

Royal Brompton & Harefield



# Personalised Medicine in Paediatric Coronary Angiography: Matching CT protocols to clinical questions

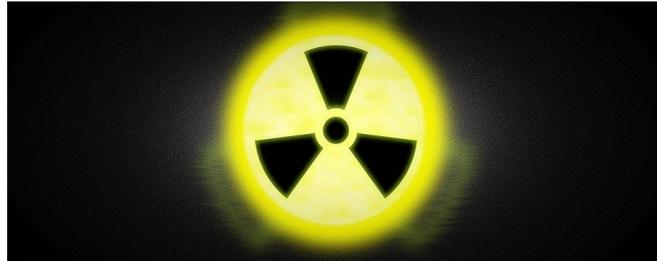
Varja Čučulović, Dr Emily Ashworth, Dr Thomas Semple



# Introduction



## Matching image quality to clinical indication in our quaternary paediatric cardiac surgical centre



Tailoring radiation  
dose



Children <2 years



4 different available  
CTCA protocols

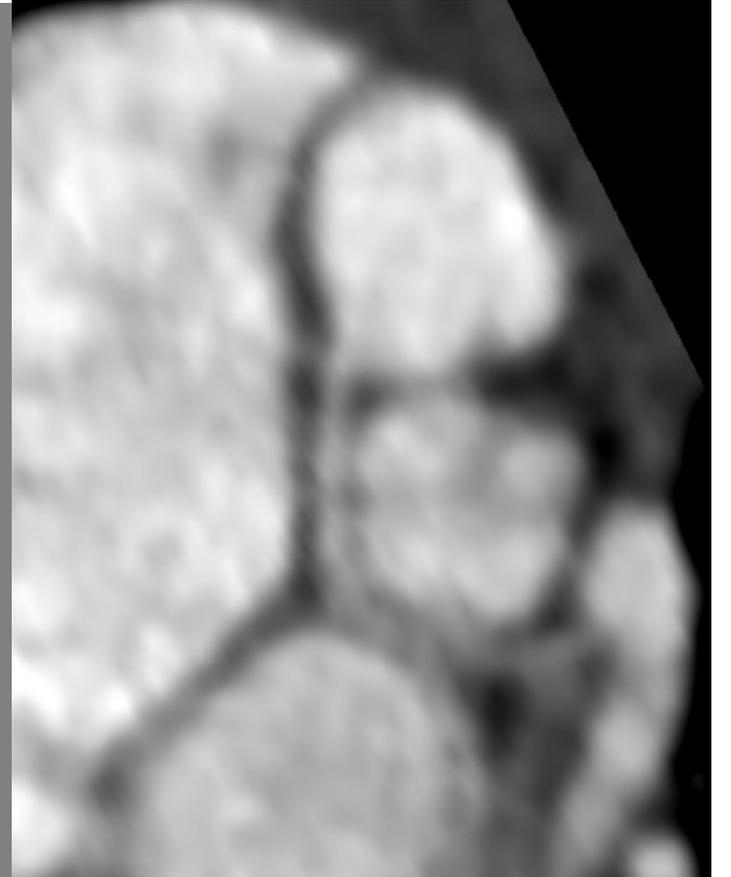
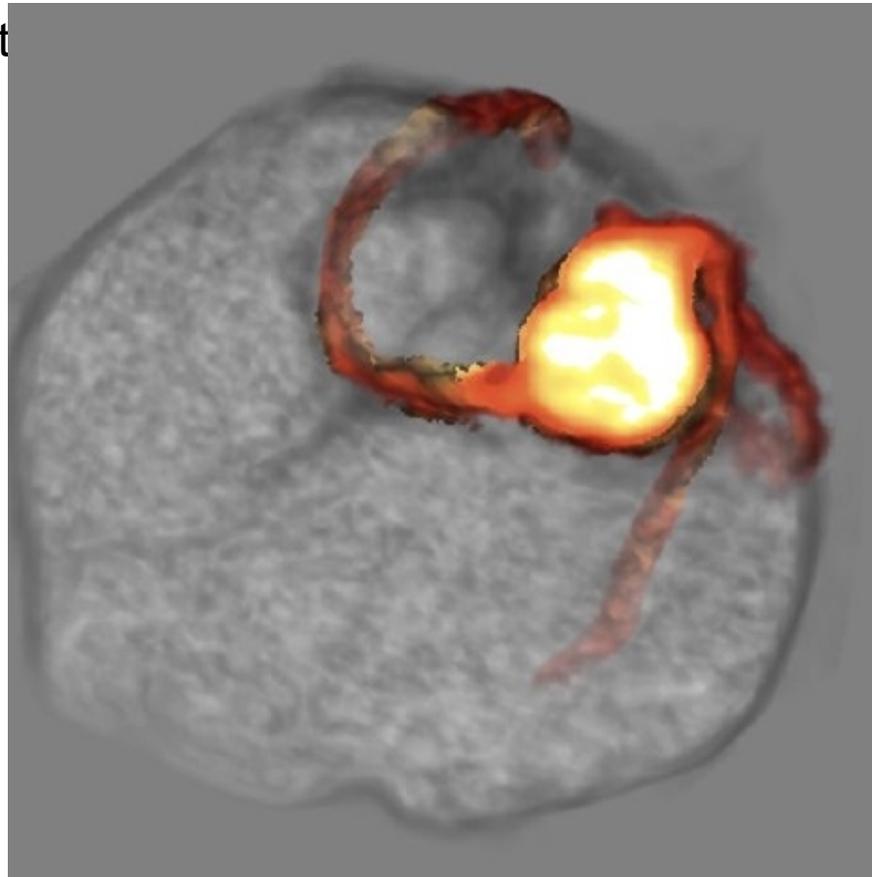
## Cardiac CT should not be 'one size fits all'

