



Royal Brompton & Harefield **NHS**

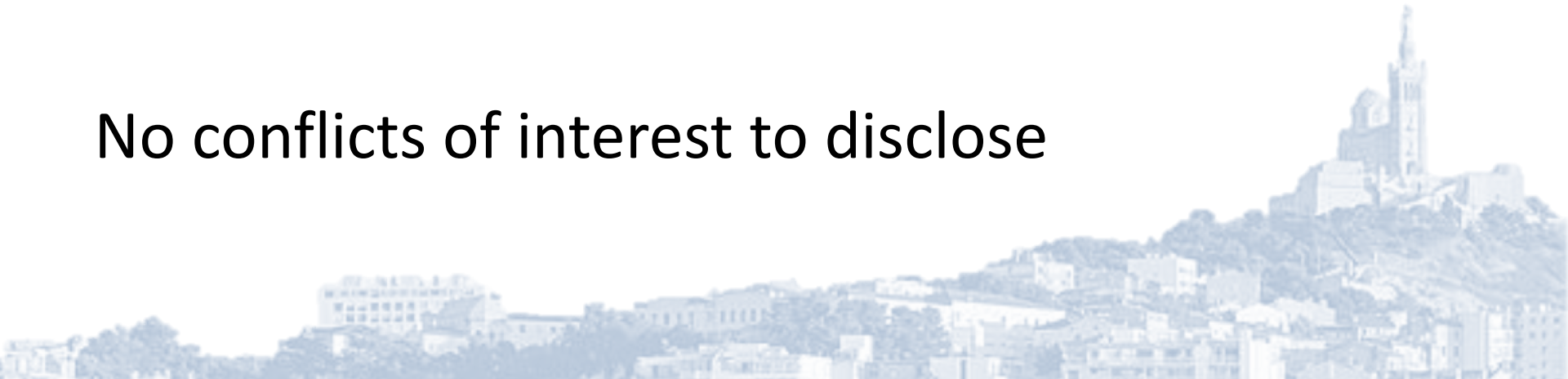


Neonatal Cardiac CT

ESPR Cardiothoracic Taskforce
Session

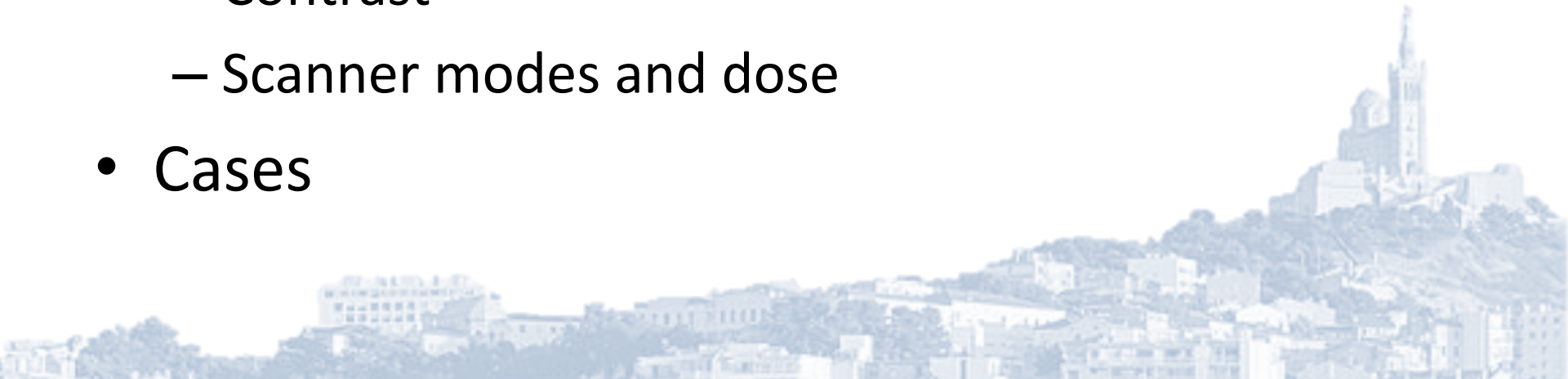


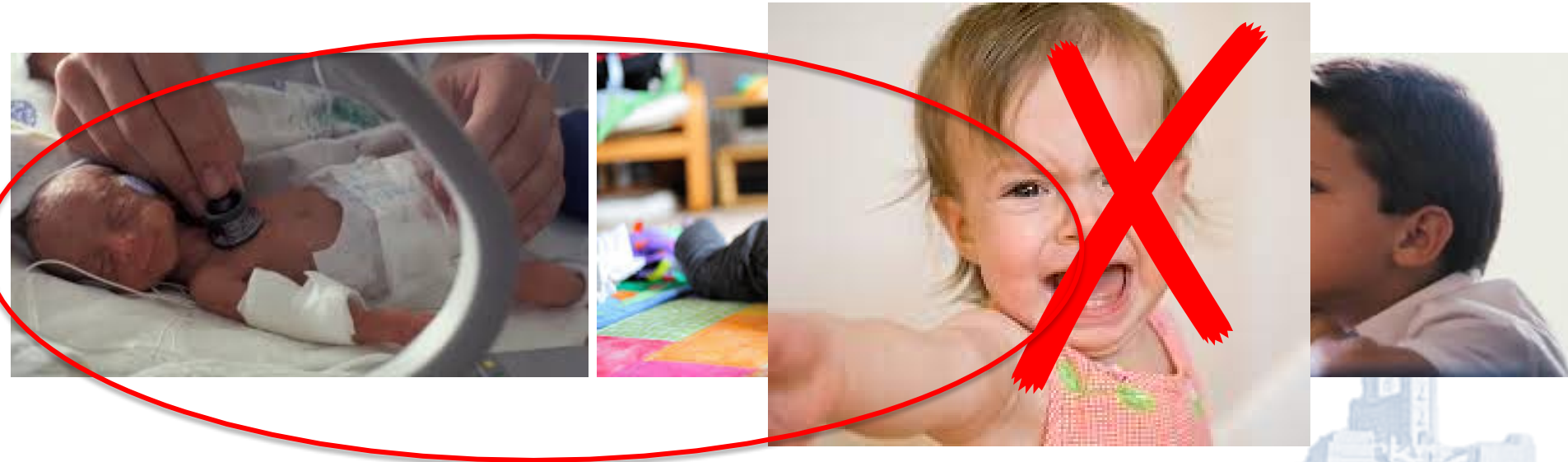
No conflicts of interest to disclose



