SURGERY FOR CONGENITAL HEART DISEASE

BASEM AGLAN.MD

OBJECTIVES:

- Introduction
- Attitude
- Q: why there is no guidelines for CHD surgery.
- How to understand CHD
- Classification of CHD
- Decision making in CHD
- Timing for intervention by case

INTRODUCTION

- OUR OBJECTIVE IS TO PROVIDE THE BEST AVAILABLE HEALTHCARE
- THE KNIFE OF THE SURGEON IS NOT A REMEDY FOR EVERY FAILED MEDICAL TREATMENT.
- THE DIFFERENCE BETWEEN HIGH-RISK OPERATIONS AND INOPERABILITY.
- UNDERSTANDING HEALTHCARE ENVIRONMENT IS MANDATORY FOR SCIENTIFIC DECISION-MAKING.

Attitude
(esp. attitude in subspecialties)

- Vision (Target) and mission (Through) must be optimistic not realistic nor pessimistic.
- Learning objectives:
  - Knowledge
  - Skills
  - Attitude (CME, cont. unconditioned giving,..)
- Your job and role:
  - ttt
  - Education
  - Research
- Do not underestimate yourself: might discover this after decades.
- You can choose not to treat in bad circumstances but your patients can't.

Q: why there is no guidelines for CHD surgery.

♡ Disease spectrum (each heart is a fingerprint).

♡ Child spectrum (Syndromes, CNS, Chest, immunity, anomalies,...)

♡ Centre Experience (the whole armamentarium)

eg: ● Adult vs Pediatric and Pediatric vs neonates

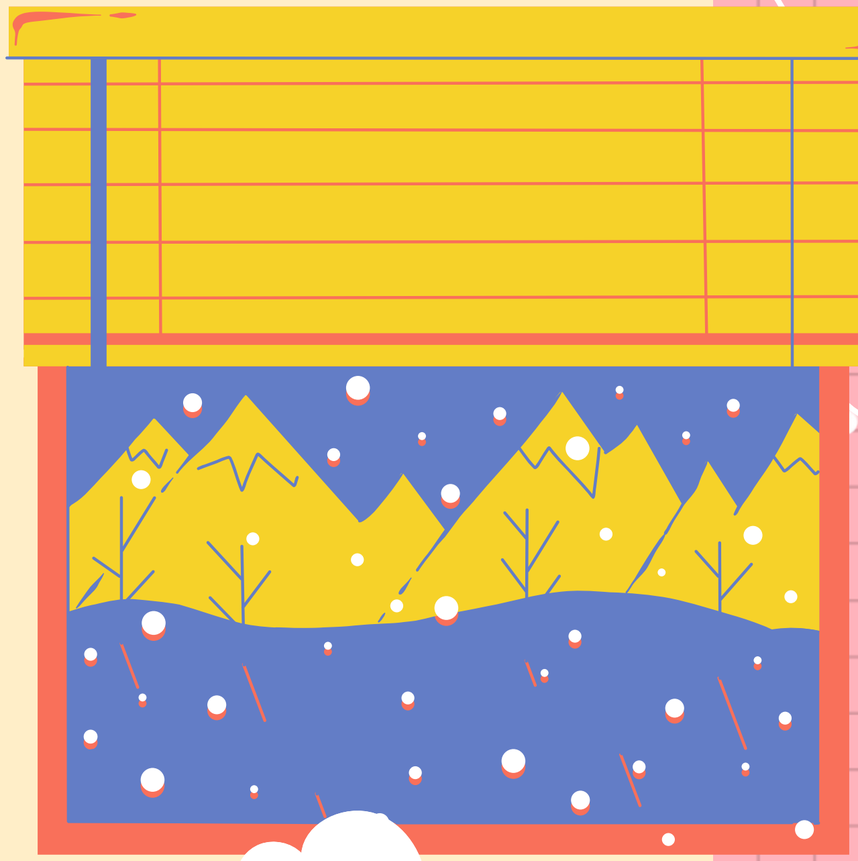
● A lot of gray zones ● The balance between early mortality and long-term durable repair

