



Innovations in Teaching Cardiac Anatomy

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Disclosure:

- I have no financial interest in the companies or software described in this lecture.
- The CT and rotational movements of these slides were produced using Snagit Software.

Why 3-D“Virtual Anatomy”?

- Trend is away from cadavers to other methods of teaching anatomy
- The cost of building a cadaver lab is prohibitive. (> \$10 million)
- Time in the curriculum for teaching anatomy is decreasing
- Percentage of questions on the licensing exams is decreasing
- Anatomy should be taught over all four years of medical school and into residency
- These are the principle reasons why the UNLV School of Medicine is teaching anatomy using “Virtual Anatomy”

Why 3-D “Virtual Anatomy”?

- While practicing medicine, the primary source of anatomic information is through CT, MRI and Ultrasound
- The transition from cadaver to radiologic anatomy is very difficult for most physicians
- Why not teach cross-sectional anatomy from the beginning?

3D “Virtual Anatomy” Tables

- Produced by two companies (Anatomage and SECTRA)
- Based on actual humans who donated their bodies and were frozen at the time of death.
- Cutting the frozen body in thin slices (1 to 3 mm) from head to toe provides the transverse cross-sections that are digitized. This is essentially what a CT/MRI does.
- These transverse cuts can then be converted into sagittal, and coronal representations, much like the conversions done by the PACs software that operates CT and MRI machines.
- The sections are then reconstructed into a 3D representation of the original body

SECTRA Tables:



- “A giant iPad”
- PC Based Touch Screen computer.
- Software on the table retrieves its data from the “cloud”
- Two separate functions:
 - Virtual Human (VH) Dissector (Toltech)
 - IDS7 - Case Based Data (CT, MRI, Ultrasound and Histo-pathology)

For the remainder of the talk:

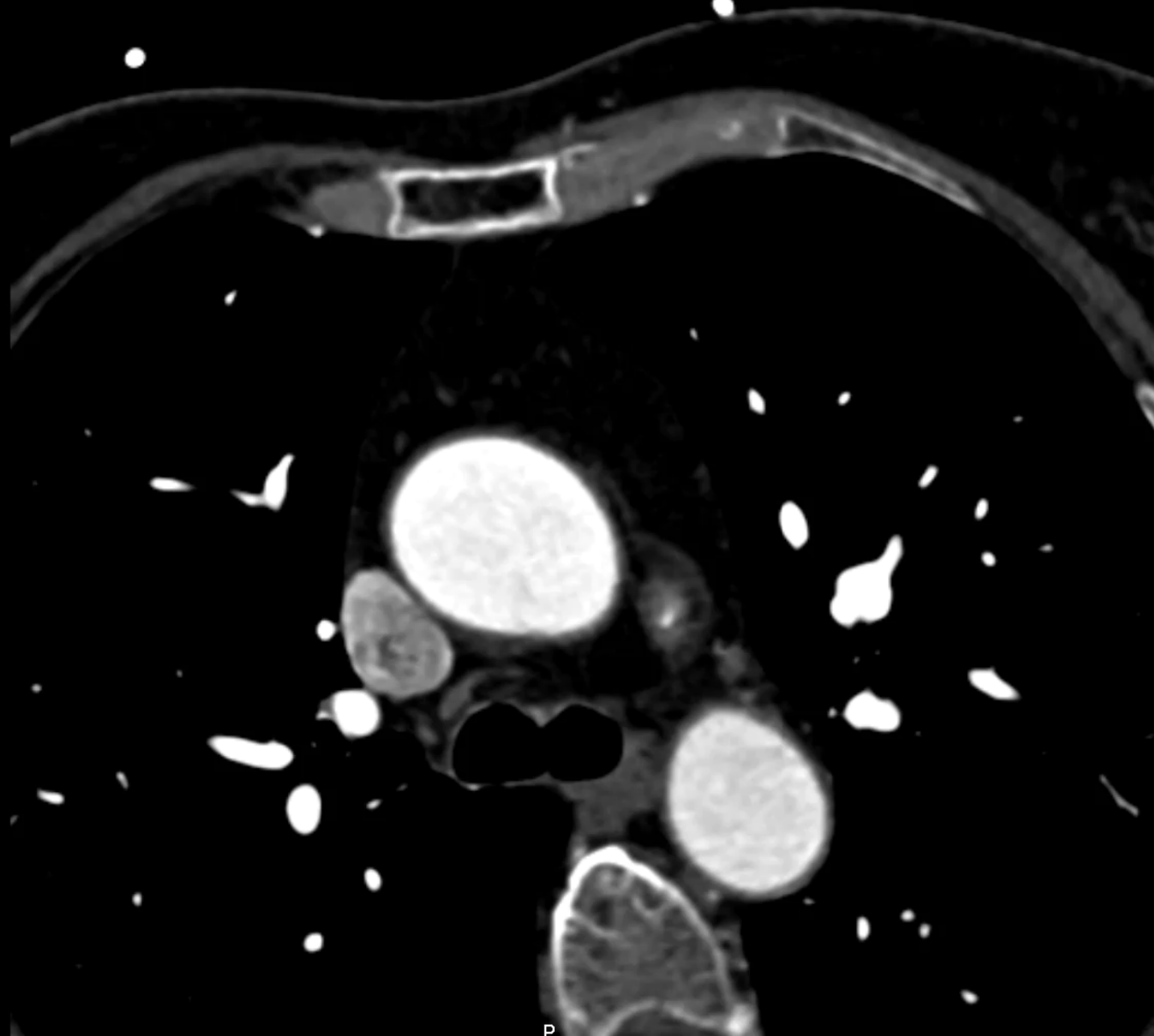
- Normal CT of the heart
- Demonstrate conversion into a 3-D representation using PACS software
- Select a representational transverse CT cut
- Show how the table can integrate the CT with the virtual cadaver
- Render the virtual cadaver into a 3-D teaching tool

