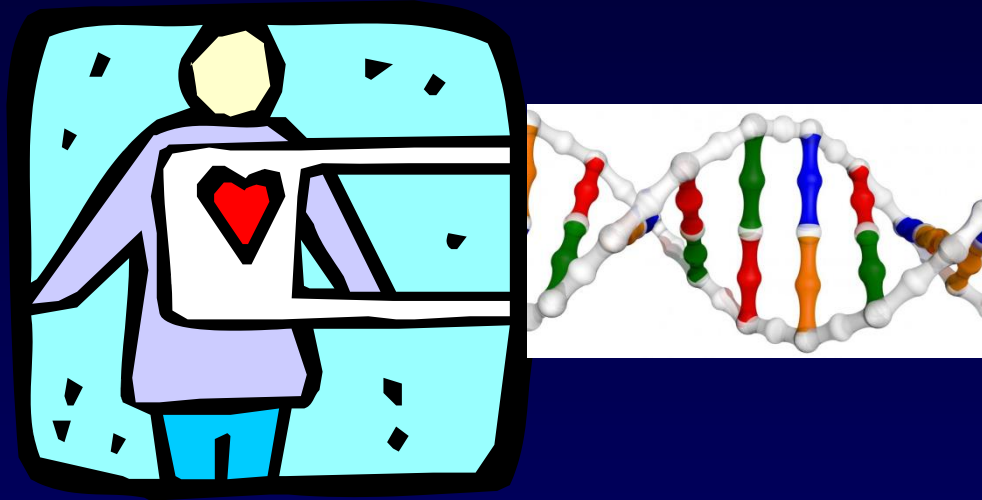


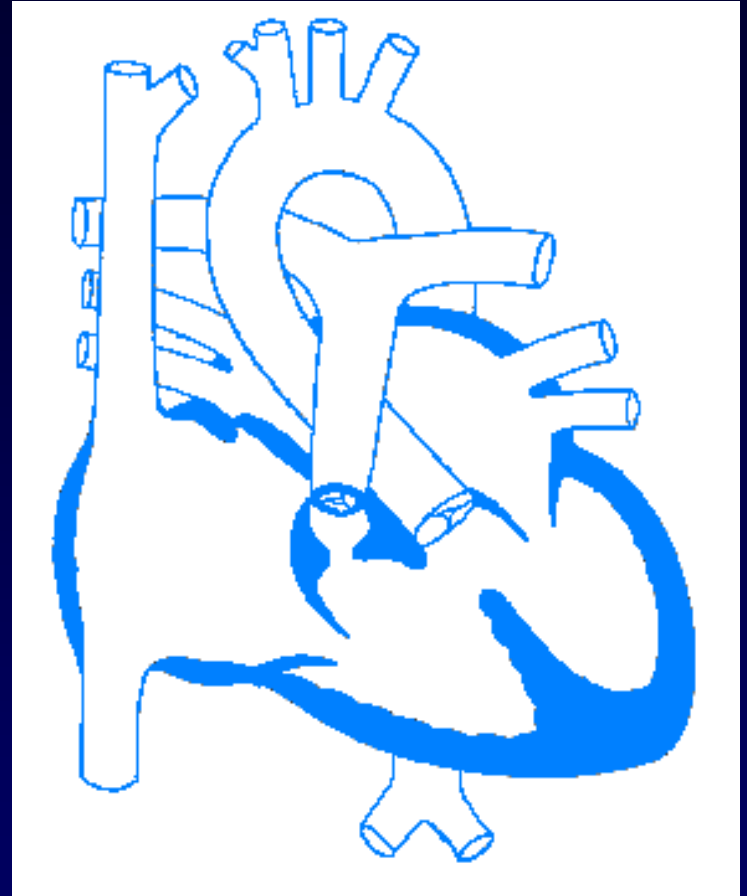
The Latest and Greatest in Pediatric Cardiology: What's New???



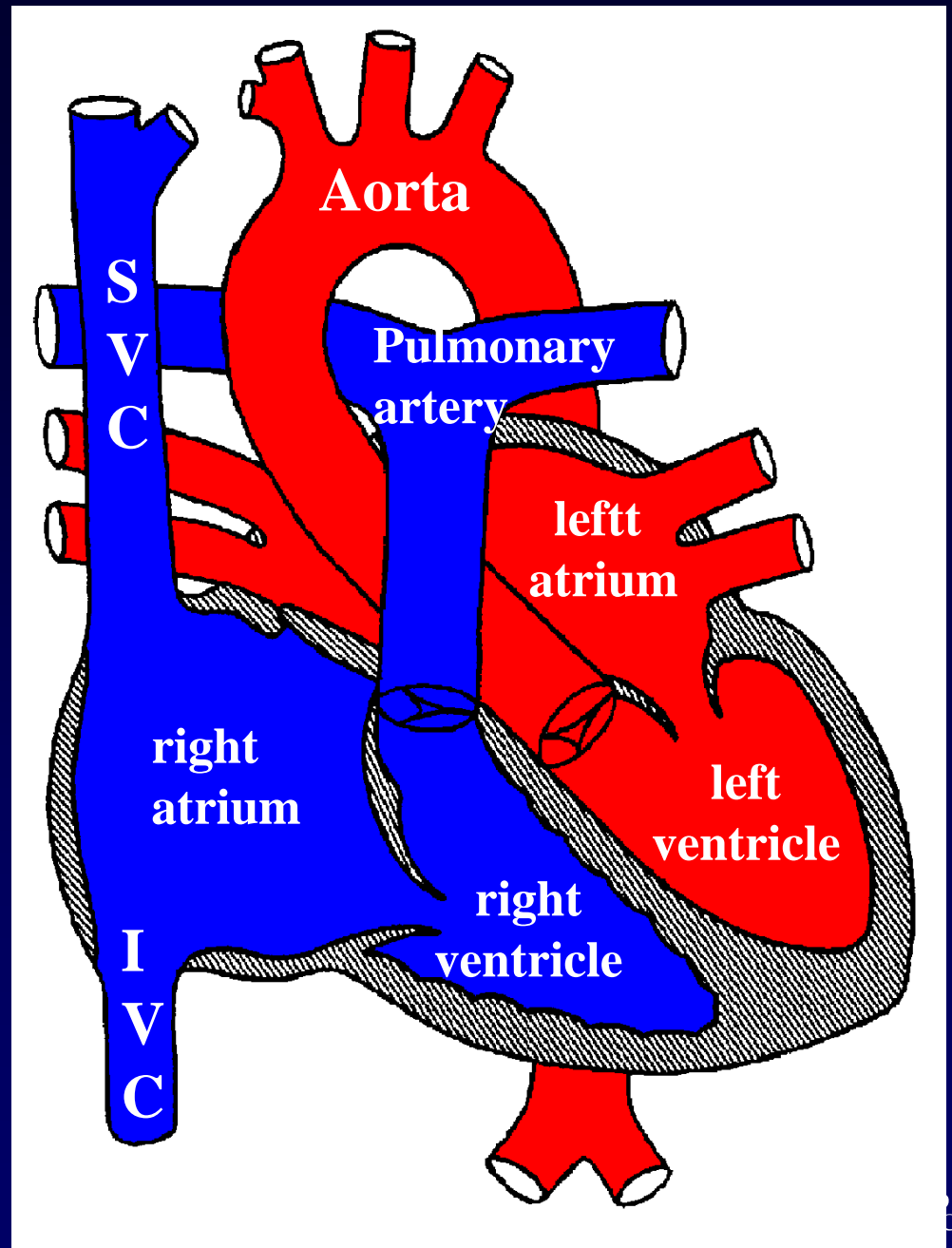
Bryan Cannon, MD
Professor Pediatric Cardiology

Past President
Pediatric and Congenital EP Society
(PACES)

