# The AngioTeacher

## A 3 Dimensional Interactive Self Learning Program for Coronary Angiography

University of Nebraska Medical Center

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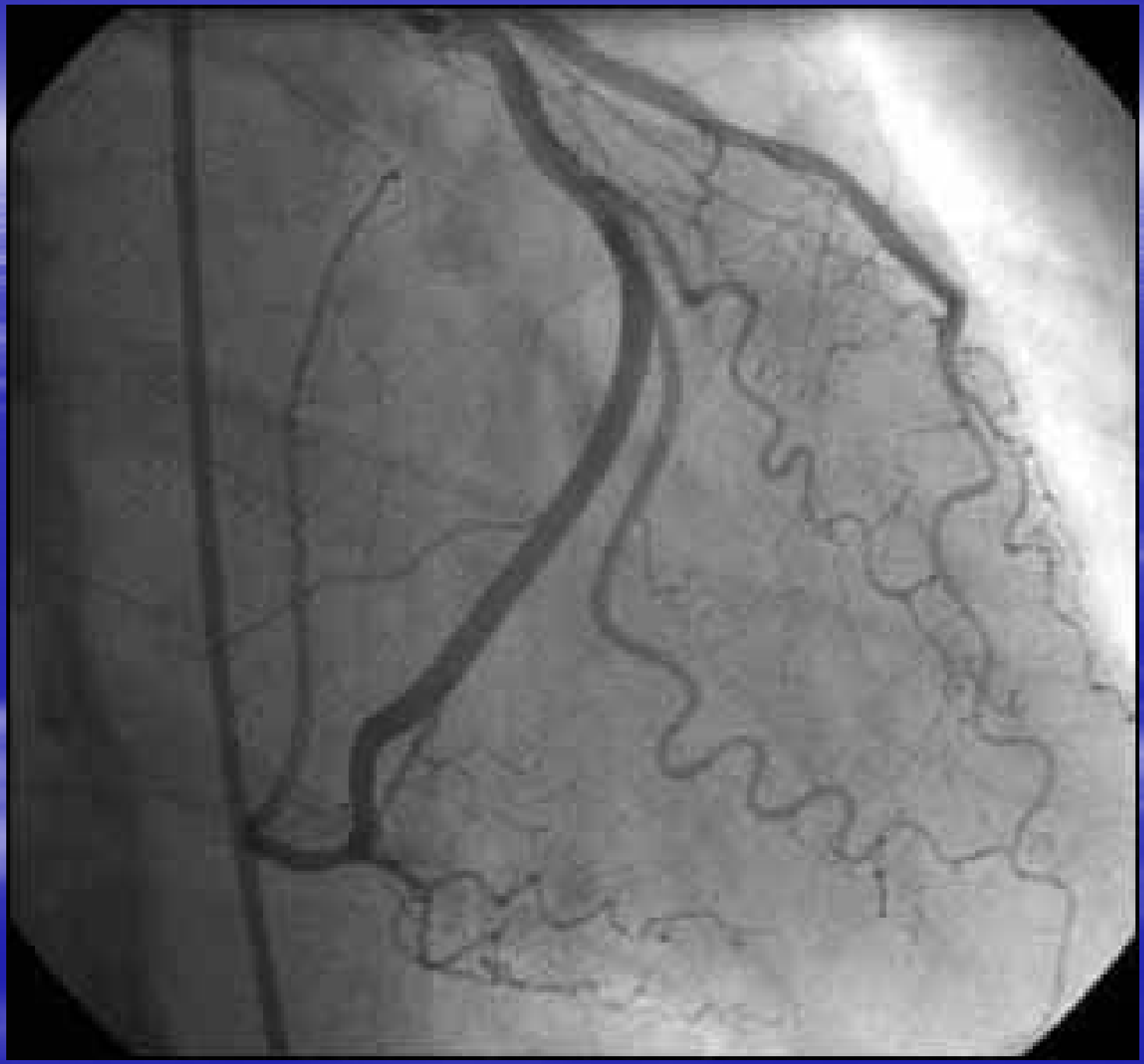
Internal Medicine Cardiology




Lossy compression - not intended for diagnosis

# Hypothesis

Traditional methods for learning how to interpret coronary angiography require a long and arduous learning curve.