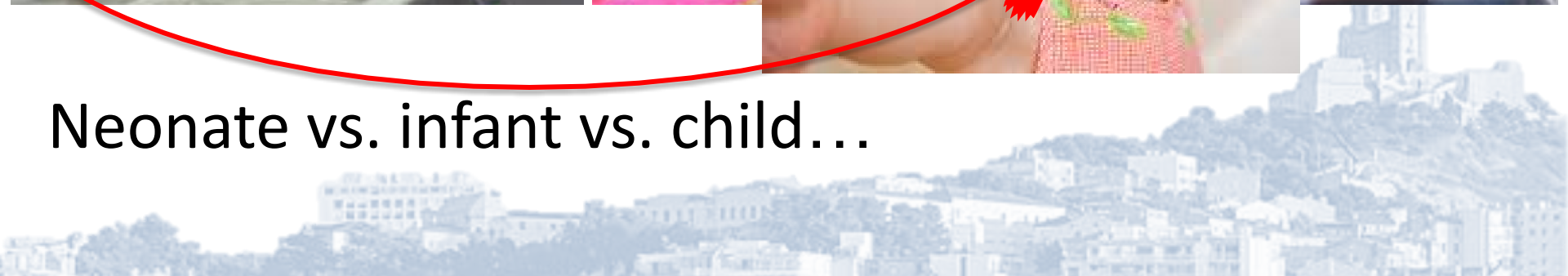
Outline

- Neonatal cardiac CT - special considerations
 - Transfer to CT
 - Positioning
 - Contrast
 - Scanner modes and dose
- Cases





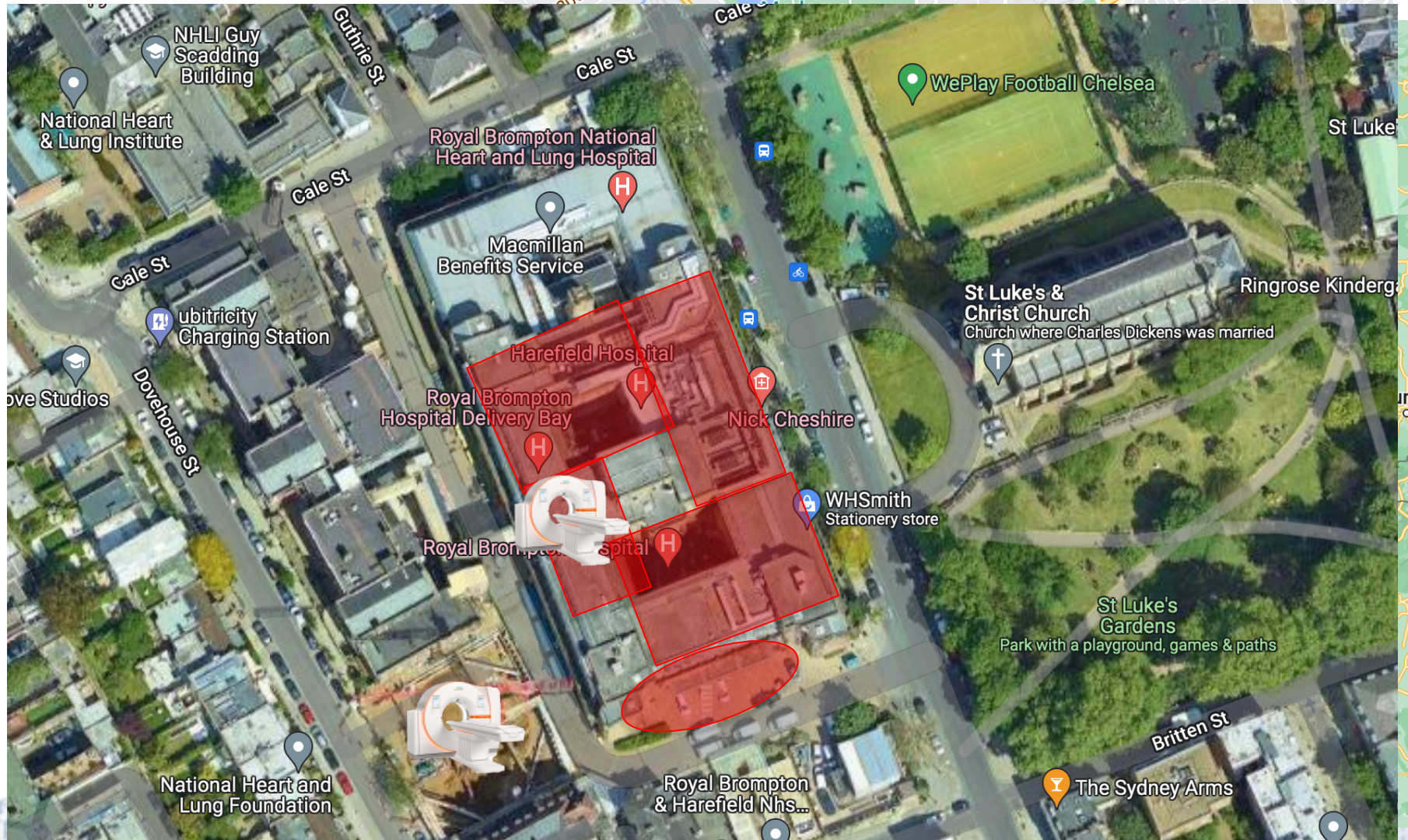
Neonate vs. infant vs. child...