**Congenital
Heart
Disease:
Present in
1% of
people**



NORMAL HEART



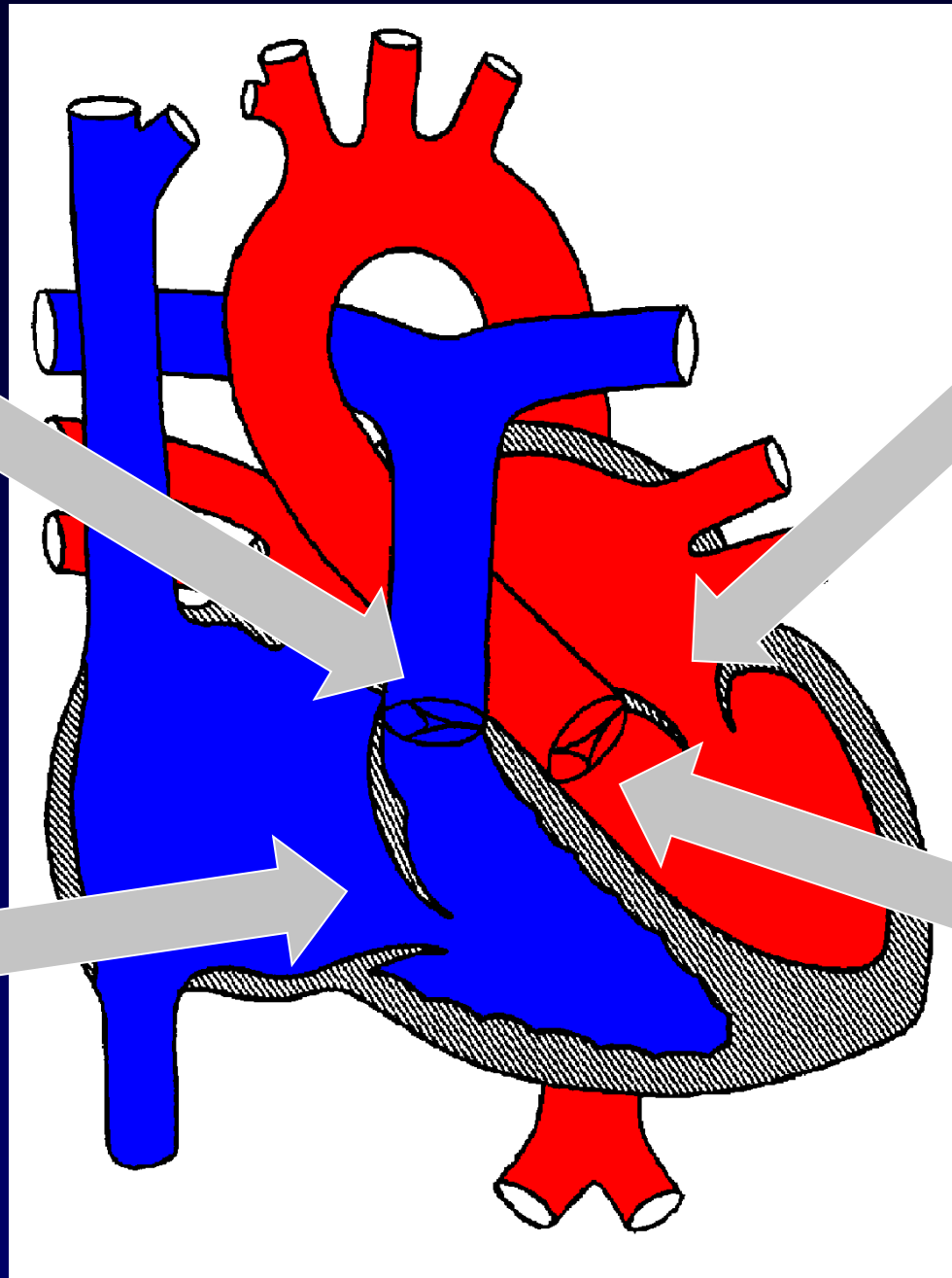
Valves

pulmonary

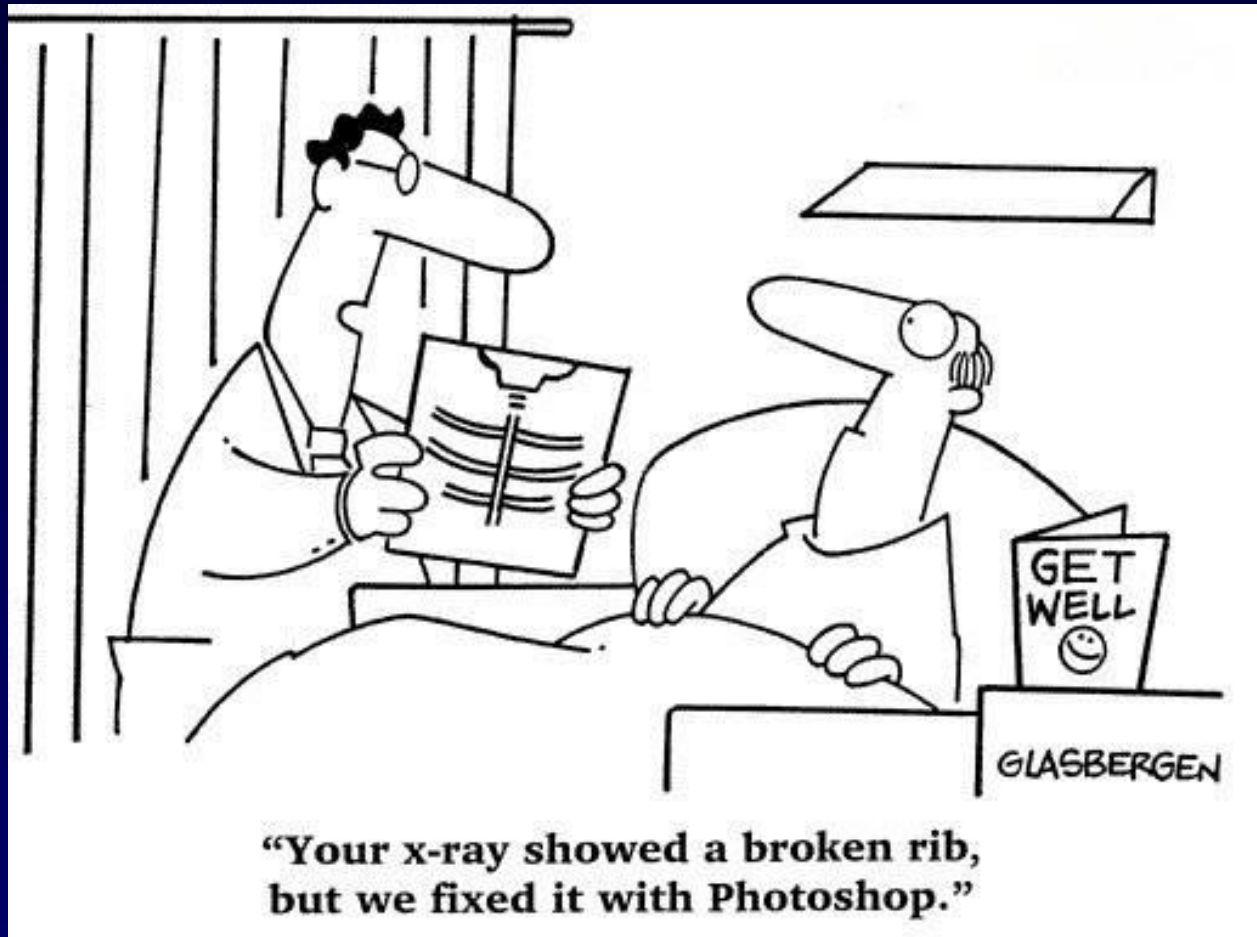
mitral

tricuspid

aortic

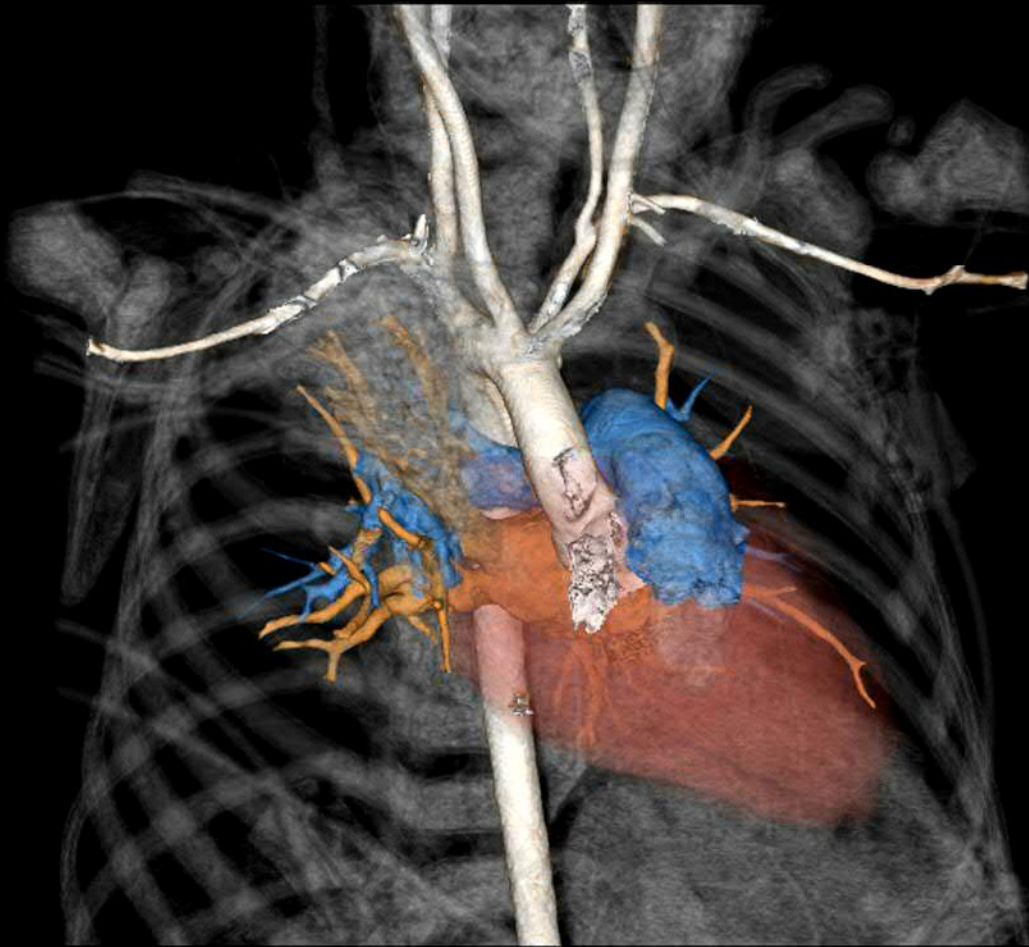


Imaging



R

L



%R-R: 75

FOV: 275.09 mm

TP75PC0460

70 kV

2249 mA

Tilt: 0.00

RAO 18: CRA 0

No: 62

F



W: 243 L: 229

R

L



F

%R-R: 75

FOV: 275.09 mm

TP75PC0460

70 kV

2249 mA

Tilt: 0.00

RAO 18: CRA 0

No: 42



W: 243 L: 229

P

A



%R-R: 75

FOV: 222.84 mm

TP75PC0460

