Penn Medicine
Lancaster General Health

50 Years of Lancaster Cardiology 1965-2015

Mark W. Burlingame, MD
Neil R. Clark, MD
William D. McCann, MD
John P. Slovak, MD
Nikitas J. Zervanos, MD - moderator

April 21, 2016
Lancaster County History Campus

50 years of Lancaster Cardiology: 1965-2015

PHYSICIANS

ELECTROCARDIOGRAMs

CONSTANT CARE UNIT

CODE BLUE/MAX CART

MOBILE CORONARY CARE

SUMMARY/ACKNOWLEDGEMENTS

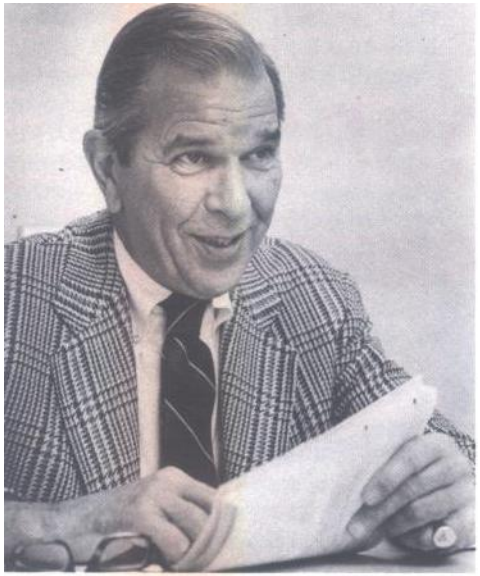
Penn Medicine
Lancaster General Health

50 Years of Cardiology in Lancaster County

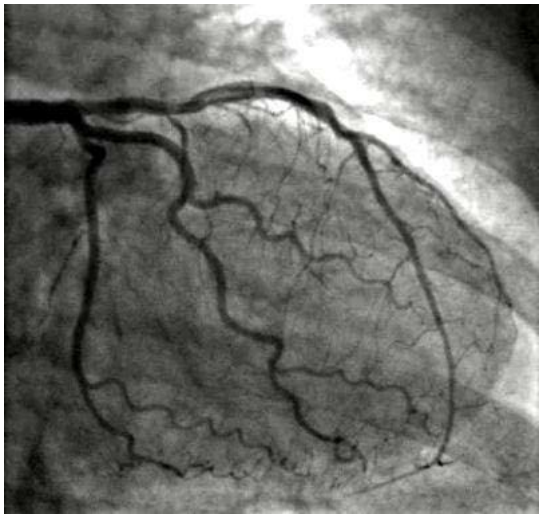
John P. Slovak, MD
The Heart Group of Lancaster General Health

April 21, 2016
Lancaster County History Campus

First Cardiac Catheterization



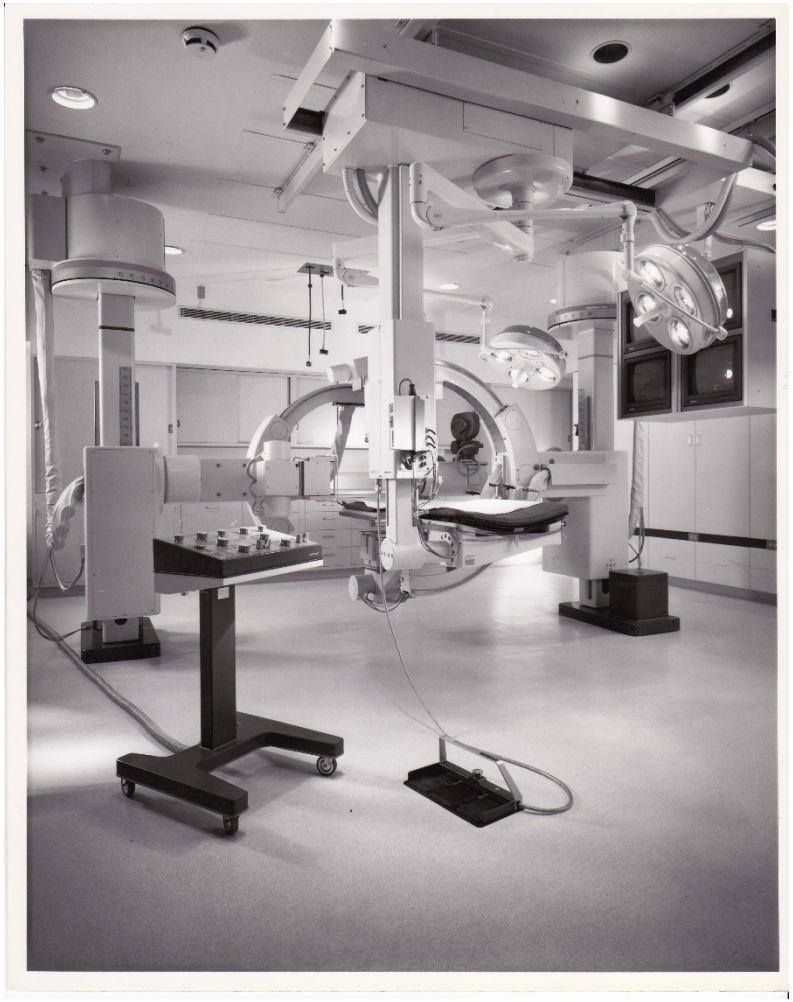
Dr. Richard Mann



Coronary Angiogram

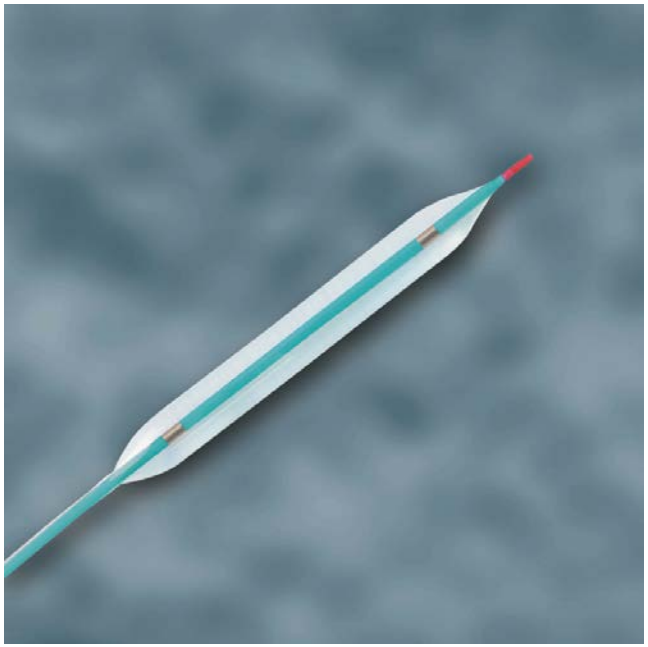
Dr. John Esbenshade

First Dedicated Cardiac Catheterization Lab

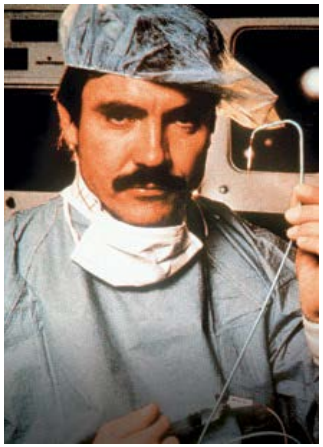


LGH Cath Lab, 1980

First PTCA



PTCA Catheter

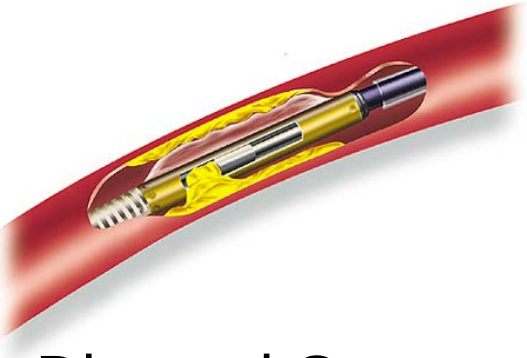


Andreas Gruentzig

Dr. James Gault

Atherectomy Era

Rotoblation Catheter



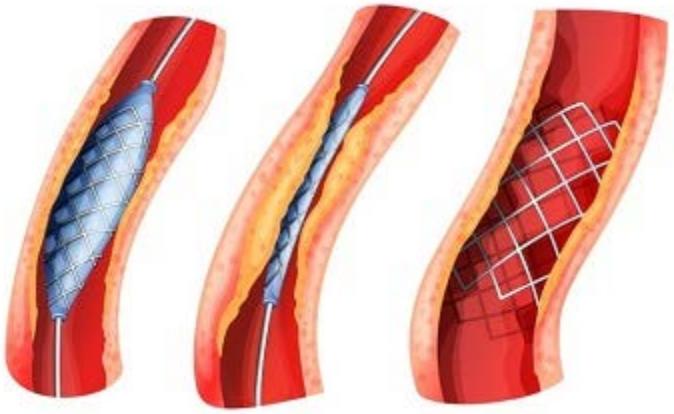
Directed Coronary Atherectomy Catheter (DCA)

Coronary Laser Catheter

First Stent

Dr. Rolf Andersen

Coronary Stent



Initial Structural Intervention Era

Dr. Paul Casale

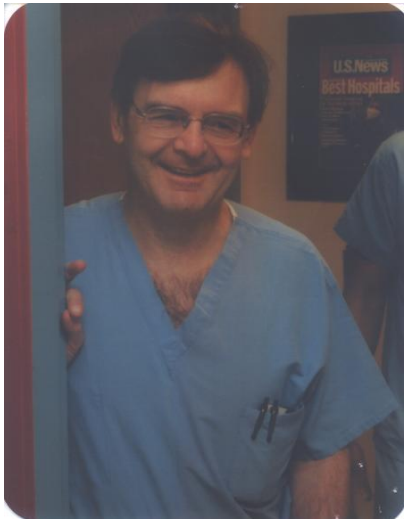
Dr. Richard Gentzler

Treatment of Acute MI

Fibrinolysis (1980s)

Primary PTCA (1990s)

Primary Stenting (2000s)



Dr. Seth Worley – Code R

New Structural Intervention Era

Dr. James Harvey

Dr. Rupal Dumasia

Hybrid Operating Room

Future

50 Years of Noninvasive Cardiology in Lancaster

Neil R Clark, MD

Noninvasive Cardiology

- Imaging of the cardiac system without invasion of the vascular system

Noninvasive Cardiology

- Imaging of the cardiac system without invasion of the vascular system
- Explosion of technology over the last fifty years

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- Digital technology and micro processing has led to incredible advances

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- CT Imaging
- Cardiac MRI

Noninvasive Cardiology

- Dedicated physicians exploring and bringing new technology to the community

Noninvasive Cardiology

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- Commitment of the hospital systems here in Lancaster to embrace new proven technology

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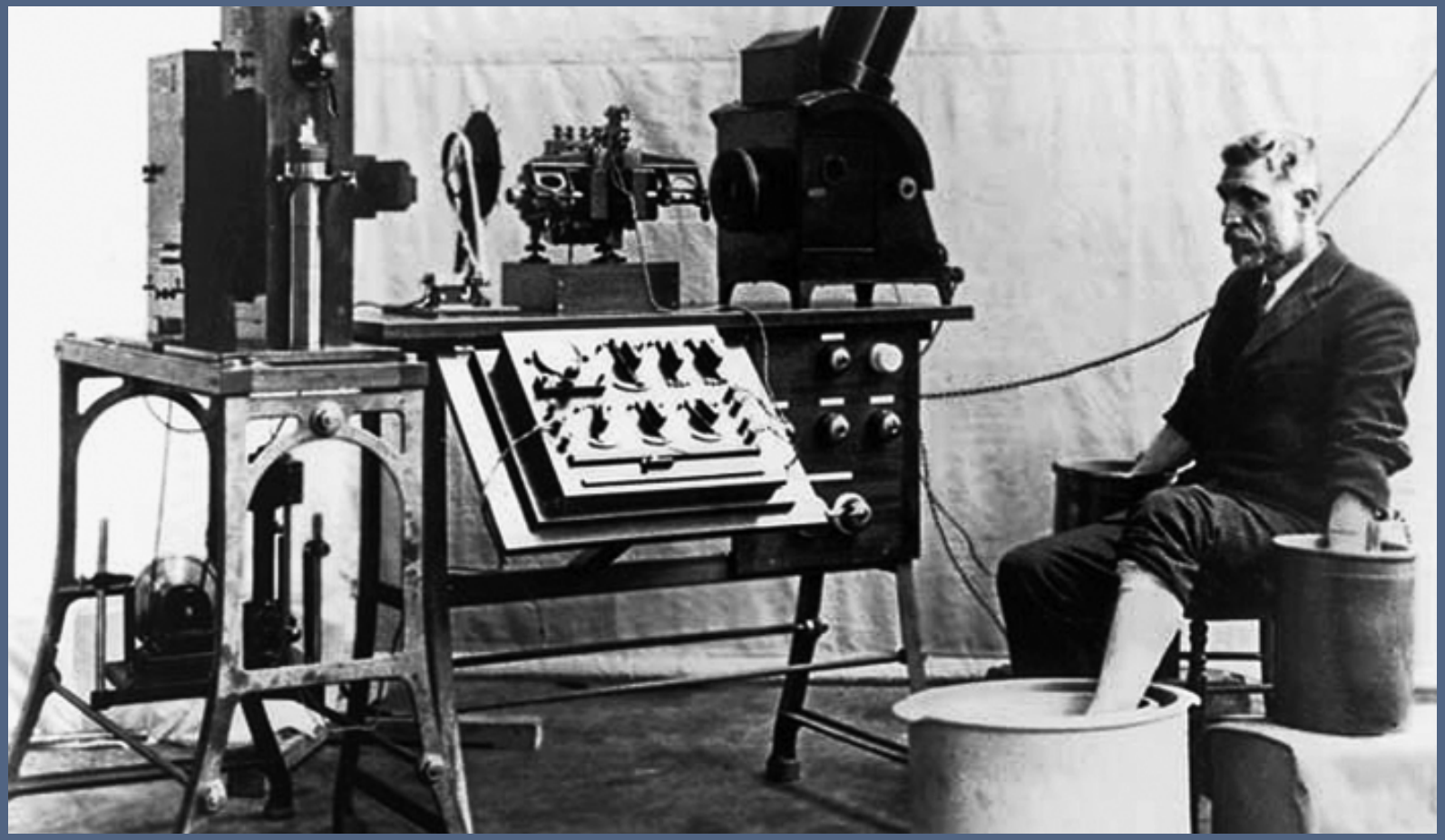
- Commitment of the community