We use CT for large easy to see and small hard to see structures...

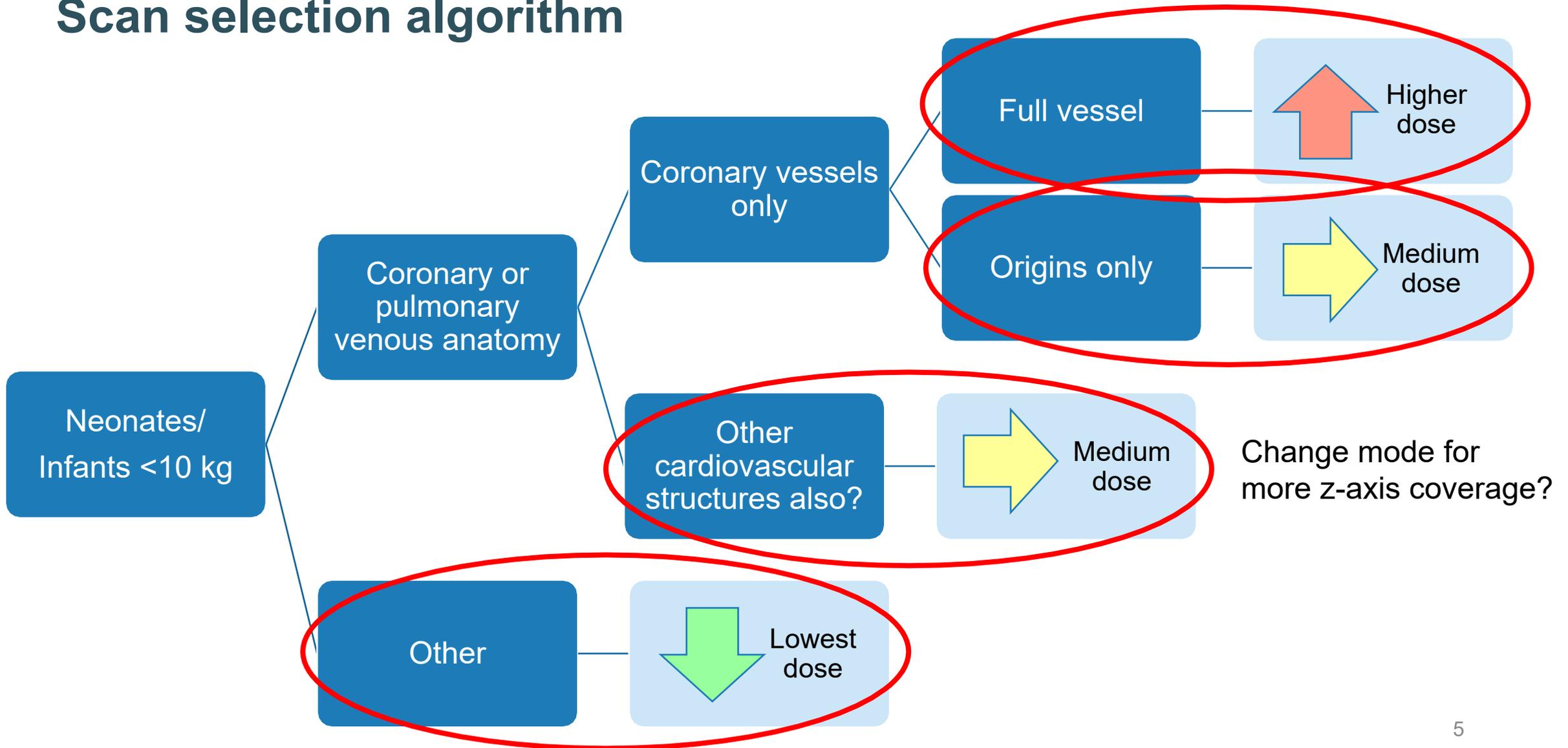
Anomalous coronary arteries are small and very fast moving