We hypothesis that an interactive self learning method based on a three dimensional model will shorten the learning curve and improve the understanding of the anatomical relationships of the coronary arteries and myocardium.

# Goals

- Better understanding anatomical relationship of cardiac structures and vasculature
- More comprehensive understanding of the heart and surrounding structures
- Accelerate learning curve for learning coronary angiography
- More interactive and engaging modality to learn coronary angiography

# Method

- Development a three dimensional model based on CT angiography and compare this to standard coronary angiography
- CTA and coronary angiogram will be taken from the same study patient
- CTA images will include all parts of the human torso
- Team
  - Computer  Personnel
  - Clinical  Personnel

# Personnel

- Clinical
  - Physician
- Computer
  - Programmer
  - Supervisor
- Others
  - Graphic Artist
  - Education Specialist

# Target Students

- Physicians
  - Medical
  - Surgical
- Medical students
  - Basic anatomy
  - Clinical studies
- Ancillary medical personnel
  - Nurses
  - Technicians
- Medical industry

# Medical Schools

- There are 113 medical schools in the USA
- There are 17 medical schools in Canada
- Vast number of foreign medical schools

# Medical Schools

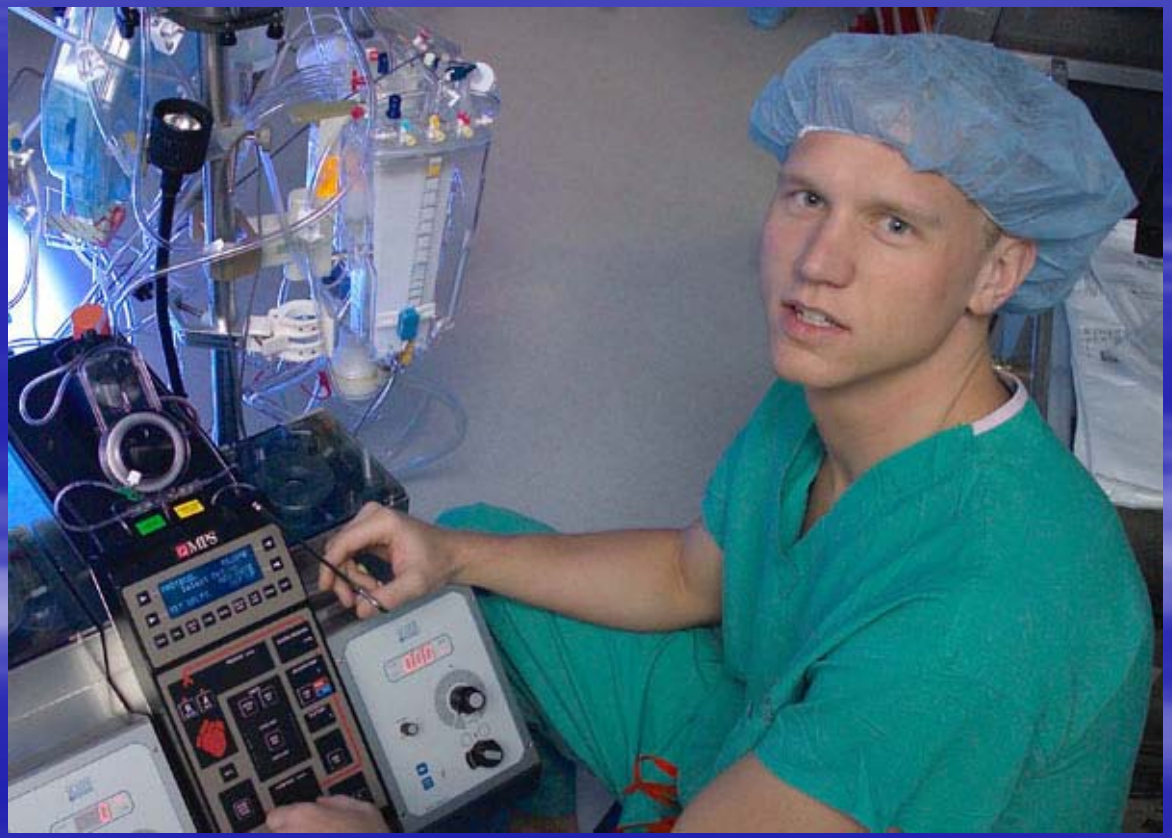
- Medical Students
  - First to fourth years
- Residents
  - Internal Medicine
  - Surgery
- Fellows
  - Cardiology
  - Cardiothoracic

