



Getting the Most of Your 3DRA System: 3 Perspectives on Equipment Capabilities and Limitations Philips Equipment

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Disclosures

Philips Healthcare:

Grant support

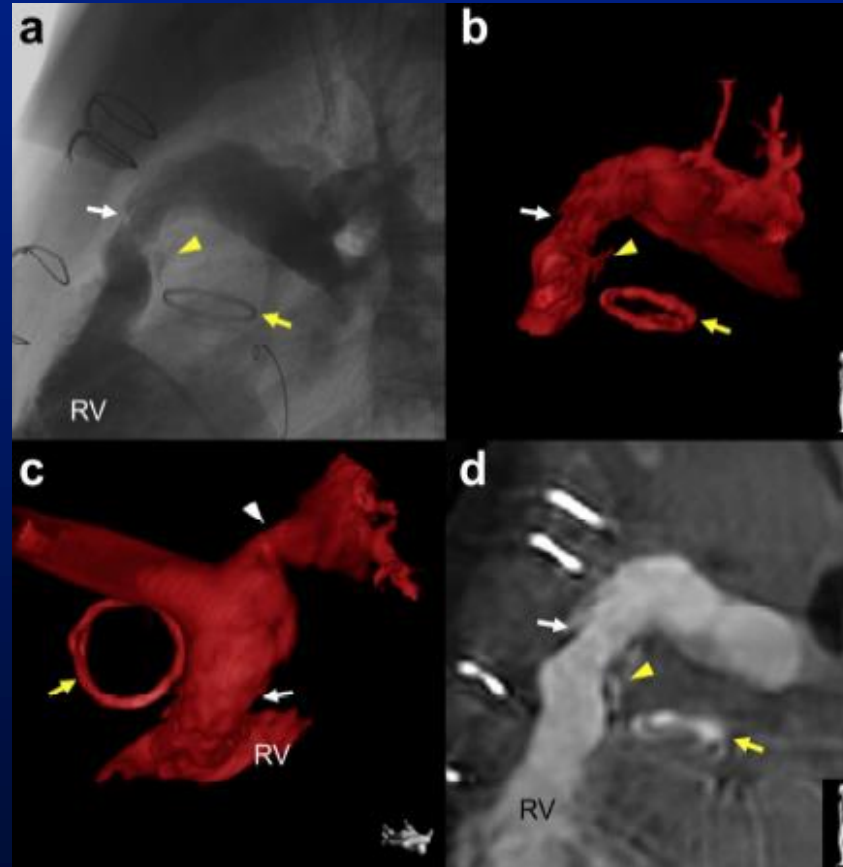
Speaking Bureau / Teaching

3DRA



Diagnostic Capabilities

- Multiple reports of diagnostic utility
- Radiation exposure not increased



Berman, *CCI*. 80:922–930

Glatz, *J Am Coll Cardiol Img*. 2010;3:1149-57

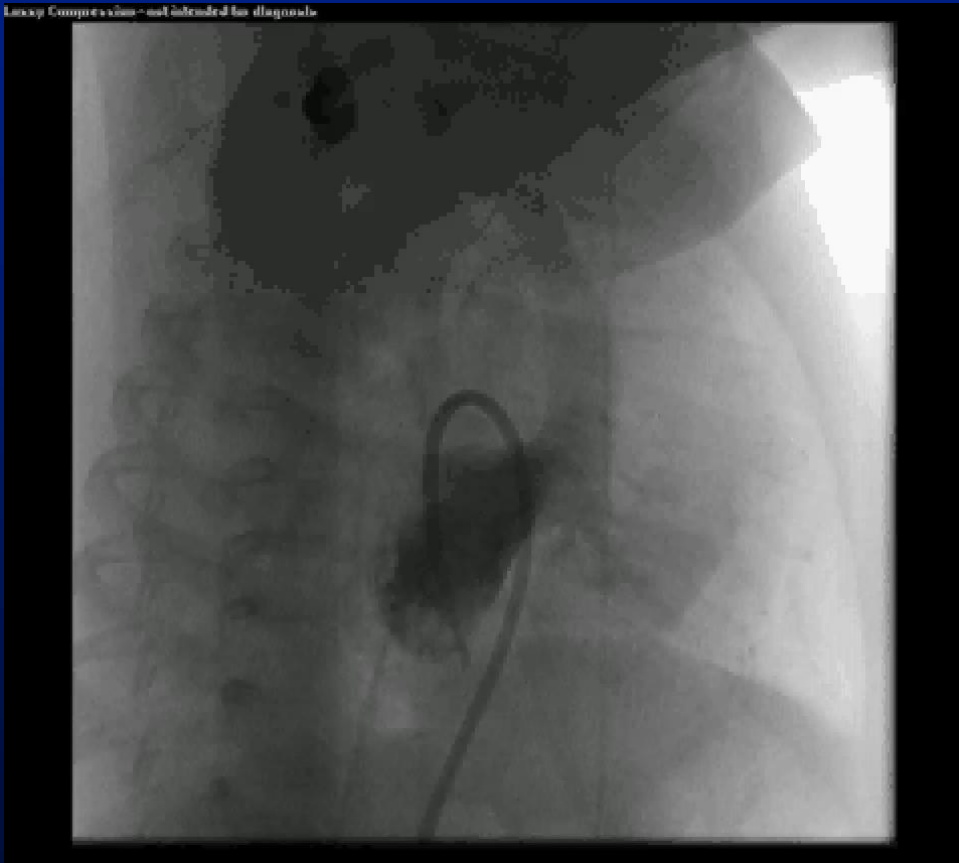
Glockler, *Eur Radiol*. 2011;21:2511-2520

Aldoss, *Pediatr Cardiol*. 2016 Oct;37(7):1211-21

Stenger, *Pediatr Cardiol*. 2016 Mar;37(3):528-36

3D Rotational Angiography

3DRA



240° acquisition over 4 sec

- RAO 120° to LAO 120°
- 30 fps
- Expiratory breathhold

Contrast Injection

- Uniform opacification throughout

We have not utilized RRVP

3DRA

Contrast Injection Protocols

- Uniform opacification through 4s acquisition
- Contrast diluted 2/1 with saline
- Delivered proximal to area of interest
- Contrast dose
 - Arterial structures: 2cc/kg
 - Venous structures (Glenn; Fontan): 2cc/kg
 - Shunts/Coronary/other: Varies depending on structure
 - With or without proximal balloon occlusion