Aort  
and



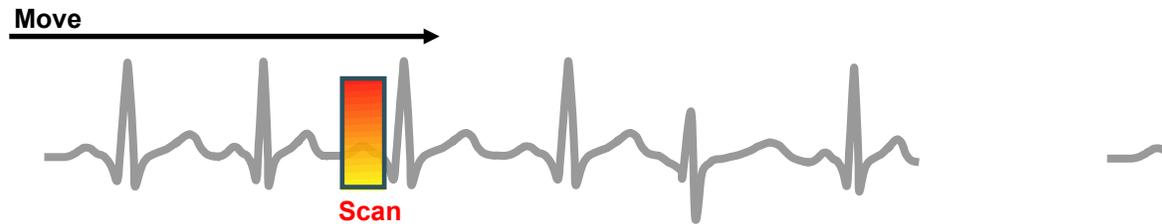
# Scan selection algorithm



Does this algorithm work?



## We use 4 Cardiac CT protocols:

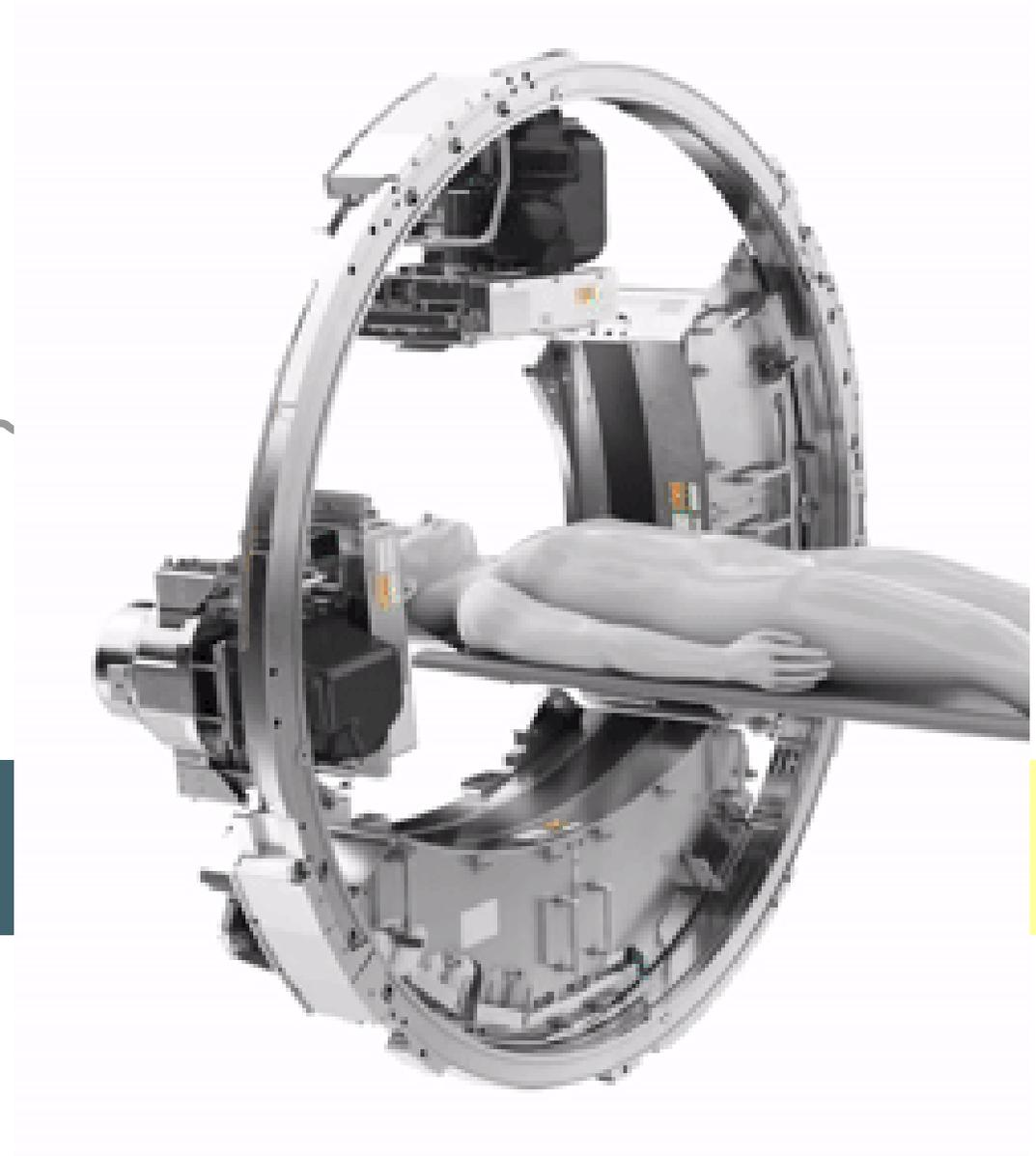


Non-gated FLASH  