IDS7-Case Based Data

S020 Heart B
HqPrf_ANON6H1F4A119
Gantry: 0°
FoV: 200 mm
Time: 330 ms
Slice: 0.75 mm
Couch: -554
Pos: HFS

C: 201.0, W: 602.7
WINDOW1 * 1/8


F: B26f
299 mA
120 kV
Image no: 1
Image 1 of 271
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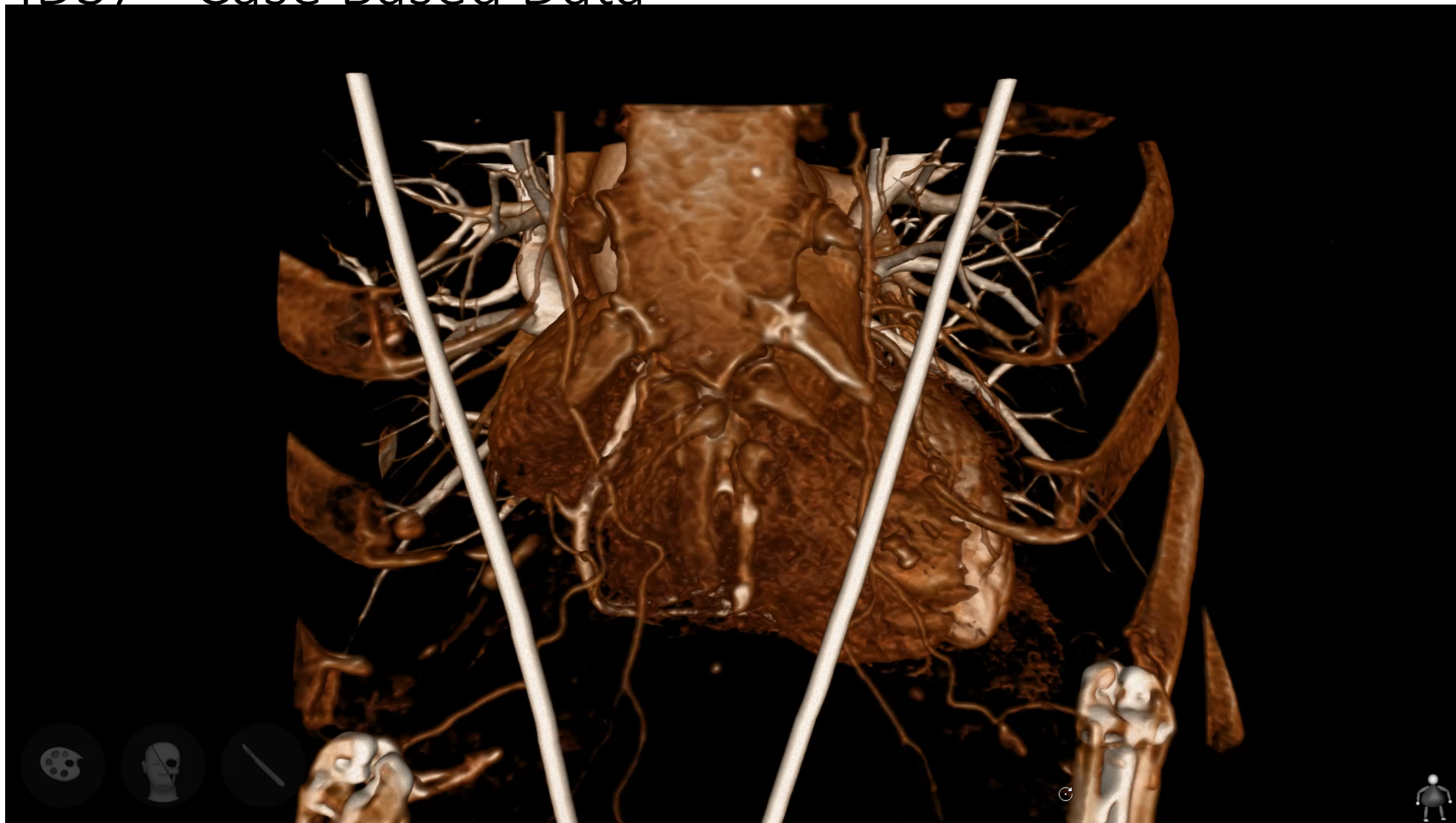