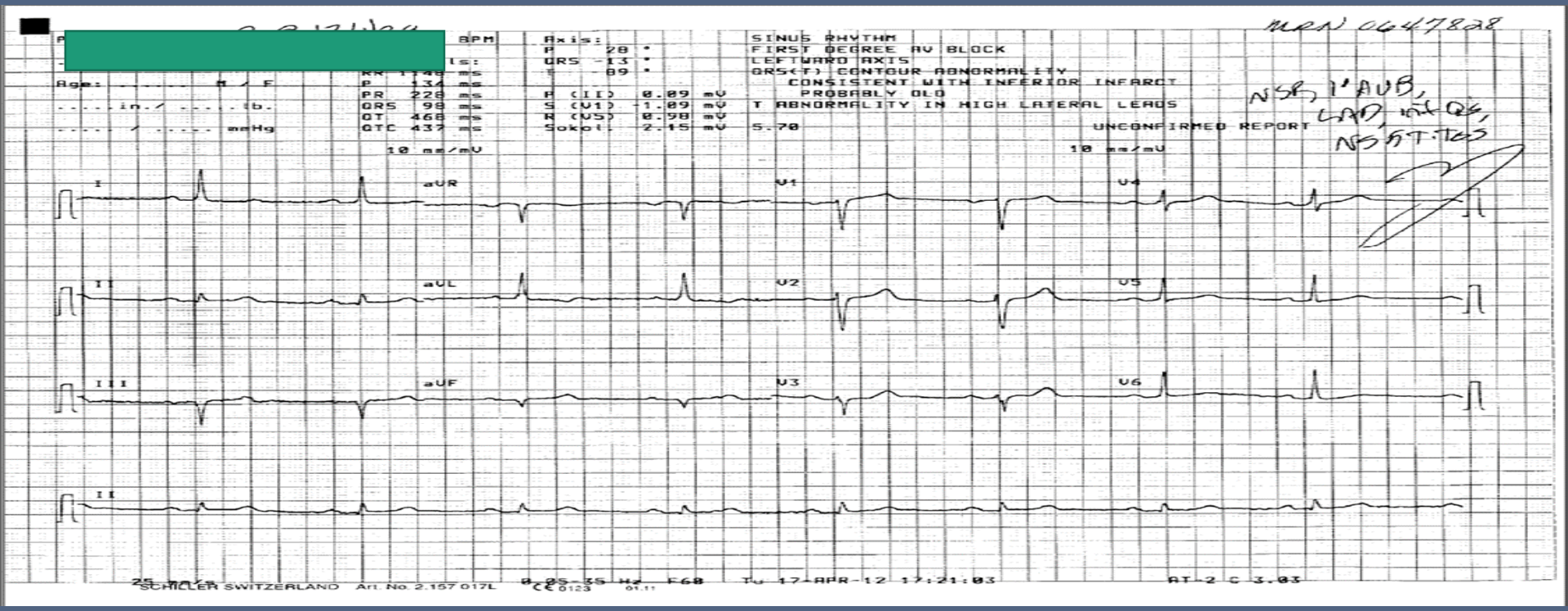
Noninvasive Cardiology

- Dedicated physicians exploring and bringing new technology to the community.
- Commitment of the hospital systems here in Lancaster to embrace new proven technology.
- Commitment of the community
- A robust and fiscally sound economy.

Early EKG



Appearance of a typical scanned ECG.



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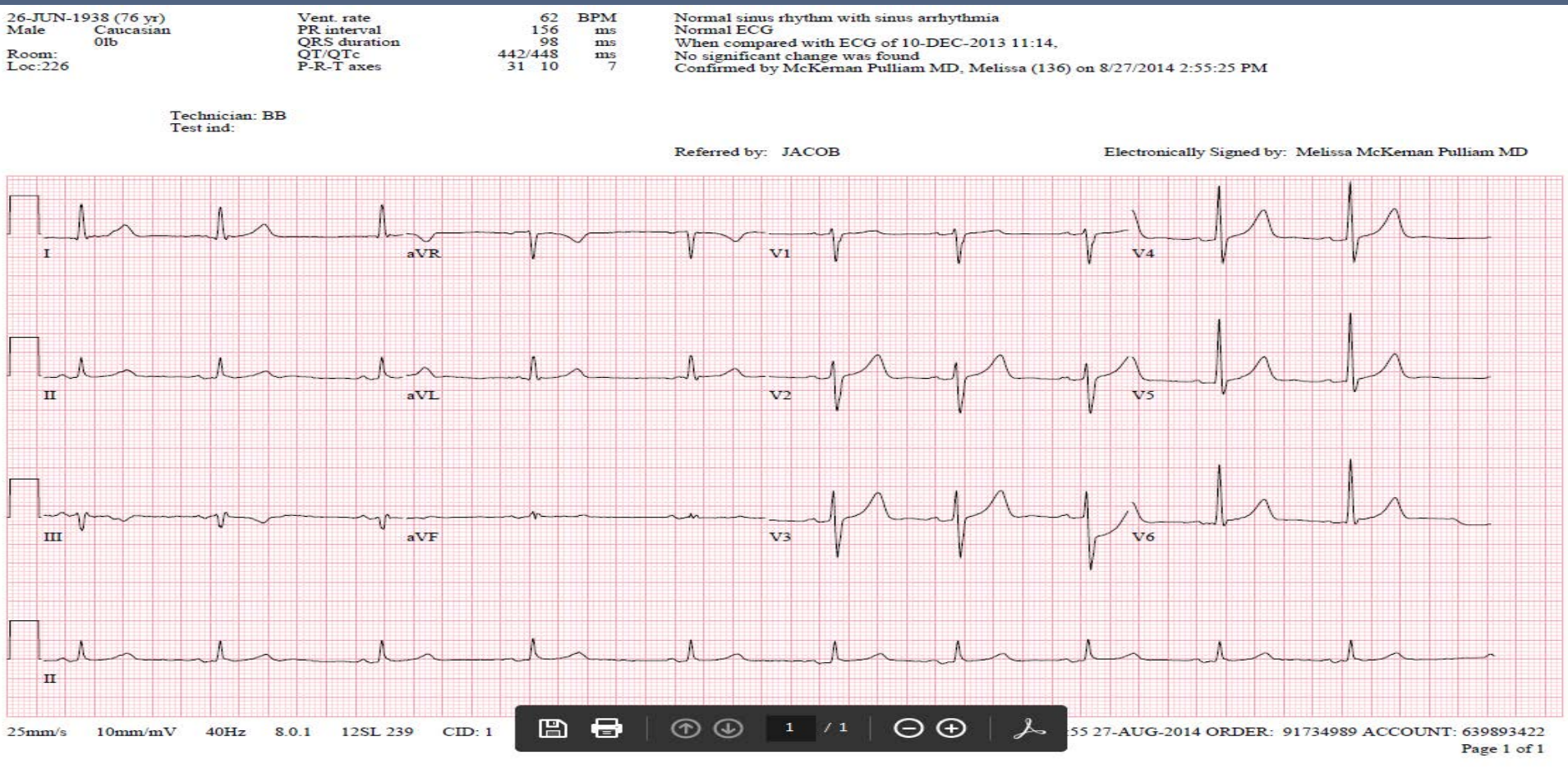
GE MUSE ECG in EPIC