70 kV

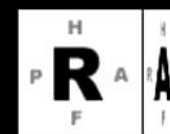
2249 mA

Tilt: 0.00

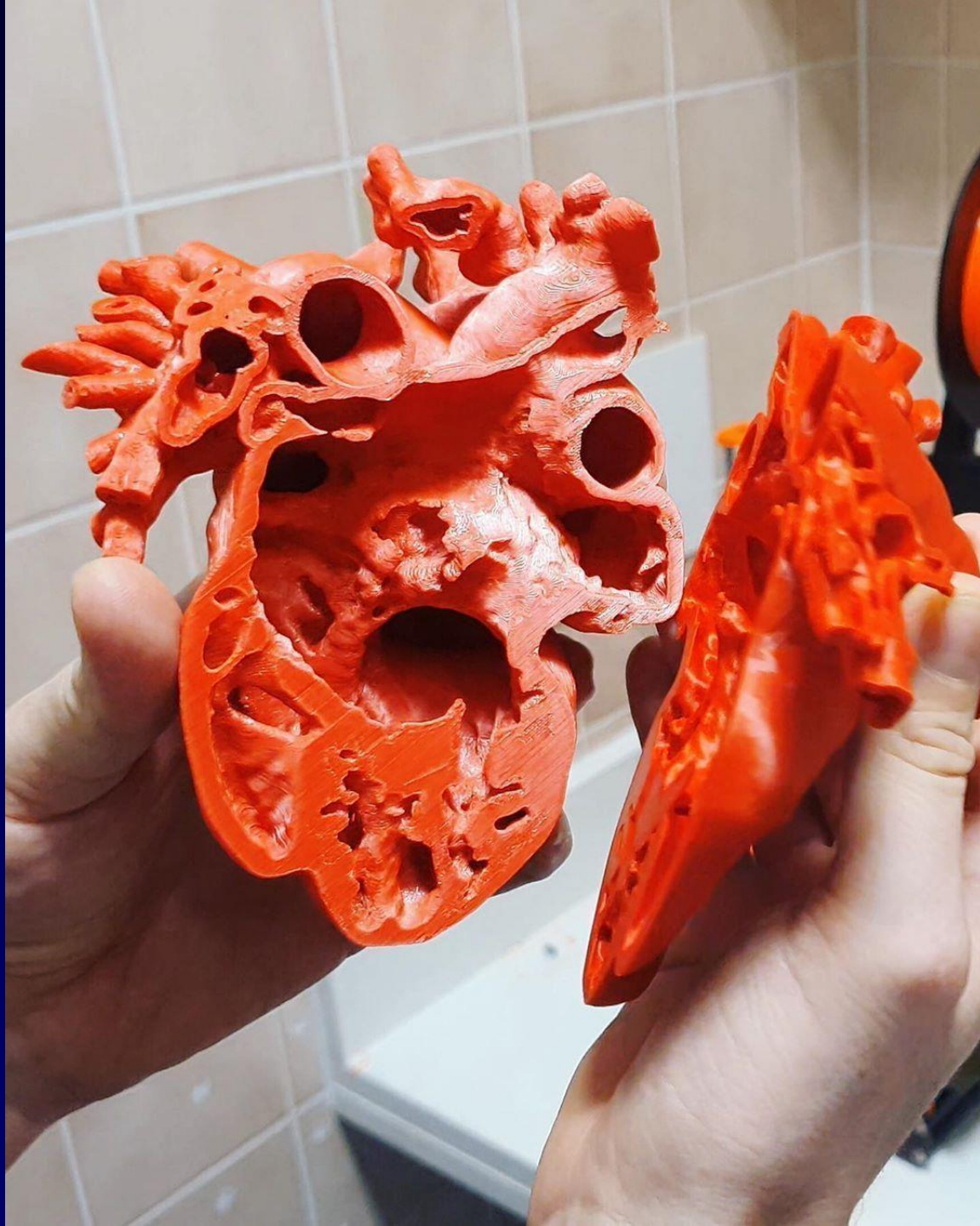
RAO 72: CRA 0

No: 5

F



W: 243 L: 229



Ablations without Fluoroscopy

File Amplifier HotKeys Help

Jan 28, 2013 04:01:27 PM



Ablation Procedure



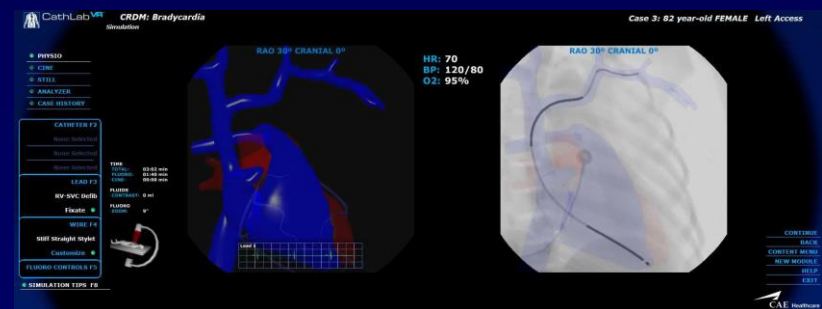
Training the next generation of cardiologists



Pictures: Courtesy



Training the next generation of cardiologists



Pictures: Courtesy



Non-Invasive Procedures
Important to be more than just close to
the real thing.....