eg: 2kg baby with CVC induced RA mass

TOOLS TO UNDERSTAND CHD

السهل الممتنع

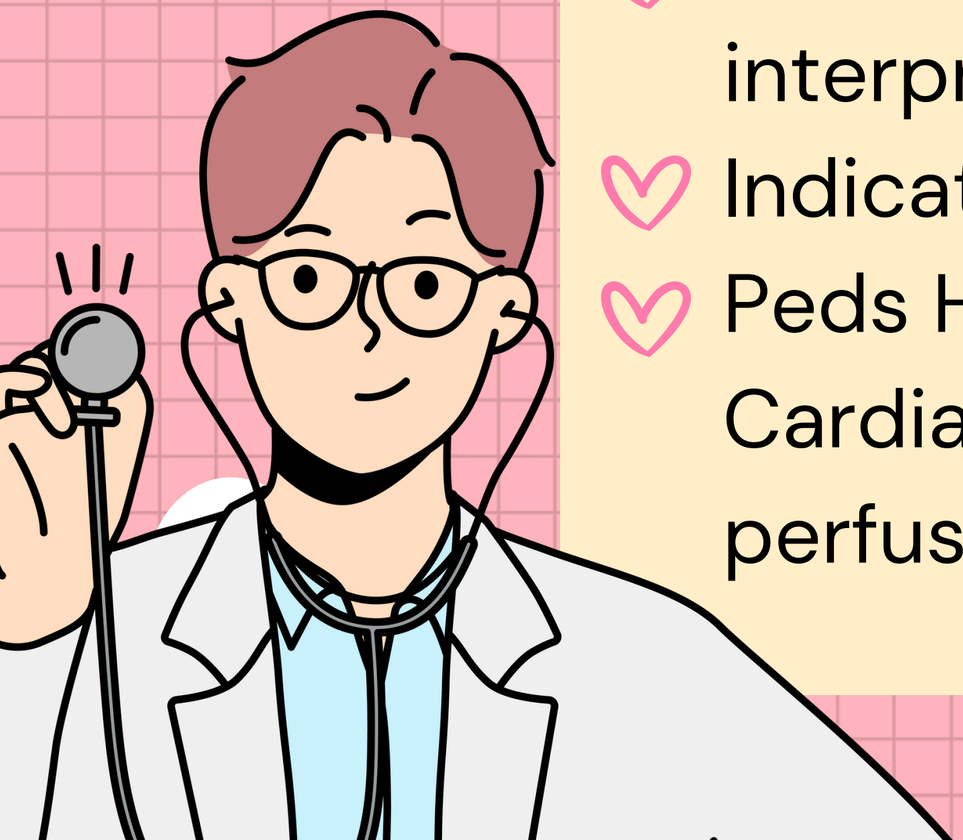
- Basic Knowledge of General pediatrics and pediatrics cardiology
- Embryology
- Anatomy
- Physiology
- Pathology
- Pharmacology
- Radiology