2015

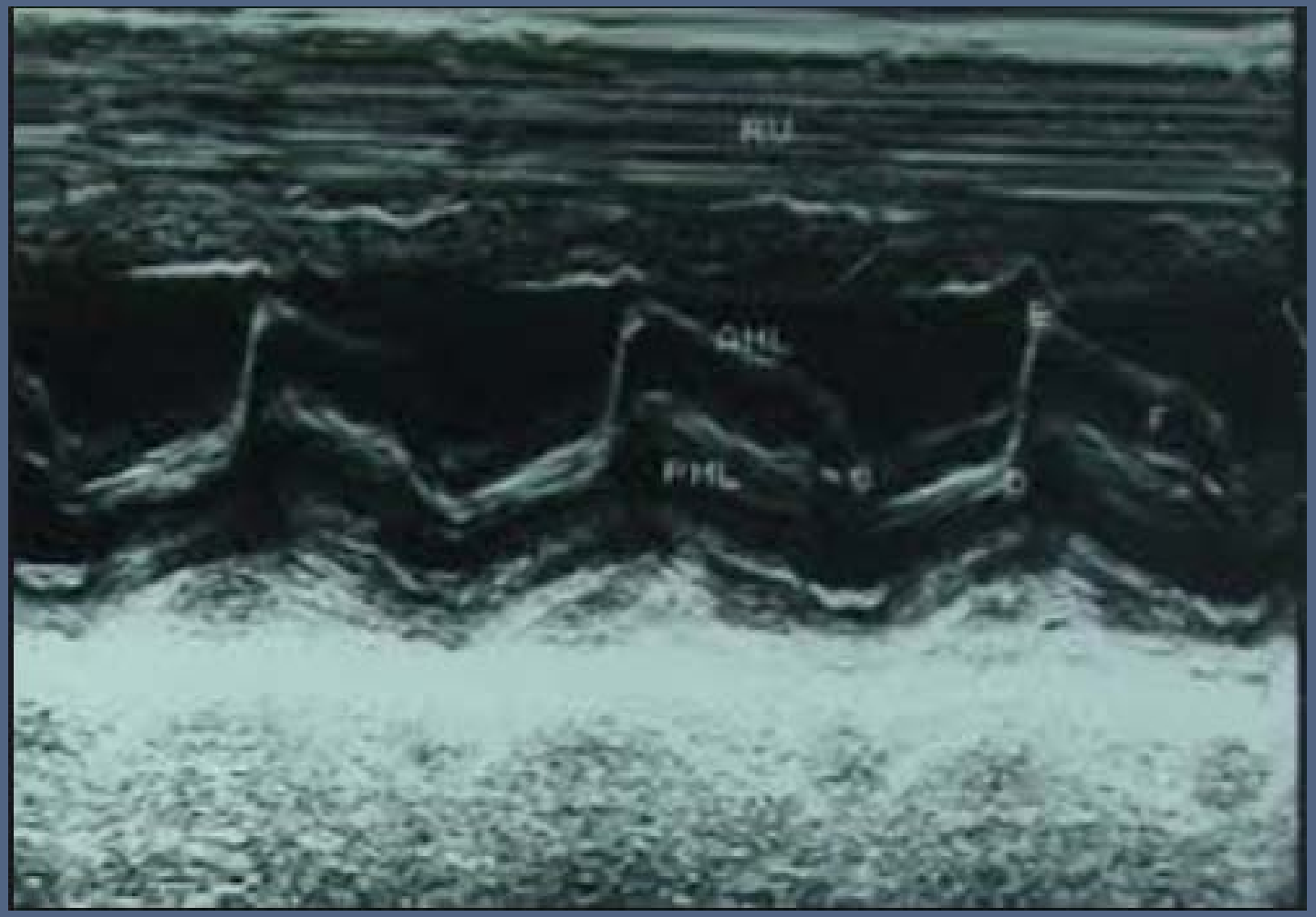


Lancaster General Health
Heart & Vascular Institute
Penn Medicine

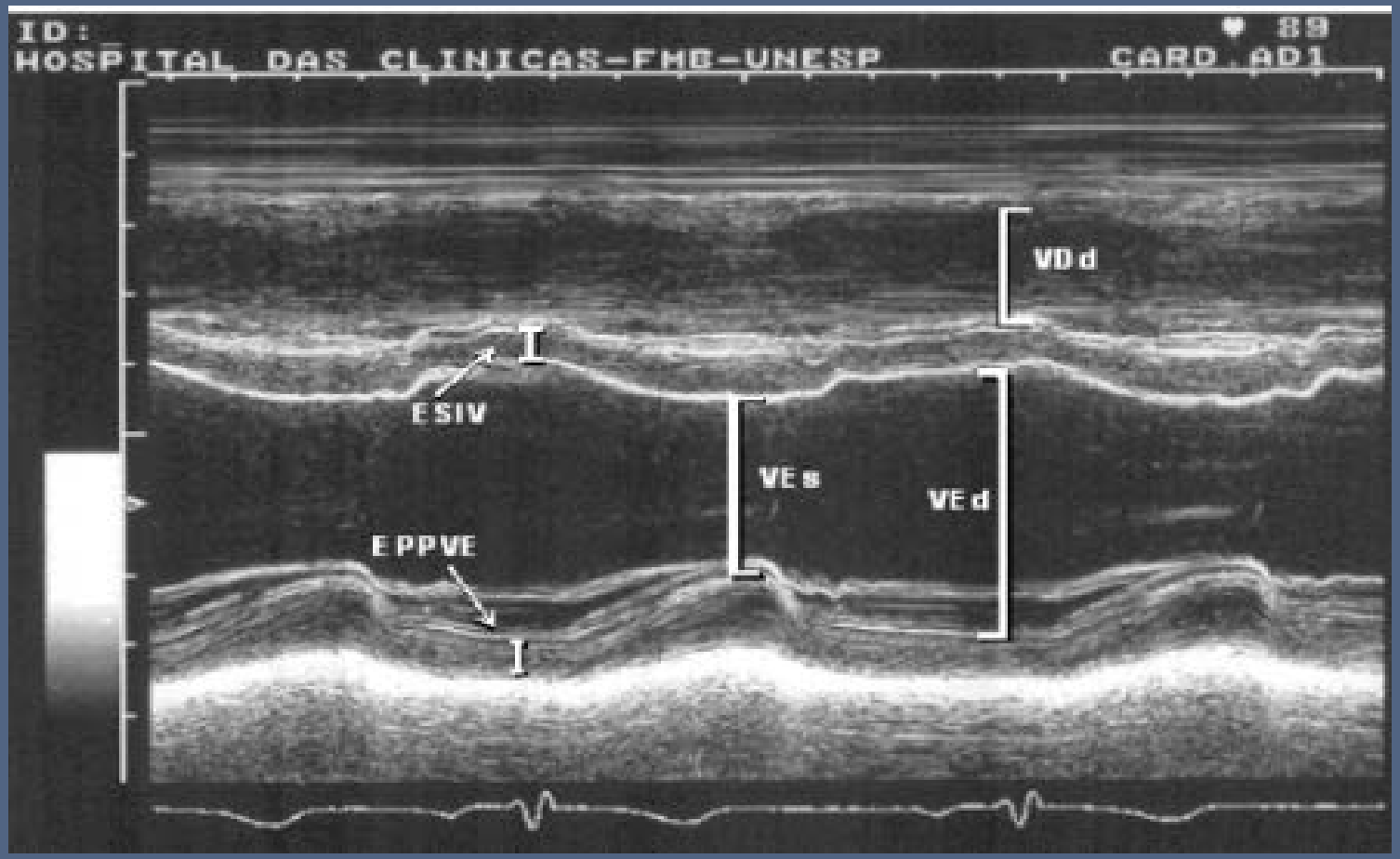
Echocardiography

- M Mode invented and used in the mid 1960's

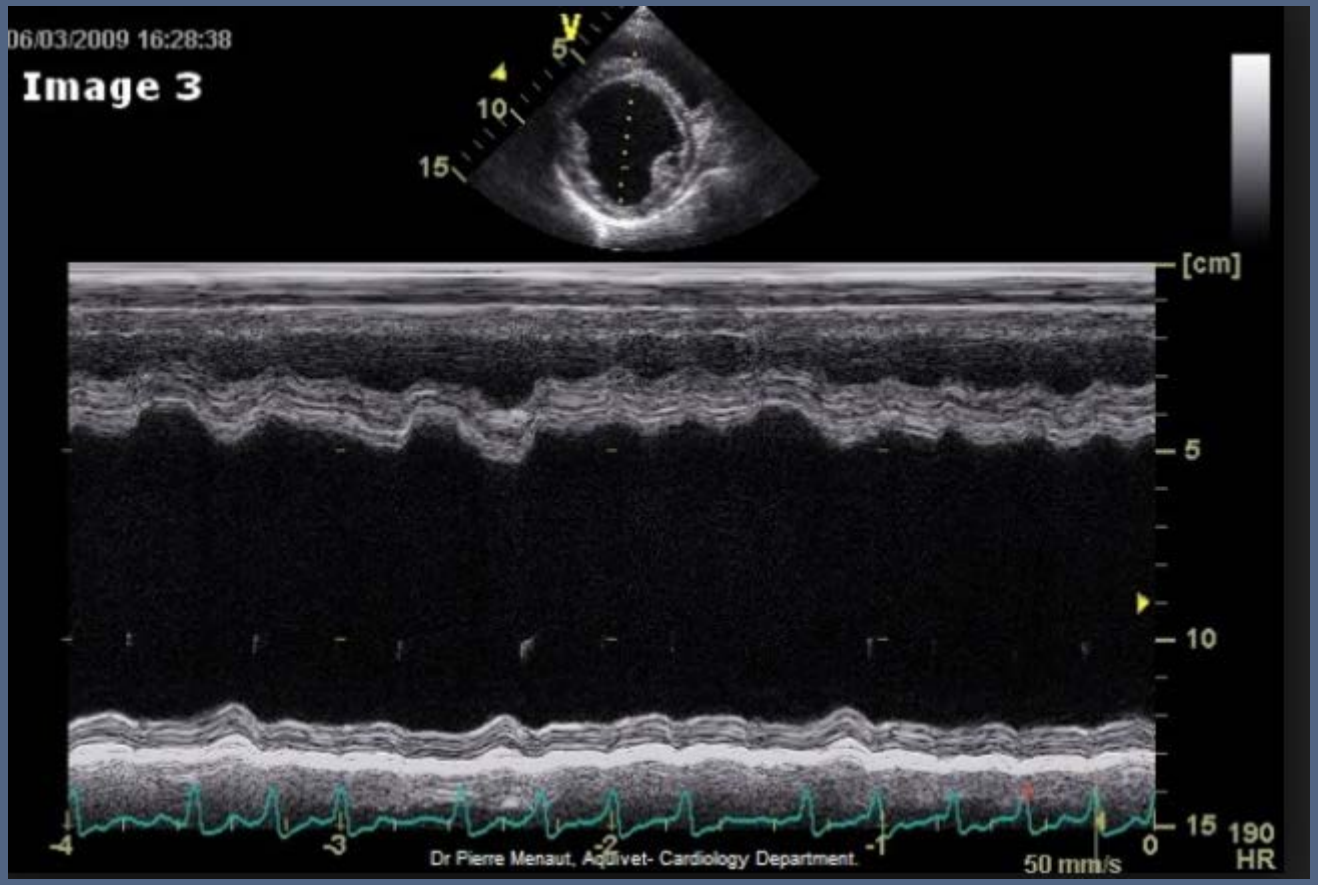
Early M Mode Echocardiography



Early M Mode Echocardiography



Early M Mode Echocardiography



Echocardiography

- M Mode invented and used in the mid 1960's
- Two dimensional echocardiography in the mid 1970's

Echocardiography

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- Two dimensional echocardiography in the mid 1970's
- 1980's Color flow Doppler was introduced

Color Flow Doppler

Echocardiography

- M Mode invented and used in the mid 1960's
- Two dimensional echocardiography in the mid 1970's
- Tranesophageal Echocardiography

TEE

TEE

TEE

TEE

Echocardiography

- M Mode invented and used in the mid 1960's
- Two dimensional echocardiography in the mid 1970's
- Tranesophageal Echocardiography
- 3 Dimensional imaging

3D TEE

3D TEE

3D TEE

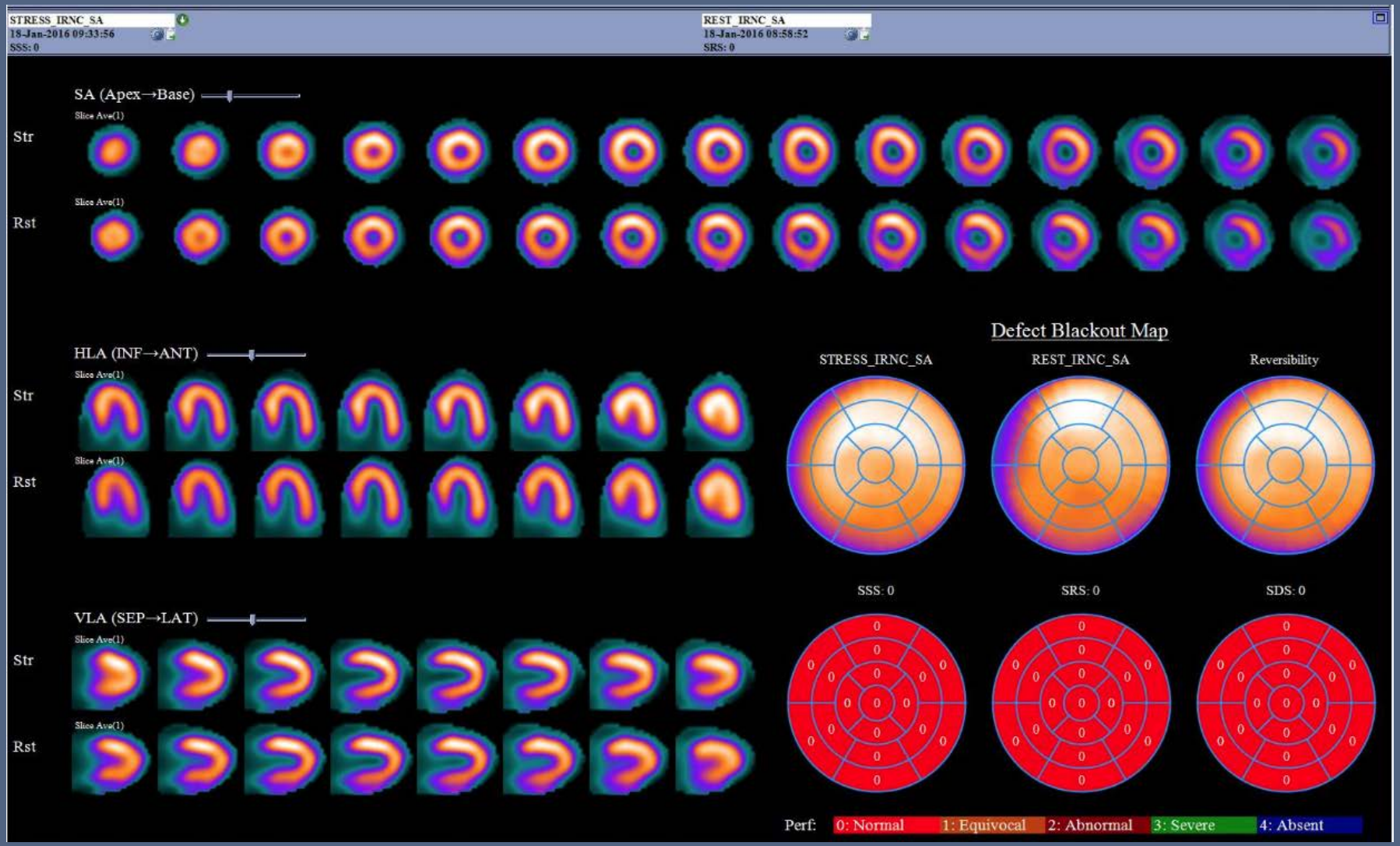
Echocardiography

- M Mode invented and used in the mid 1960's
- Two dimensional echocardiography in the mid 1970's
- Tranesophageal Echocardiography
- Strain Imaging

Left Ventricular Strain

Nuclear Imaging

Nuclear Imaging



CTA

- CT scanner technology

CTA

- CT scanner technology
- Fast acquisition times

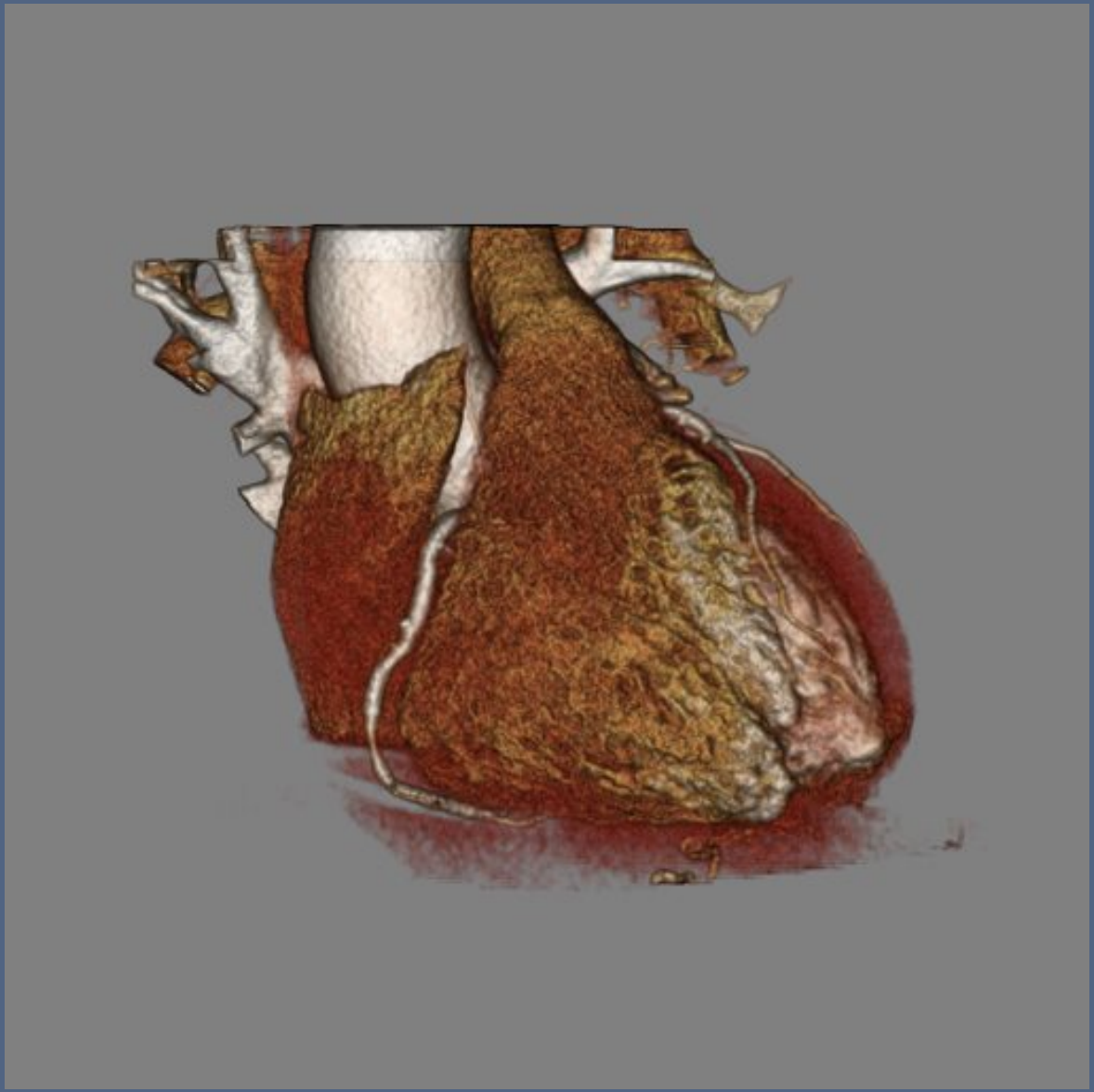
CTA

- CT scanner technology
- Fast acquisition times
- 3D reconstruction

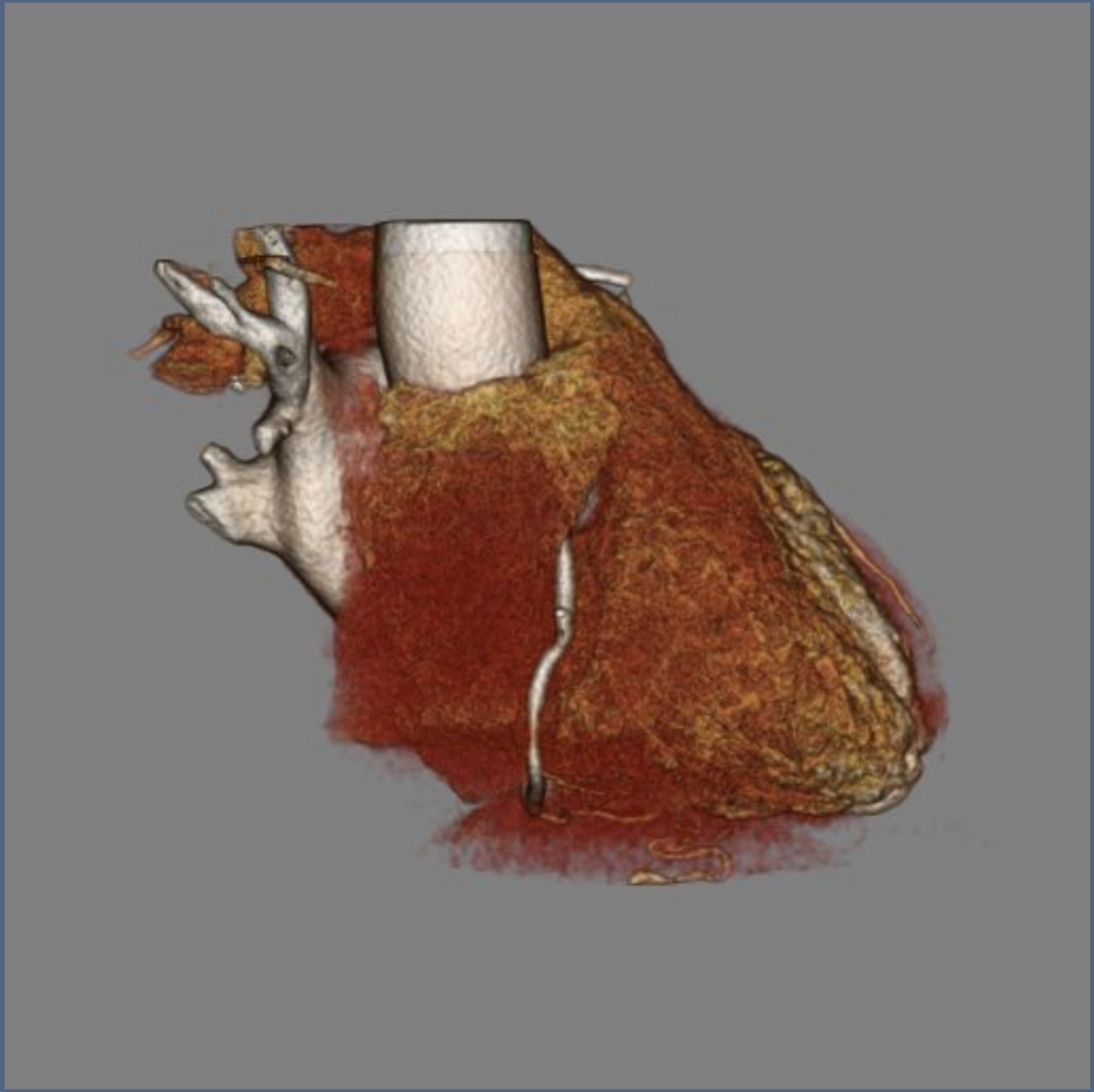
CTA

- CT scanner technology
- Fast acquisition times
- 3D reconstruction
- Imaging of coronary arteries