Geography matters...

TRANSFER CONSIDERATIONS





National Heart & Lung Institute

NHLI Guy Scadding Building

Royal Brompton National Heart and Lung Hospital

Macmillan Benefits Service

Harefield Hospital

Royal Brompton Hospital Delivery Bay

Nick Cheshire

Royal Brompton Hospital

St Luke's & Christ Church

Church where Charles Dickens was married

Ringrose Kindergarten

St Luke's Gardens

Park with a playground, games & paths

Royal Brompton & Harefield Nhs...

The Sydney Arms

National Heart and Lung Foundation

Ubitricity Charging Station

ove Studios

WePlay Football Chelsea

St Luke

WHSmith Stationery store

Cale St

Cale St

Cale St

Guthrie St

Dovehouse St

Britten St

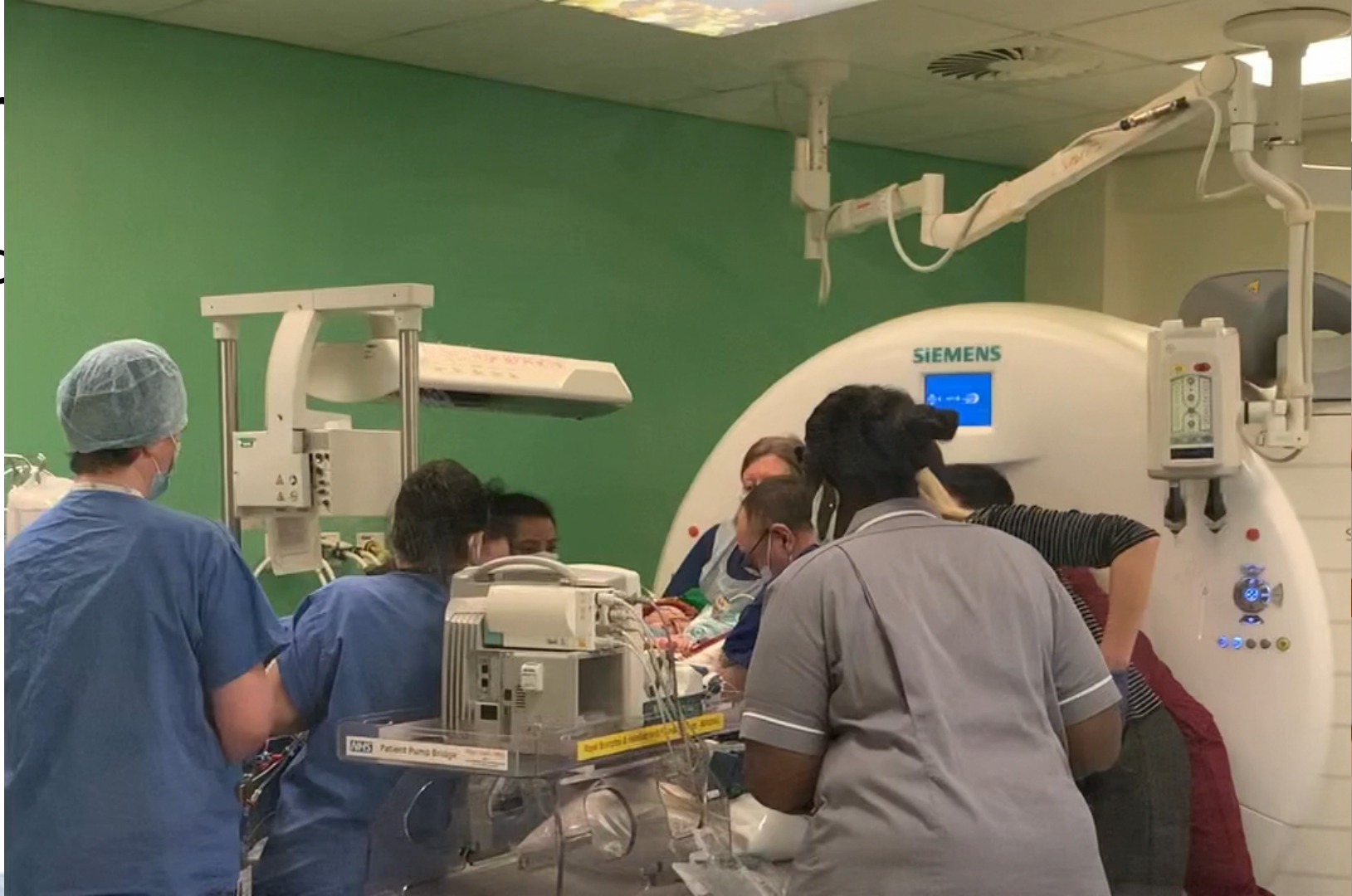
Transfer consideration

- Location of CT