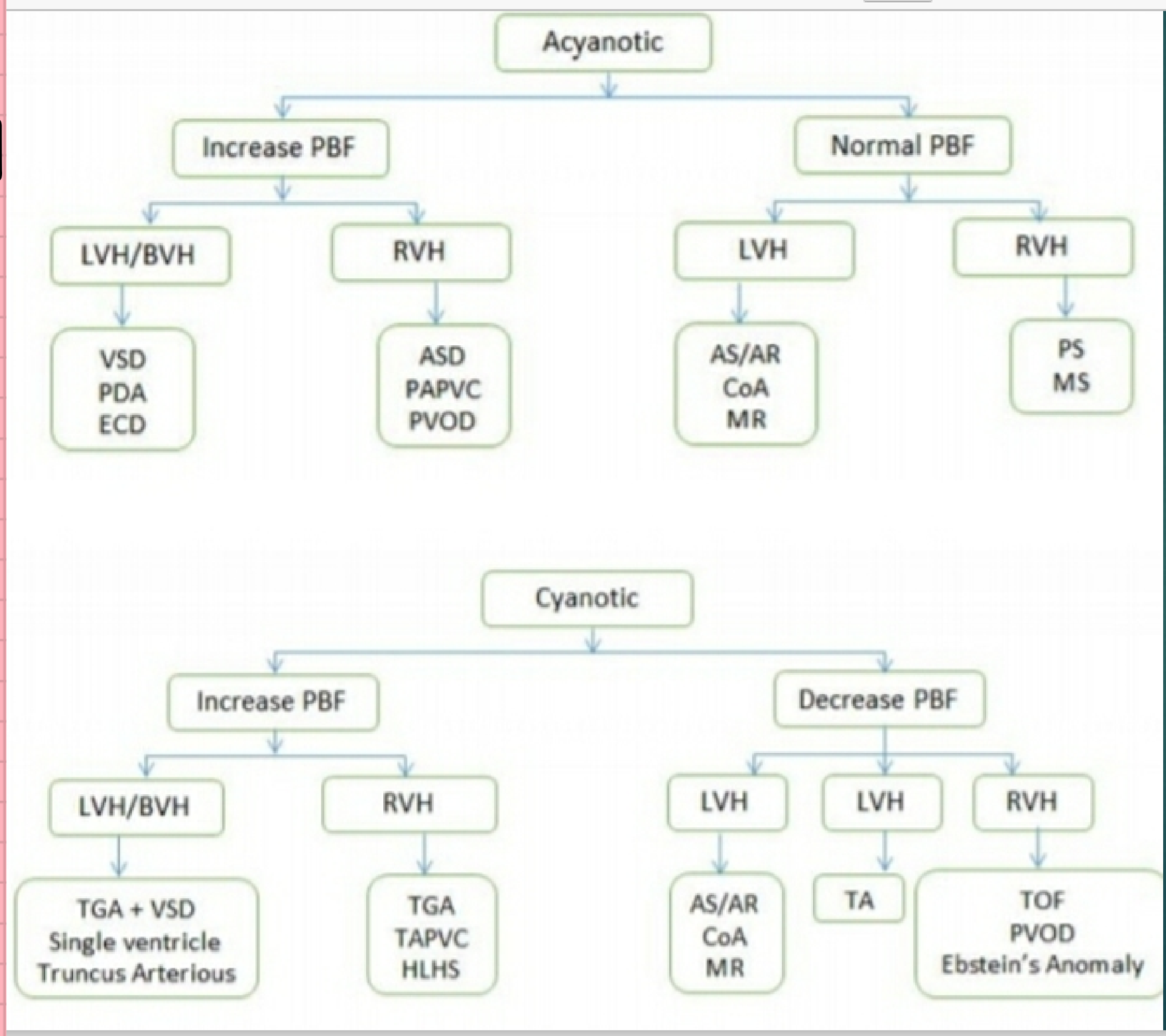
TOOLS TO MANAGE

العيان مش ورق

- Peds Cardiology sheet (history, examination and investigations)
- Echo, MSCT, MRI, Cath,.. (analysis and interpretation)
- Indication, timing and type of intervention
- Peds Heart team communication (Radiology, Cardiac surgeon, Peds cardiology, anesthesia, perfusionist, ICU staff)