thoracic angiogram

High-pitch spiral

ECG-gated FLASH  
coronary angiogram

Prospective,  
single acquisition

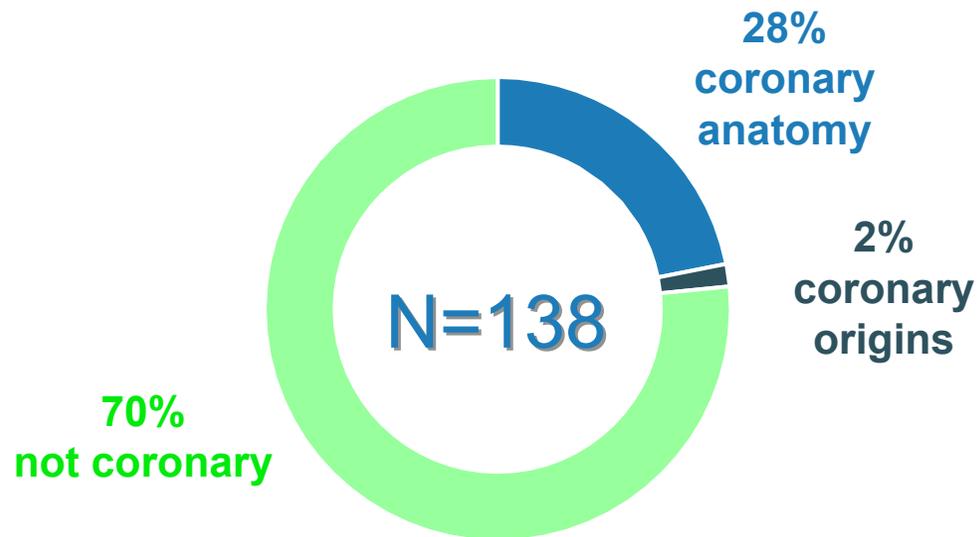


# Methods

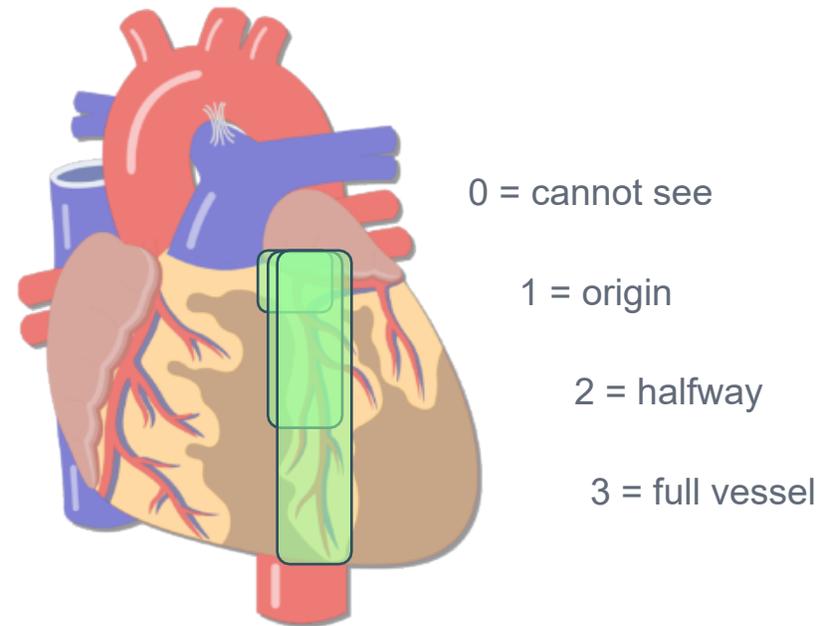