- Transfer team



Trans

- Loc
- Tra



Transfer

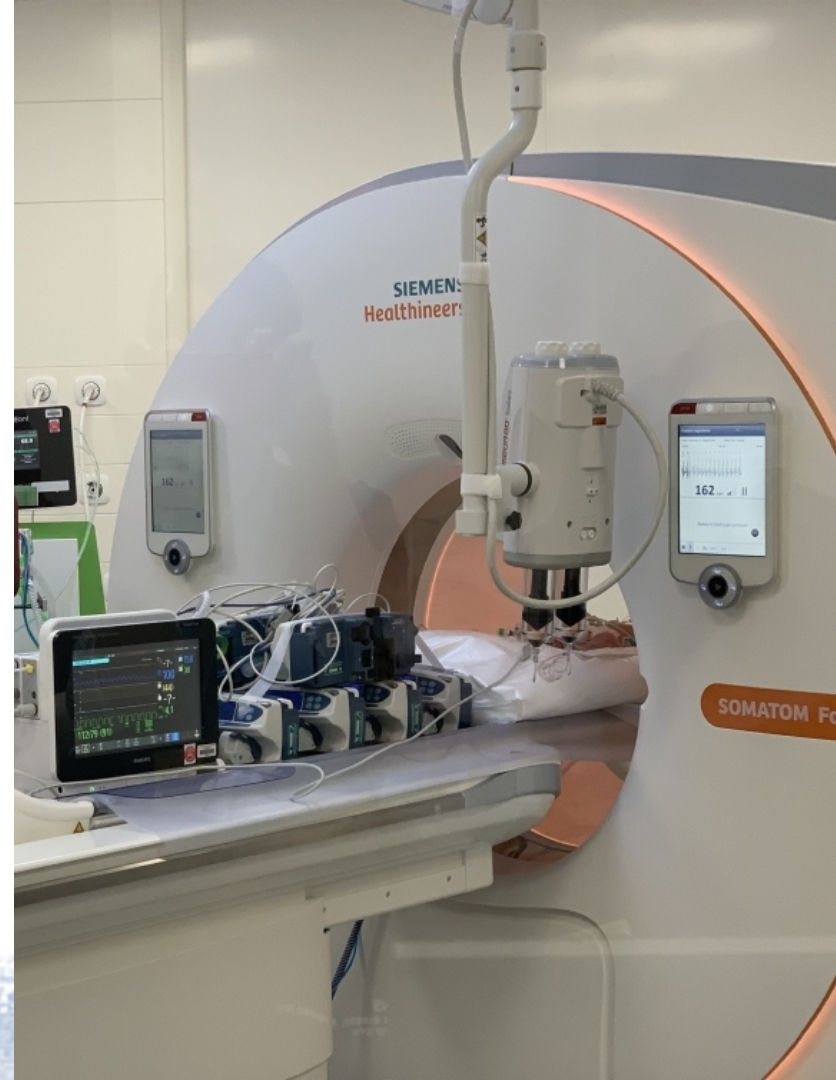
- Location
- Transfer



PATIENT POSITIONING



- Isocentre of the scanner
 - May require extra-help...
 - Scout dose
 - mAs modulation
 - Image quality





In the right place at the right time - first time!

CONTRAST MEDIA



- Largest most central line
 - PICC (power injectable)
 - Femoral/jugular
 - Peripheral cannula
 - Side holes...
- Contentious options...
 - ~~✗~~ Umbilical vein cannula
 - ~~✗~~ Scalp cannula
 - ✓ ECMO return cannula

Pump injector

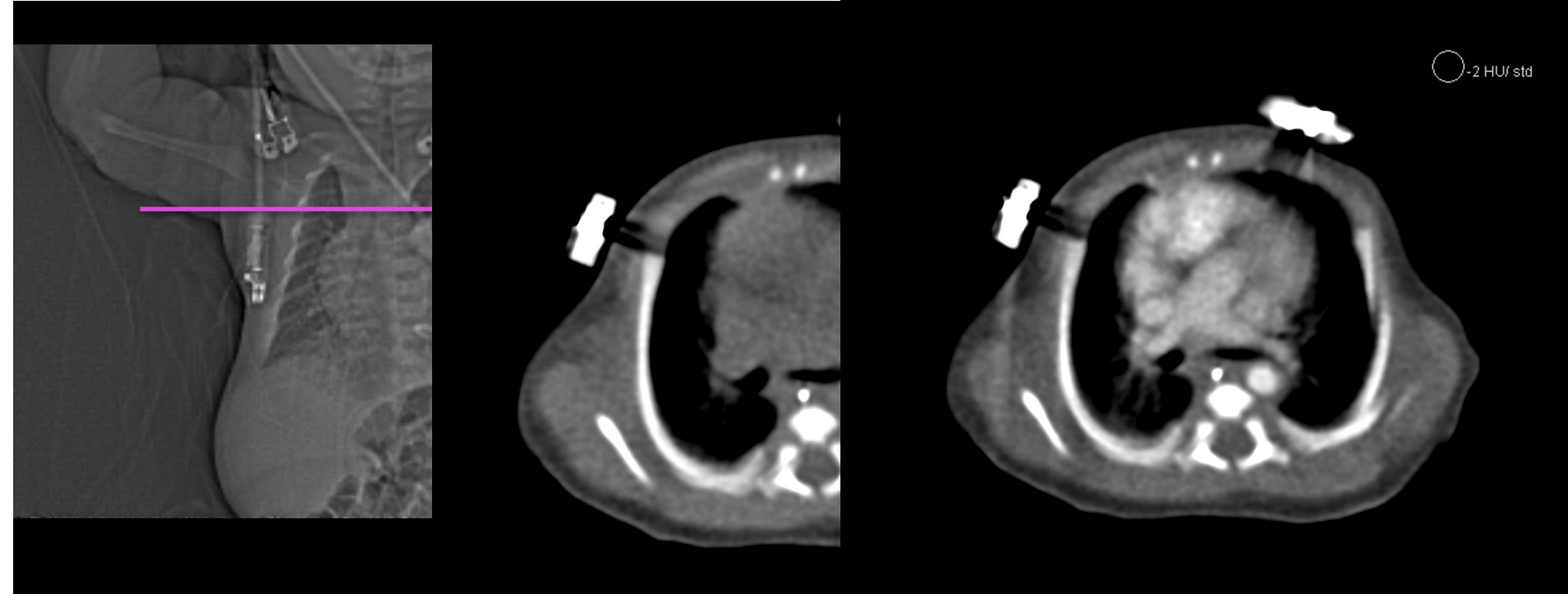
Stroeder, J et al. Prospective safety evaluation of automated iomeprol 400 injections for CT through peripheral venous cannulas. *Clin. Radiol.* 2020; **75**: 396.e1-396.e6.