CLASSIFICATION OF CHD



SEGMENTAL SYSTEM OF CLASSIFICATION OF CHD

Segmental system of Classification of CHD: Level 1

I. Great Veins II. Atria III. Atrioventricular junctions V. Ventriculoarterial junction

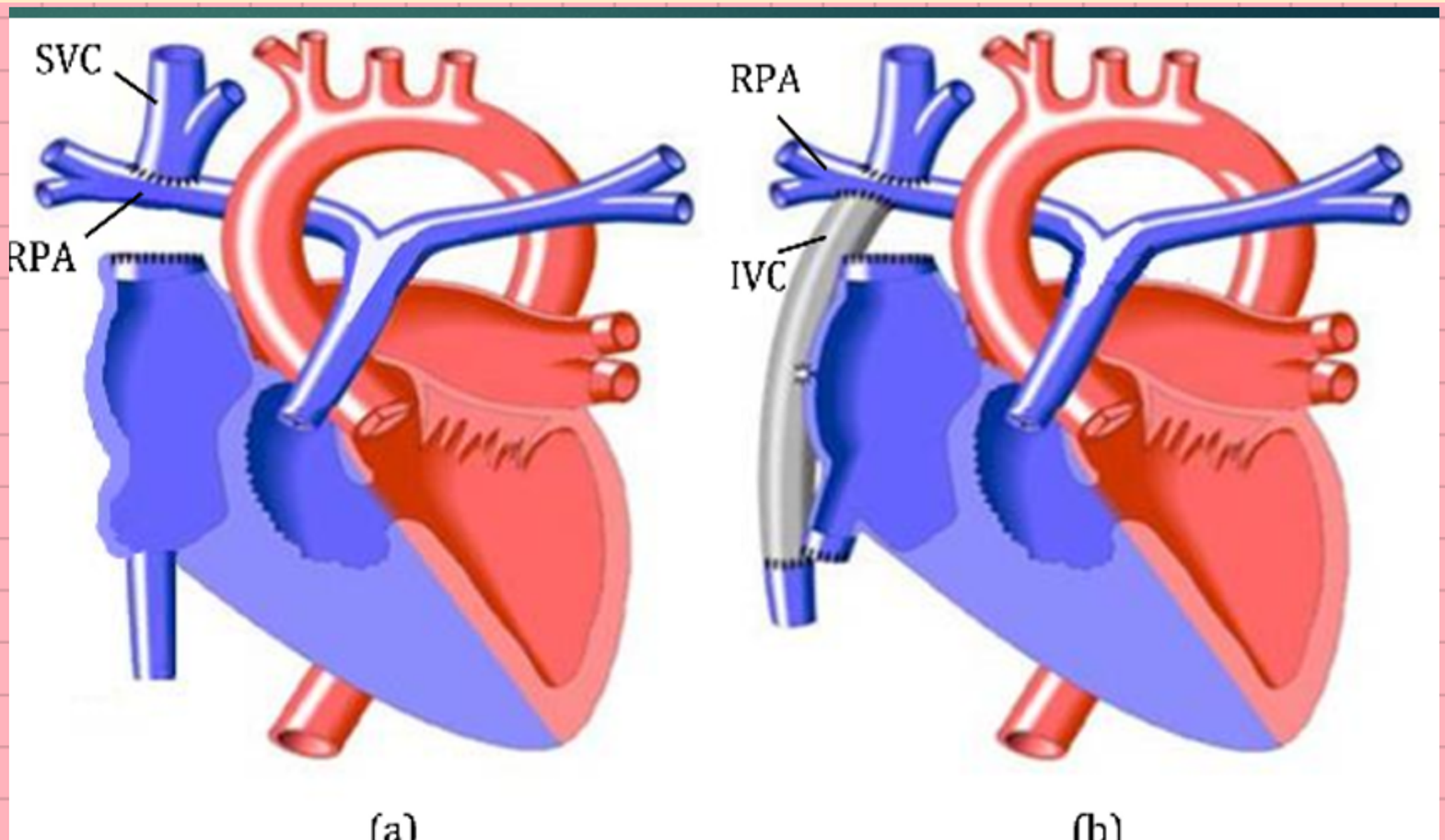
IV. Ventricles VI. Great Arteries

Segmental system of Classification of CHD: Level 2,3 and 4

Constantine Mavroudis and Carl L. Backer. Pediatric Cardiac Surgery: Nomenclature and Classification of Pediatric and Congenital Heart Disease, Jeffrey P. Jacobs. FOURTH EDITION. A John Wiley & Sons, Ltd., Publication. 2013, Chapter 2: 27-51.

REPAIR ORIENTED CLASSIFICATION

- Single vs two ventricles
- Pulmonary tree size
- Segmental analysis



APPROACH FOR DECISION MAKING (STUDY THE CASE, DON'T JUST READ IT)

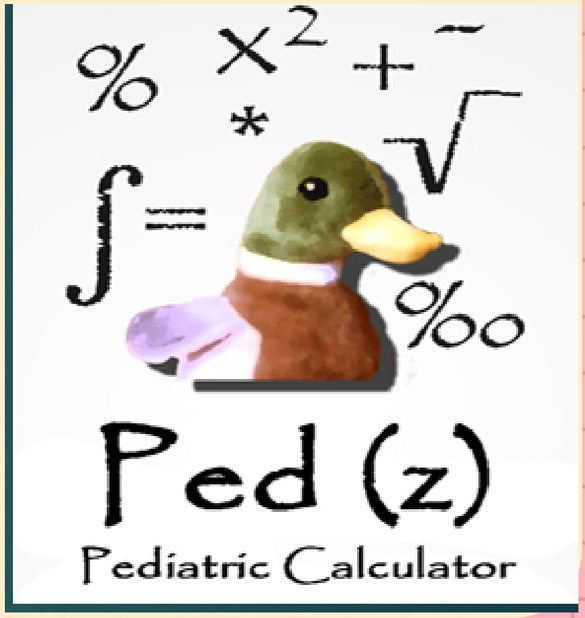
1- Definitive repair: Single Ventricle vs Biventricular repair

2- One stage vs staged repair: Pulmonary tree size Z-score (Measured – mean normal/SD) Ped(z) app **(-2 - -3)** Mc Goon **(1.5 – 1.8)**, PAI (Nakata) **(150 – 250)**, Neo PAI

Always think about gray zones (in heart, baby, system)

3- segmental analysis

4- Clinical correlation (weight, Ht Failure, RC infection, Failure to thrive,....)