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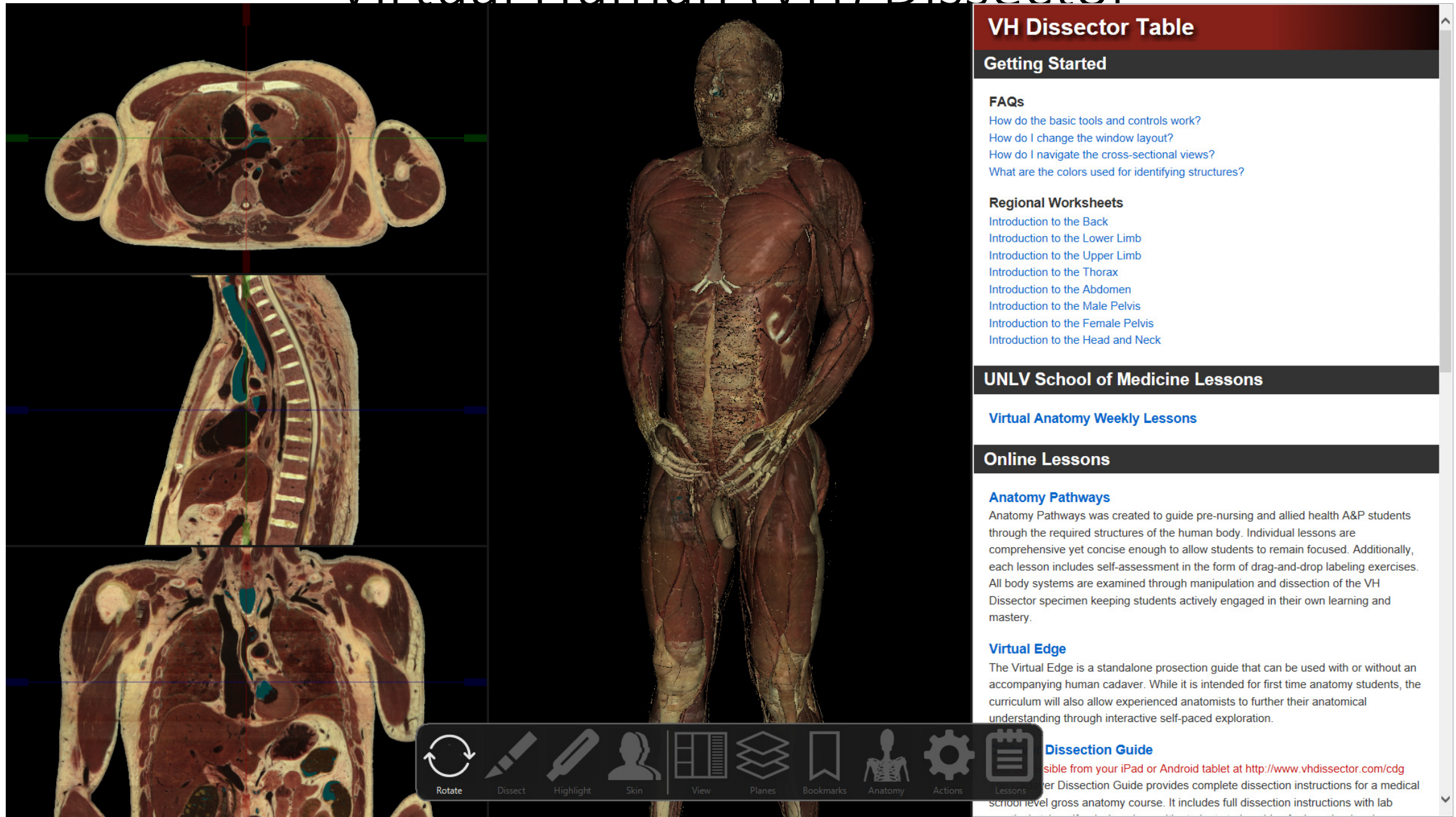
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IDS7 - Case Based Data



Virtual Human (VH) Dissector



VH Dissector Table

Getting Started

FAQs

- [How do the basic tools and controls work?](#)
- [How do I change the window layout?](#)
- [How do I navigate the cross-sectional views?](#)
- [What are the colors used for identifying structures?](#)

Regional Worksheets

- [Introduction to the Back](#)
- [Introduction to the Lower Limb](#)
- [Introduction to the Upper Limb](#)
- [Introduction to the Thorax](#)
- [Introduction to the Abdomen](#)
- [Introduction to the Male Pelvis](#)
- [Introduction to the Female Pelvis](#)
- [Introduction to the Head and Neck](#)

UNLV School of Medicine Lessons

Virtual Anatomy Weekly Lessons

Online Lessons

Anatomy Pathways

Anatomy Pathways was created to guide pre-nursing and allied health A&P students through the required structures of the human body. Individual lessons are comprehensive yet concise enough to allow students to remain focused. Additionally, each lesson includes self-assessment in the form of drag-and-drop labeling exercises. All body systems are examined through manipulation and dissection of the VH Dissector specimen keeping students actively engaged in their own learning and mastery.