# Nursing Programs

- There are almost 500 graduate nursing programs in the United States.

# Cardiovascular Technicians

- There are 34 accredited programs in the United States



# Medical Industry

ABBOTT

Boston Scientific
Delivering what's next.™

Medtronic

# Government Applications

- There are 21 VISNs in VA healthcare system
  - There are 1,384 VA facilities overall.
  - 90% are clincs or hospitals
- Military hospitals
- Simulation Centers
- Research

# Patient and Family Education

# Study

- N = 12 medical students
- Group 1 (n=6)
  - Standard teaching materials
- Group 2 (n=6)
  - Angioteacher
- Both groups took coronary angiogram pre-test
- 45 minute study period
- Trend though not statistically significant toward better scores in the AngioTeacher grp.
  - Low number of students

# Future Development

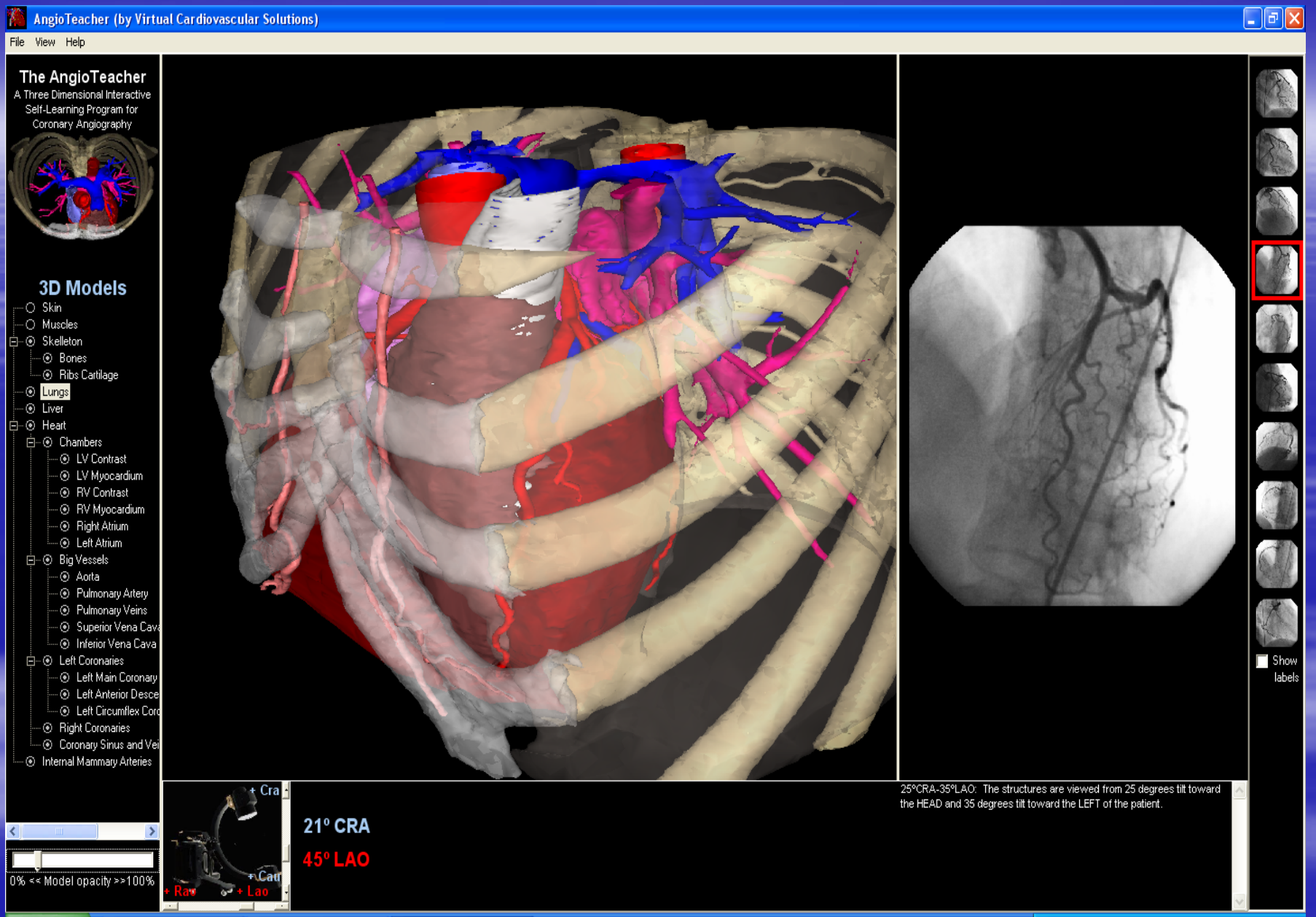
- Current version
- Library of studies
  - Normal variants
  - CABG
- Improvements in software
  - Dynamic images
  - User friendly changes