Cardiac CT Angiography



Cardiac CT Angiography



Cardiac CT Angiography

Cardiac CT Angiography

Computer Tomographic Angiography 2015

Lancaster General Health
Heart & Vascular Institute
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Invasive Coronary Angiography

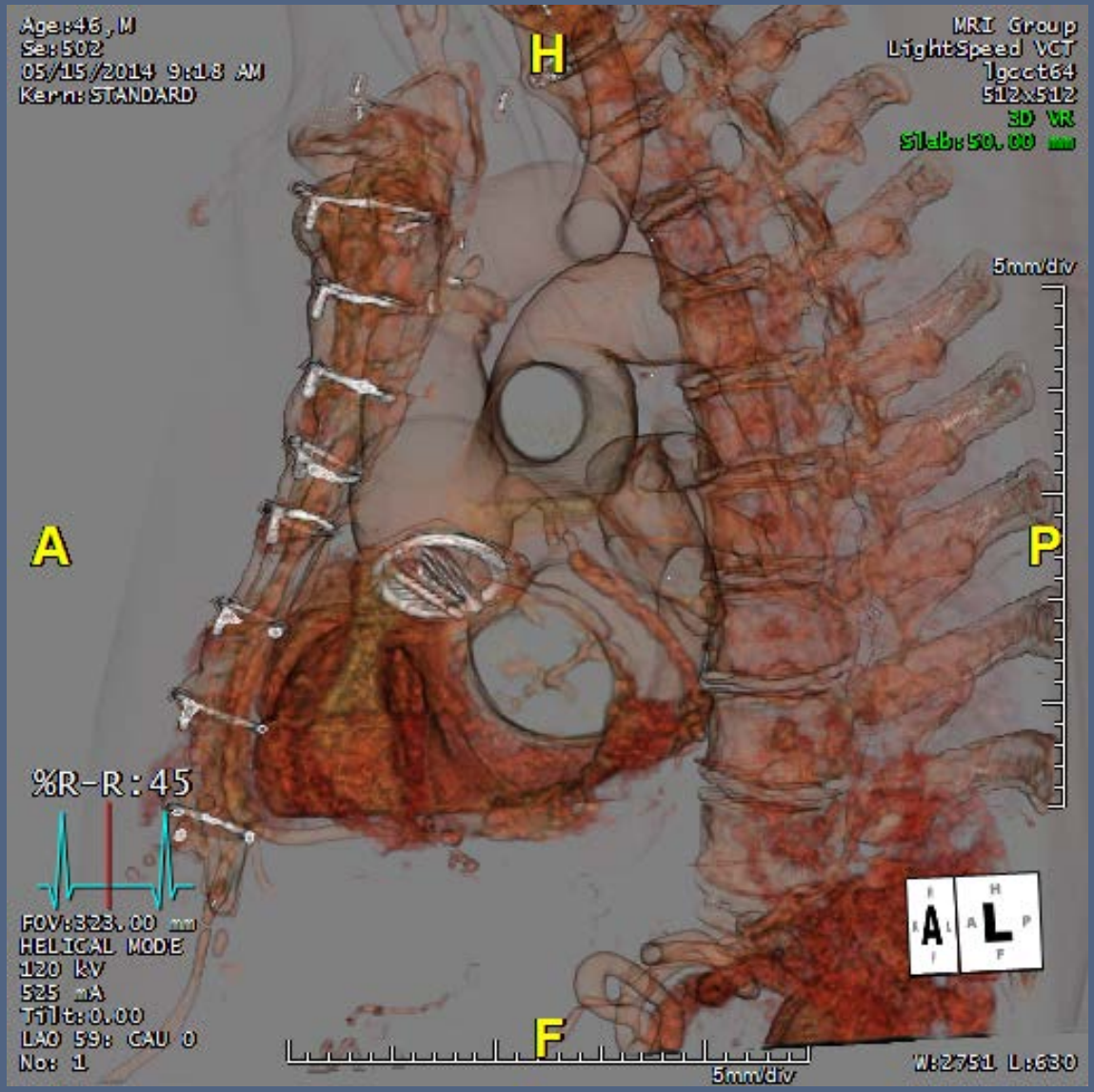
2015

Lancaster General Health
Heart & Vascular Institute
Penn Medicine

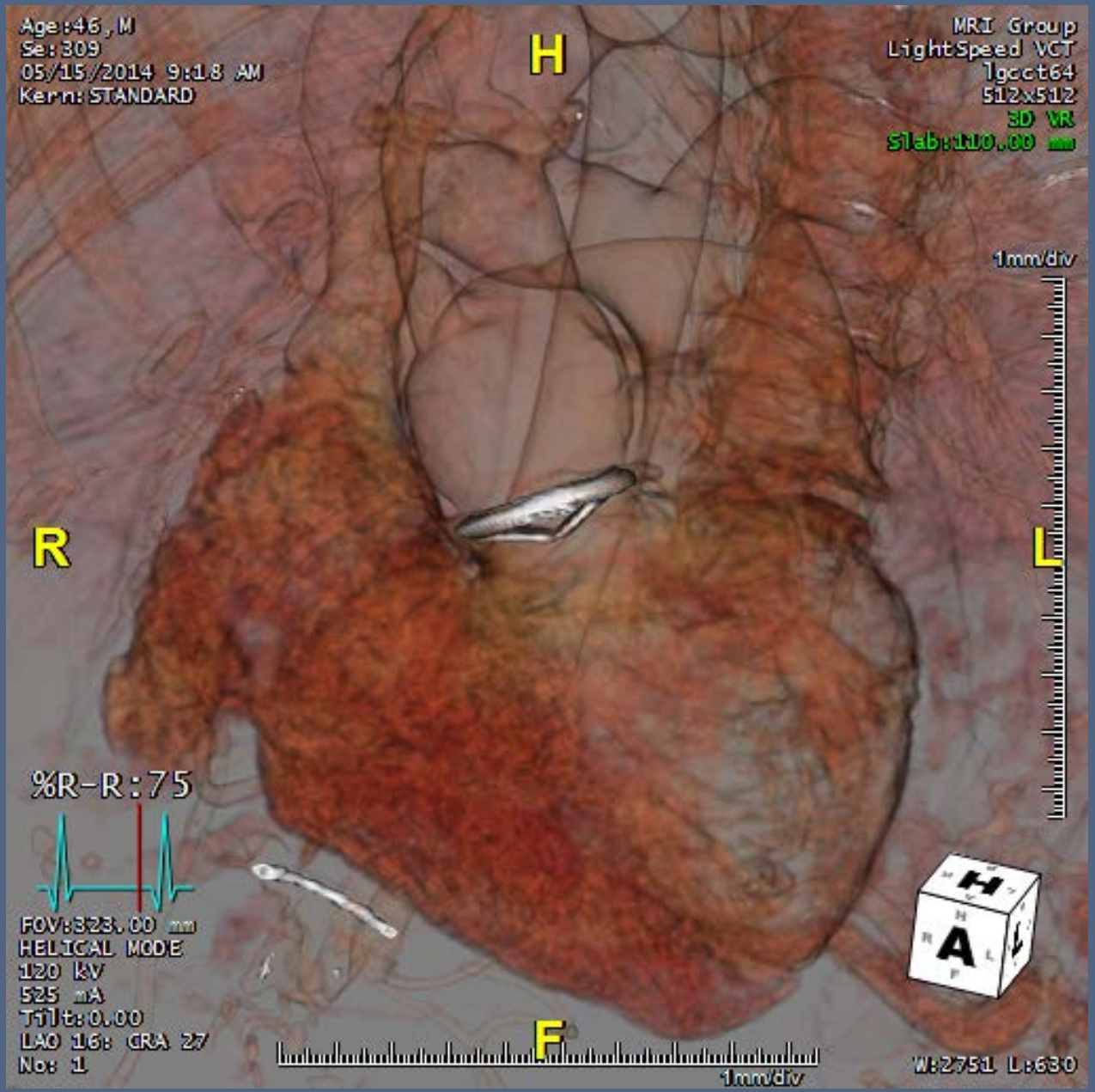
Invasive Coronary Angiography Post Stent 2015

Lancaster General Health
Heart & Vascular Institute
Penn Medicine

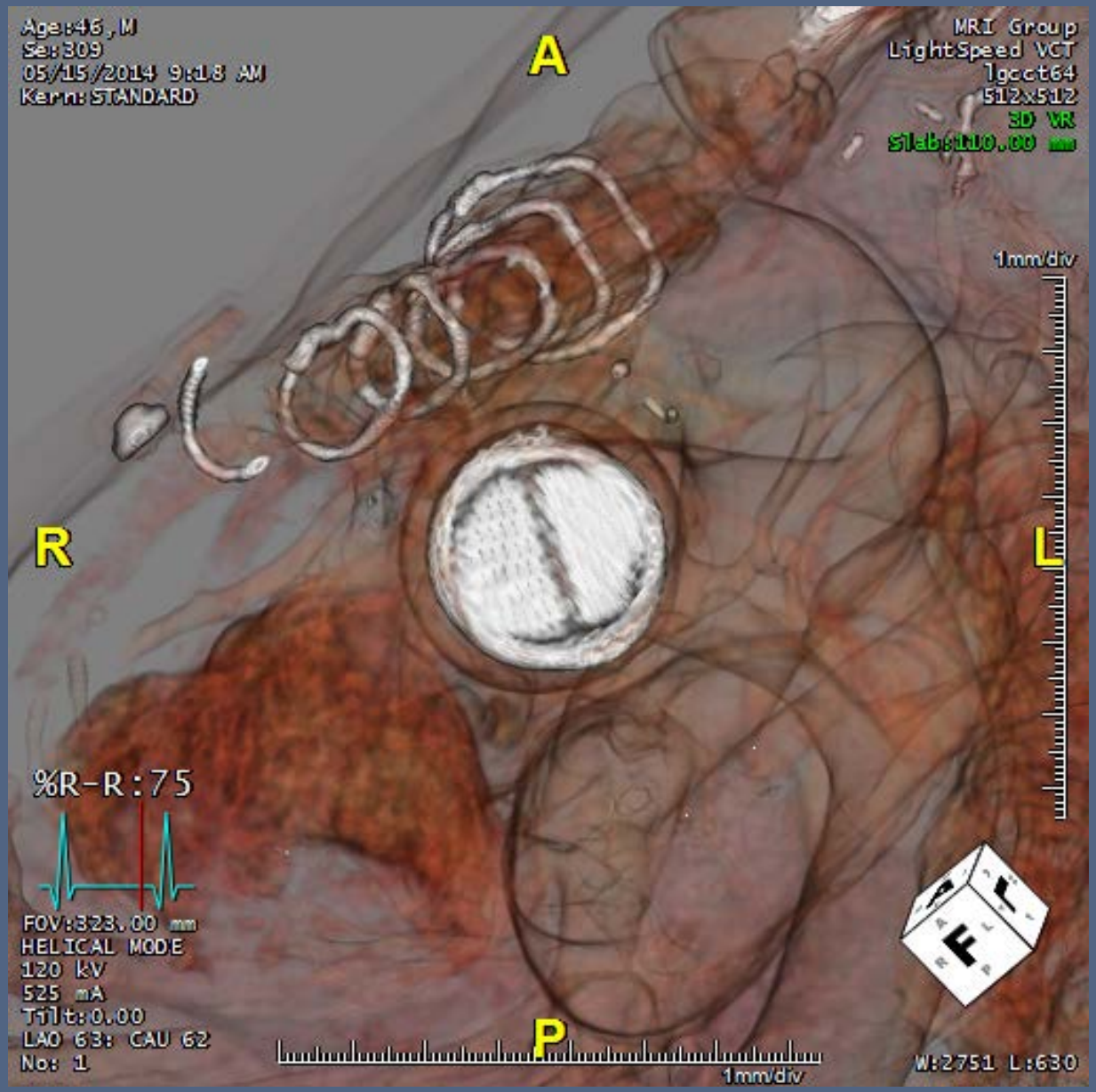
Cardiac CT imaging of a mechanical valve



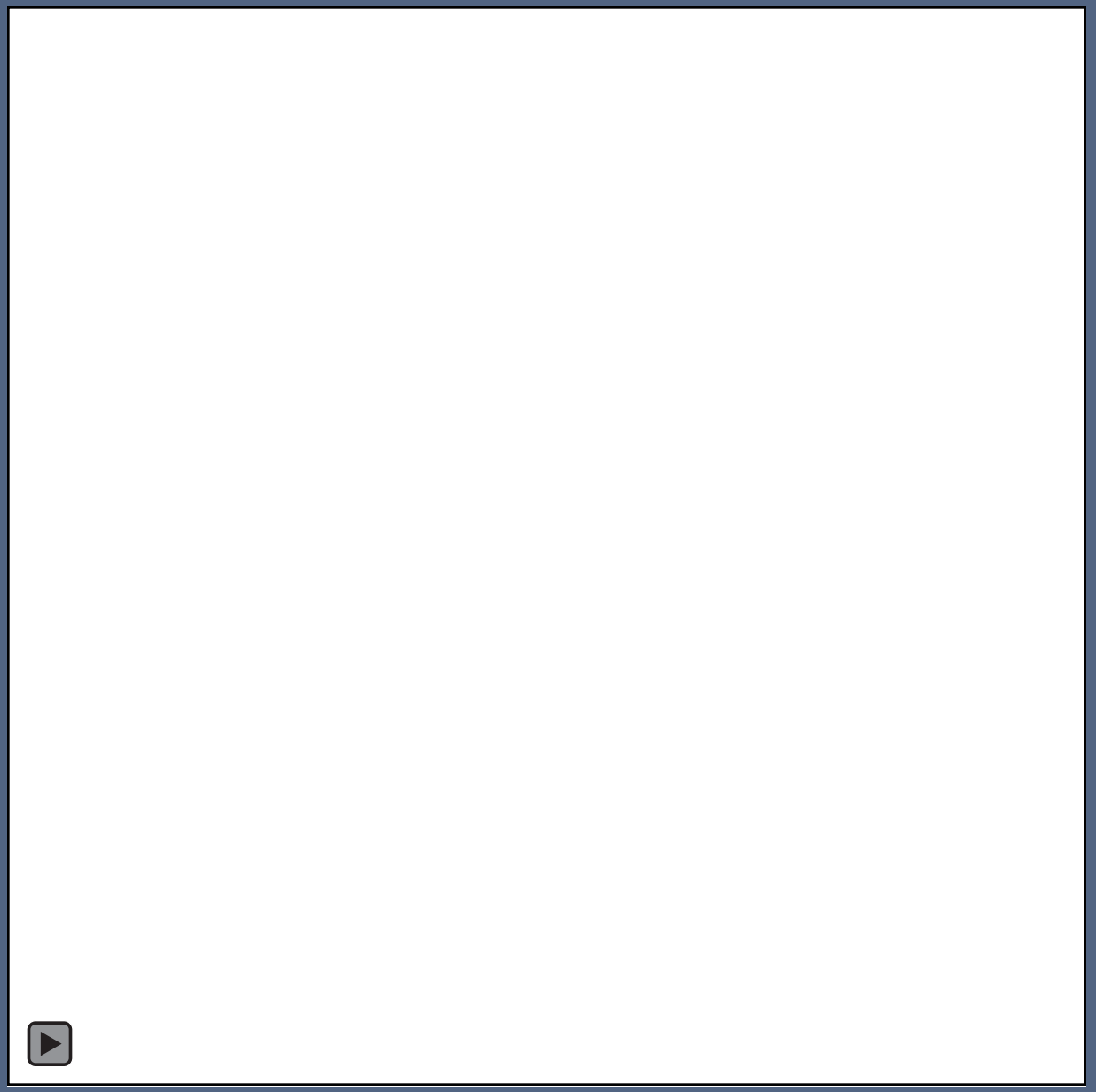
Cardiac CT imaging of a mechanical valve