Siegel, M. J. Pediatric CT angiography. *Eur. Radiol.* 2005; **15 Suppl 4**: D32-6.

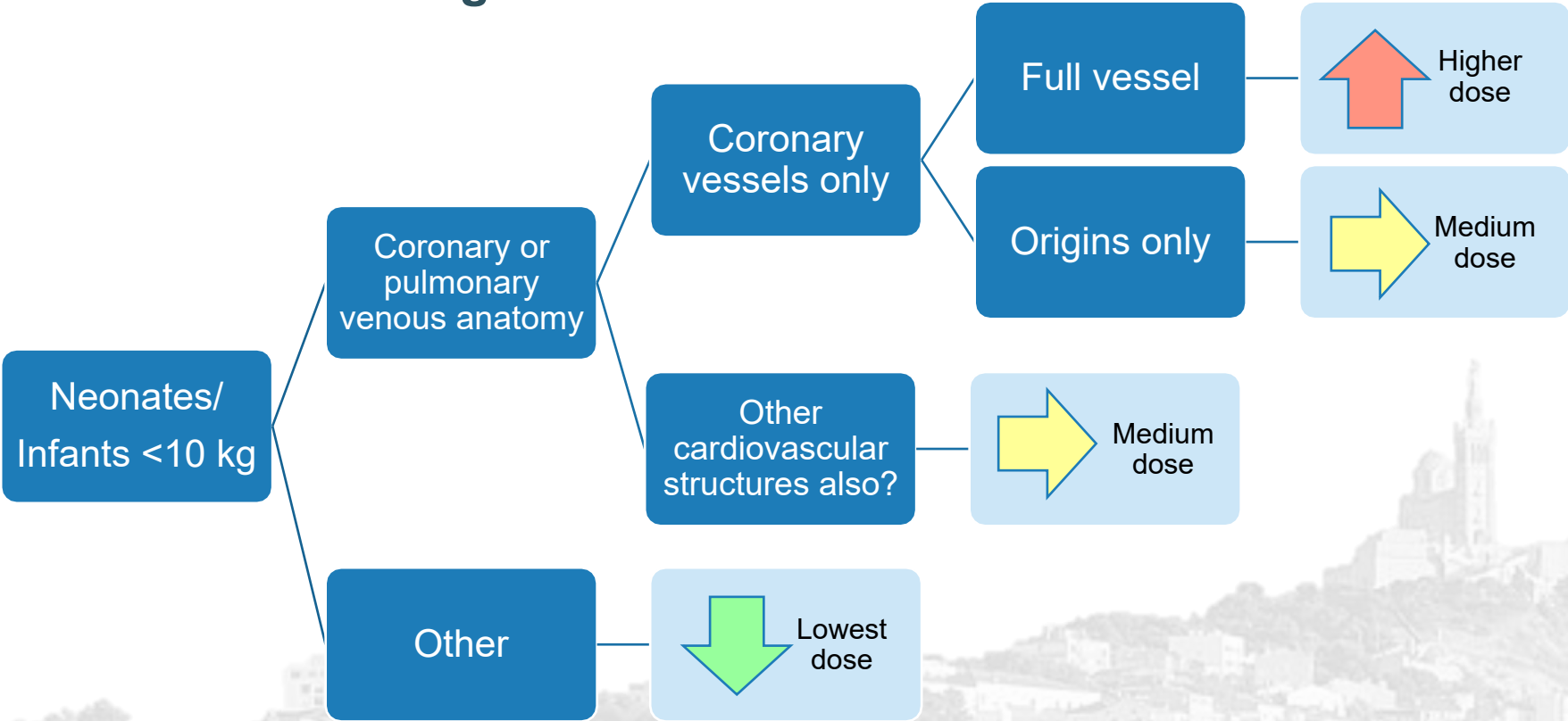
- Pump injector...
- Pump injector...
- Pump injector...