TIMING FOR INTERVENTION (RISK-BENEFIT CASE BY CASE)

- Diagnosis ≠ Indication ≠ Referral to intervention

eg. Small shunts, mild lesions

- Diagnosis = indication ≠ Referral to intervention

TOF,PDA, mod-large ASD, mod-Large VSD, AVC, Ao Coarc,

- Diagnosis = indication = Referral to intervention

TGA, severe lesions, HLHS

risk of early intervention **(mortality is the commonest bad outcome)**

Risk of late intervention (cardiac (myocardium), arrhyth, and systemic complications (CNS, HTN, Pul HTN, IE,....)

GUIDELINES FOR THE MANAGEMENT OF COMMON CONGENITAL HEART DISEASES IN INDIA: A CONSENSUS STATEMENT ON INDICATIONS AND TIMING OF INTERVENTION.

Indian Heart Journal 71 (2019) 207-223.

Evidence-based recommendations for management of CHD have been published by task force members from a number of national and international associations, but these are primarily meant for children born in high-income countries. Applicability of these guidelines to the Indian population with CHD is likely to be limited. Majority of patients with CHD are not diagnosed in the antenatal period and often present late in the course of the disease. These patients are often underweight and malnourished and have co-morbidities such as recurrent infections and anemia. Many of the late presenters have an advanced level of pulmonary hypertension, ventricular dysfunction, hypoxia, polycythemia, and so on. Modifications in the treatment protocol may be required for optimizing the outcomes in such patients. All these factors justify the need for separate guidelines for management of CHD in India, including the timing of intervention.

TIMING BY LESION

- PDA
- Elective time: around 6-12m, 6-8kg.
- Urgent time: clinically based (refractory to med treatment)
- Choice (catheter based coil or occluder device) decision of pediatric cardiology or surgical

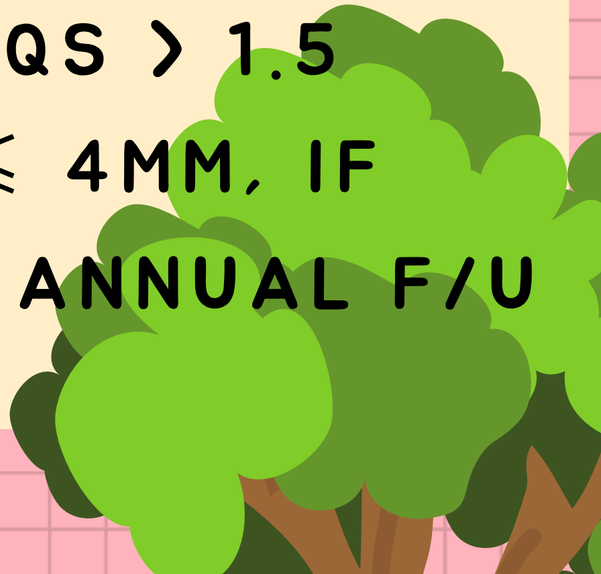
NOT indicated if not audible

ASD

- INDICATION: NON-SMALL ASD > 4MM
- ELECTIVE TIME: 2-4 YEARS OR > 10 KG
- URGENT TIME: ECHO; VENTRICULAR DILATATION, PHT, CLINICAL: FAILURE TO THRIVE, RC INFECTION, REF HT FAILURE

ONLY WITH LARGE ASD > 8MM // QP:QS > 1.5

TRANSCATH VS SURGERY IN SMALL ⩽ 4MM, IF PARADOXICAL STROKE OTHERWISE JUST ANNUAL F/U



VSD

♡ Indication: non-small vsd > 3mm

♡ Elective time: 1-2 y, > 8-10 kg

♡Urgent time: Echo; ventricular dilatation, PHT, mild AR

Clinical: Failure to thrive, RC infection, Ref Ht Failure, IE

If ⩾ 6kg surgical closure, if < 6kg PA banding

(Centre experience)