3DRA Rotation



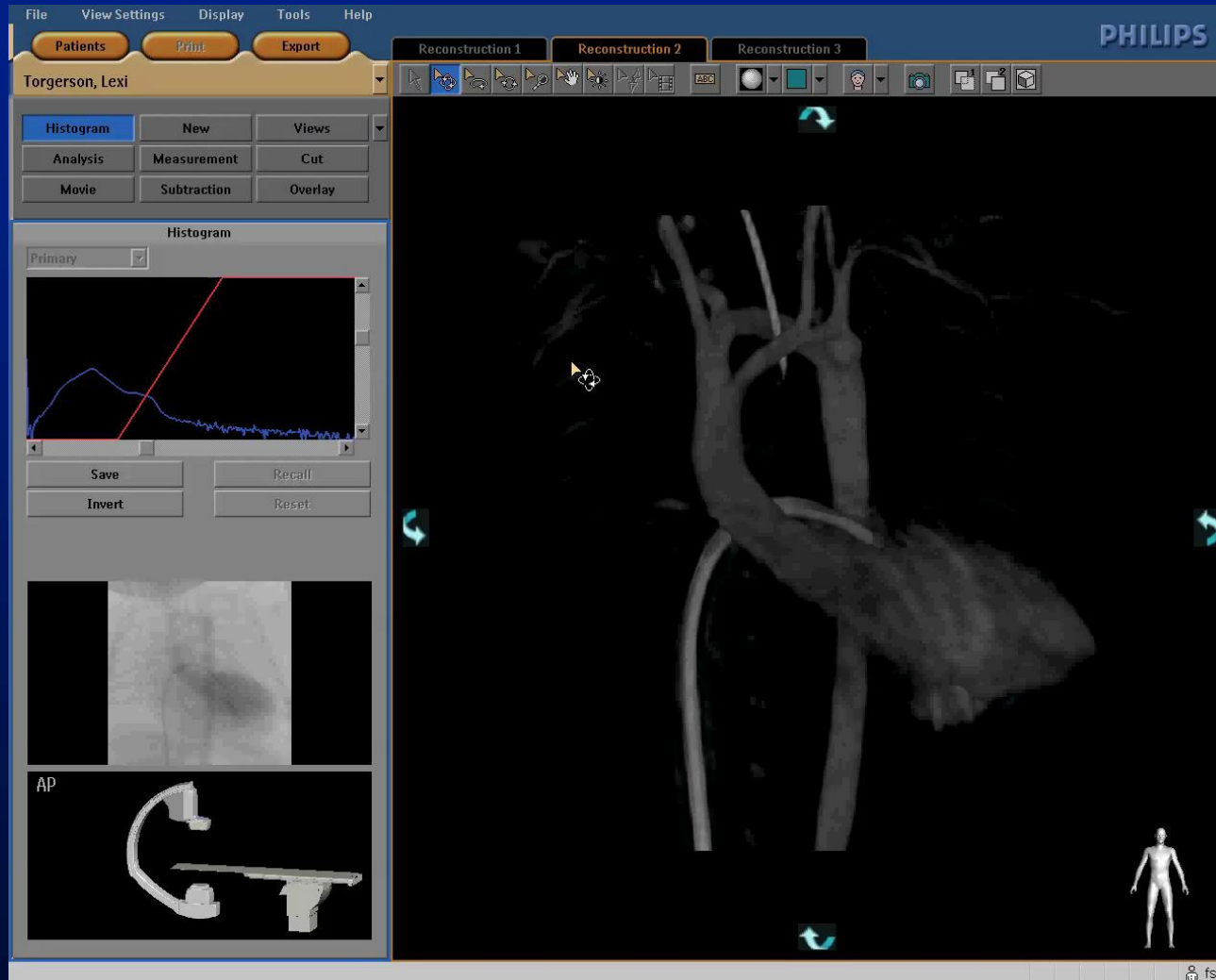
3DRA

3-Dimensional Reconstruction



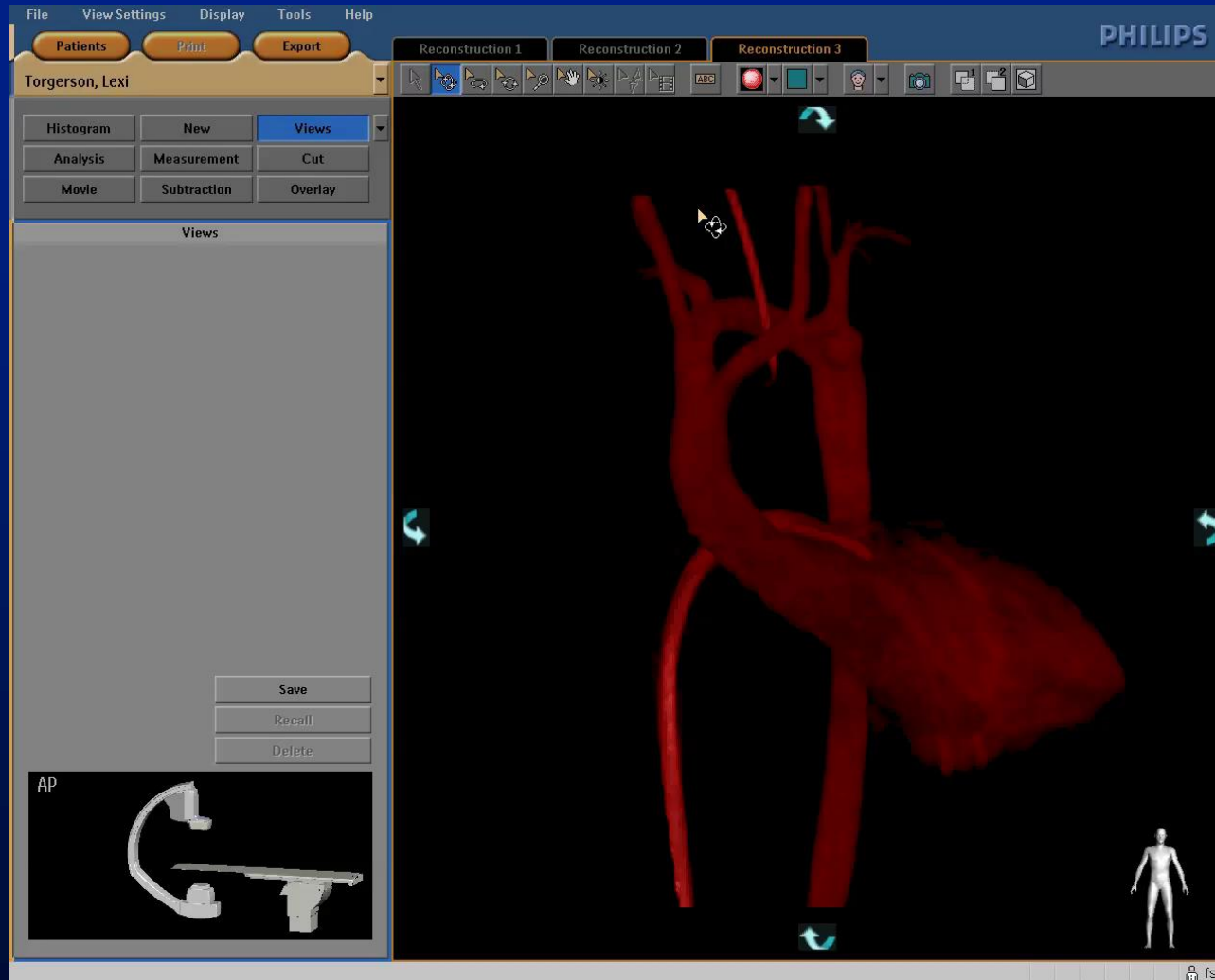
- CT-like reconstruction algorithms applied
- Workstation or bedside controls