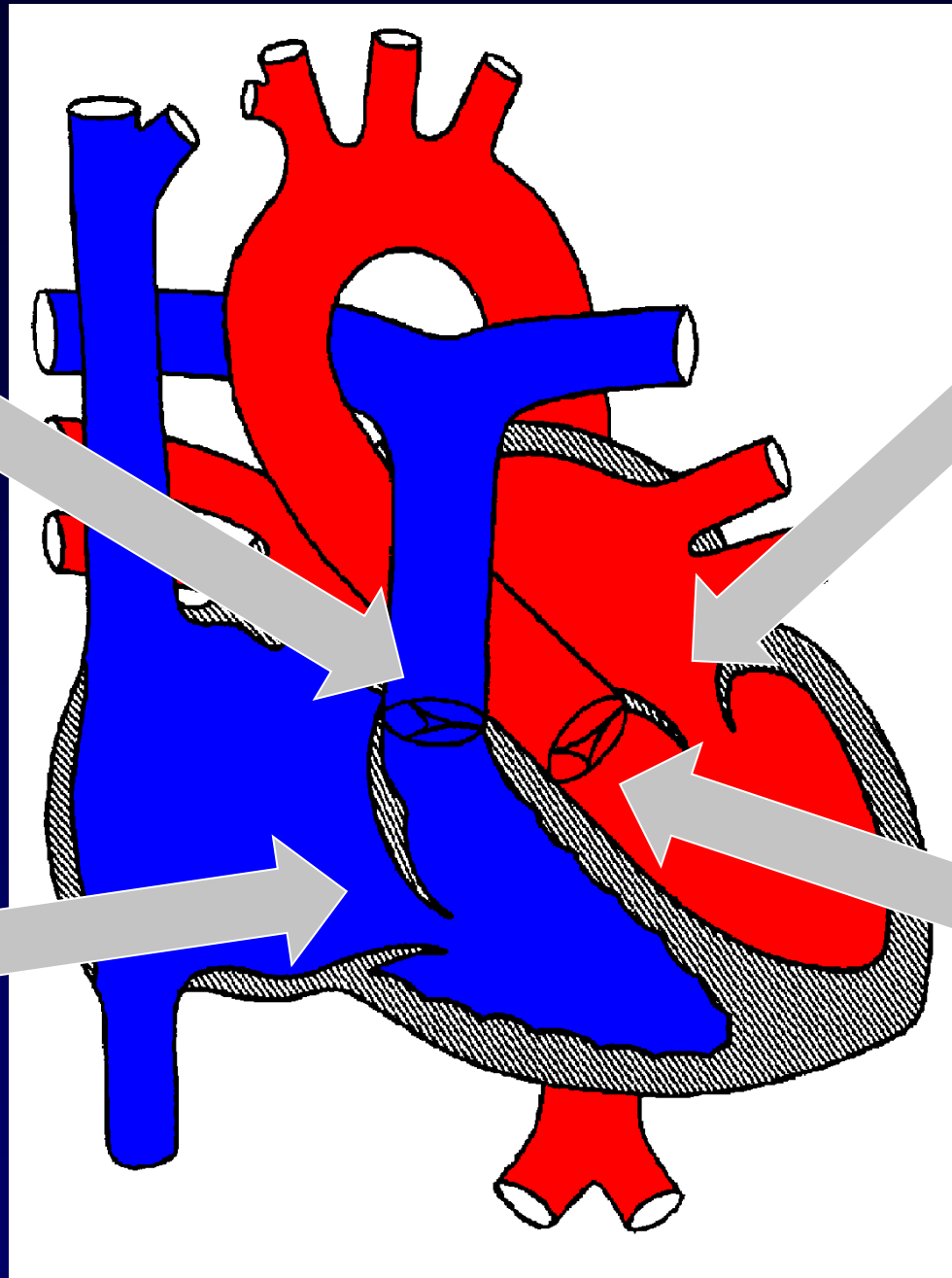
Valves

pulmonary

mitral

tricuspid

aortic

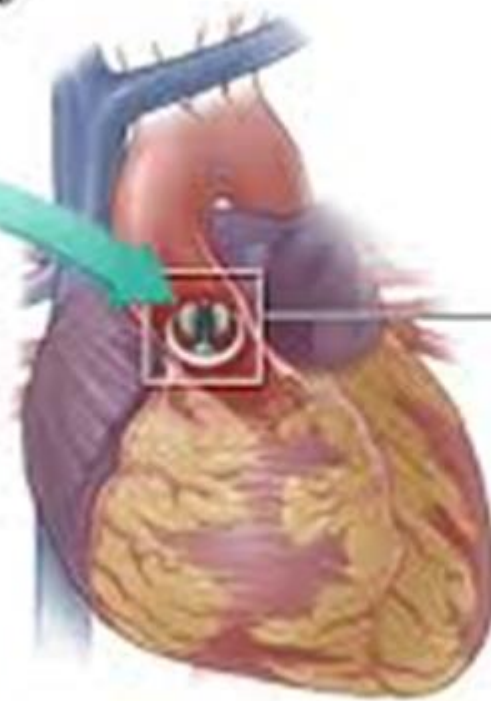




Mechanical valve

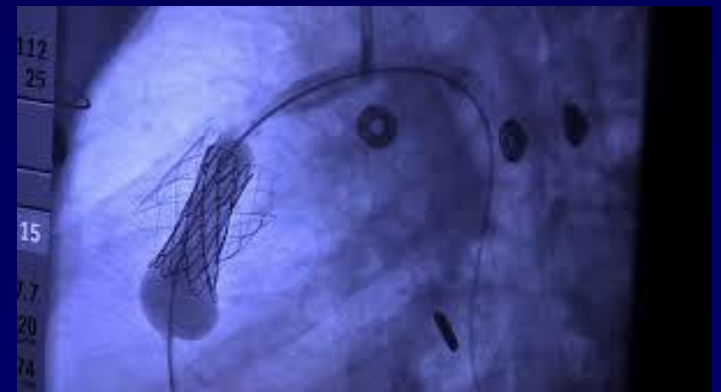


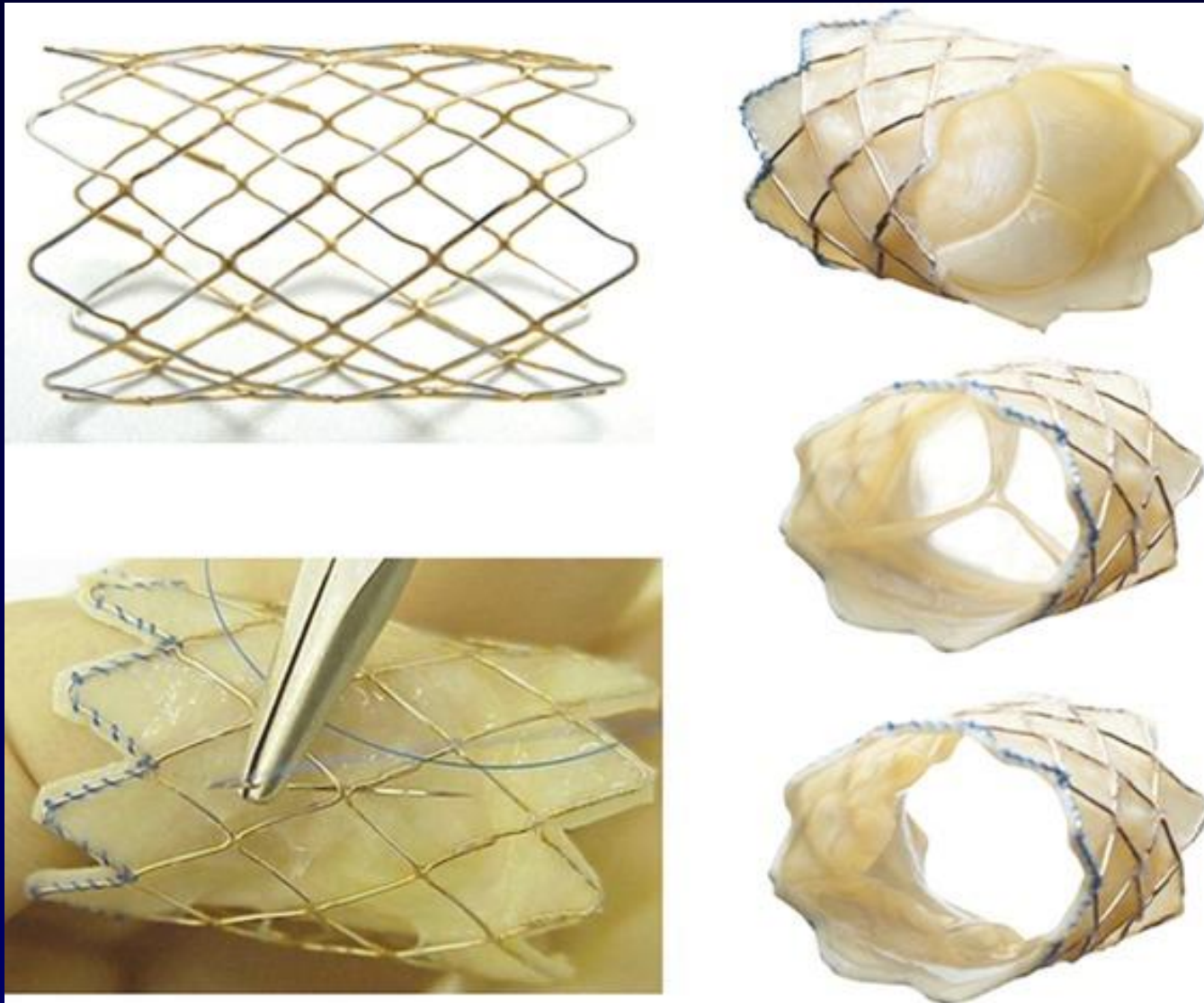
Tissue valve



Artificial valve
is sewn in place