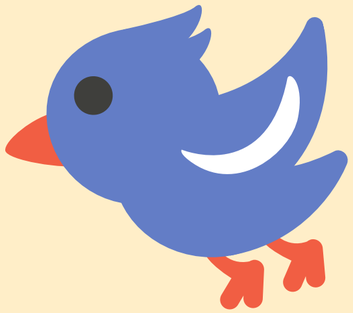
Transcath vs Surgery

In small < 4mm if IE , otherwise just ann

TOF

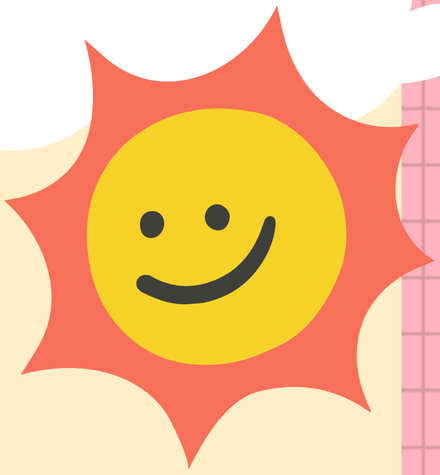
- Indication: diagnosis
- Timing: Elective time: 1-2y, 8-10kg
- Urgent: if saturation < 70-75 % and weight > 6kg total repair

If < 6 kg go for MBT shunt (Centre experience)



AVC

- Indication: diagnosis
- Timing:
- Partial AVC like ASD
- CAVC: Elective > 6m, > 6kg
- PA banding if < 6kg