# Retrospective review of coronary quality in paediatric cardiac CT

Jan 2016 – August 2021, patients <2 years



Included CTCAs by indication

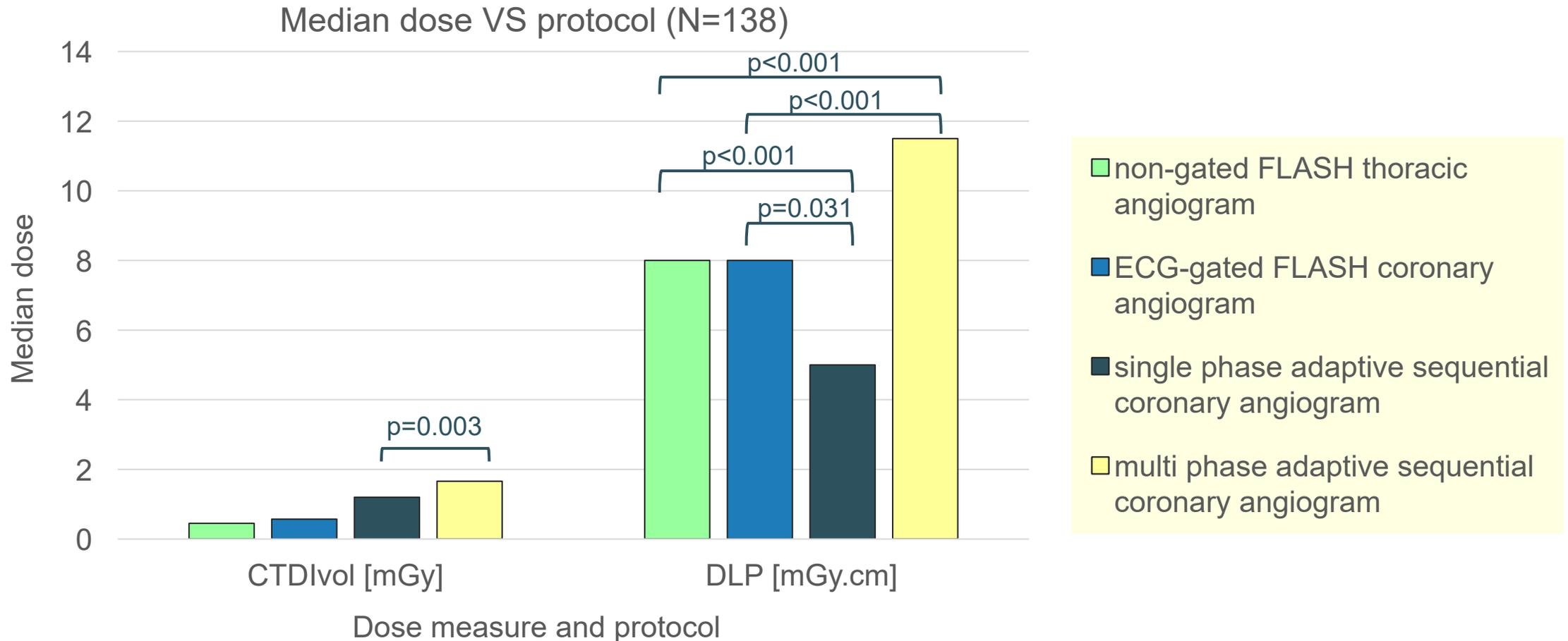


Subjective image quality