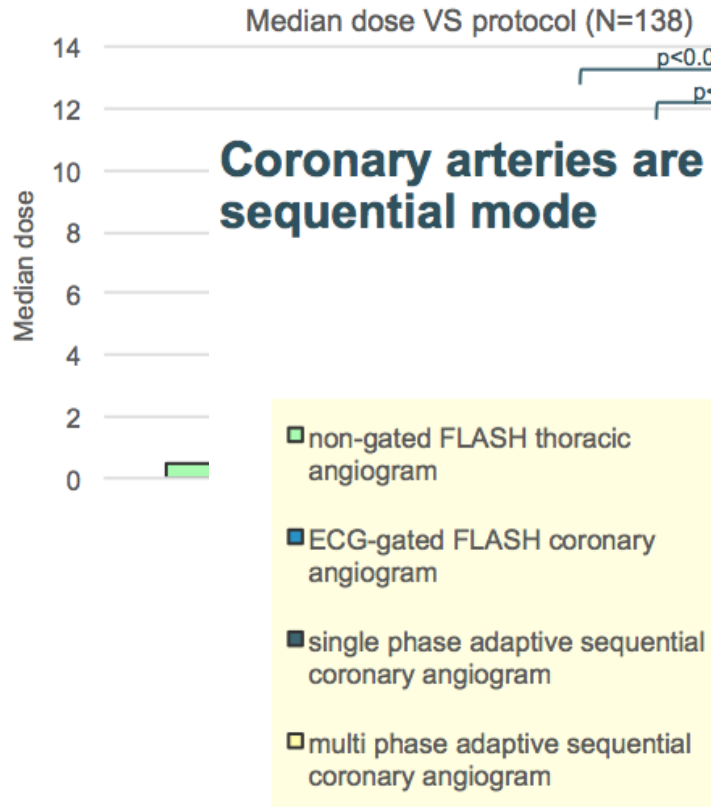
- Test bolus vs. manual triggering



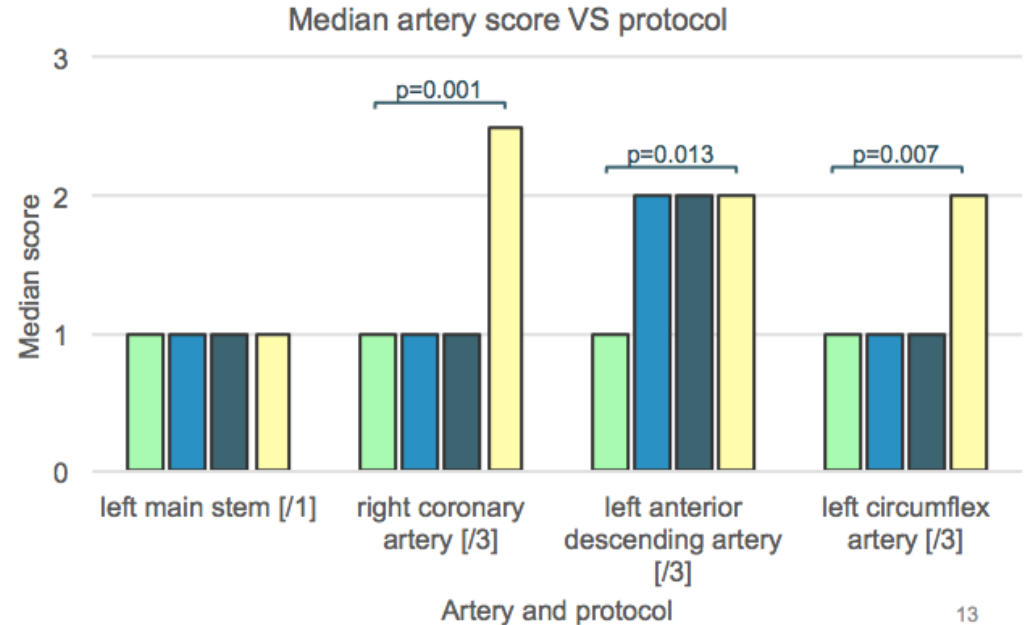
Scan selection algorithm



DLP and CTDIvol doses were appropriately higher in gated scans



Coronary arteries are more reliably demonstrated in adaptive sequential mode



Too many indications for one talk...!

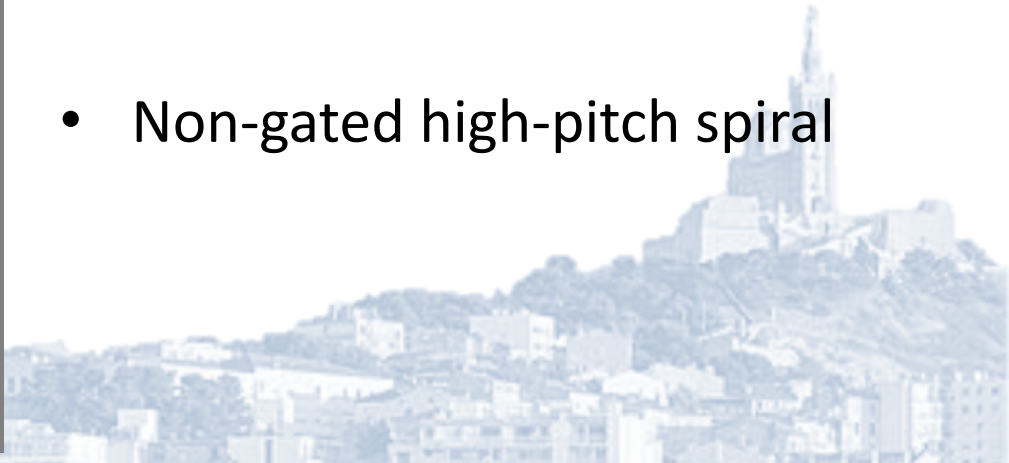
CASES



Indications depend on available scanner, staff expertise (radiology, radiographers, transfer team...



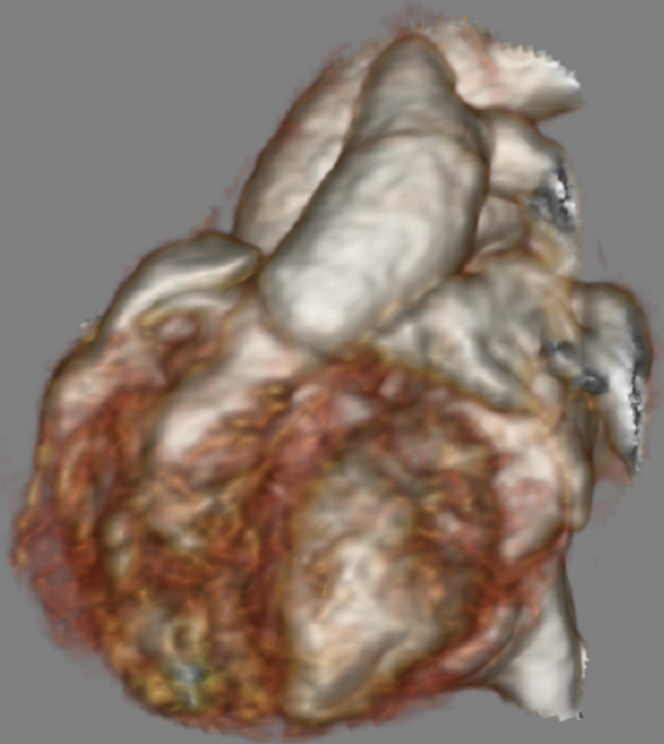
- 2 days old
- Stridor at birth
- Vascular ring?
- Non-gated high-pitch spiral