3-Dimensional Reconstruction Window Leveling / Cropping



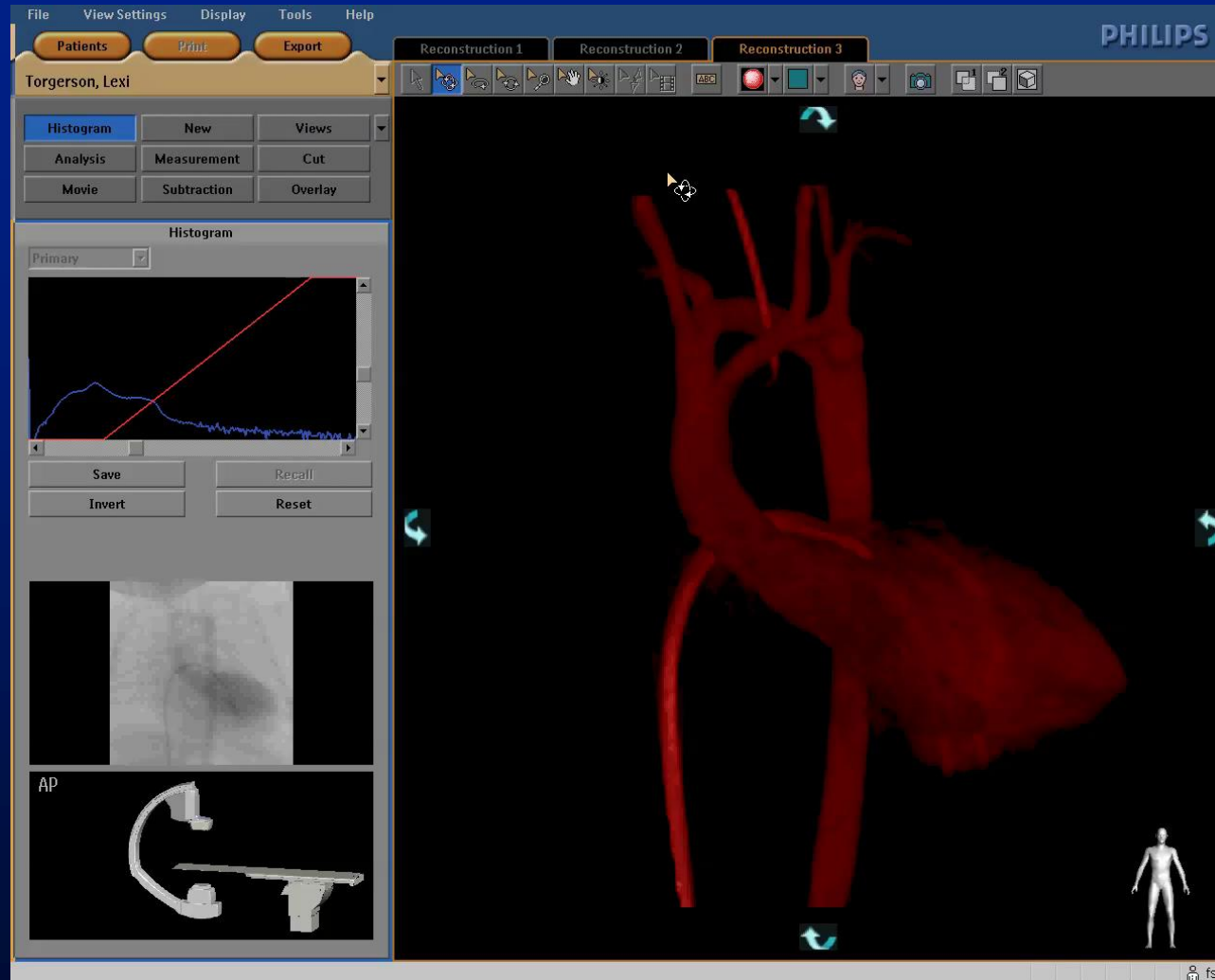
- Workstation or bedside controls

3-Dimensional Reconstruction Orientation Windows



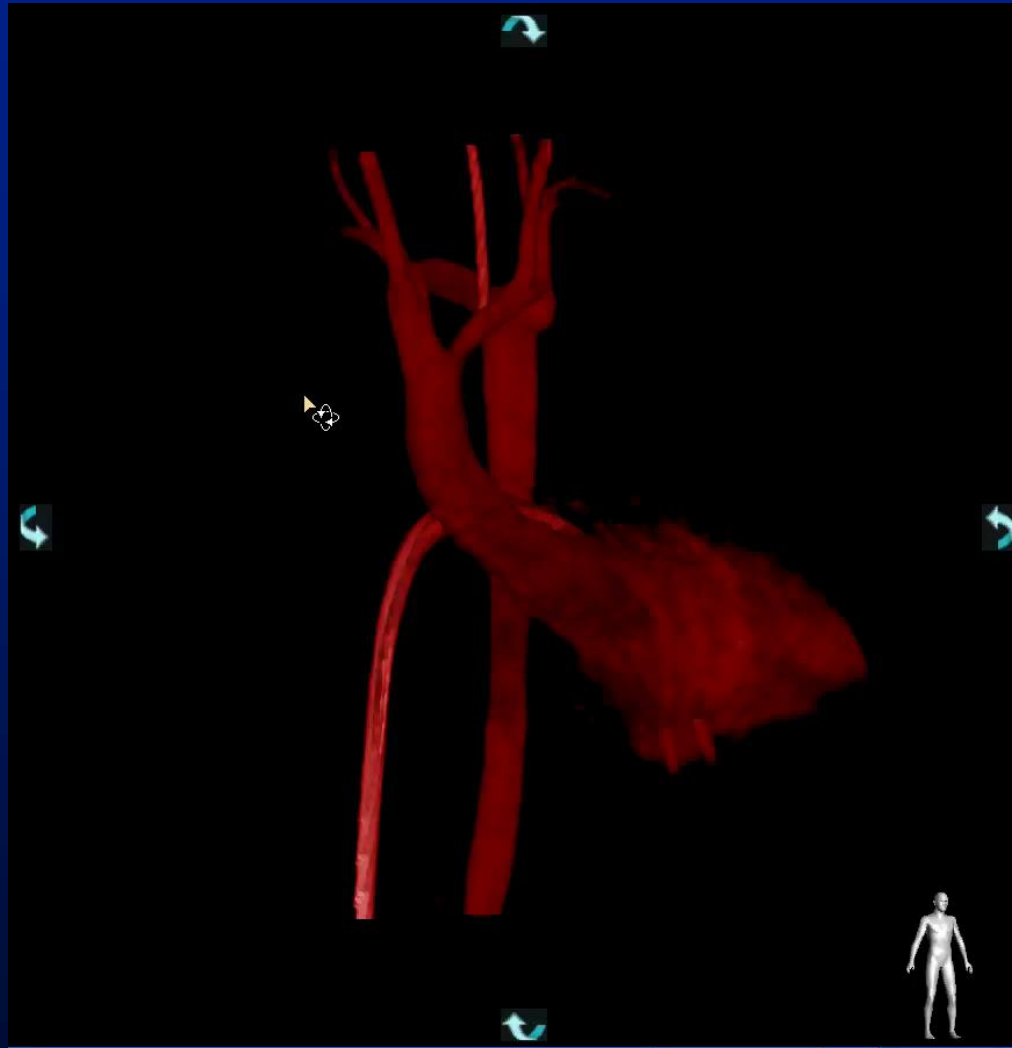
- Workstation or bedside controls