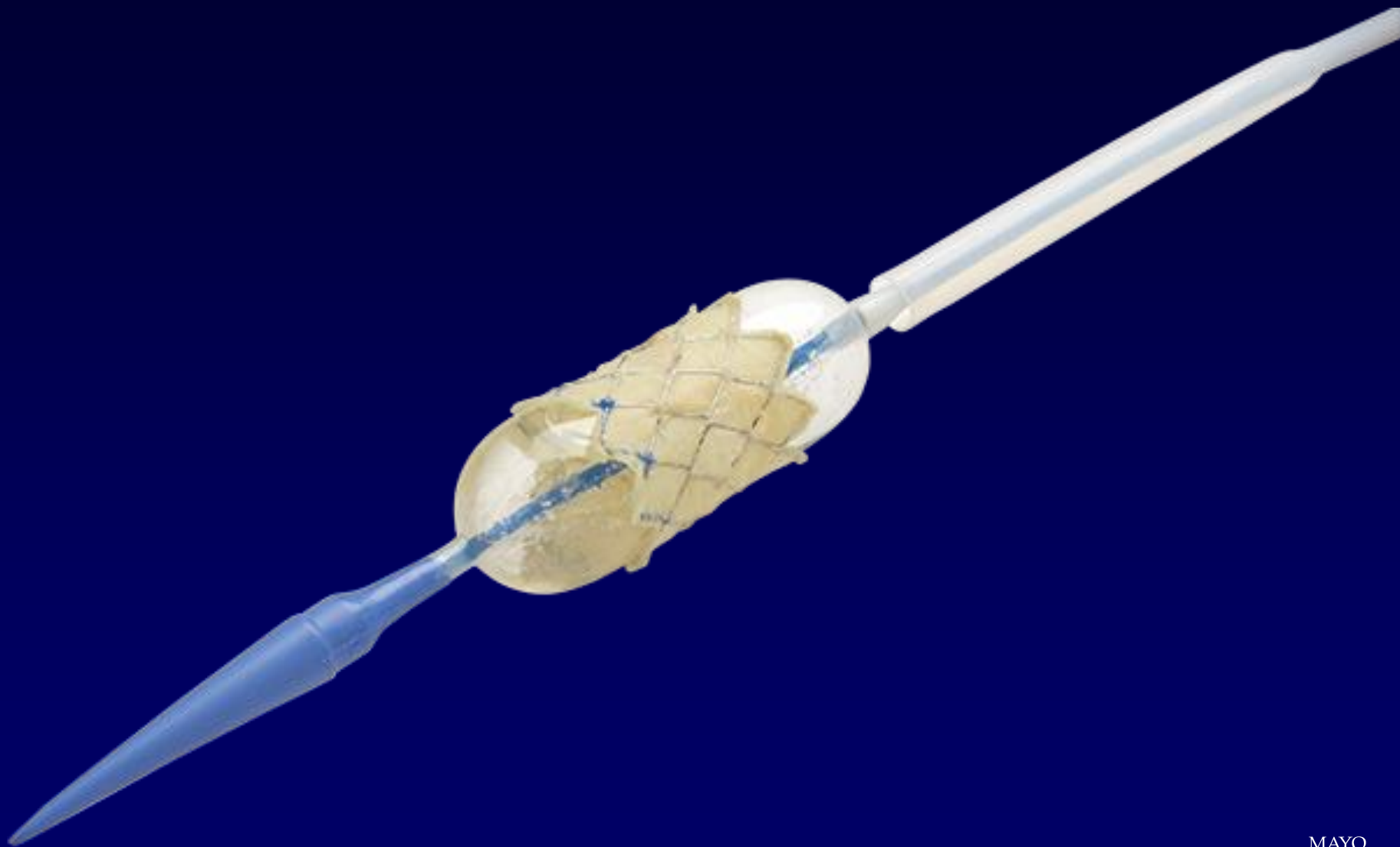


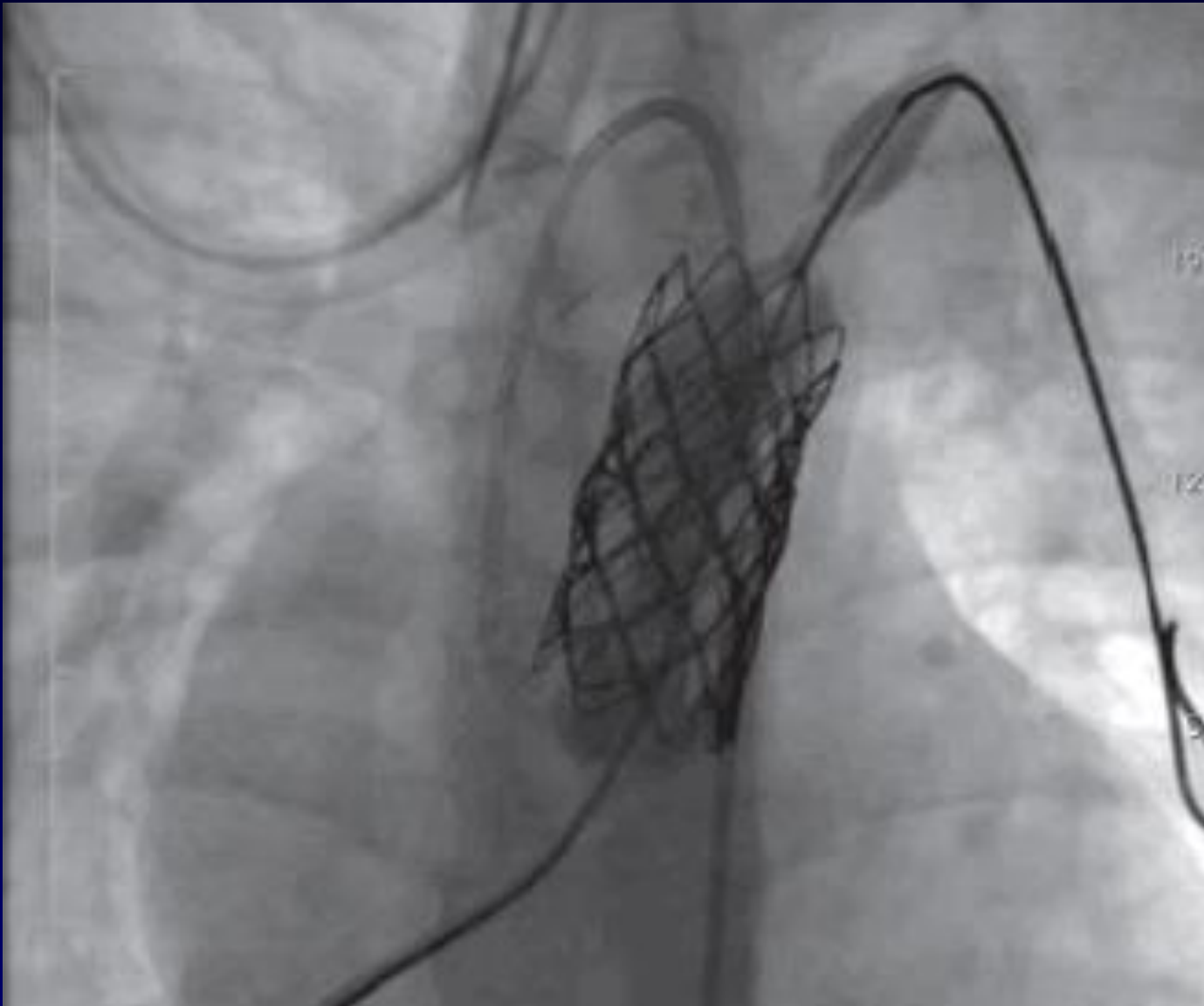


McElhinney DB, Hennesen JT. Ann N Y Acad Sci. 2013 Jul;1291:77-85.

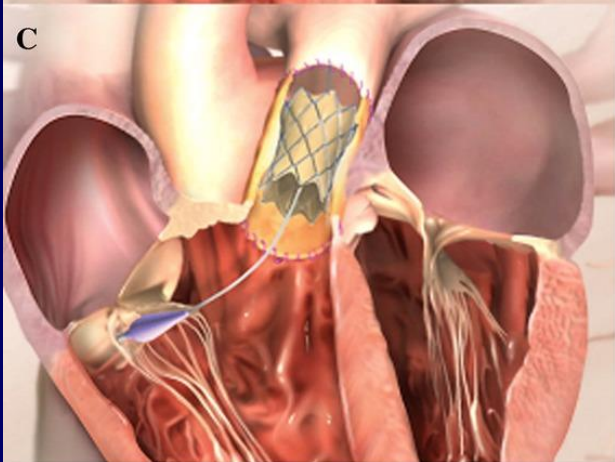
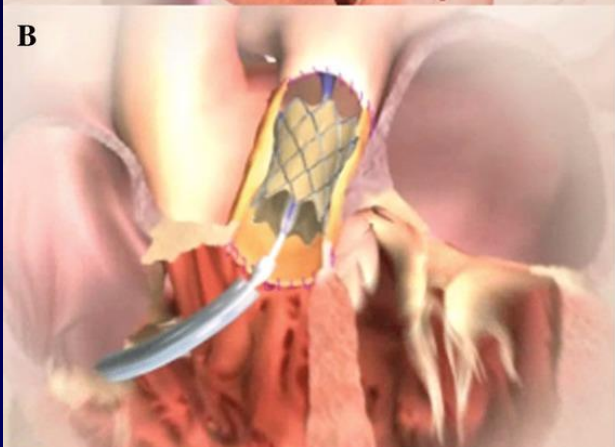


McElhinney DB, Hennesen JT. Ann N Y Acad Sci. 2013 Jul;1291:77-85.