# Results

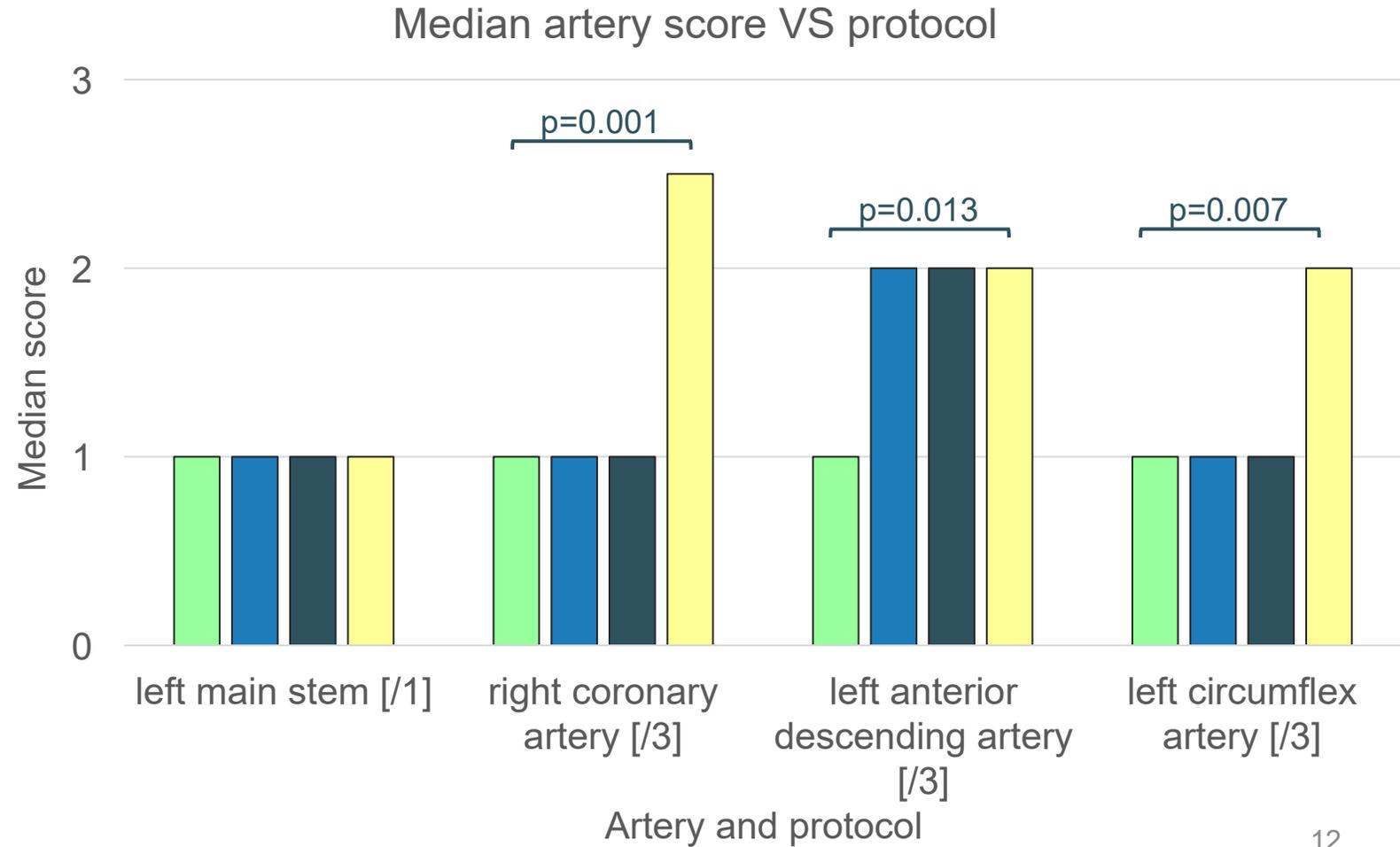


## DLP and CTDIvol doses were appropriately higher in gated scans



# Coronary arteries are more reliably demonstrated in adaptive sequential mode

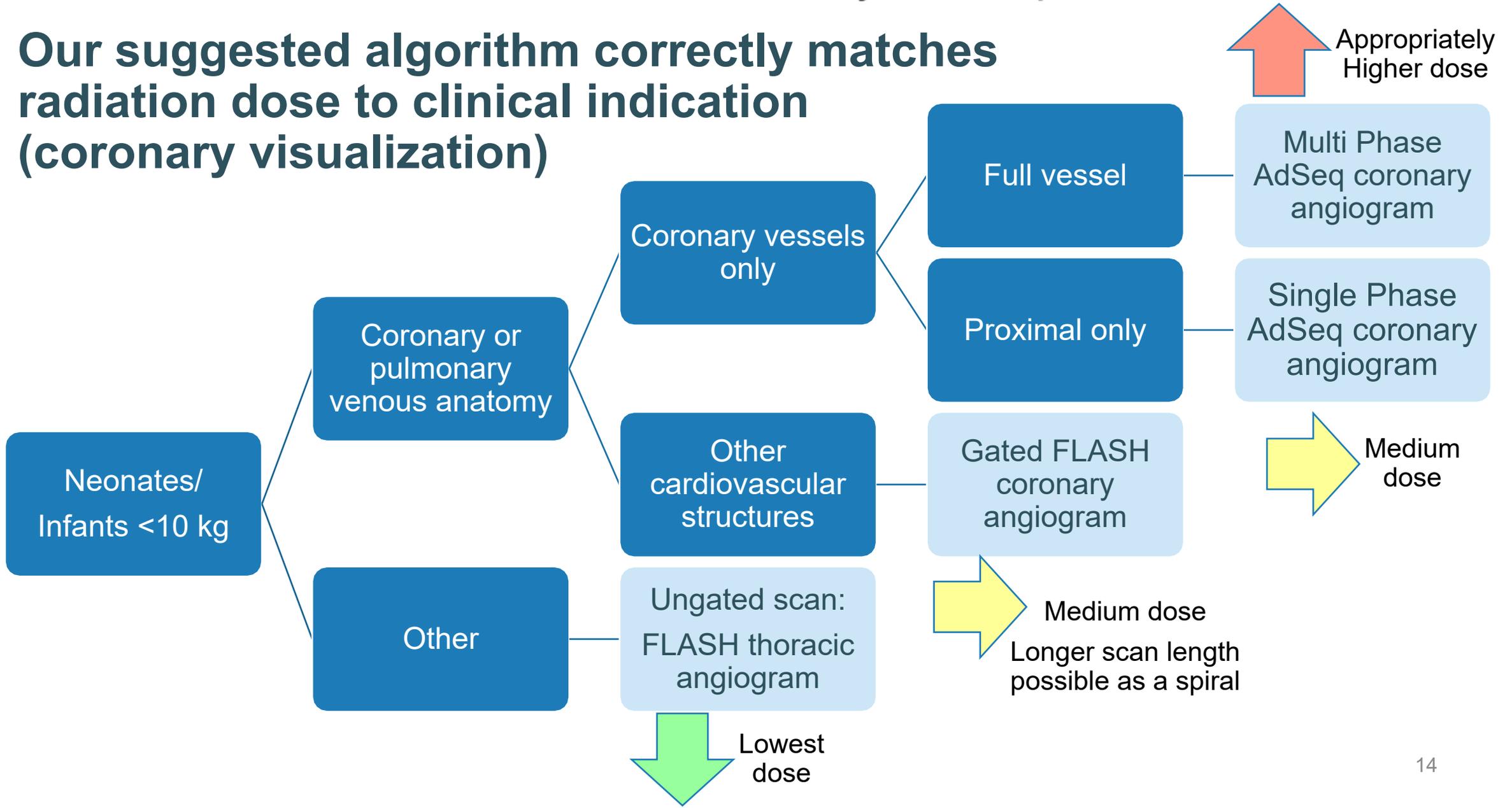
- non-gated FLASH thoracic angiogram
- ECG-gated FLASH coronary angiogram
- single phase adaptive sequential coronary angiogram
- multi phase adaptive sequential coronary angiogram