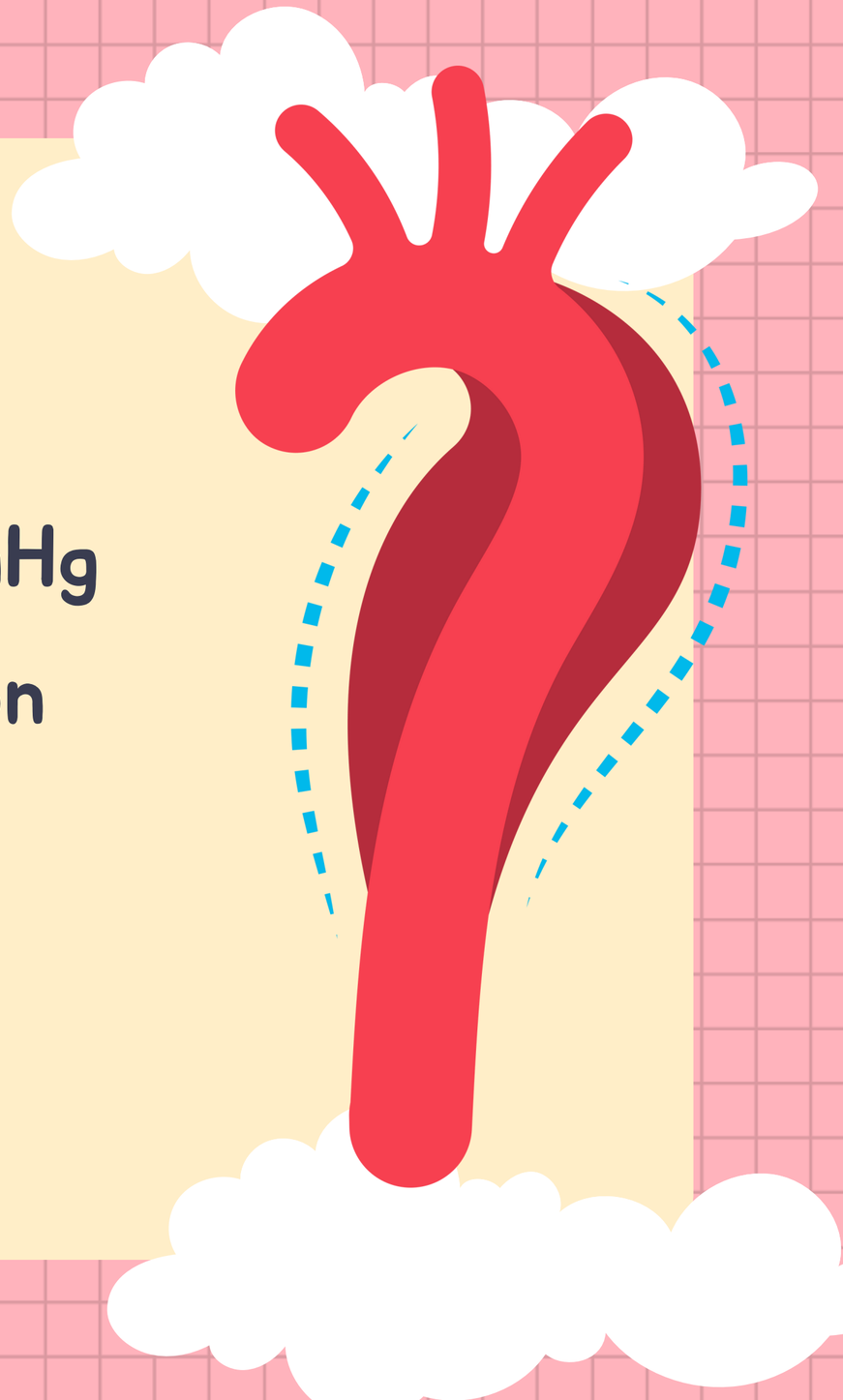


AO COARCTATION

- Indication: gradient > 20 mmHg or >50% narrowing at the site of CoA
- Timing: Elective: 6-12m
- Urgent: if left ventricular dysfunction, congestive heart failure or severe upper limb hypertension
- Beyond 2y risk of persistent systemic HTN

AORTIC STENOSIS

Valvular: peak gradient of >64 mmHg or a mean gradient of >40 mmHg on echo Doppler; Balloon vs surgical ?



SINGLE VENTRICLE

- IF PULMONARY OVERFLOW – PA BANDING BEFORE 3M
- IF PULMONARY UNDERFLOW SAT 02 < 70-75 --- MBT SHUNT
- IF BALANCED --- BD GLENN SHUNT 6-9M
- 2ND STAGE FONTAN --- IF DESATURATED < 70 OR DEVELOPED AV MALFORMATIONS.

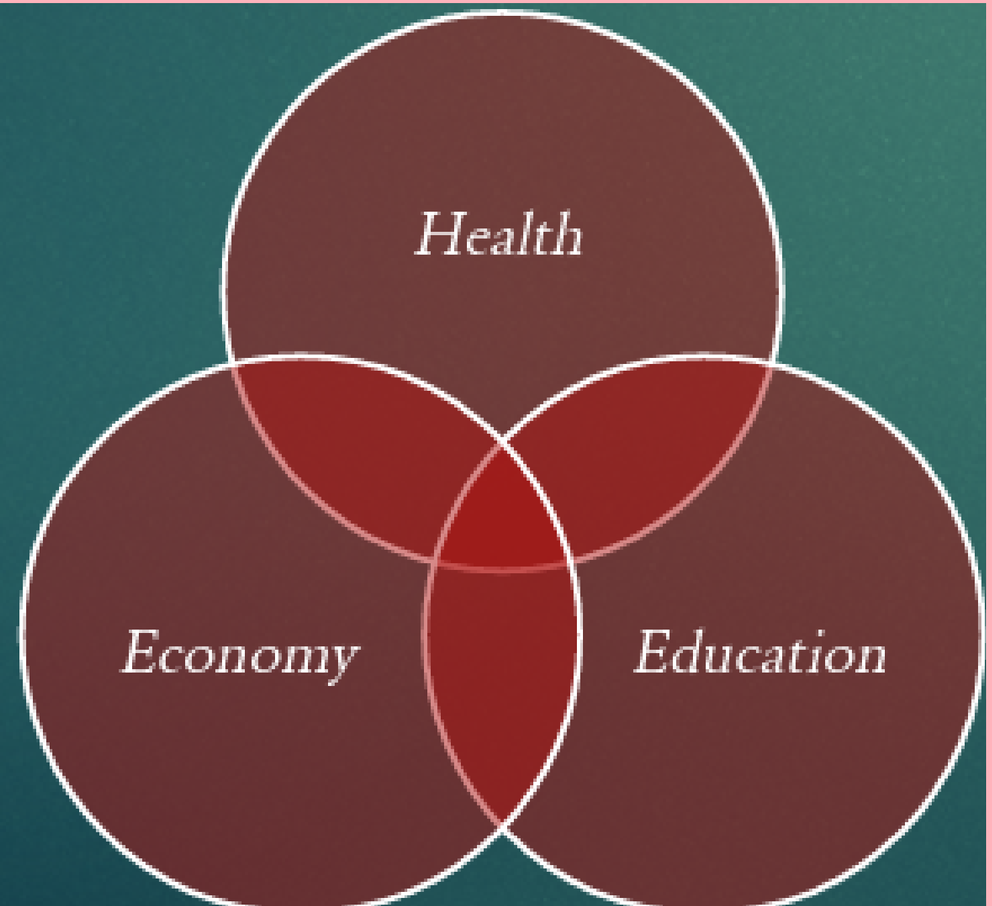
AUDIT TO ADVANCE,
OTHERWISE YOU WILL STEP BACK

Audit (evaluation): = honest reports: Best obtained from Morbidity and mortality meetings