# Future Development

- Other models
  - Cardiac
    - Echocardiography
    - Electrophysiology
    - Structural heart diseas
  - Anatomical
    - Basic Anatomy
    - Surgical training and testing
  - Other vascular beds
    - Cerebro-vascular bed
    - Peripheral vascular bed

# International Applications

- This is the end of the presentation as we move into the software demonstration portion. I am adding this slide and the following slides to send on to Cindy.


AngioTeacher (by Virtual Cardiovascular Solutions)
File View Help
The AngioTeacher
A Three Dimensional Interactive Self-Learning Program for Coronary Angiography
3D Models
Skin
Muscles
Skeleton
Bones
Ribs Cartilage
Lungs
Liver
Heart
Chambers
LV Contrast
LV Myocardium
RV Contrast
RV Myocardium
Right Atrium
Left Atrium
Big Vessels
Aorta
Pulmonary Artery
Pulmonary Veins
Superior Vena Cava
Inferior Vena Cava
Left Coronaries
Left Main Coronary
Left Anterior Descending
Left Circumflex Coronary
Right Coronaries
Coronary Sinus and Veins
Internal Mammary Arteries
0% << Model opacity >>100%
+ Cra
+ Caud
+ Ran
+ Lao
21° CRA
45° LAO
25°CRA-35°LAO: The structures are viewed from 25 degrees tilt toward the HEAD and 35 degrees tilt toward the LEFT of the patient.
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3 D project
VCS Introduction - ...
AngioTeacher
9:35 AM
Thursday

AngioTeacher (by Virtual Cardiovascular Solutions)