3-Dimensional Reconstruction Render Modes



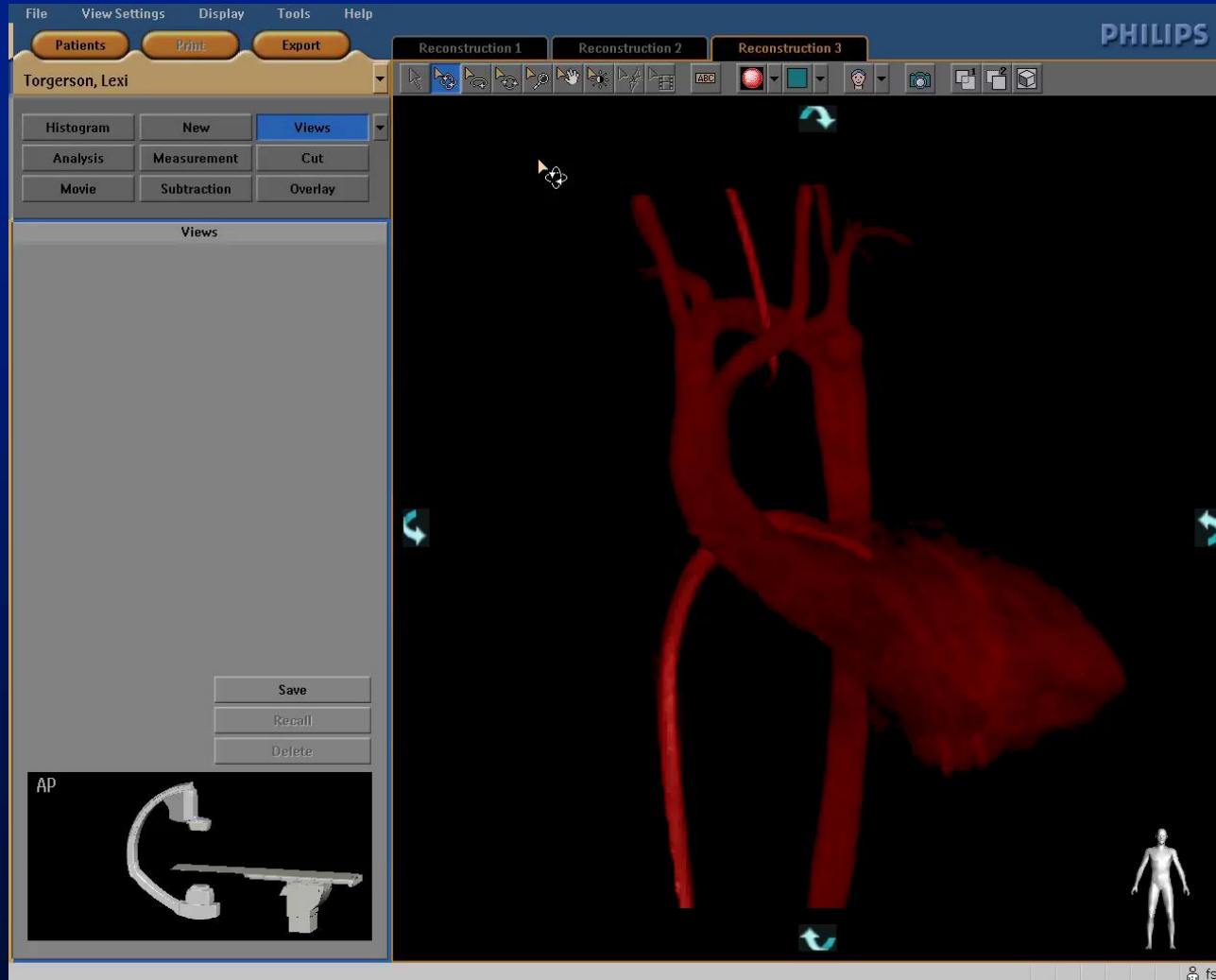
- Workstation or bedside controls

3-Dimensional Reconstruction Cut Planes



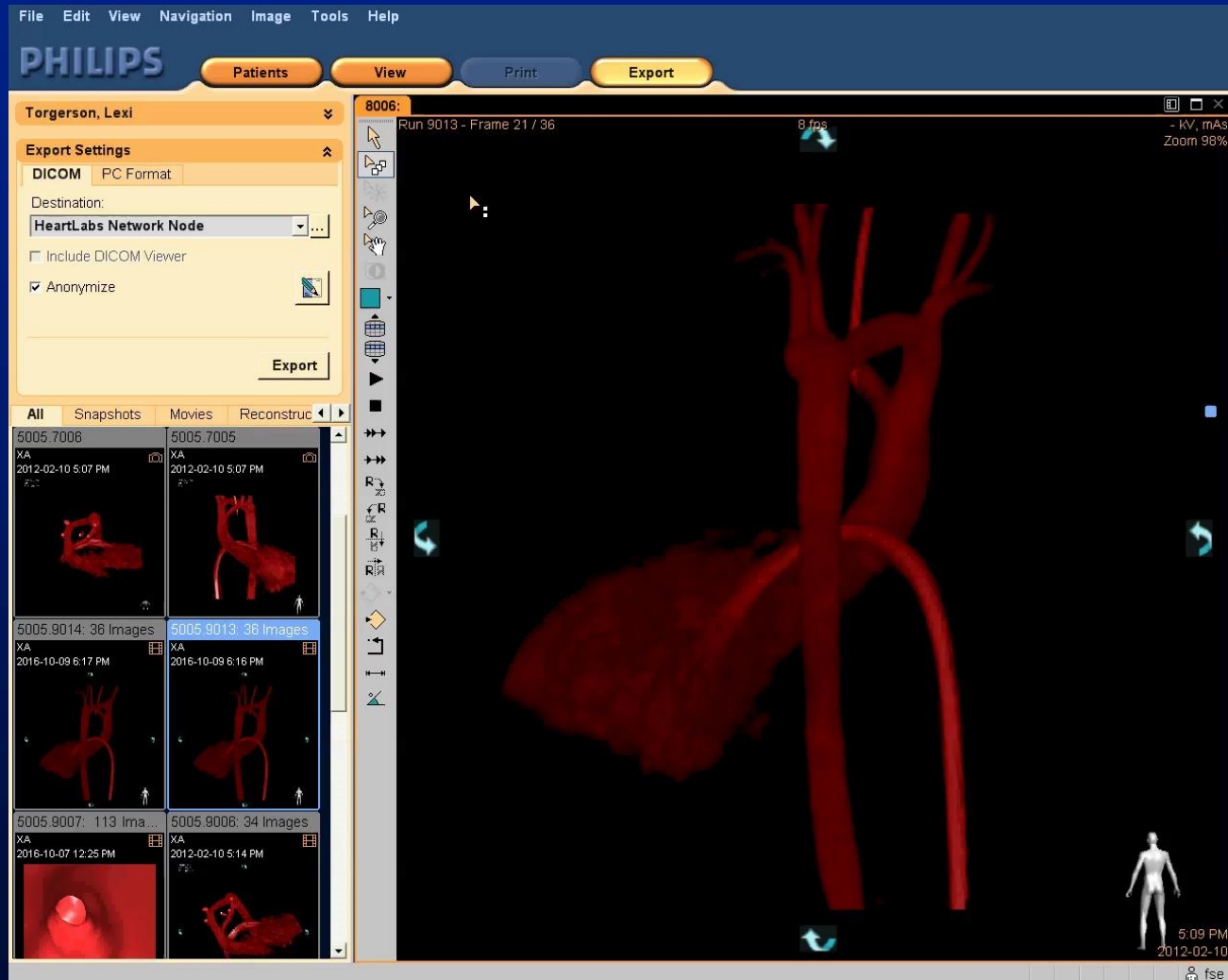
- Workstation or bedside controls