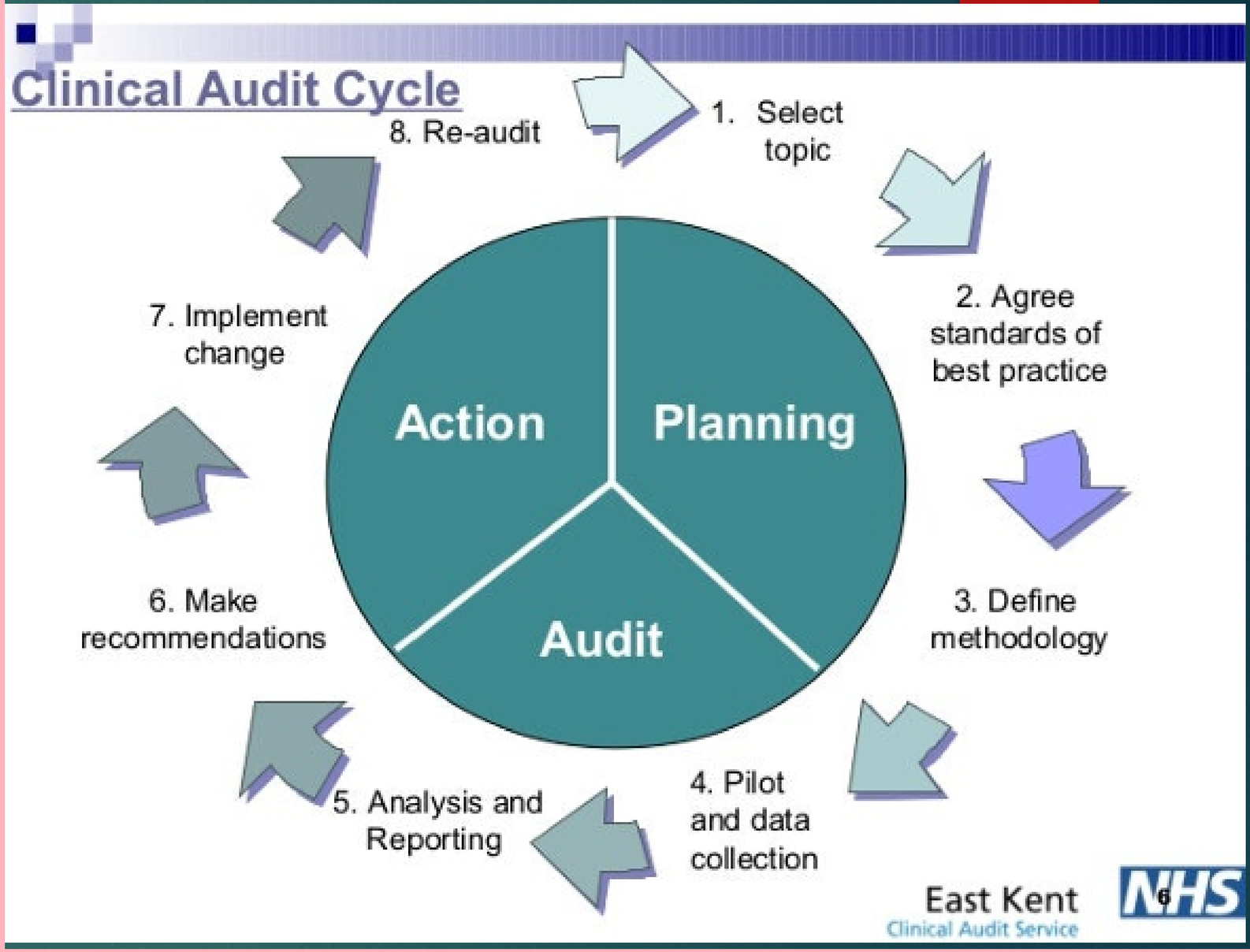
= Action: right actions

= Planning: targeting improvement

Transplantation, Ht F, Norwood programs



Clinical Audit Cycle



THANK YOU