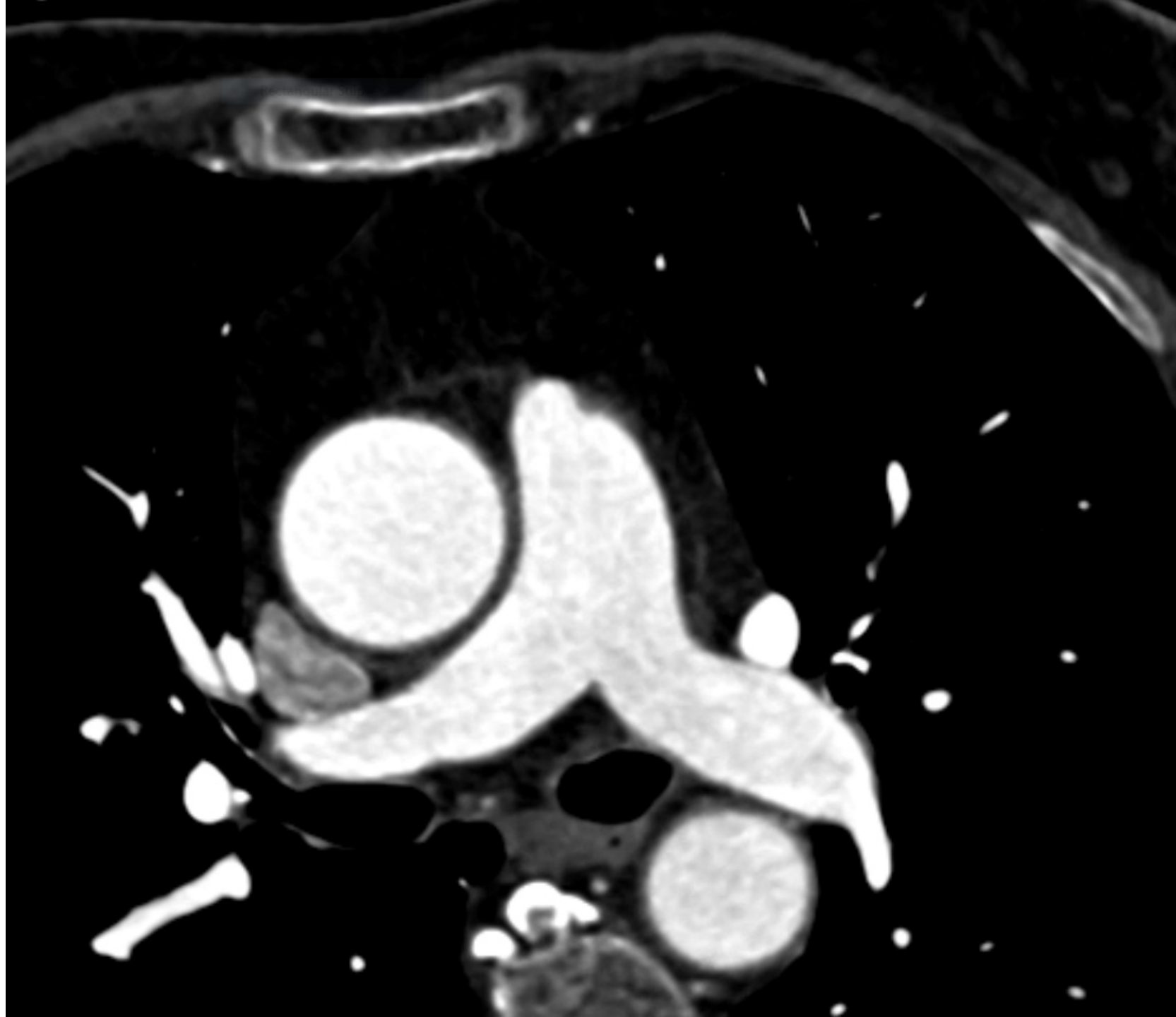
Virtual Edge

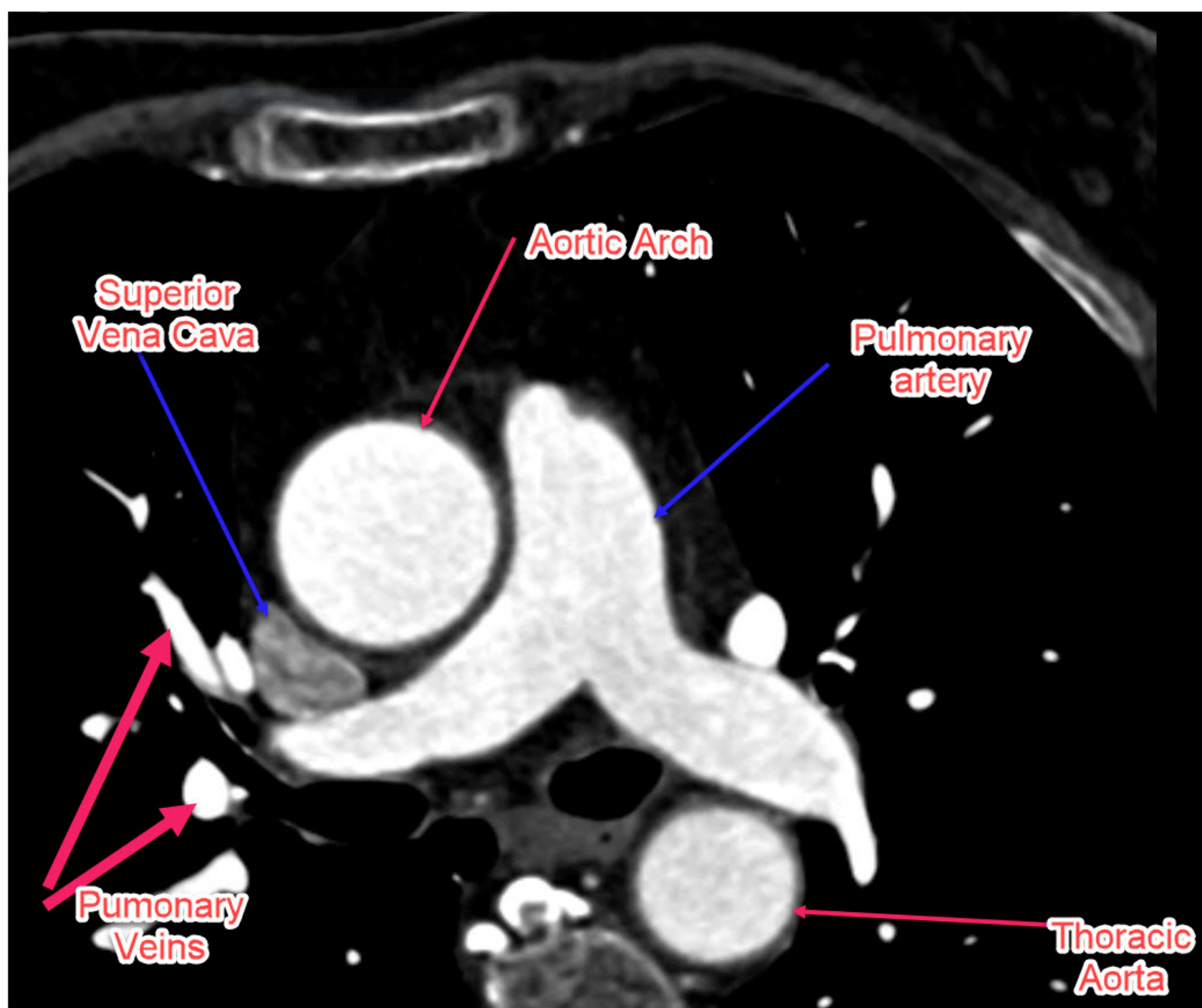
The Virtual Edge is a standalone prosection guide that can be used with or without an accompanying human cadaver. While it is intended for first time anatomy students, the curriculum will also allow experienced anatomists to further their anatomical understanding through interactive self-paced exploration.