3-Dimensional Reconstruction Create Videos



- Workstation or bedside controls

3-Dimensional Reconstruction Export Files



- Workstation or bedside controls

3DRA

Multiplanar Reformat

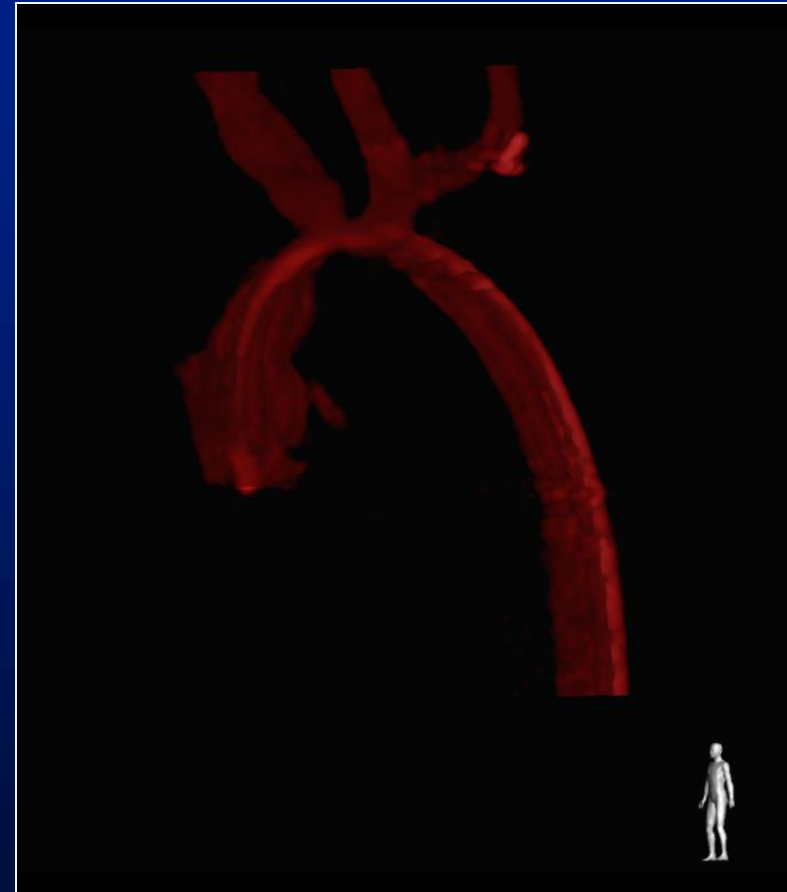
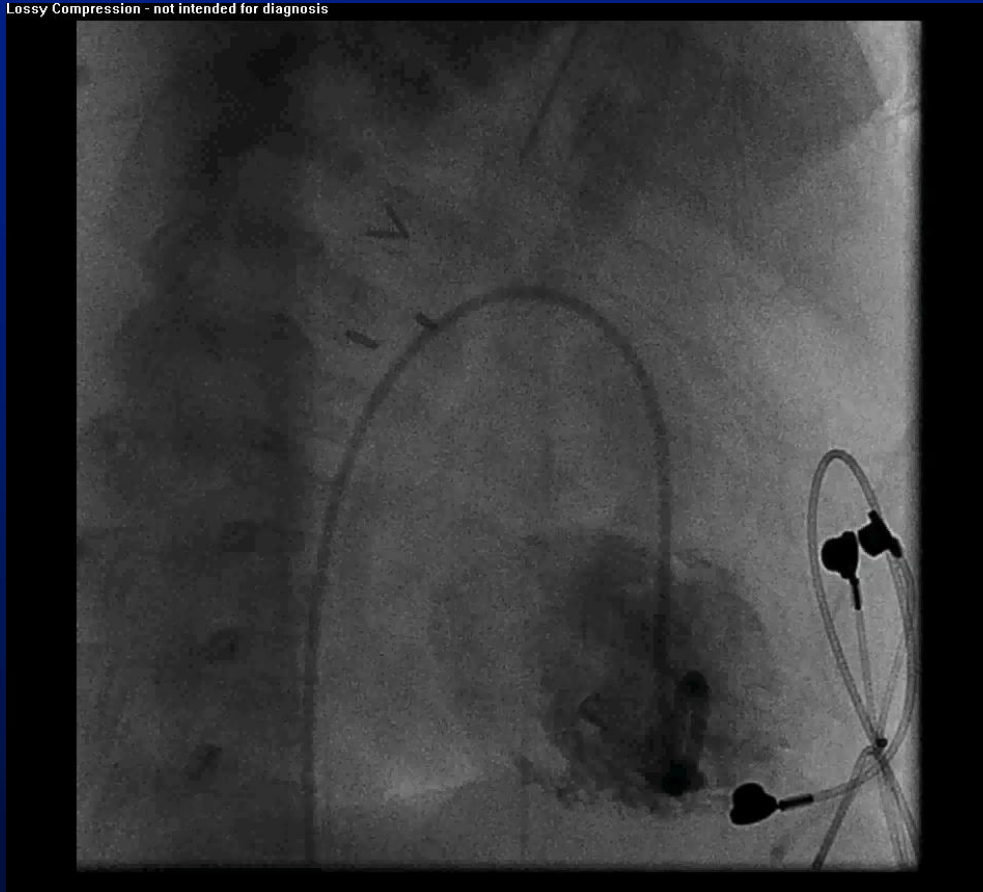