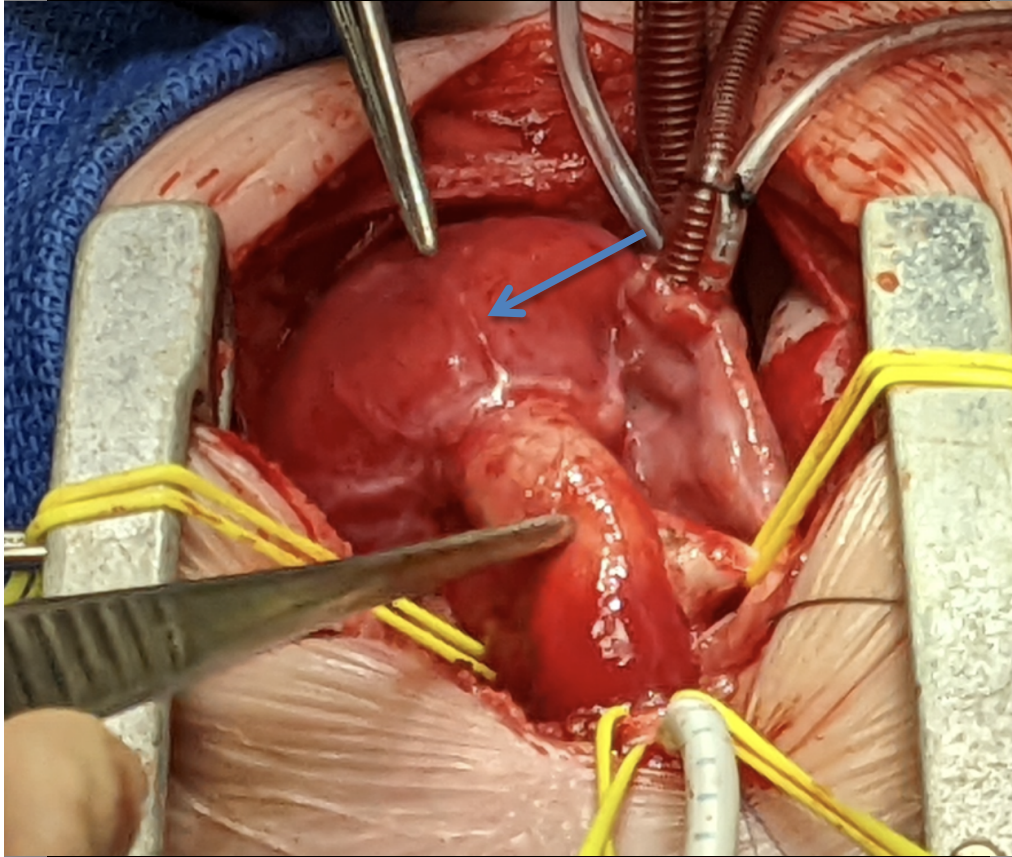


- 3 days old
- Haemodynamic collapse
- Confirm venous anatomy
- ECG gated high-pitch spiral