Andreas Eicken. Interventional Cardiology (2012) Volume 4, Issue 2

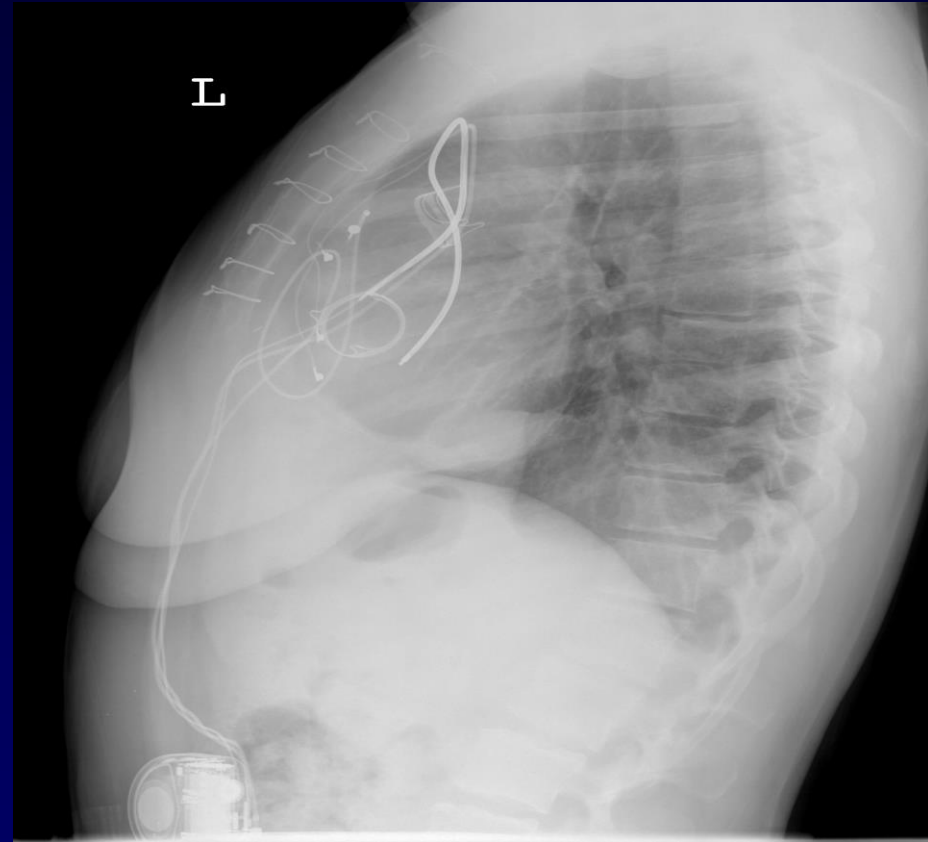
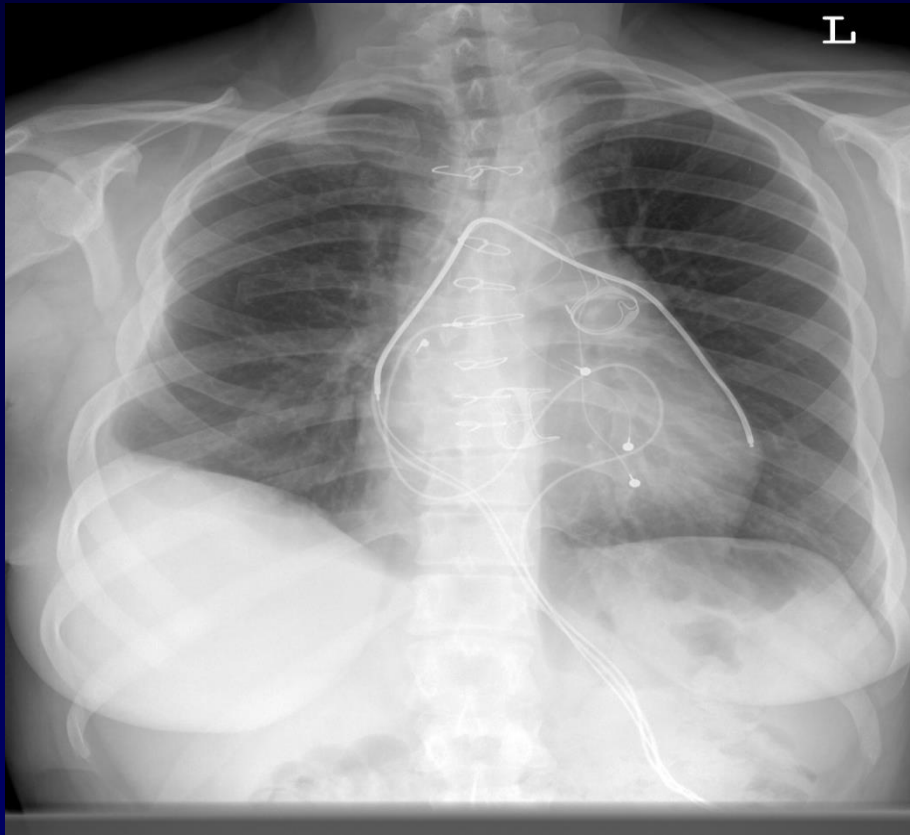


McElhinney DB, Hennesen JT. Ann N Y Acad Sci. 2013 Jul;1291:77-85.

Congenital Heart Disease is Different!
Just because things look the same.....



Lead in Pericardial Sac

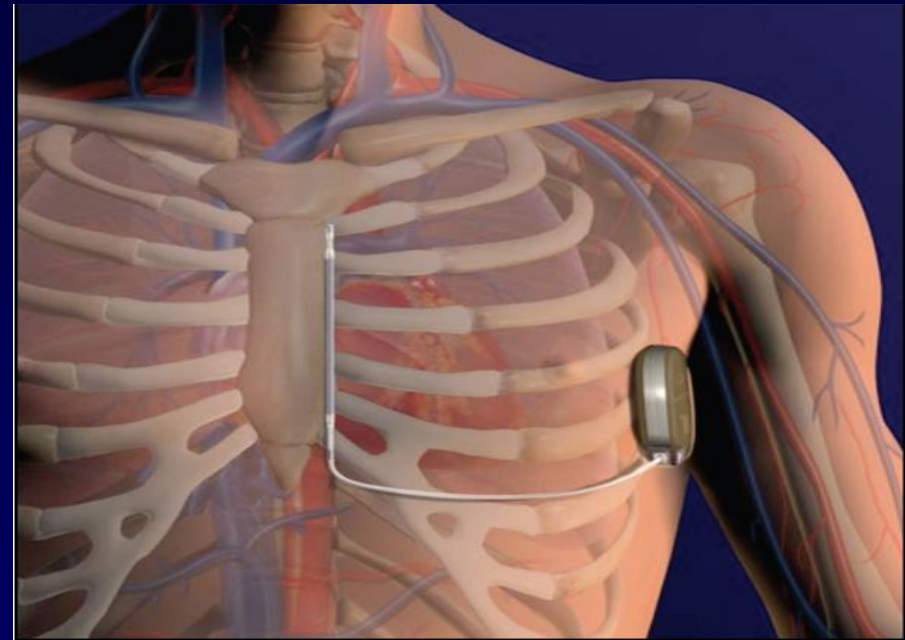


Cannon. *Pacing Clin Electrophysiol.* 2006;29(2):181-7



Subcutaneous ICD

- ICD placed laterally with lead along sternum
- No leads or wires in the heart or in the blood vessels
- Outpatient surgery



Picture: Courtesy Boston Scientific







10 year old 34 kg

McLeod KA, McLean A. Pacing Clin Electrophysiol. 2012 Jan;35(1):e20-3.

Is Smaller Better???



