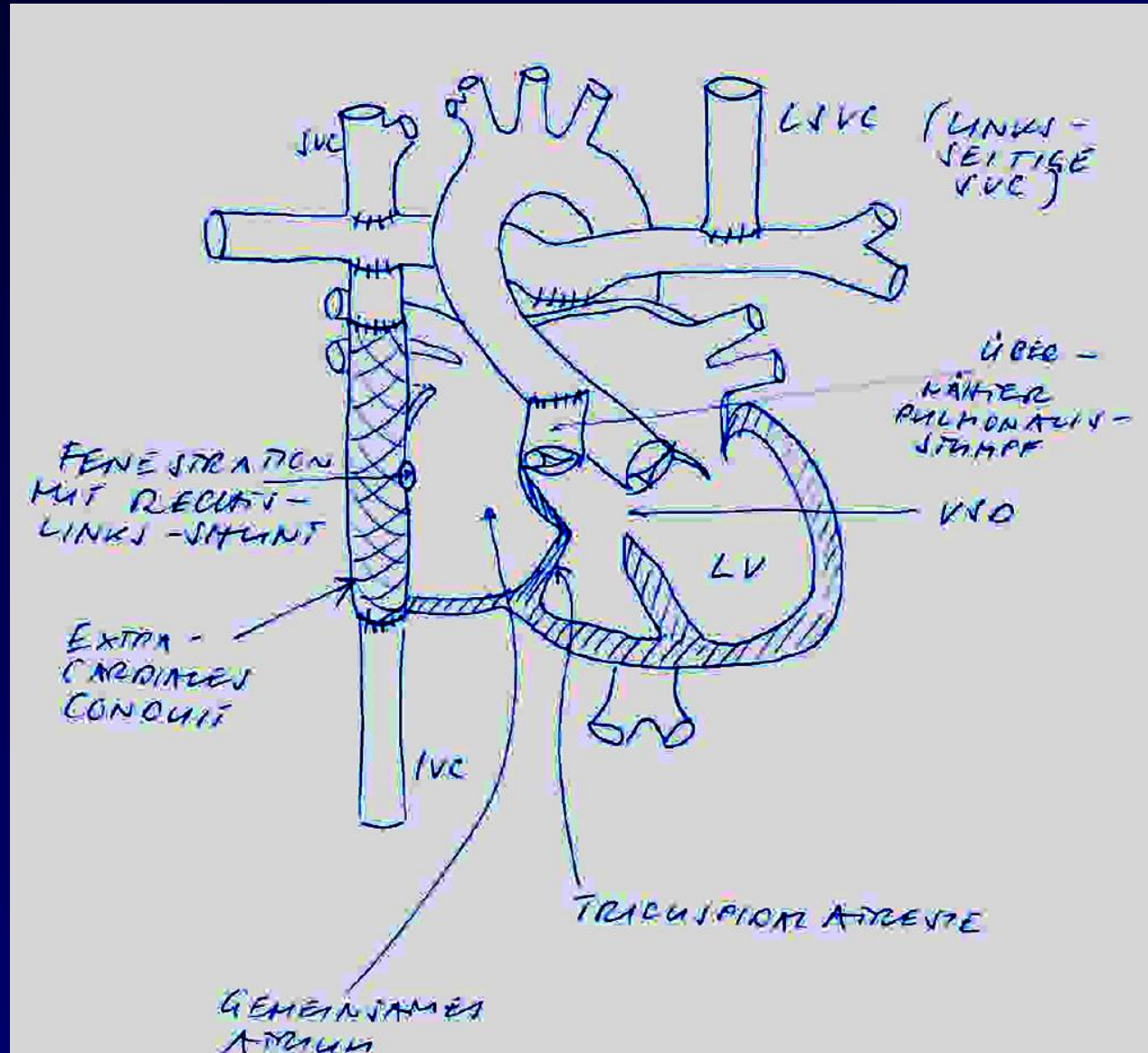
BNP < 100:

→ 100% neg. predictive
for cardiovascular
complications

Management & Care

- **Patient education!**
- **Management plan**
 - Available!
 - Clear & detailed enough!
 - Drugs that need to be available

Complex anatomy: Drawing!



Ressources



European Heart Journal
doi:10.1093/eurheartj/ehr218

ESC GUIDELINES

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)

www.heartdiseaseandpregnancy.com

HEART DISEASE
& PREGNANCY



Physician Information

Physician Information

Patient Information

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Select a topic of interest

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Cardiac Tests

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Cardiovascular Changes

Coarctation of the Aorta

Contraception

The following sections, for physicians and other health professionals, provide information pertaining to risk assessment and management strategies for cardiovascular disease. An international panel of physicians including obstetricians and other medical specialists contributed to the website. The website also contains educational material on heart conditions commonly seen in young women.

Heart Disease and Pregnancy

Edited by
Philip J Steer, Michael A Gatzoulis and
Philip Baker



RCOG Press

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Thank you



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