File View Help

# The AngioTeacher

A Three Dimensional Interactive Self-Learning Program for Coronary Angiography

## 3D Models

- Skin
- Muscles
- Skeleton
  - Bones
  - Ribs Cartilage
- Lungs
- Liver
- Heart
  - Chambers
    - LV Contrast
    - LV Myocardium
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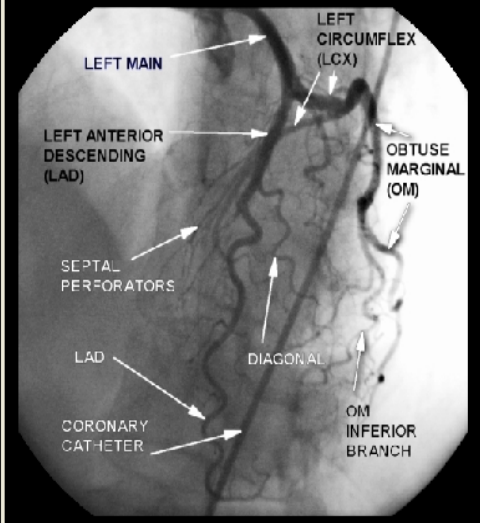


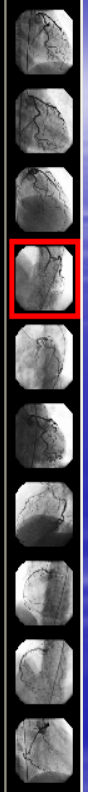

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11° CRA

74° LAO

25°CRA-35°LAO: The structures are viewed from 25 degrees tilt toward the HEAD and 35 degrees tilt toward the LEFT of the patient.

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File View Help

**The AngioTeacher**

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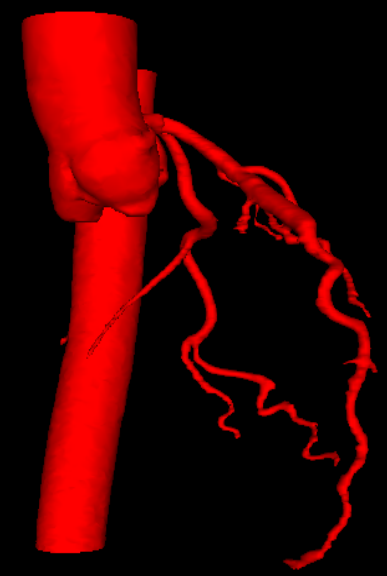

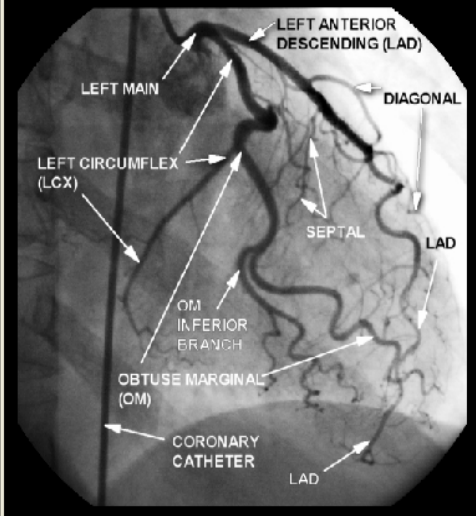


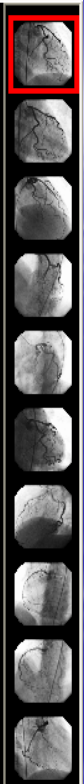

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**Same projection as:** 0°CAU-15°RAO: 0° Caudal - 15° Right Anterior Oblique

**0° CAU**

**15° RAO**

0°CAU-15°RAO: The structures are viewed from 0 degrees tilt toward the FEET and 15 degrees tilt toward the RIGHT of the patient. This is generally considered the starting angle for a coronary angiogram - a nearly straight anterior to posterior view.