Cardiac CT imaging of a mechanical valve



Cardiac MRI



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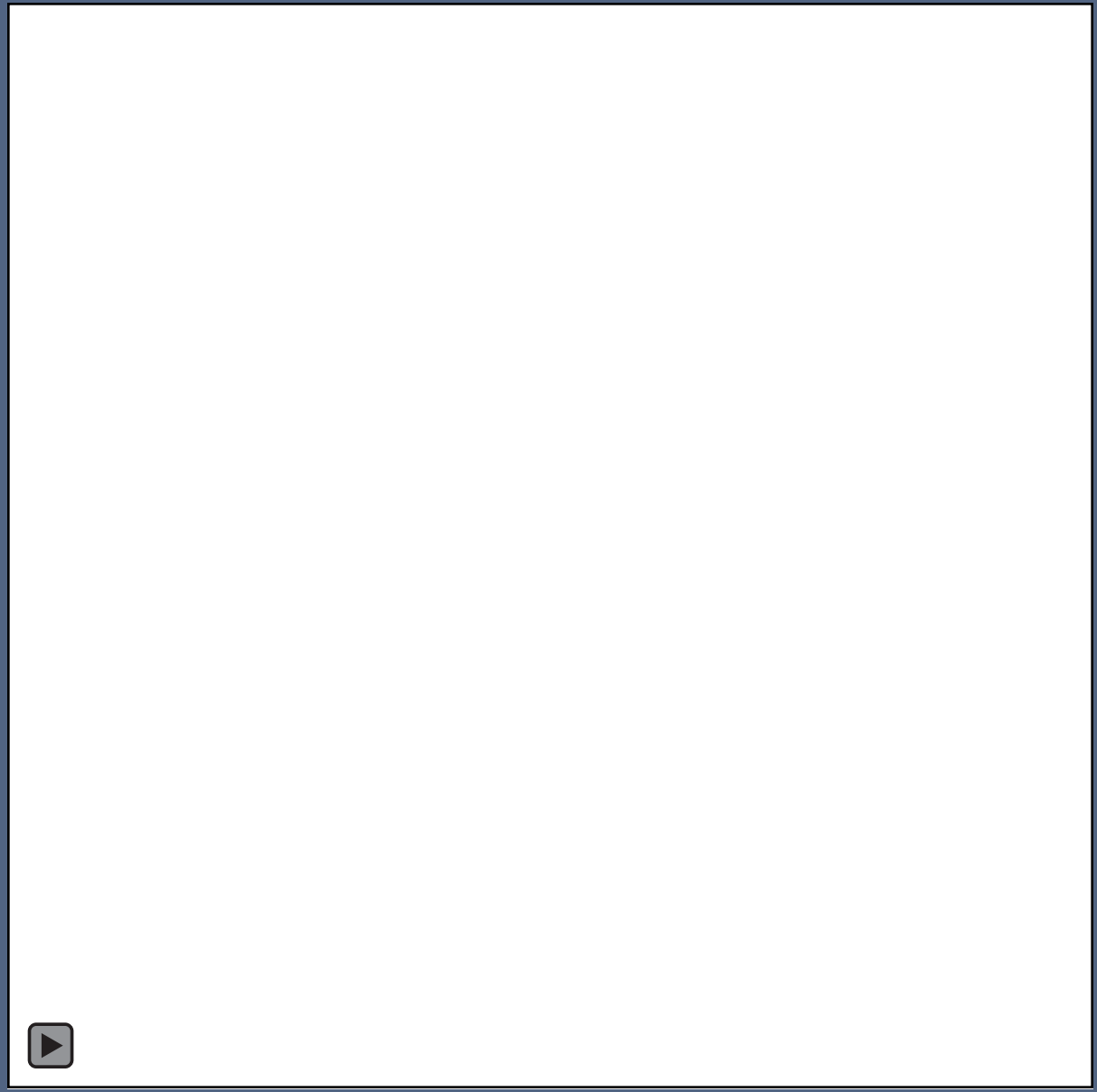

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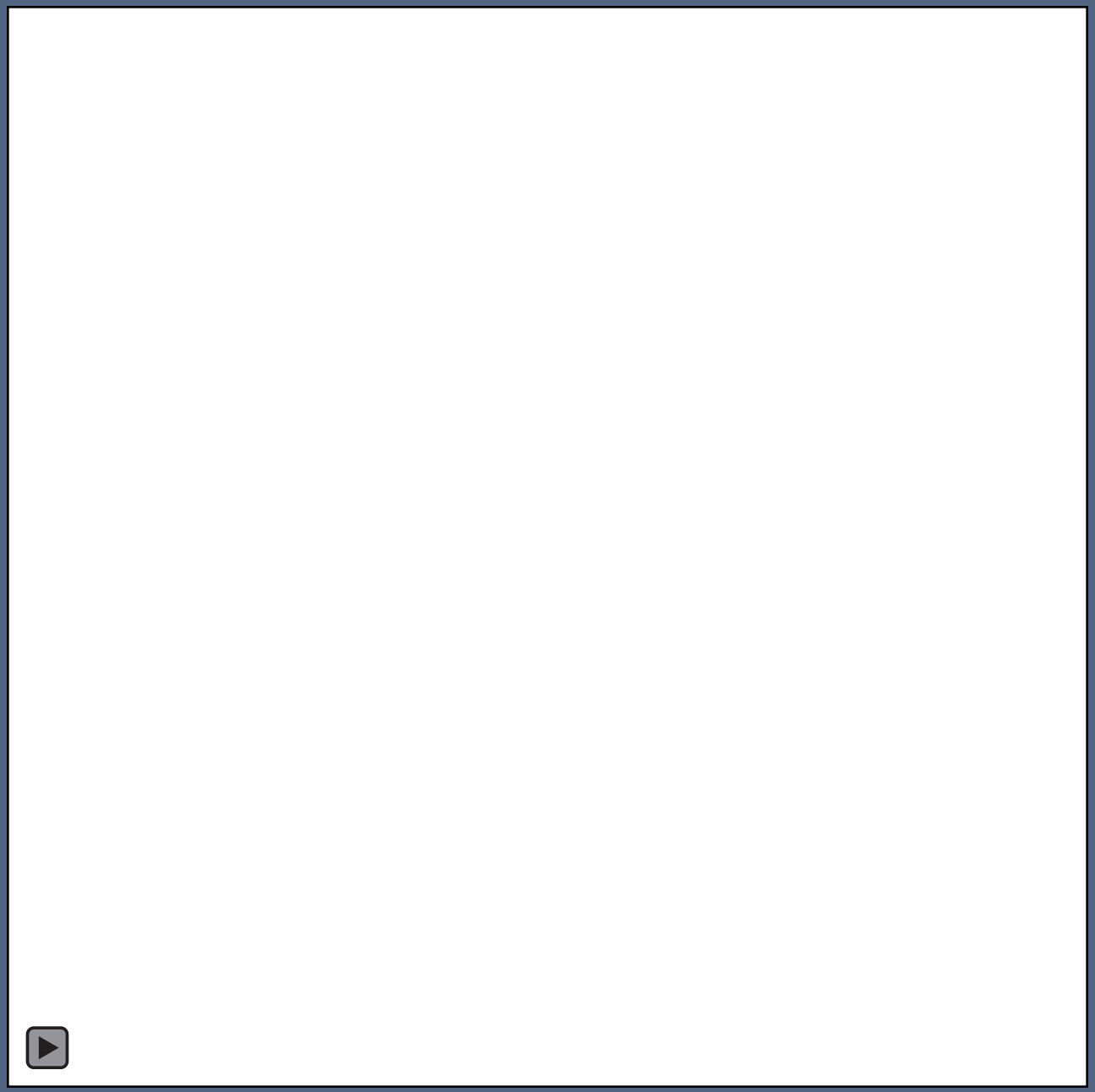
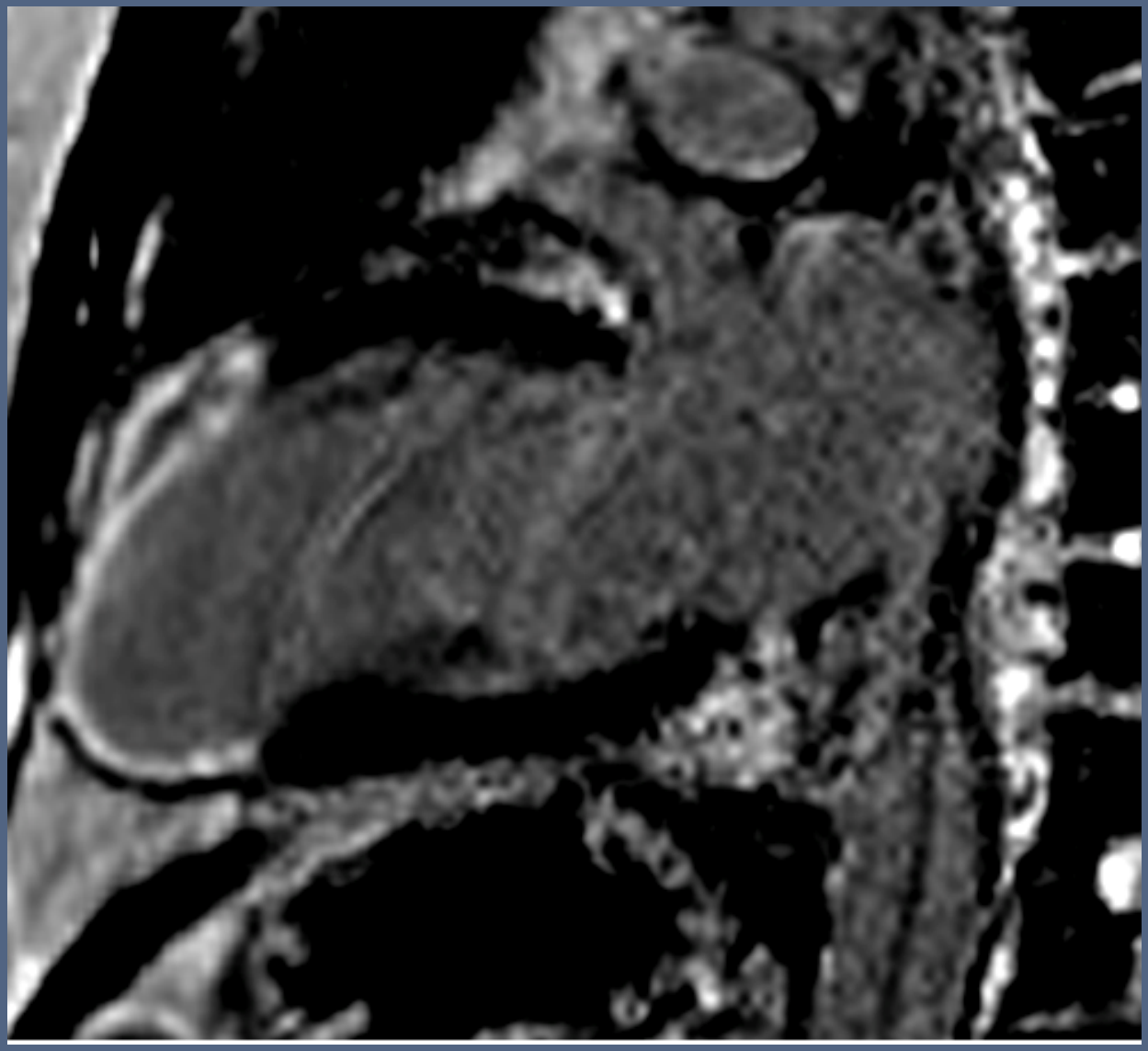