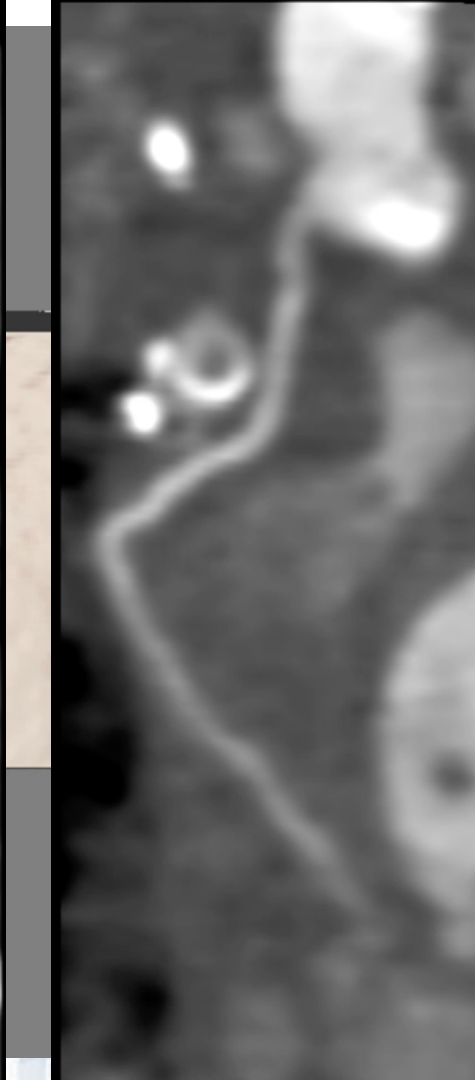
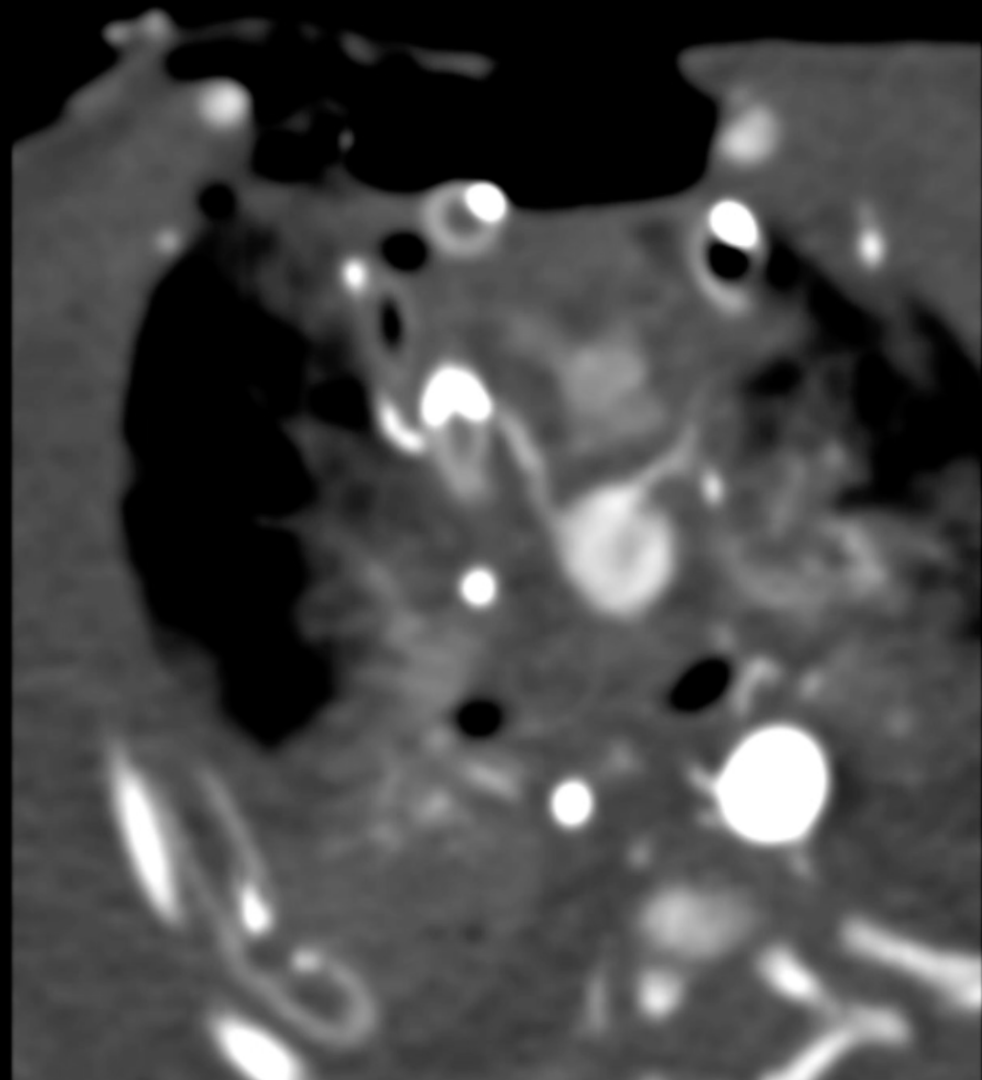




- 1 day old
- Antenatal diagnosis
- Guide surgical plan – univentricular palliation vs. primary biventricular repair
- Single phase end systolic AdSeq, no table movement

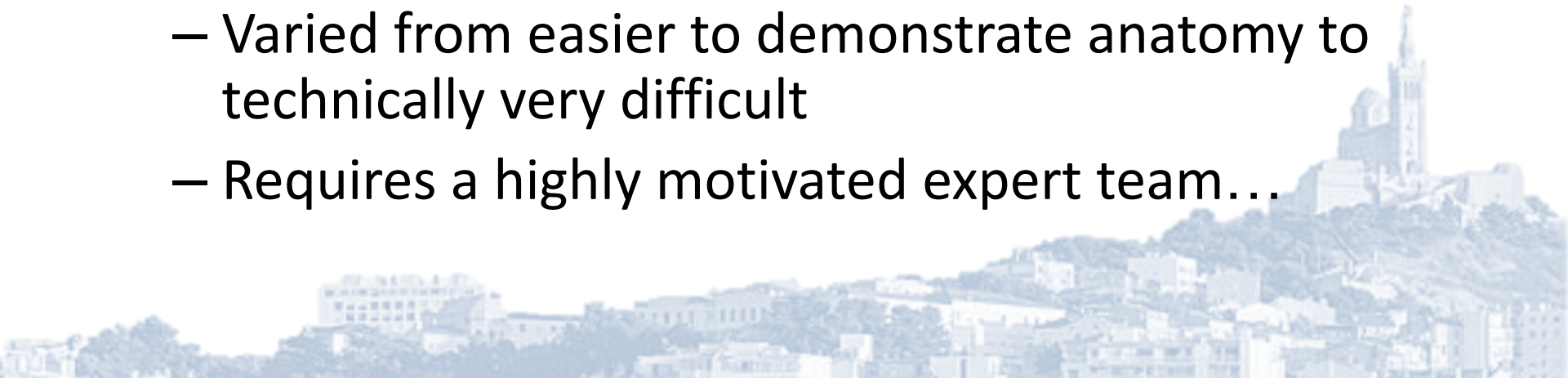


- 4 days old
- Antenatal diagnosis of TGA
- Suspicion of anomalous coronary course on echo...clarify prior to ASO
- AdSeq 140bpm



Summary

- Neonatal cardiac CT journey
 - Transfer to CT, positioning, contrast, scanner modes and dose
- Indications
 - Varied from easier to demonstrate anatomy to technically very difficult
 - Requires a highly motivated expert team...

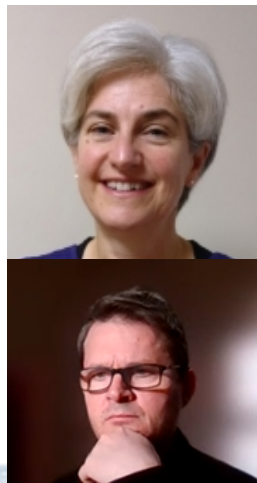




Varja, Emily and Kiarash



Play specialists – led by Maxine Ovens



Medical physics – led by Dr I Castellano



CT radiographers – led by L Shaw

Thank you

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