Leadless Pacemakers

- Implanted through femoral vein
- Self contained system with battery and lead all in one system (5-10 year life)
- 1cc volume

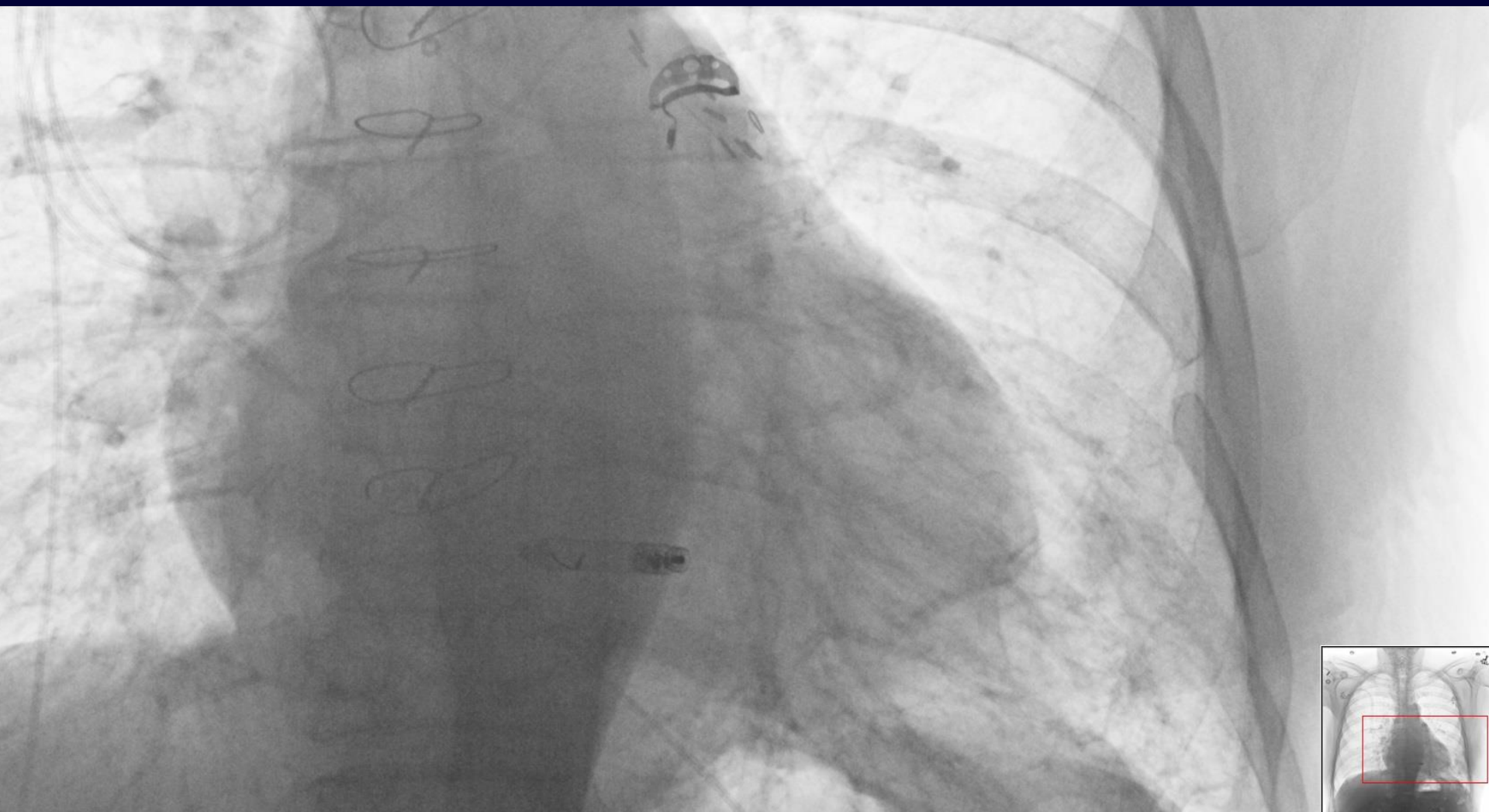


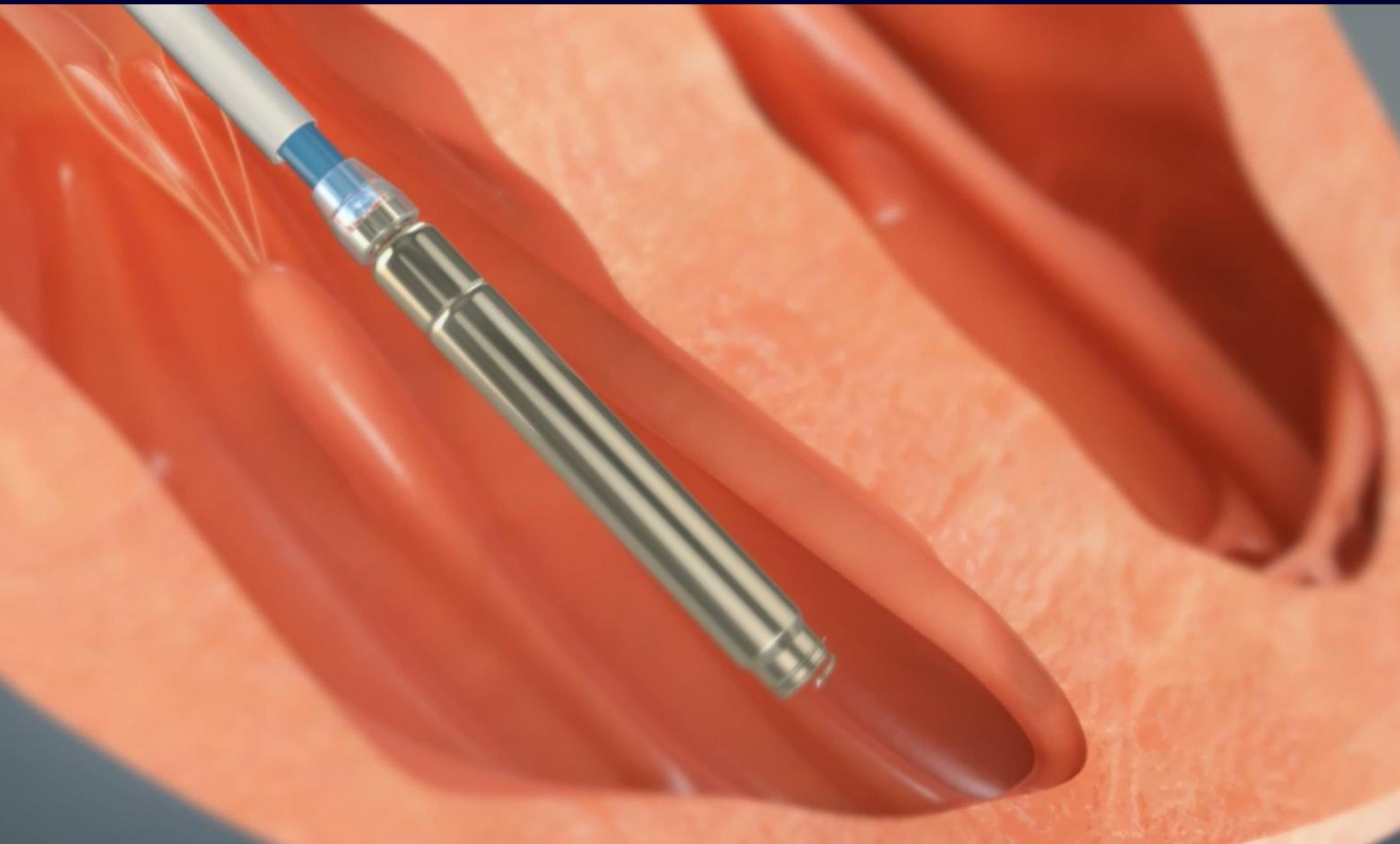
Disadvantages

- Only available for single chamber pacing
 - <10% of adult implants are single chamber
 - Possibility for pacemaker syndrome
- May be difficult to extract
 - Young patients have more fibrosis
 - Removal at device change unlikely
- Battery life decreases drastically with increased output
 - 10-12 years at 1V
 - 2-3 years at 3V