Cardiac MRI



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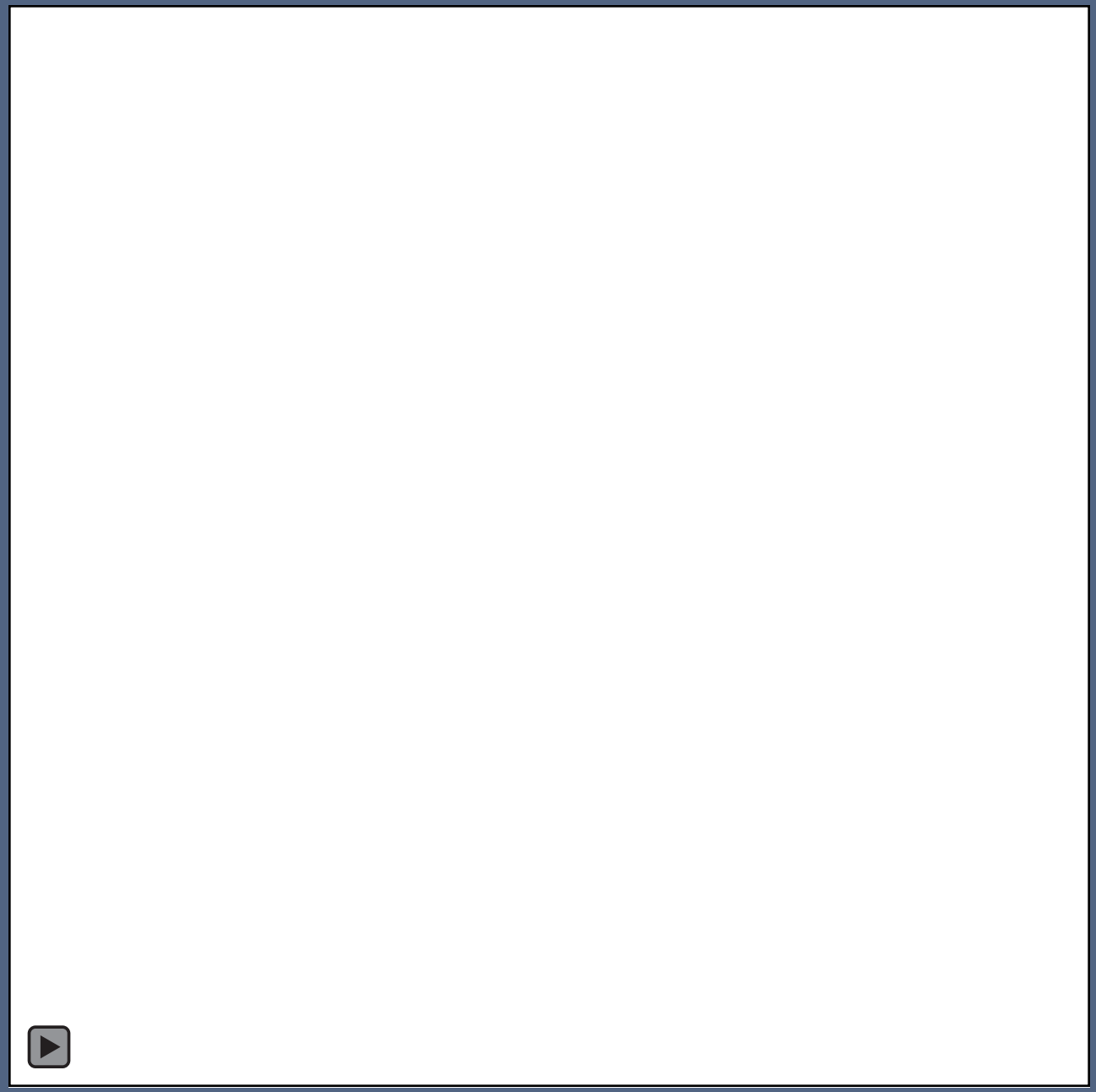
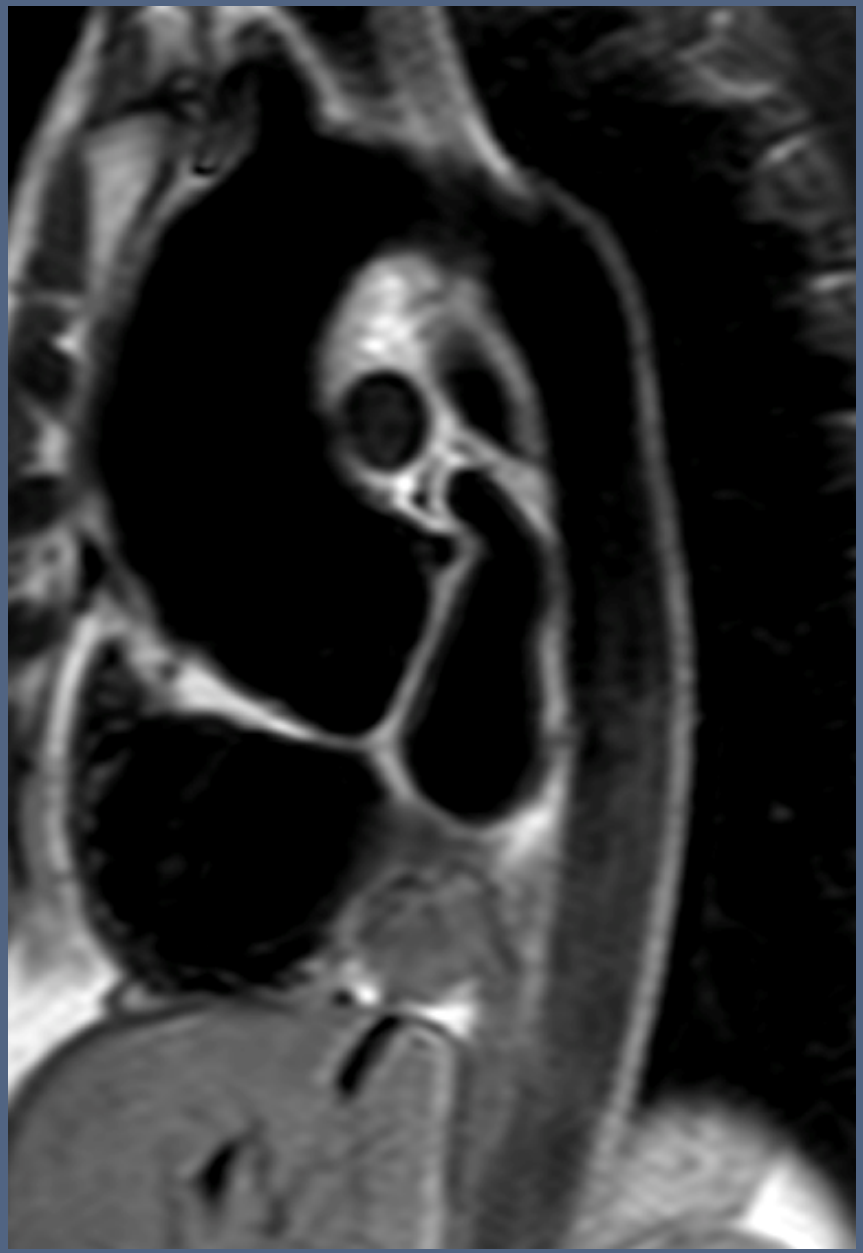
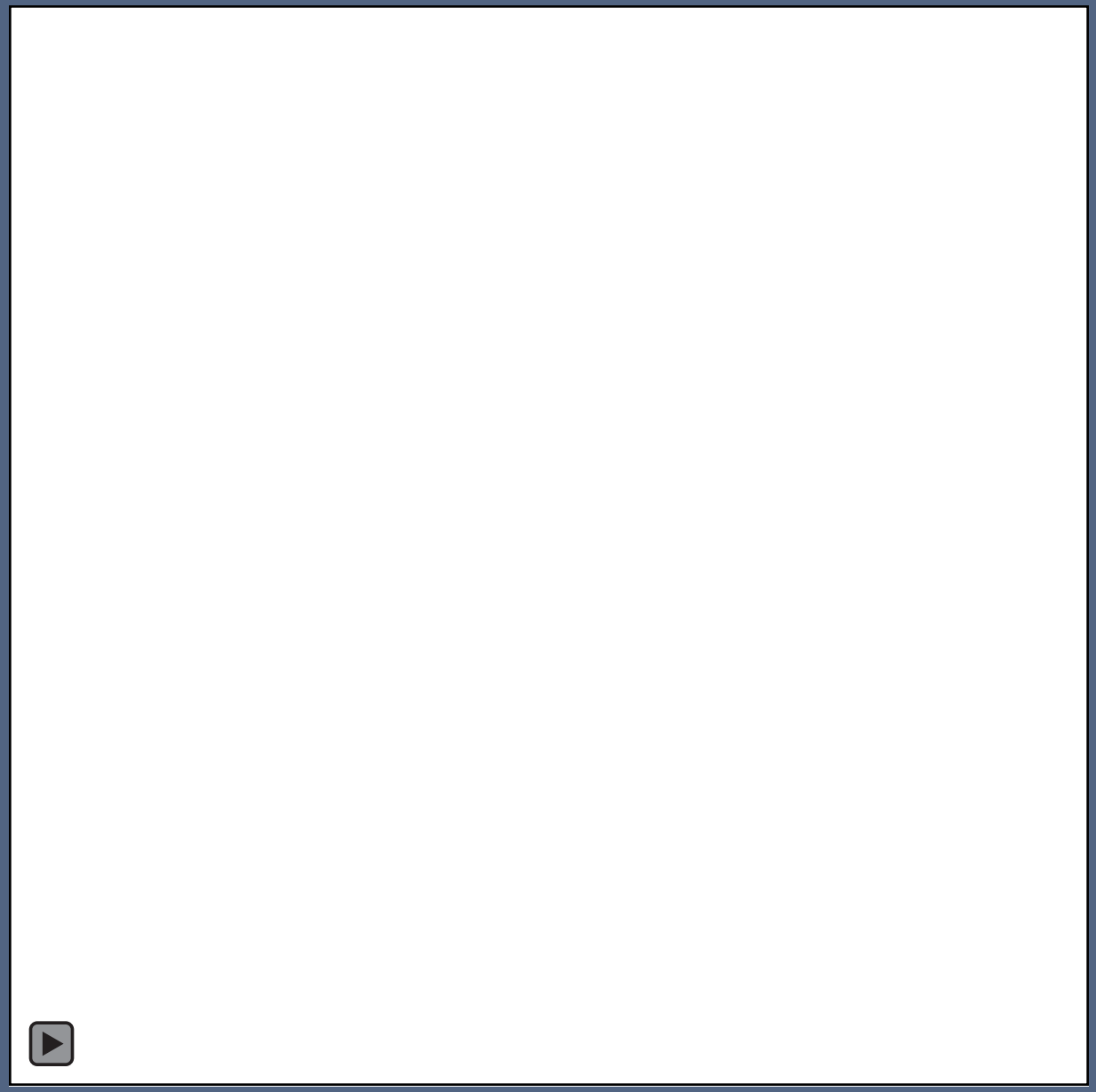


Cardiac MRI



Cardiac MRI



Cardiac MRI

Fifty years of Noninvasive Cardiology in Lancaster

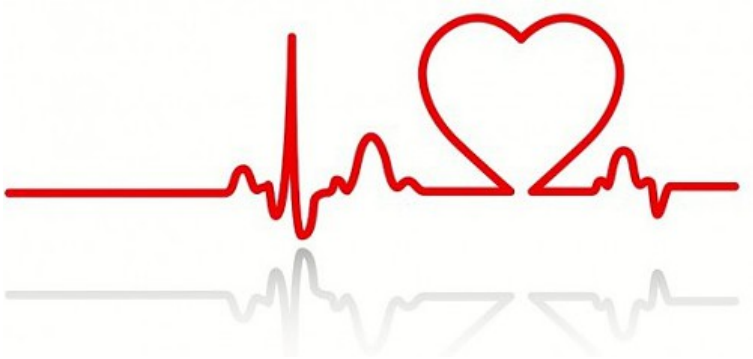
A special thanks to those who contributed images and helped in making this possible

- Ron Jacob MD
- Dean Hollenbacher
- Chris Wilt
- Jason Bell
- Debra Eshleman-Bitts

Cardiac Surgery at LGH 1983 - Present

Mark W. Burlingame, MD

April 21, 2016



Surgeons of the Past and Present

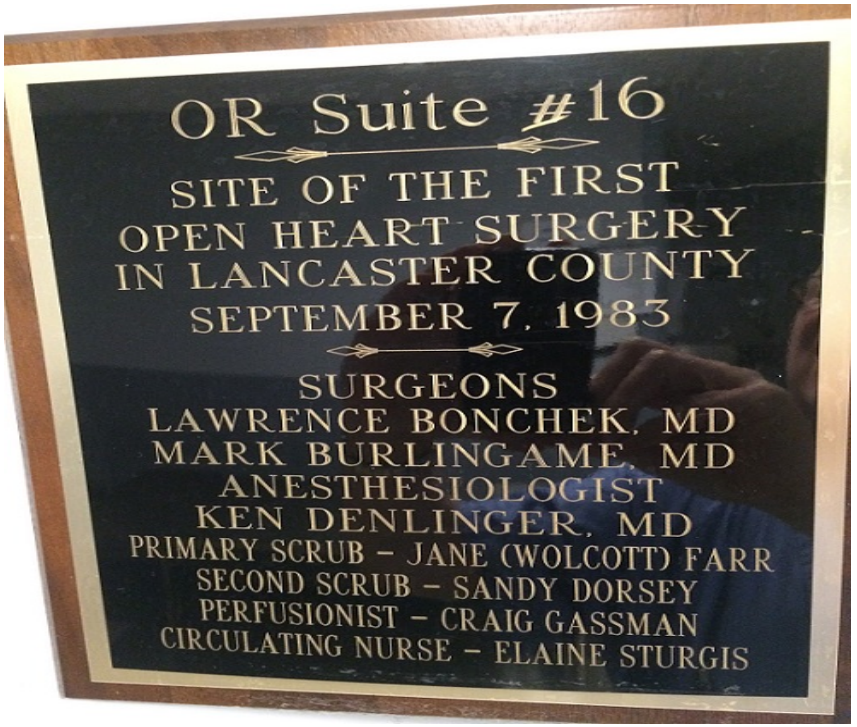
L-R: Mark Burlingame, MD; Dr. Bonchek and Dr. Burlingame perform an early surgery; program founder Lawrence Bonchek, MD

Top: Jeffrey Cope, MD
Bottom: Mark Epler, MD

L-R:
Barry Zadeh, MD;
Edward Lundy, MD;
Bradley Vazales, MD

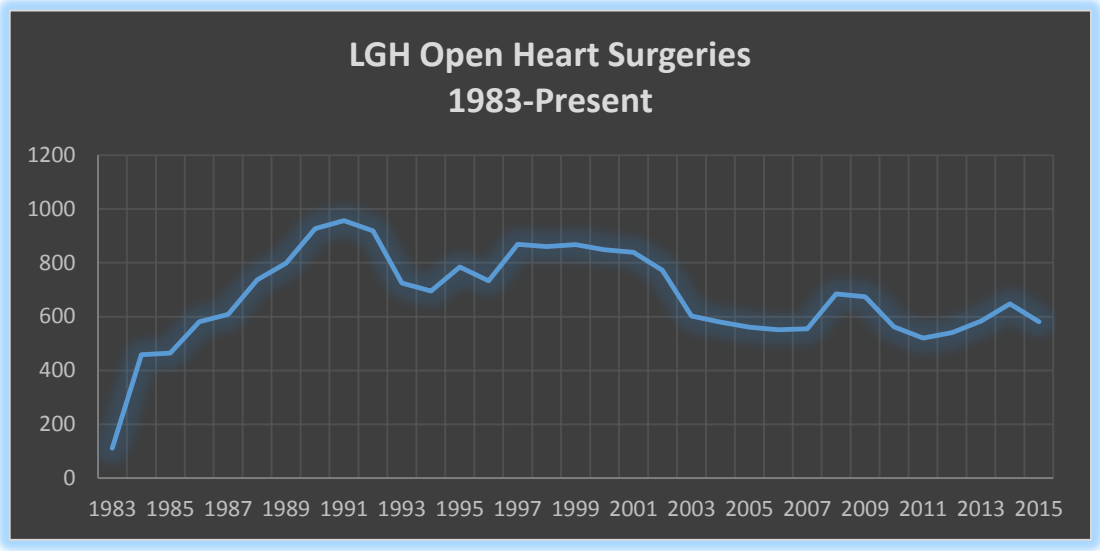
Other surgeons:
Dr. Polidori
Dr. Chatterjee
Dr. Manetta
Dr. Thompson

lst case:
Gary W. Ghee had CABG, Sept. 7, 1983



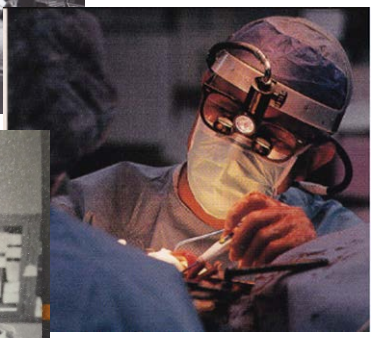
OR – then and now

Open Heart Cases LGH 1983-2015



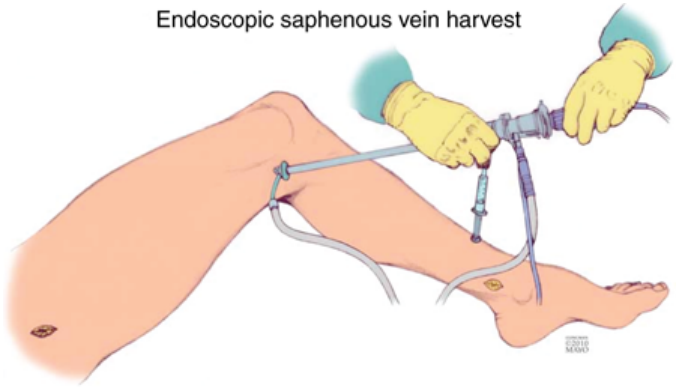
- Peak volume – 1991; total cases = 957
- Does not include case volume from St. Joseph's Hospital or Brandywine Hospital
- Total cases 1983-2015: 22,196