- Workstation or bedside controls

3DRA Registration

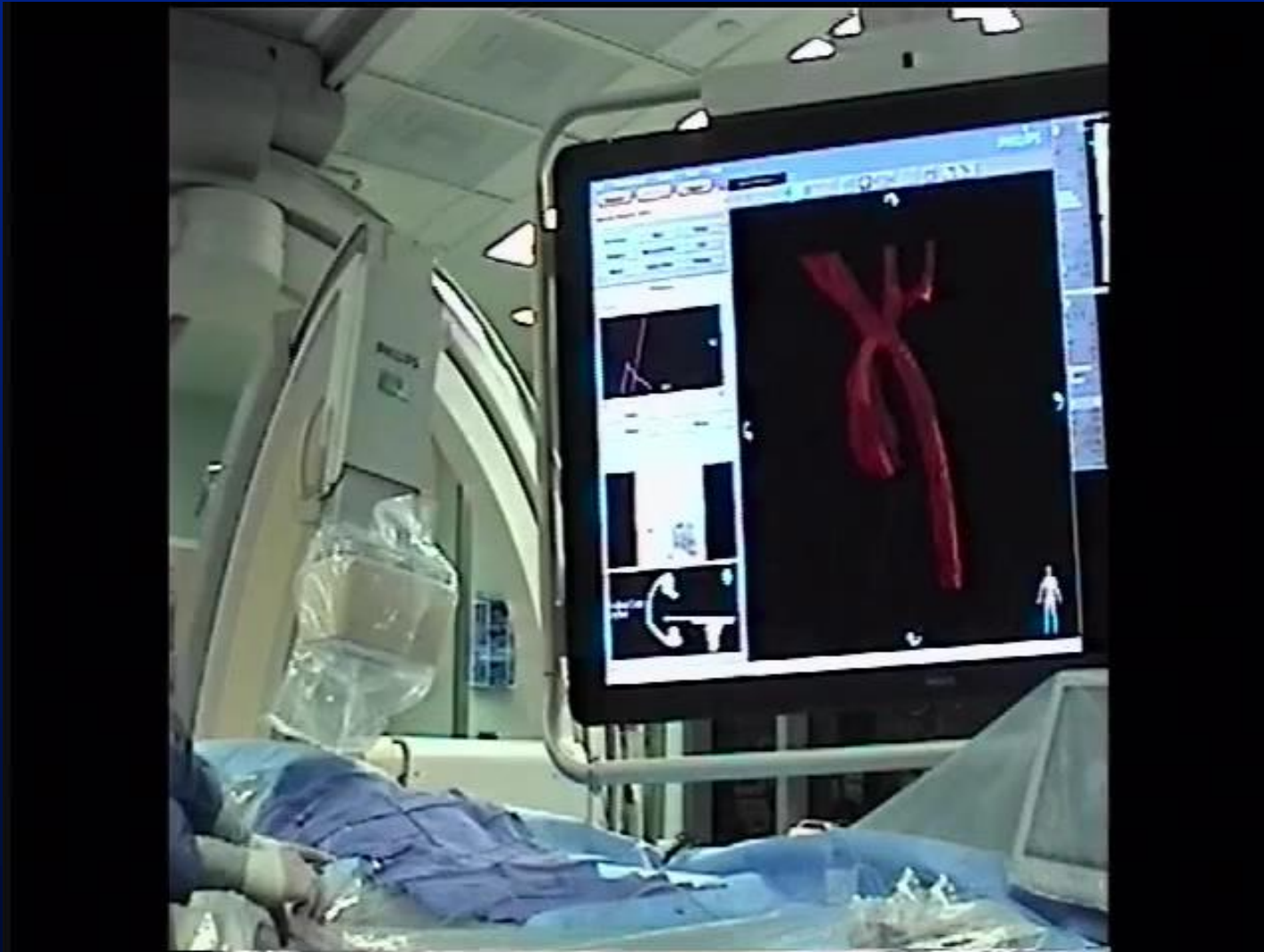


Lossy Compression - not intended for diagnosis

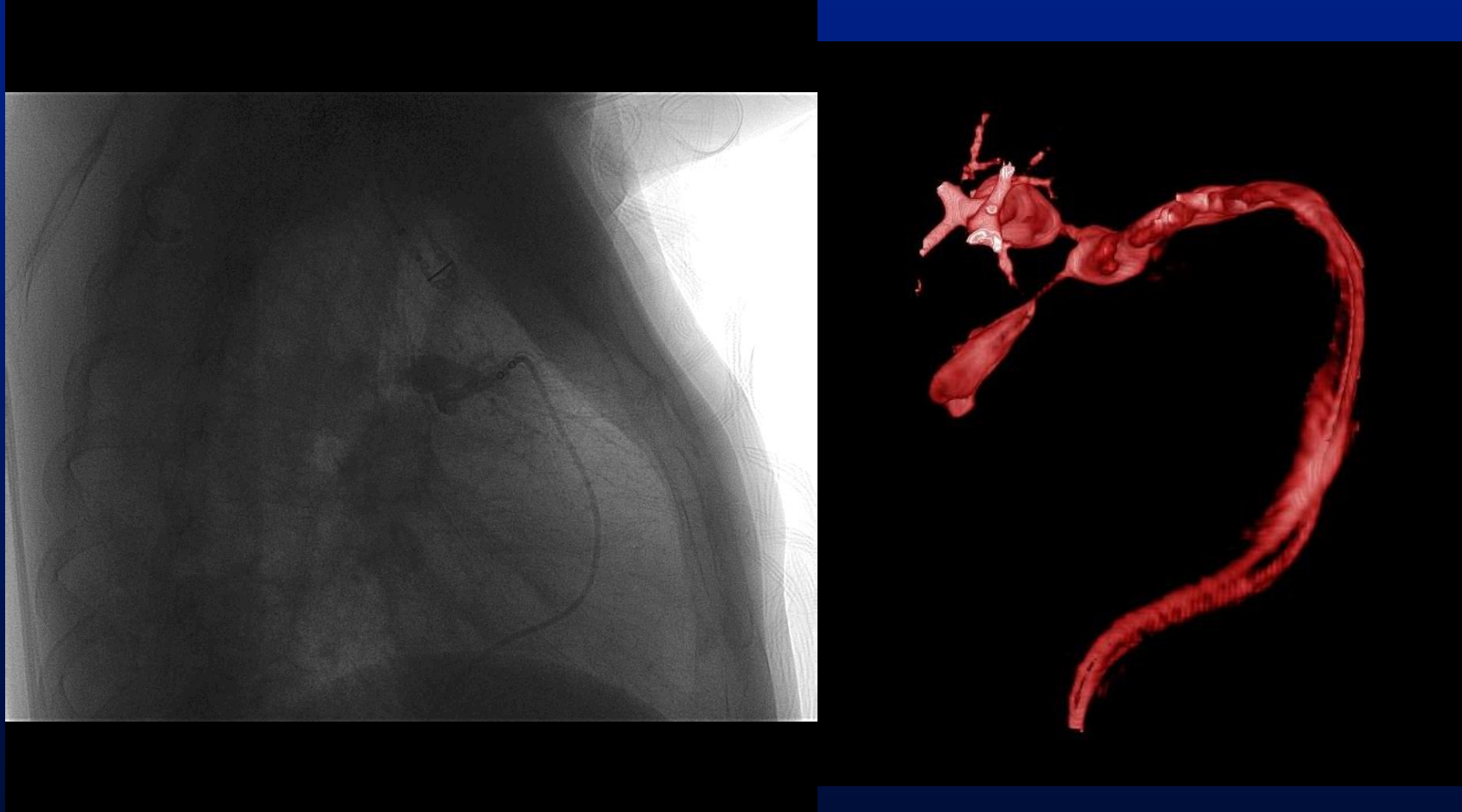


- All coordinates of gantry and table known

3DRA Registration



Interventional Guidance 3DRA Overlay



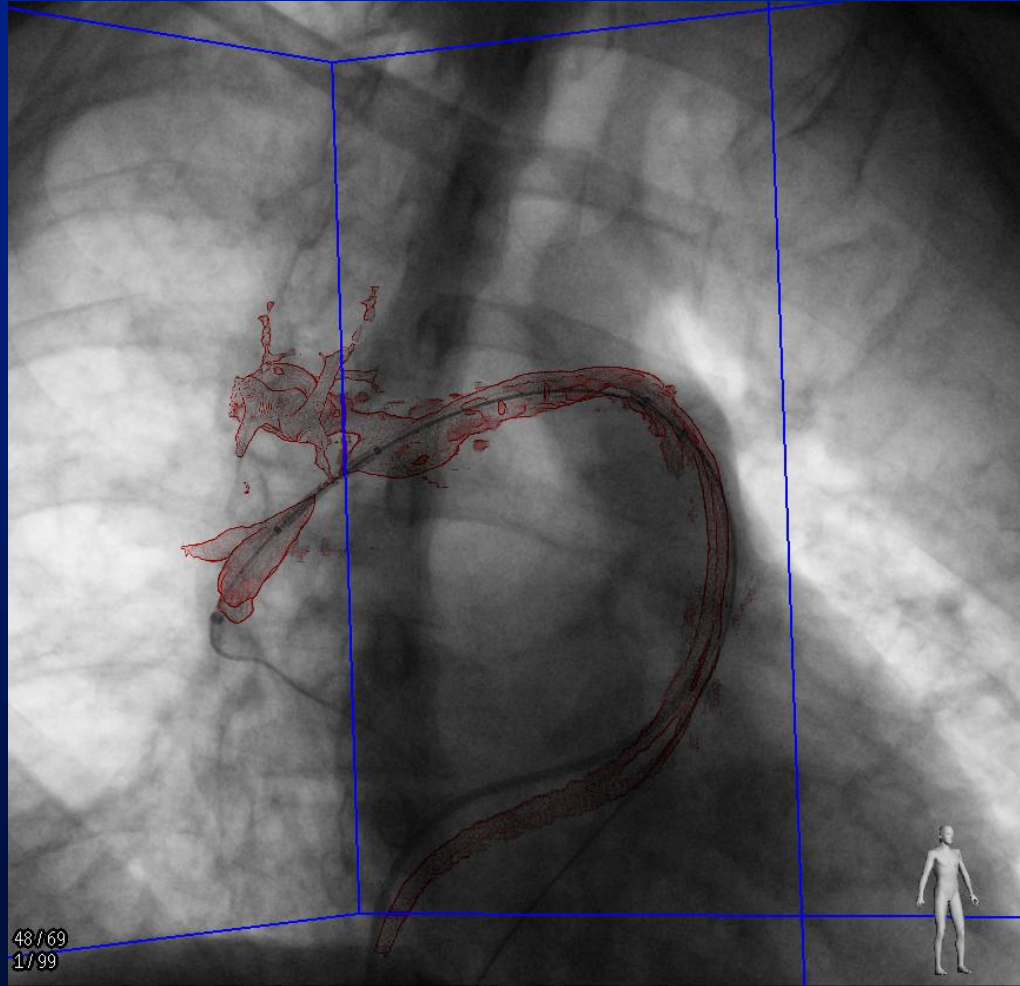
- 31 yo Isolated PA post 6 mm conduit

Interventional Guidance 3DRA Overlay



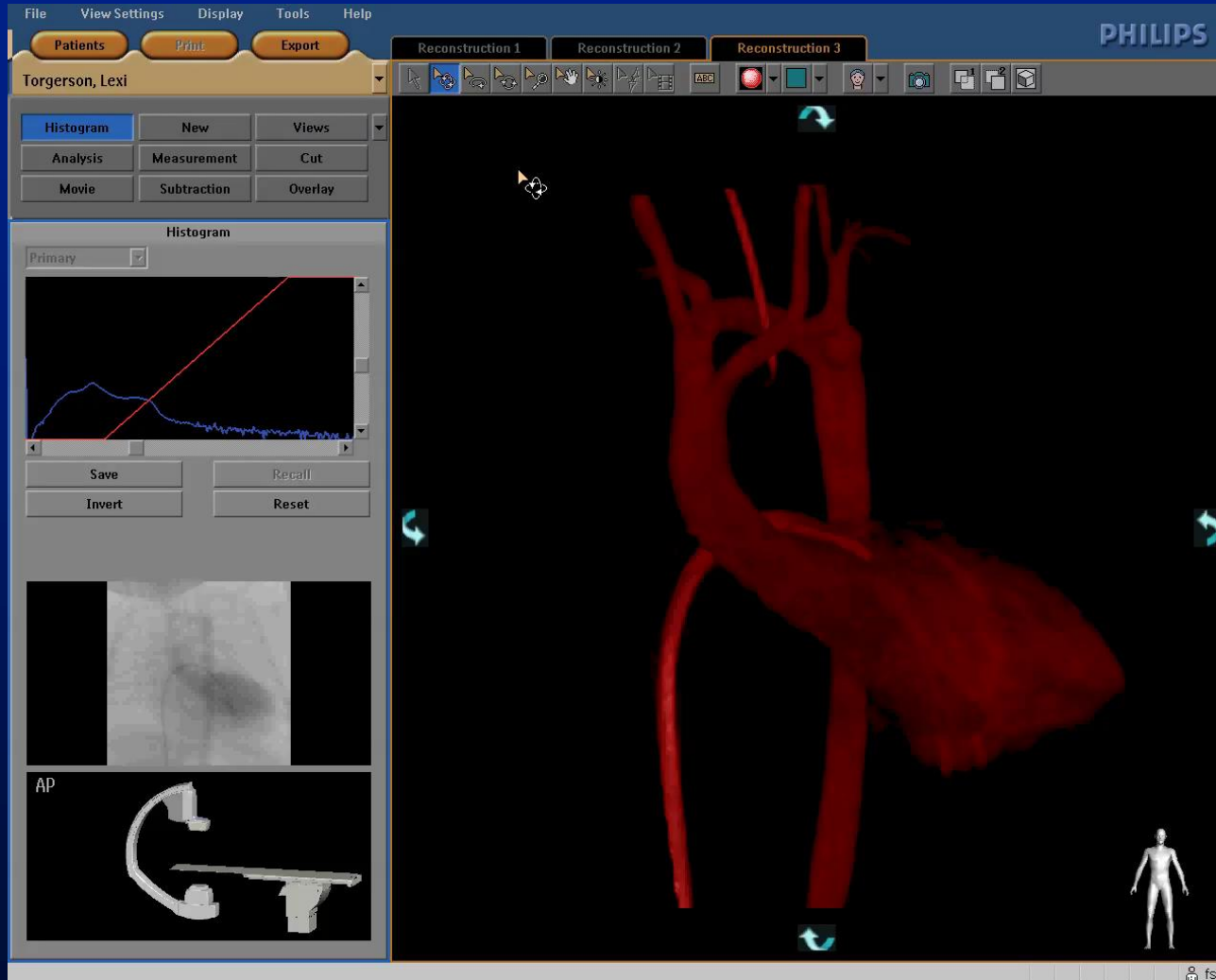
- 31 yo Isolated PA post 6 mm conduit

Interventional Guidance 3DRA Overlay



- 31 yo Isolated PA post 6 mm conduit

3-Dimensional Reconstruction Cross Sectional Area / Fly Through



3-Dimensional Reconstruction Quantification

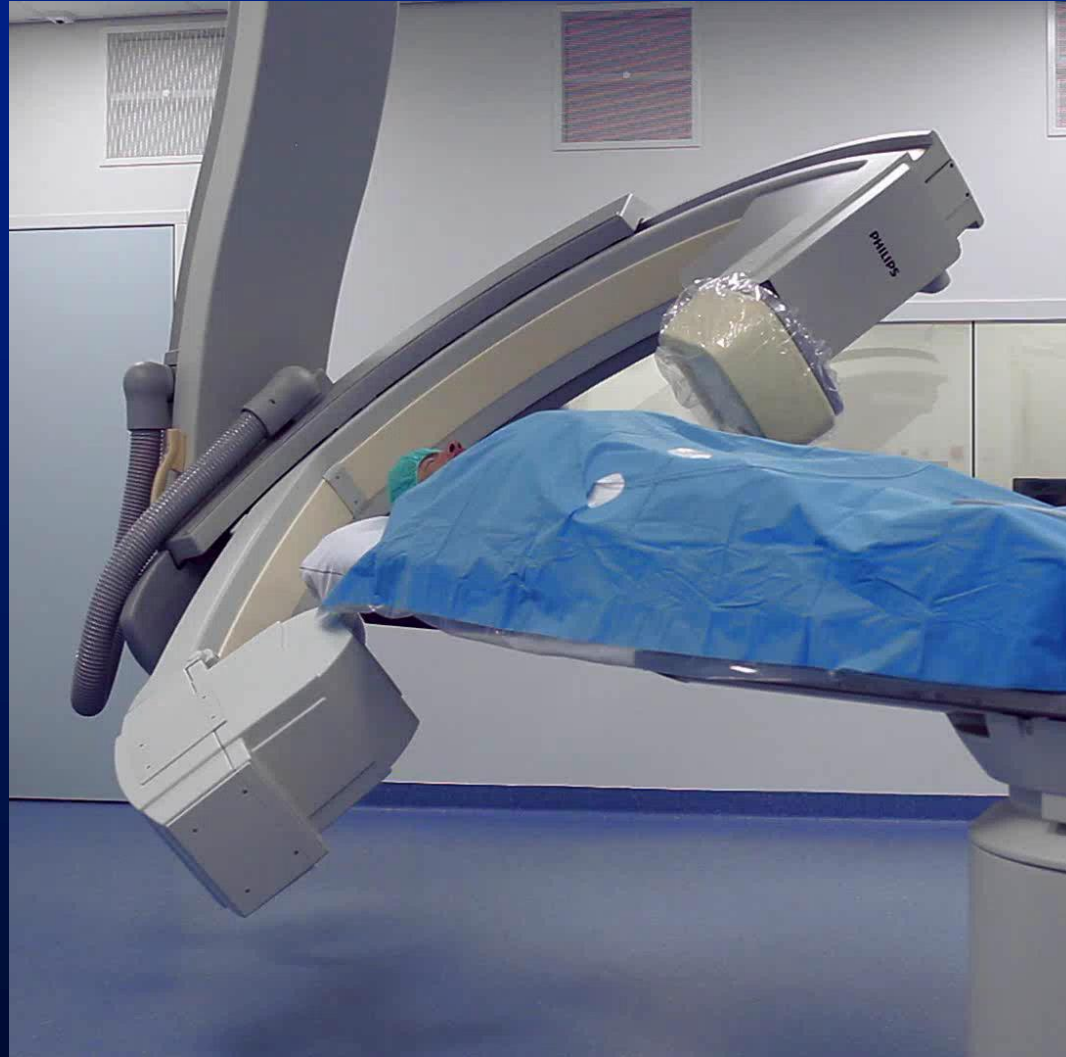


The screenshot displays the Philips 3D reconstruction software interface. The main window shows a 3D reconstruction of a heart and aorta, rendered in red. The interface includes a menu bar (File, View Settings, Display, Tools, Help) and a toolbar with various icons. The left sidebar contains a patient list (Torgerson, Lexi) and a navigation pane with buttons for Histogram, New, Views, Analysis, Measurement, Cut, Movie, Subtraction, and Overlay. The Analysis pane is active, showing a '1. Select Method' section with instructions: 'Select an analysis method: 'AVA' or 'Aneurysm'.' and 'Select 'Device' to insert a virtual device in an analyzed segment.' Below the instructions are three dropdown menus: AVA, Aneurysm, and Device. A warning message states: 'Please note that the histogram setting has been altered. This setting may not produce the best results.' At the bottom left, there is a small 2D AP (Anteroposterior) view of the heart and aorta. The bottom right corner shows a small human figure icon and the text 'fse'.