# Conclusion



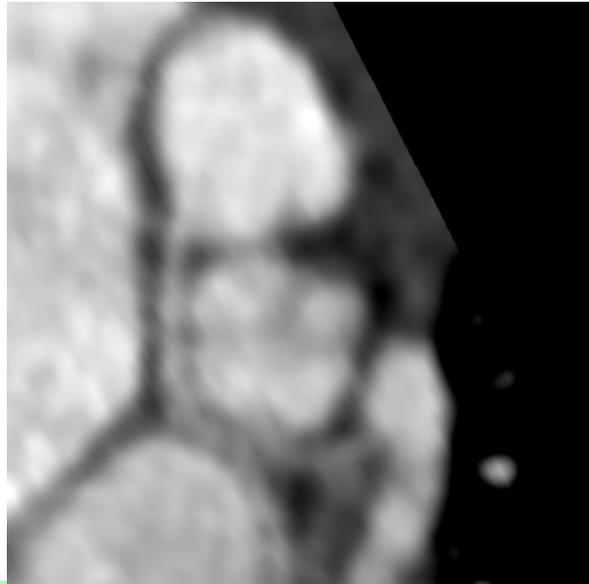
# Our suggested algorithm correctly matches radiation dose to clinical indication (coronary visualization)



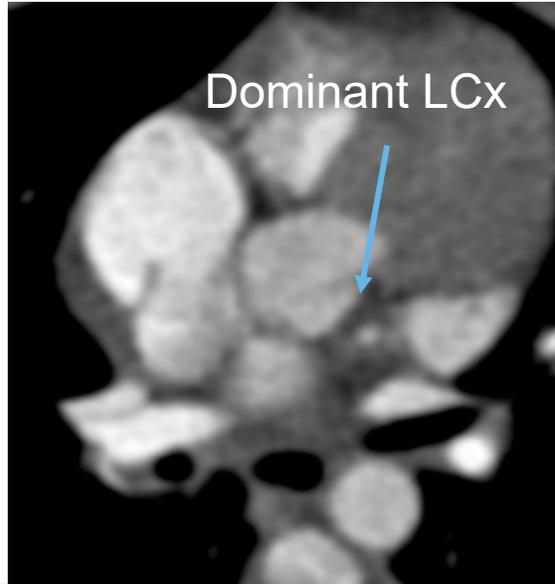
# Limitations



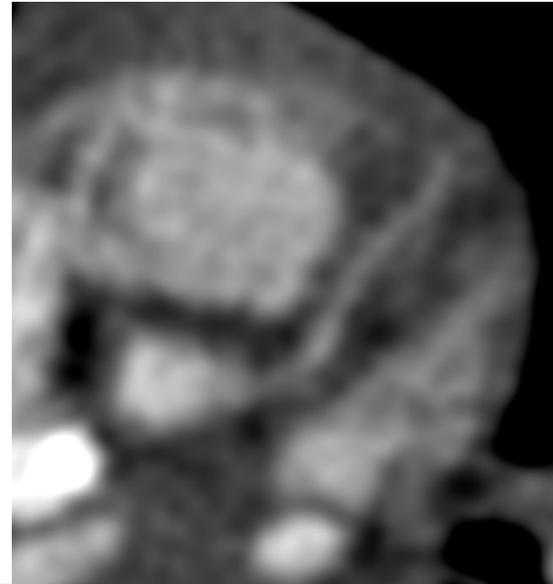
## Limitations



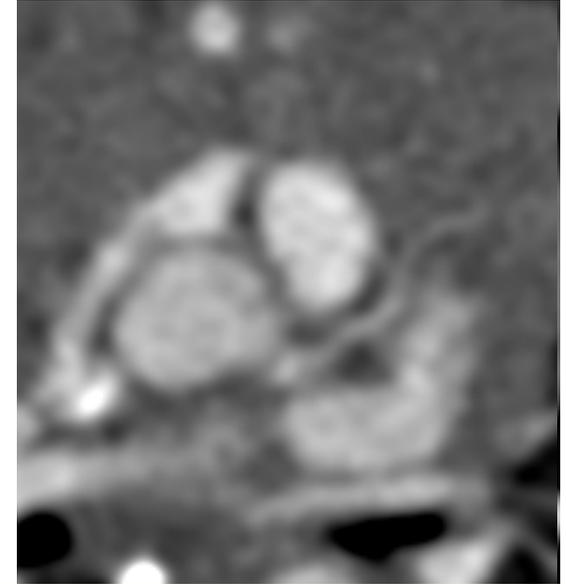
Anomalous origins



Non-dominant vessel



Peri-coronary fat



Heart rate

With thanks to:



Play specialists – led by Maxine Ovens

Thank you.

Royal Brompton & Harefield 



Medical physics – led by Dr I Castellano



CT radiographers – led by L Shaw