Historical Photos

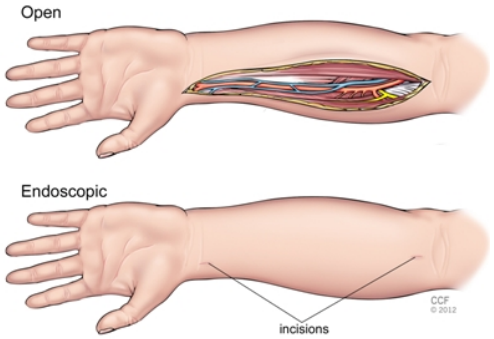


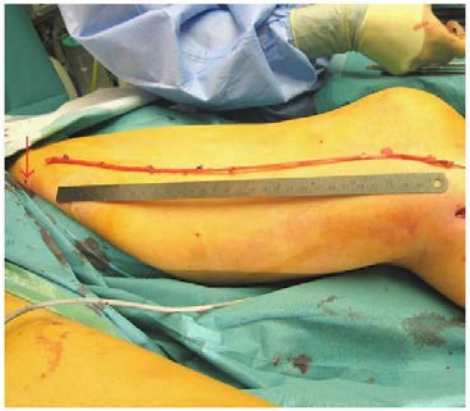
25th Anniversary of the Heart Surgery Program

Endoscopic conduit harvesting

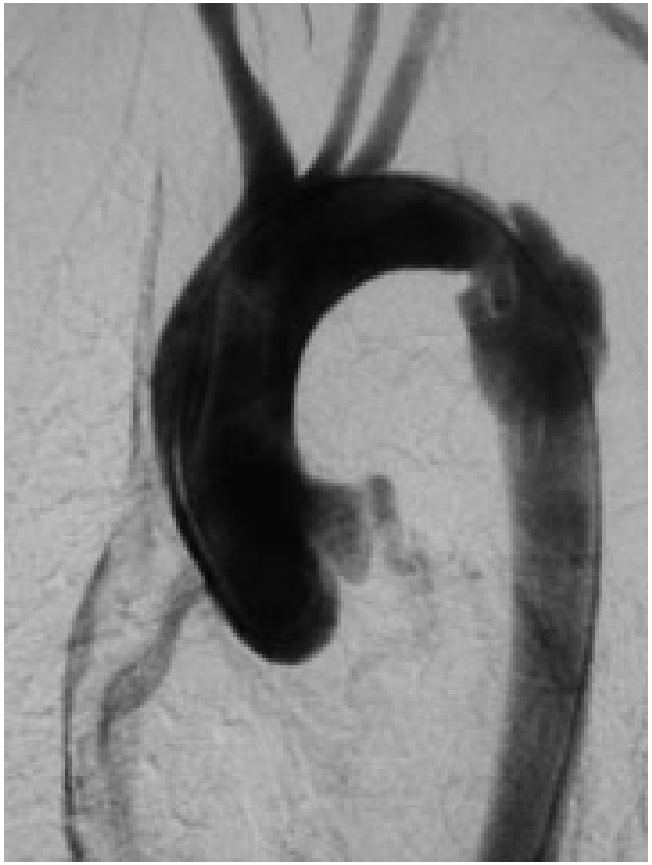


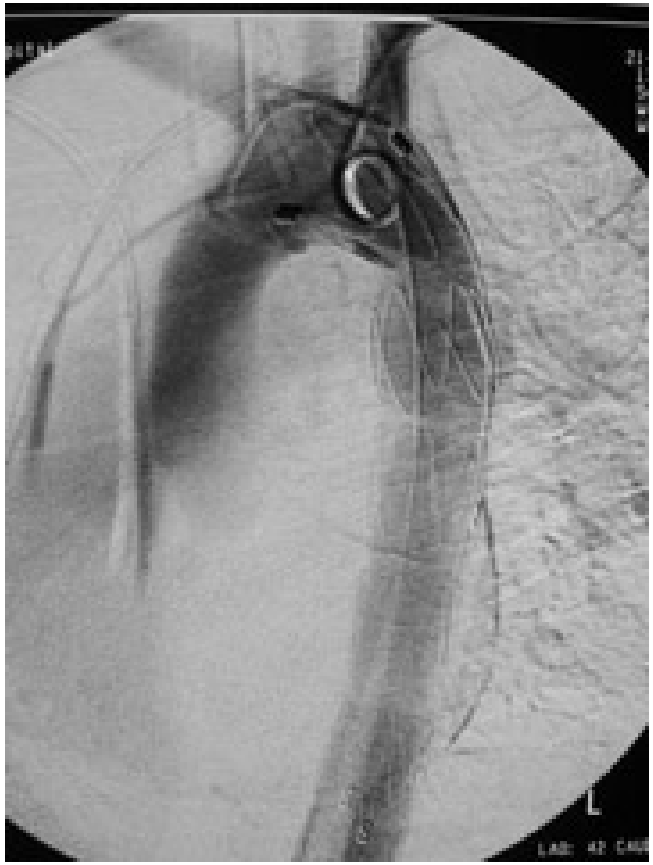
Source: Cohn LH: *Cardiac Surgery in The Adult, 4th Edition*: www.accesssurgery.com





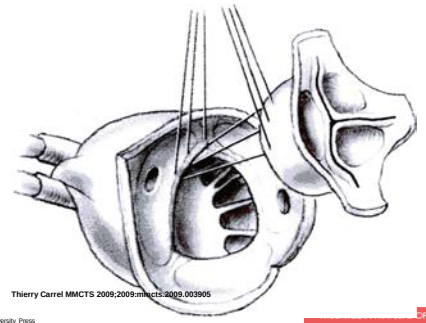
Thoracic Endovascular Aortic Repair (TEVAR)





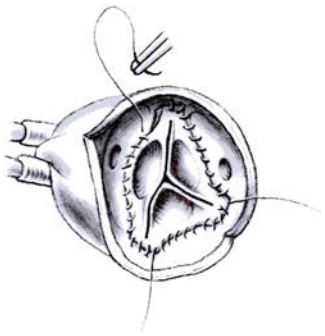
Homograft Aortic Valve Replacement

Proximal suture line during subcoronary implantation (either single U-stitches or running suture).



Thierry Carrel MMCTS 2009;2009:mmcts.2009.003905

Final stitches of the distal running suture line to fix the commissures of the homograft.



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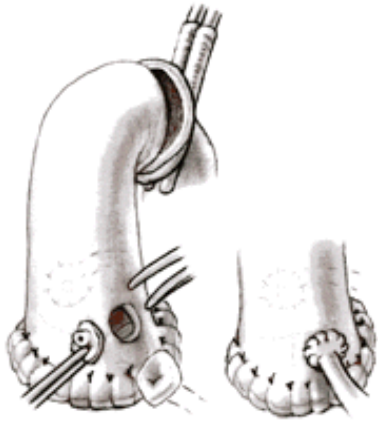
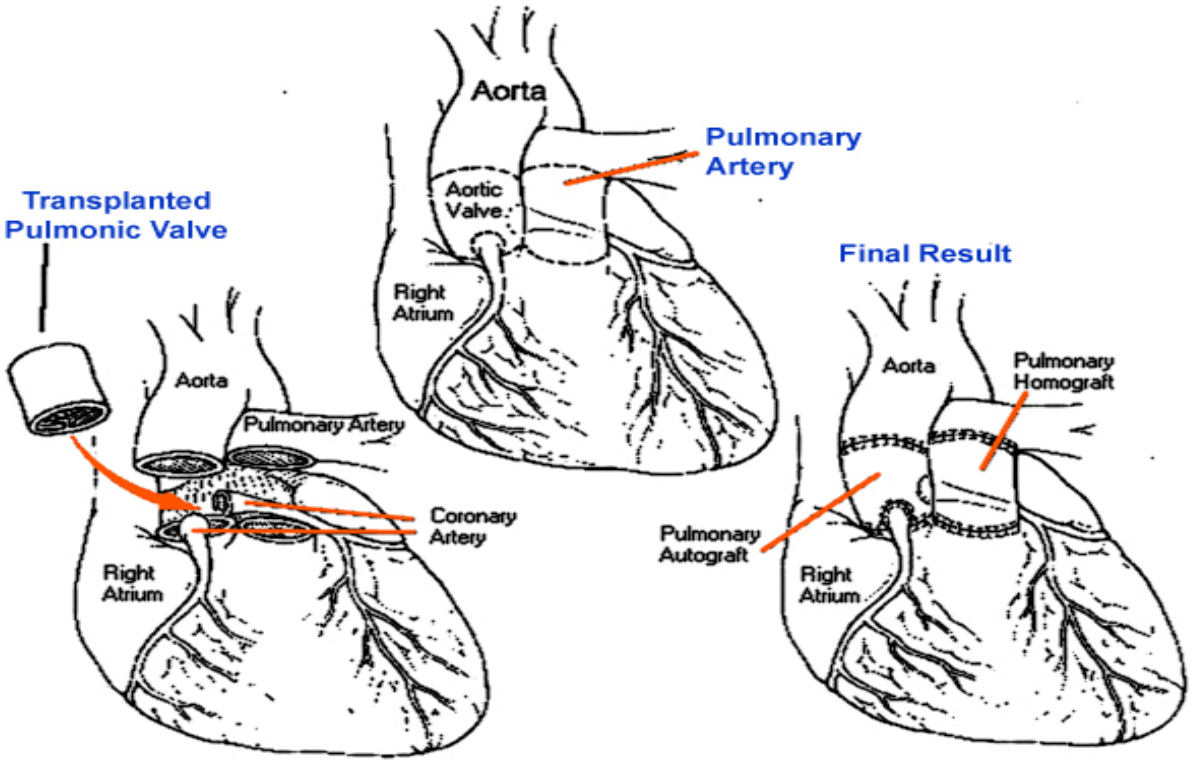
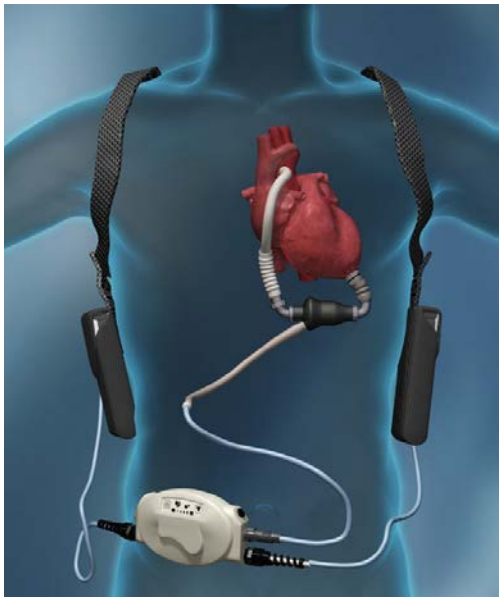


Ross Procedure



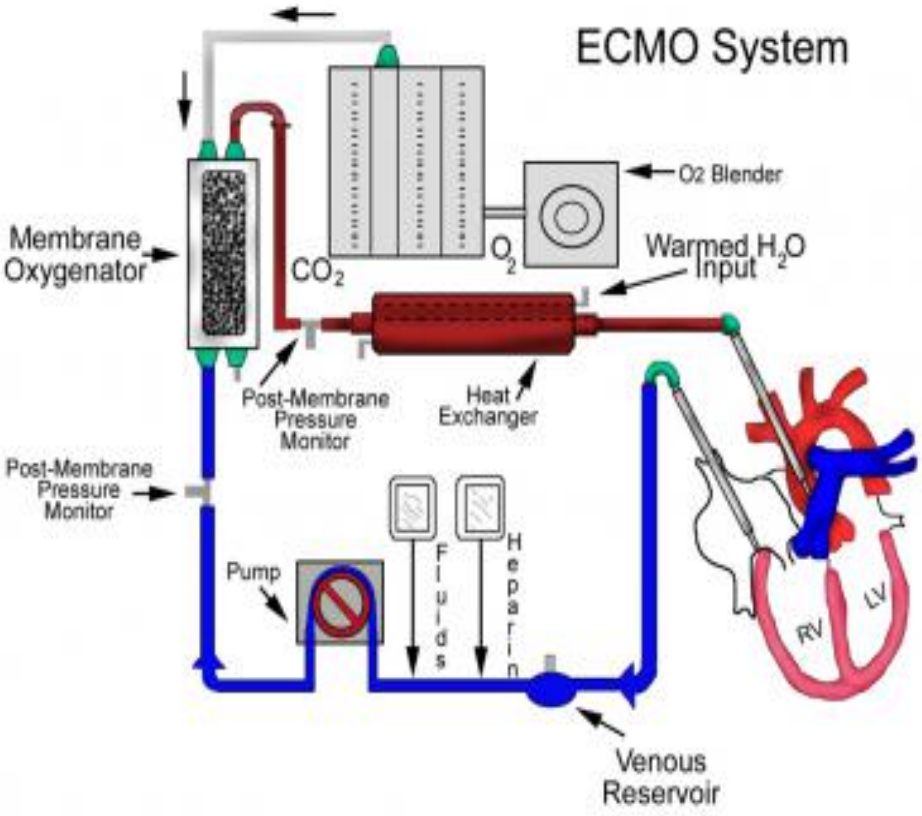
Ventricular Assist Device (VAD)



- Oct. 14, 2005 first implant by Edward Lundy MD
  This patient underwent transplantation Jan. 21, 2006
- Jeff Cope MD and Mark Epler MD presently implant
- 50 patients to date; 9 have received transplants
- 20 patients with current support, 2 of whom on transplant list

Examples of Ventricular Assist Devices (VADs)

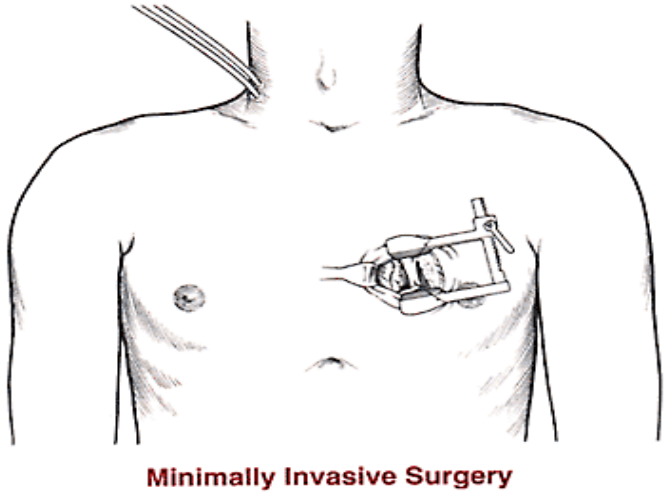
ECMO: Extracorporeal Membrane Oxygenator