3-Dimensional Reconstruction Device Simulation



Xper Swing Left Coronary Artery

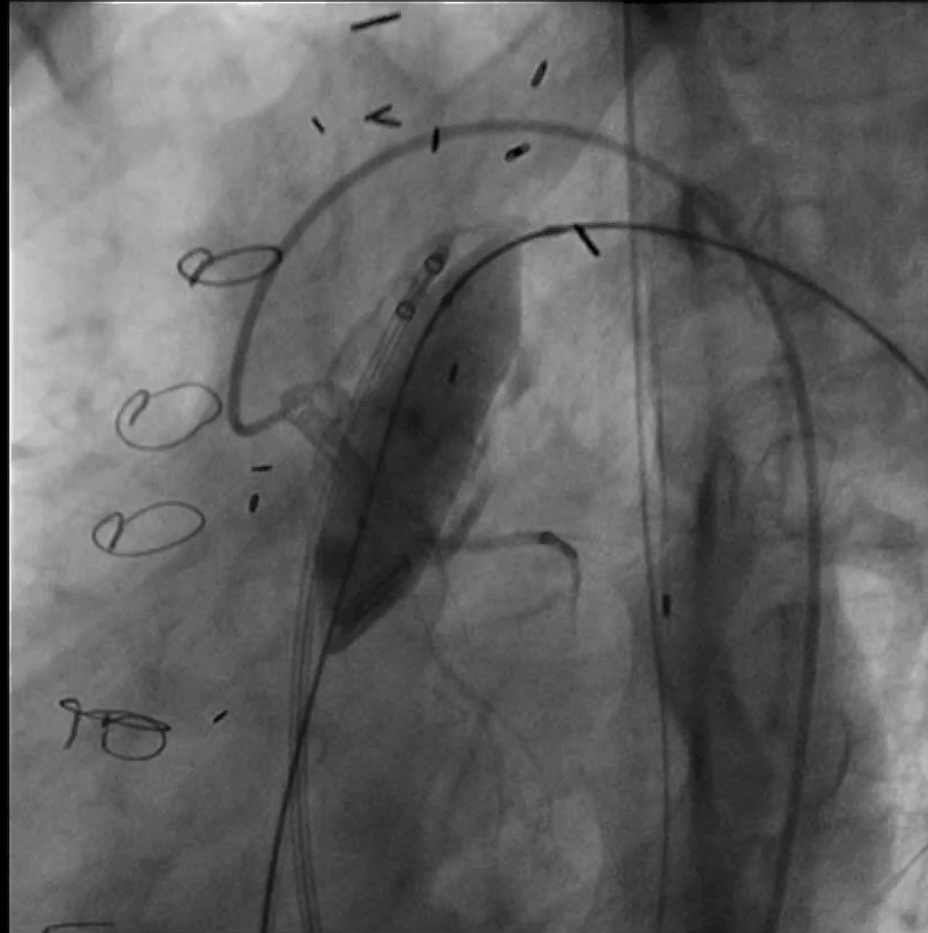


Courtesy of Drs. John Messenger, Michael Kim and Philips Healthcare

Xper Swing Left Coronary Artery



Lossy Compression - not intended for diagnosis



Provided by Michael Ross

Garcia, *Catheter Cardiovasc Interv* 73:753–761

3DRA

Limitations



- **Differential anatomic coloring coding**
- **Quantitative measures (3DRA)**
 - XperCT
- **Airway 3-D Reconstruction (3DRA)**
 - EP Navigator
 - XperCT

3DRA

The Future



- **Cardiac angiography; limited to rotational angiograms**
 - Improved imaging with less contrast
 - Continued reduction in radiation exposure
 - Prove quantitative measurements
- **Workflow improvements**
 - Workstation display / commands
 - Reduced manual reconstruction steps
- **Biplane acquisition**
 - Reduction acquisition time
 - Reduction in contrast
 - Reduced preparation
 - Biplane display

3DRA

The Future



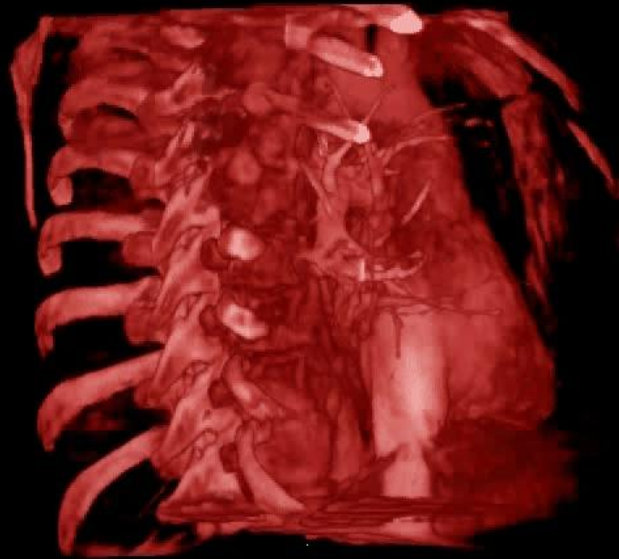
- **Gating / Sparse sampling**
 - ECG
 - Image based (Sparse sampling)
- **3-D modeling / Visualization**
 - 3-D Holography (RealView)
- **Soft tissue / Functional assessment**
 - Whole Heart imaging

Xper CT

Whole Heart Imaging



fps: 28.75
viewport: [1248, 640]
zoom: 1.30
volume dimensions: [200, 200, 180]
voxel size: [1.00, 1.00, 1.00]



- **Soft tissue cardiac structures**
- **Surrounding tissue**
- **Airway visualization / reconstruction**

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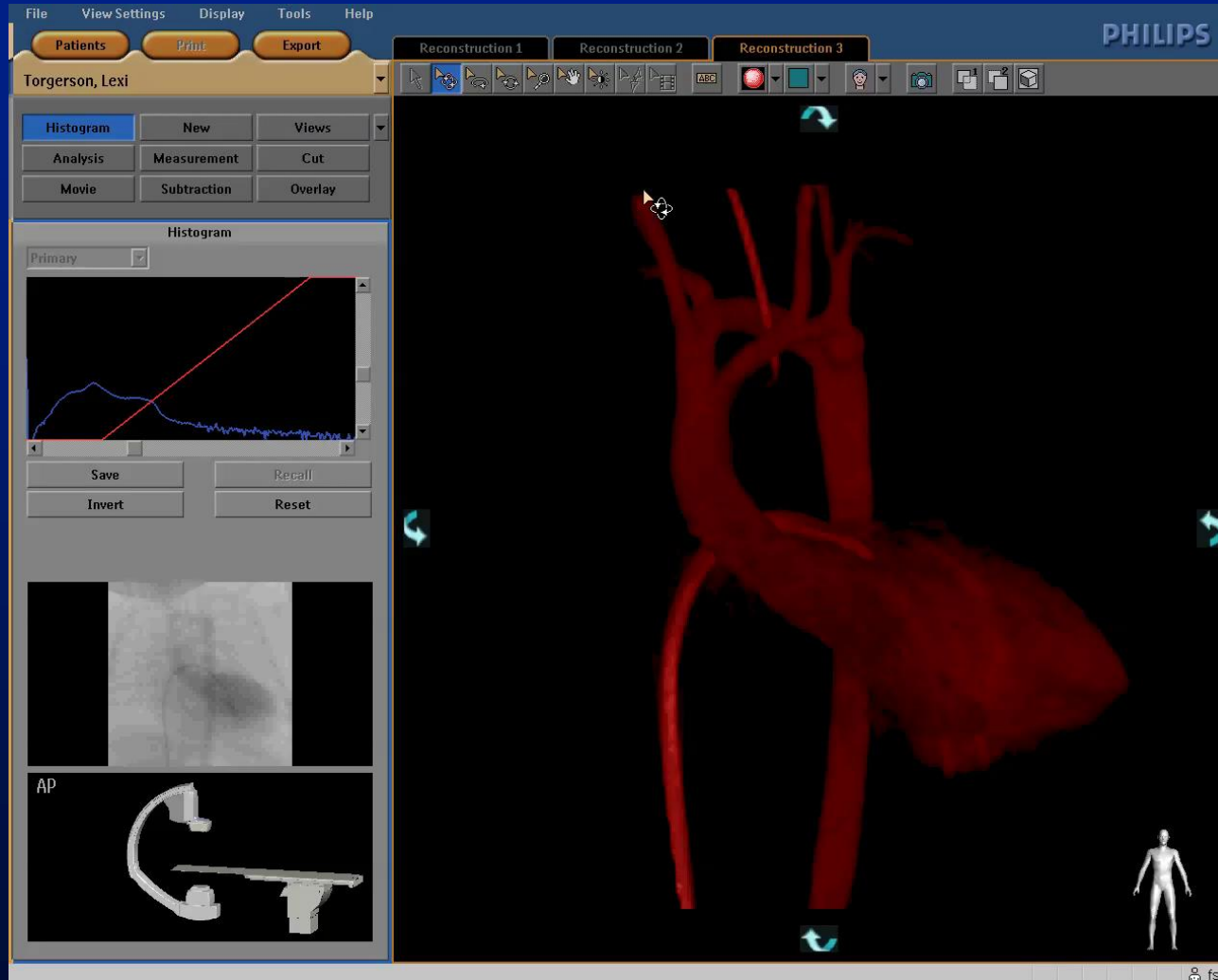
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Thank you



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3-Dimensional Reconstruction Orientation Pre-sets



- Workstation or bedside controls