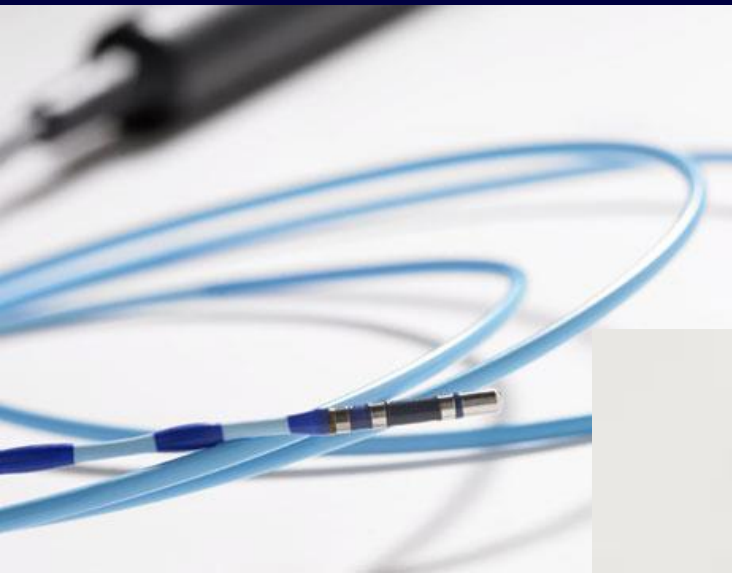




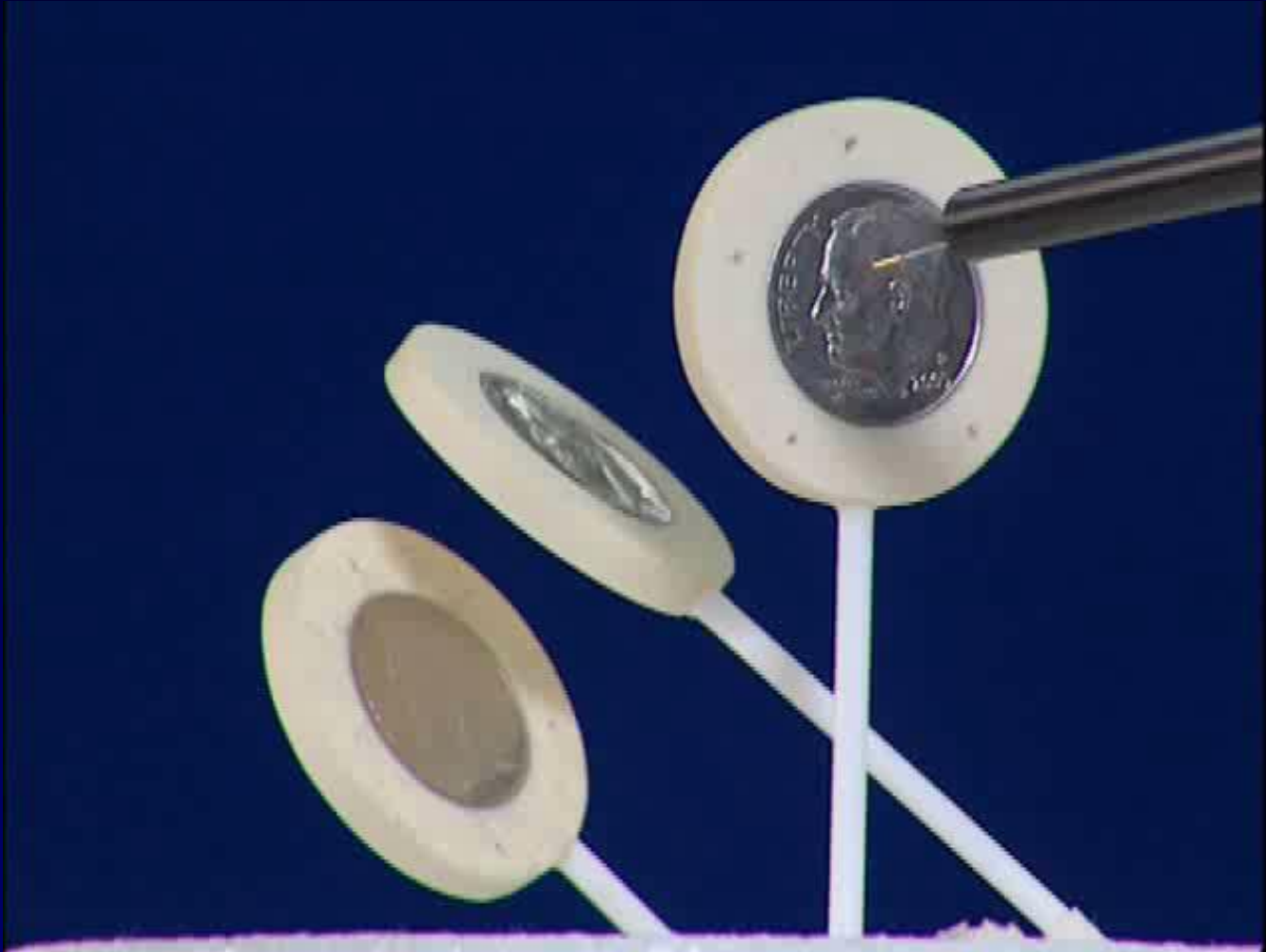
New Ways of Doing Things....



Manipulating Catheters







What is good for adults, may not be good for children...

Bad Parenting



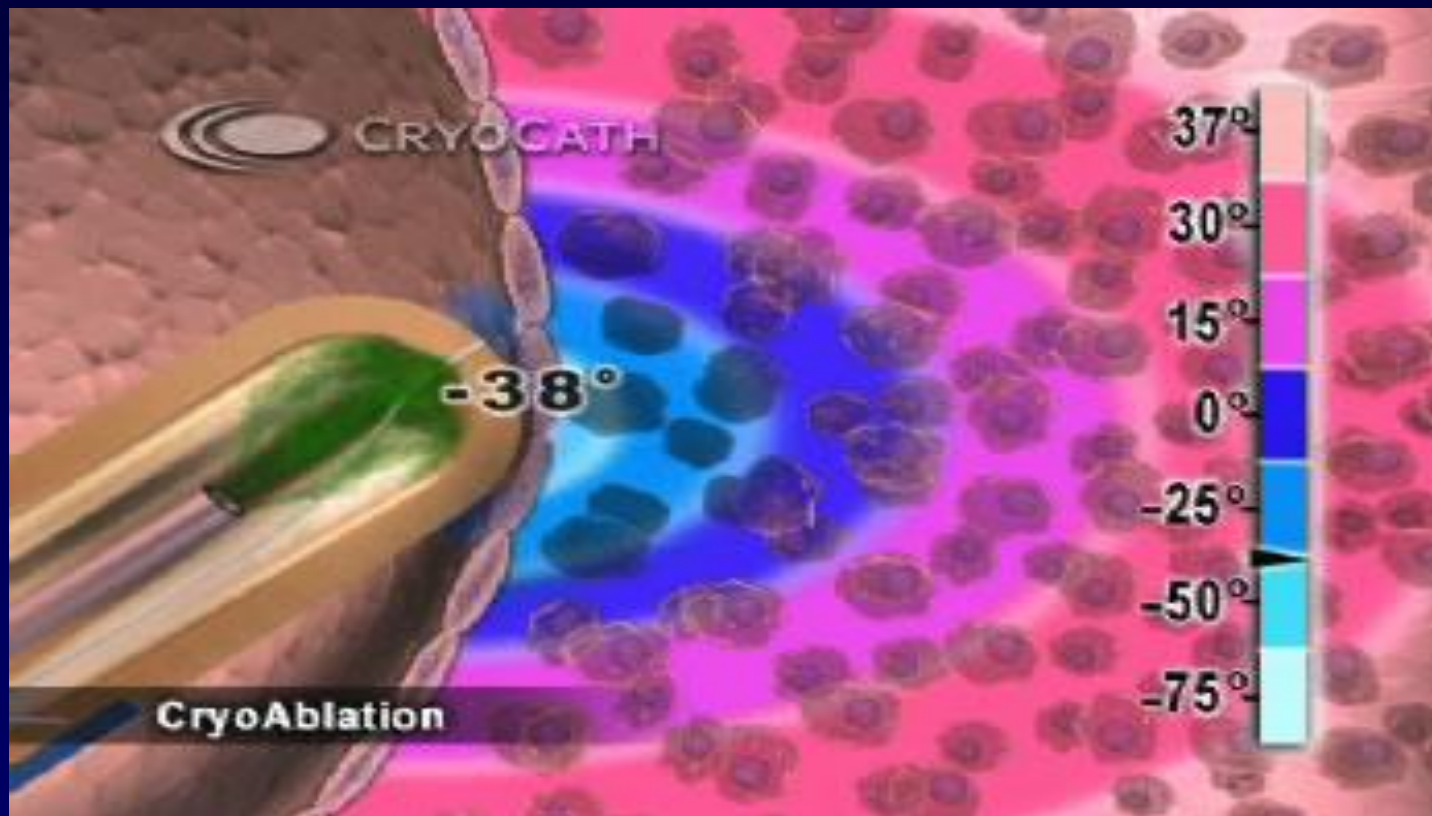
Food and Drug Administration (FDA)

- A physician can use a legally marketed device outside its labeling to treat a patient
- Although there has been no evaluation by FDA of the usage in question, off-label use is common, accepted, and legally authorized under a prescribing physician's scope of practice
- **EXTREMELY** common in pediatrics
 - Very few medication and devices approved for pediatrics

Ablations

- Potentially eliminate arrhythmias
- Risk of damage to normal fiber requiring a permanent pacemaker in 1-3%
- To date, there has not been a reported case of damage to the normal fiber using cryoablation
- Not approved in pediatrics...

Expanding zone of cooling



Until 2022

- FDA working with members of the pediatric EP community and Medtronic
- Small market for pediatrics
- Used “real world data”
- Now approved for ALL children over 2 years of age
- 8 year process, but now streamlined

So What Does Approval Do?

- Allows companies to discuss and educate physicians about their products
- Allows lectures and symposia to give specific tips and techniques for device use
- Allows open discussion and dialogue about “best practices” for approved devices
- Does not require discussion with patient about non-FDA approval during consent