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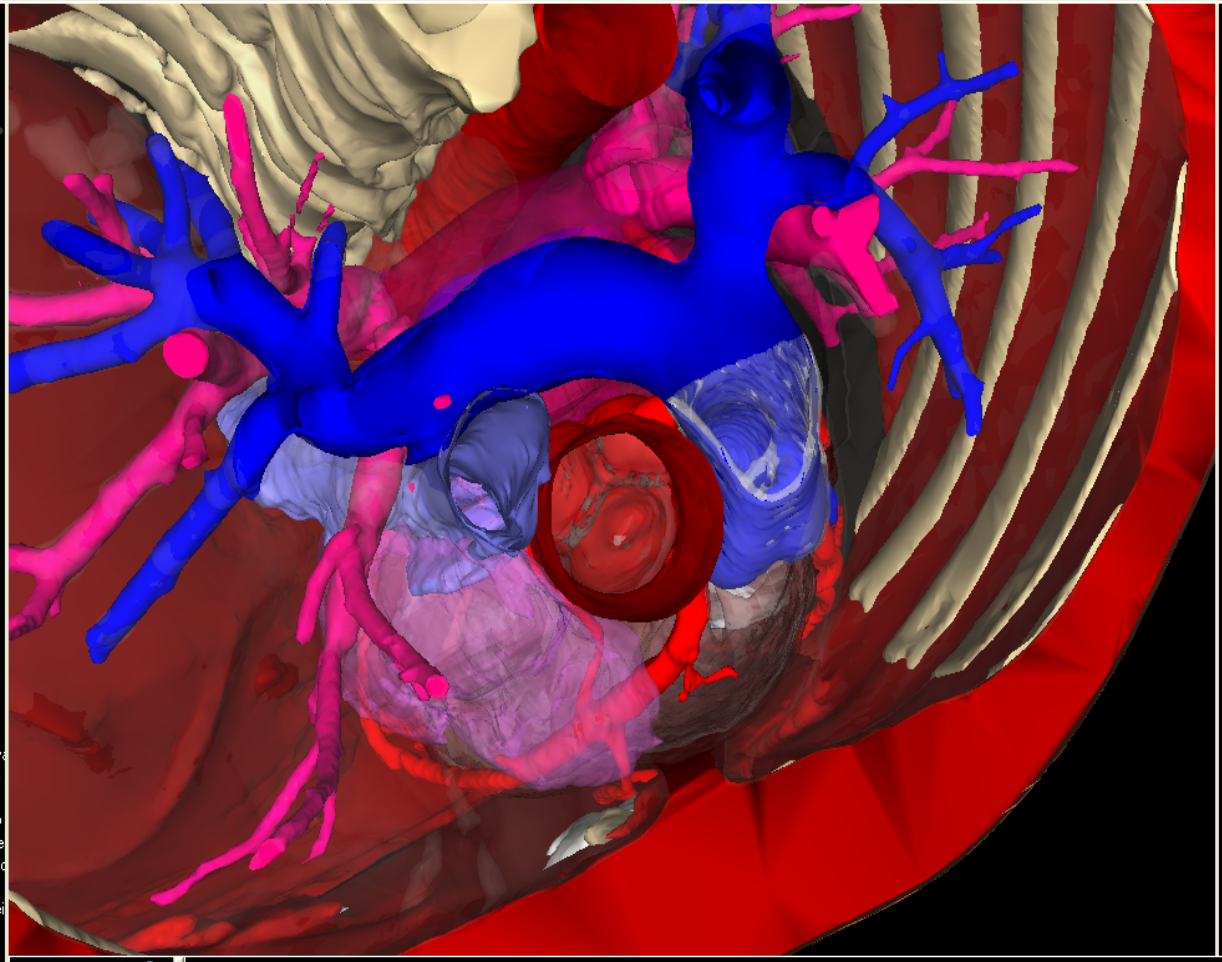

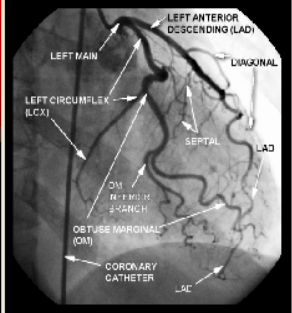


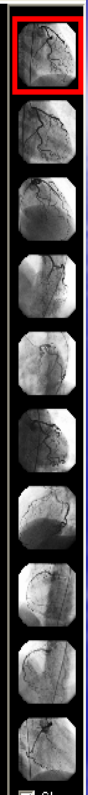

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(Warning: Unreachable C-Arm position!)

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