Off Pump CABG

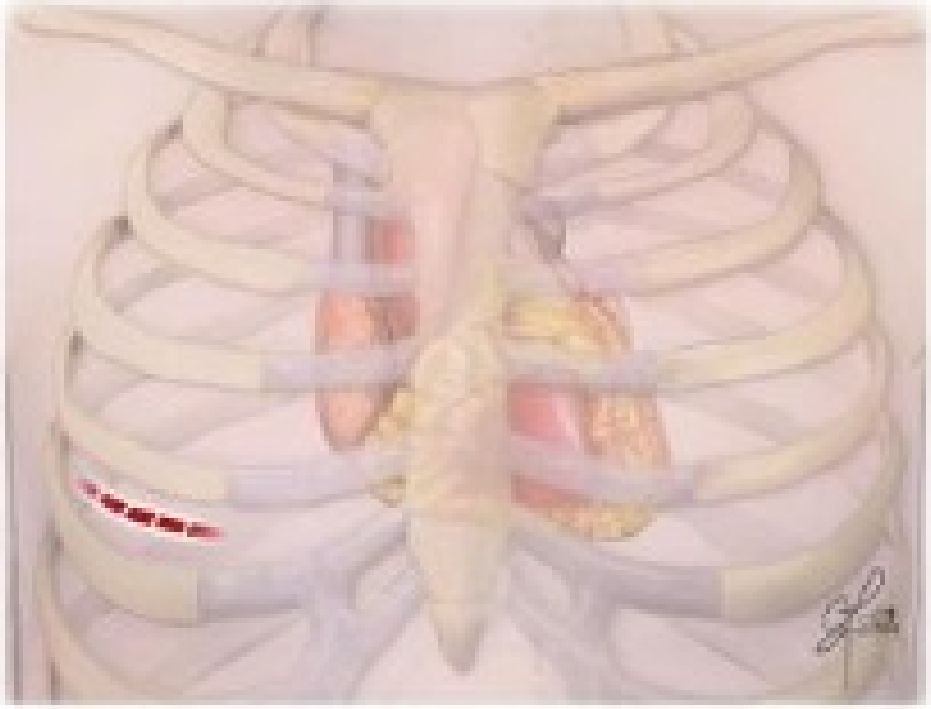
Minimally Invasive Direct CABG (MID-CAB)

- Robotics for LIMA takedown
- Anastomosis via small incision under direct vision
- First Case 2013; Jeff Cope MD



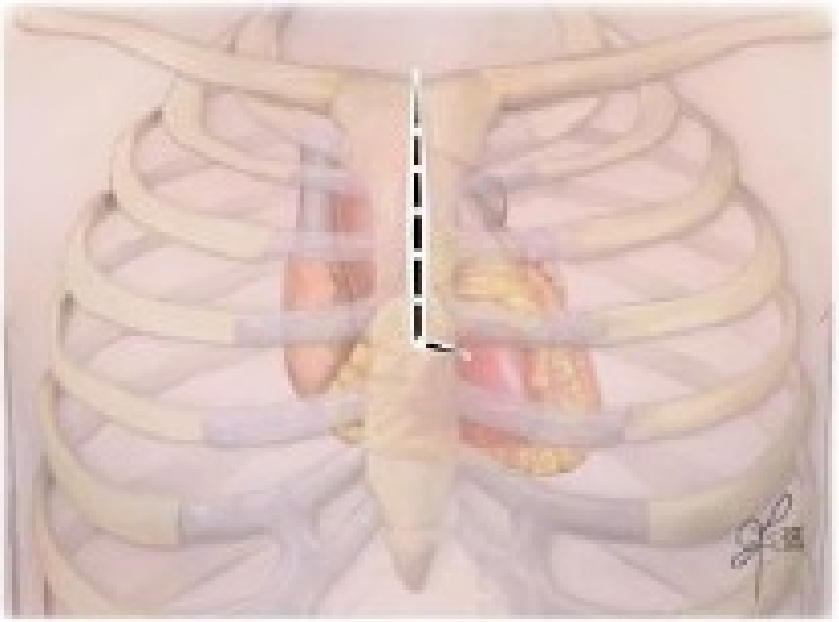
Minimally invasive Mitral Valve Surgery

First Case 2011 Mark W Burlingame MD



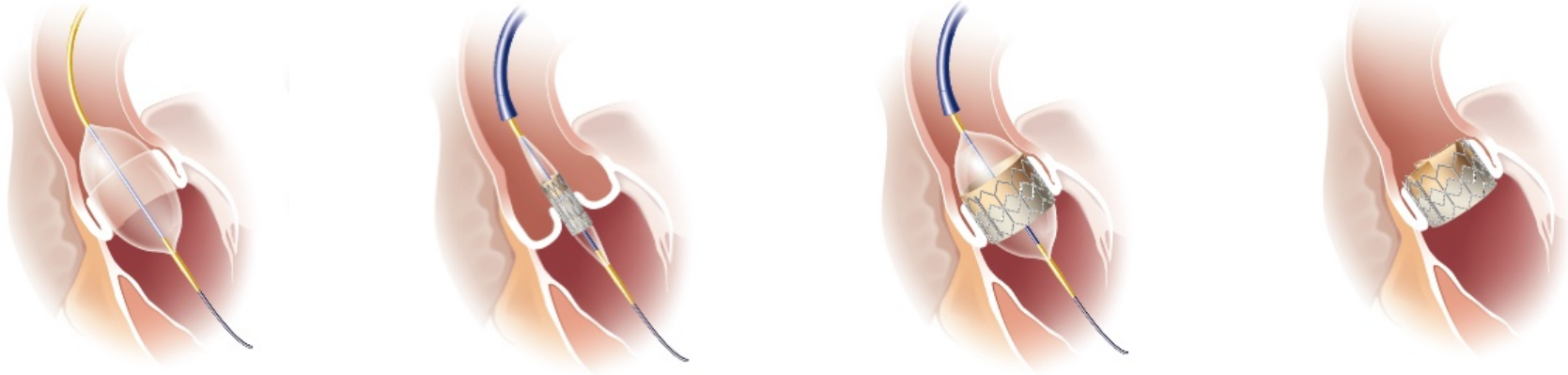
Minimally Invasive Aortic Valve Replacement

- First Case 2012 Jeff Cope MD

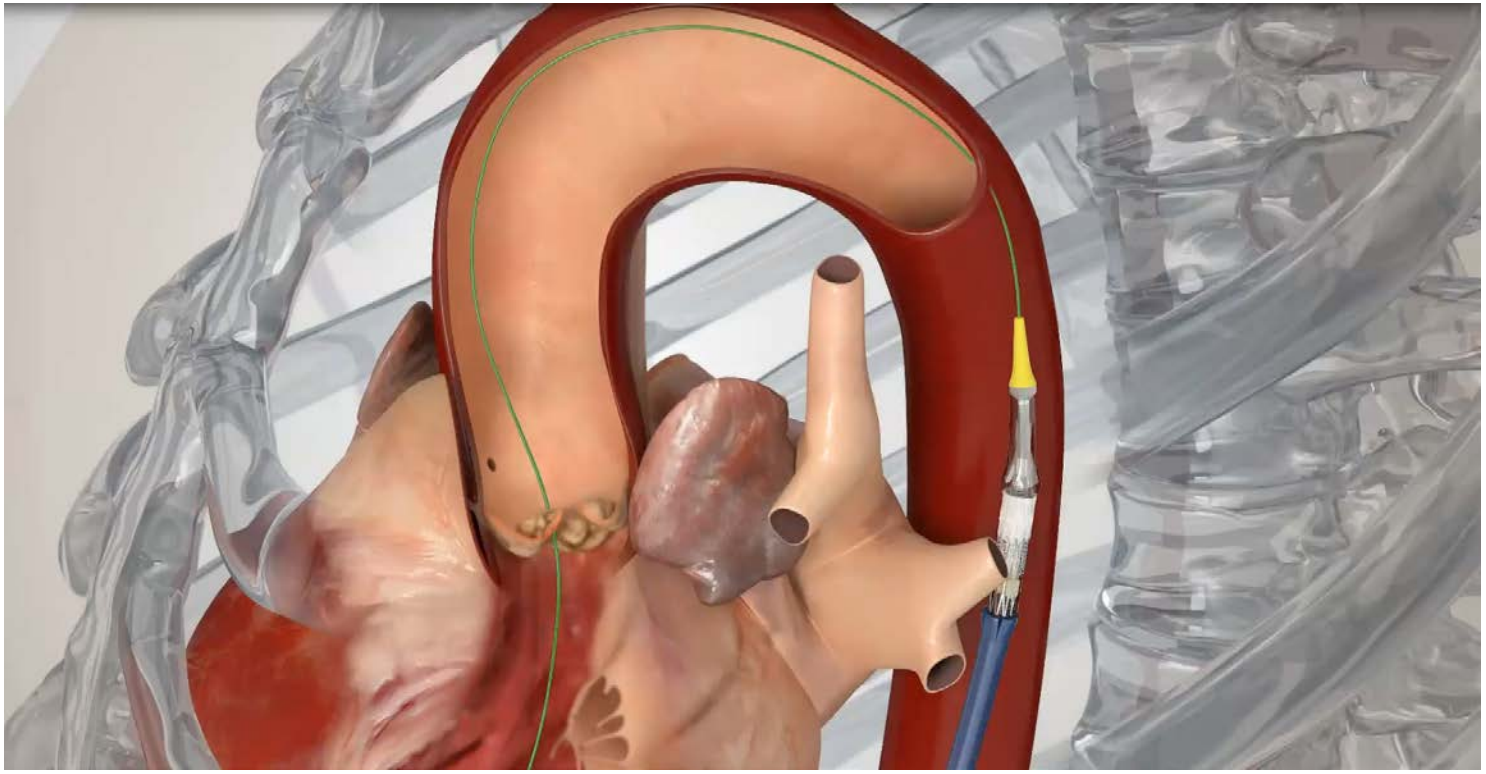


Transvascular Aortic Valve Replacement (TAVR)

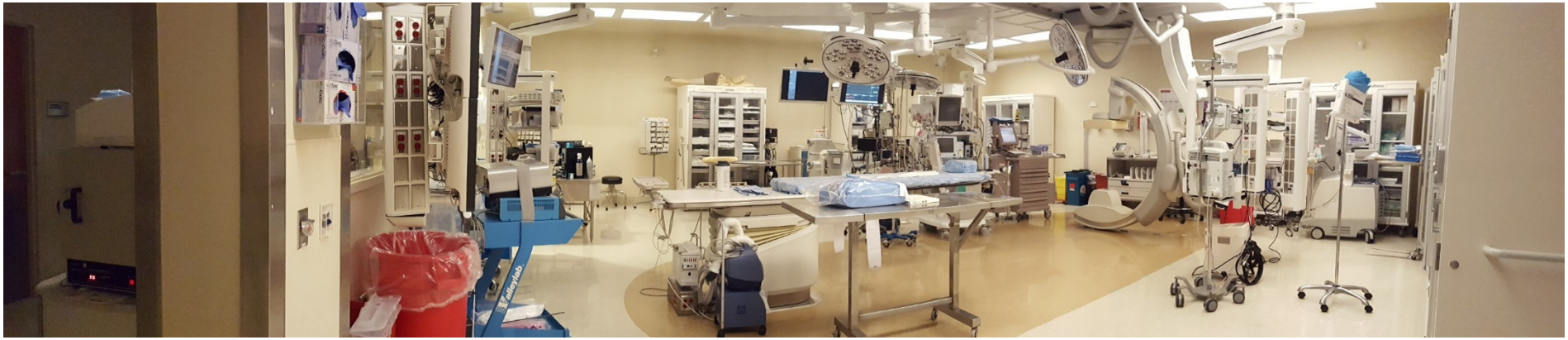
- Ist implant: August 29, 2012
- Dr's Cope, Epler, Dumasia, Harvey Total to date: 137



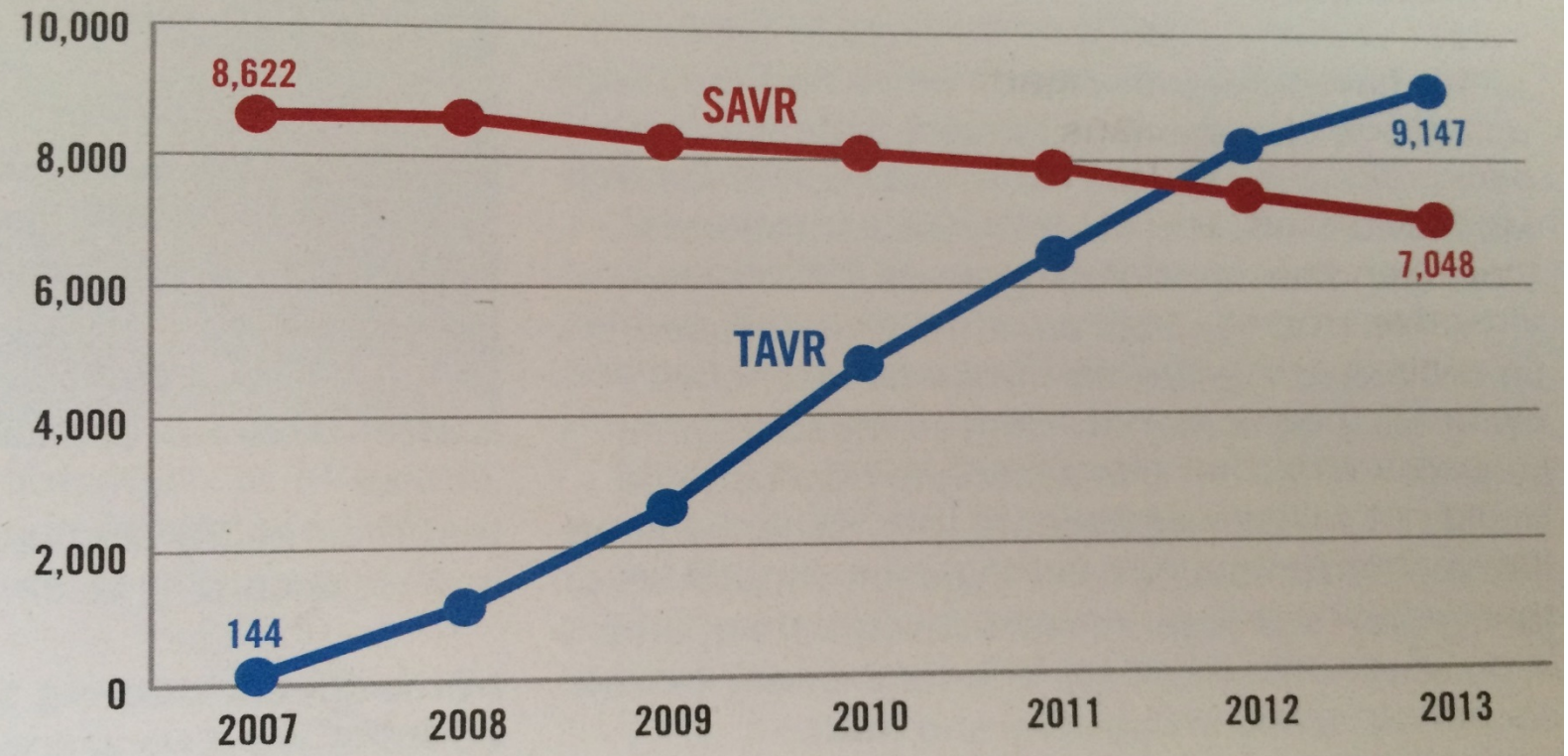
TAVR Animation



Hybrid Operating Room



Number of surgical and transcatheter procedures performed



Note: Based on data from the Institute for the Hospital Remuneration System.

Source: N Engl J Med. 2015 Dec 17;373:2438-47. doi: 10.1056/NEJMoa1500893

Transvascular/ Transapical Mitral Replacement (TMVR)