Dissection Guide

Available from your iPad or Android tablet at <http://www.vhdissector.com/cdg>. The Dissection Guide provides complete dissection instructions for a medical school level gross anatomy course. It includes full dissection instructions with lab

Rotate Dissect Highlight Skin View Planes Bookmarks Anatomy Actions Lessons





October 28 Presentation



**New innovations in teaching cardiac anatomy:
Illustrating CT Scans with VH Dissector**



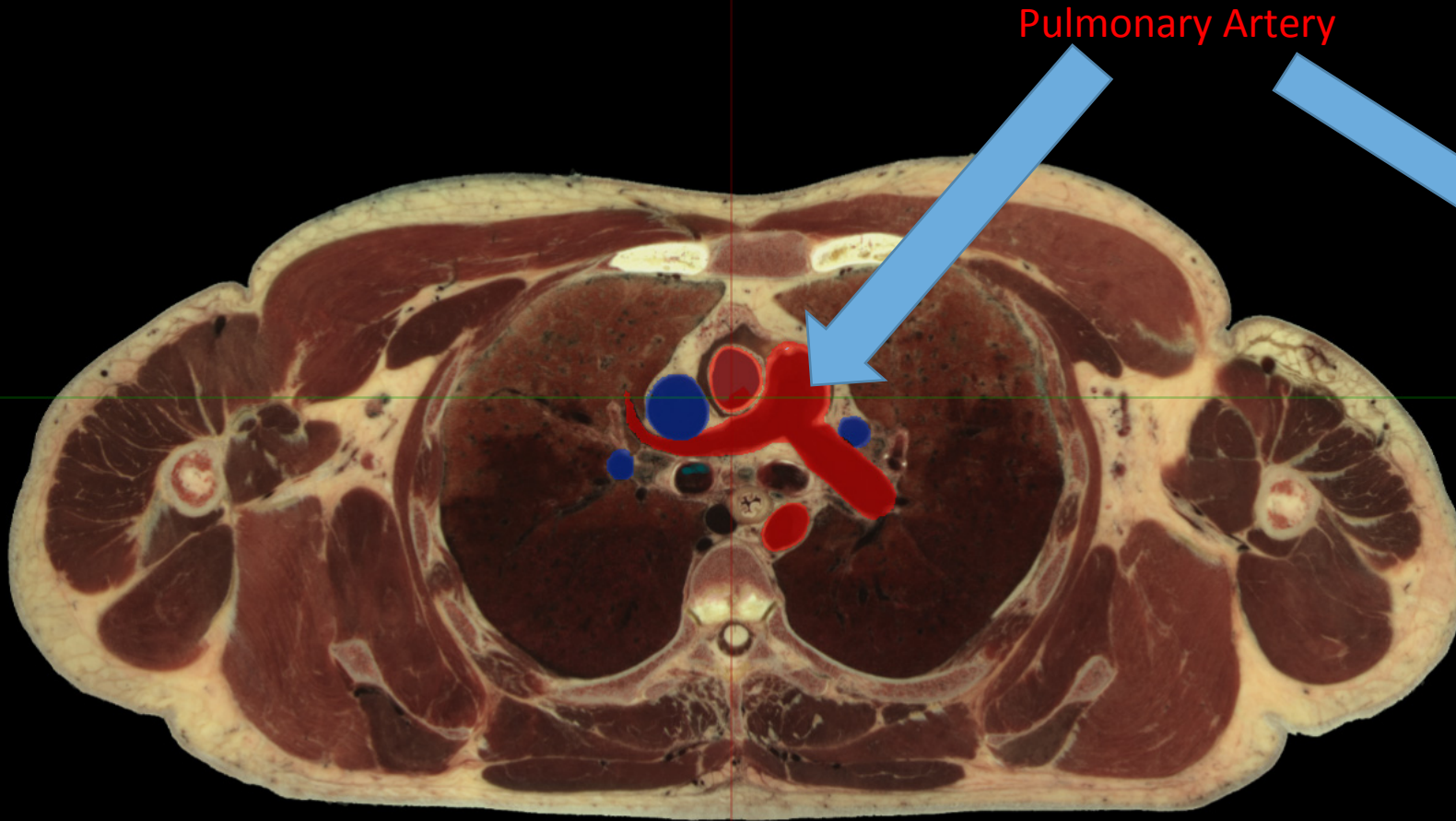
[Heart](#)

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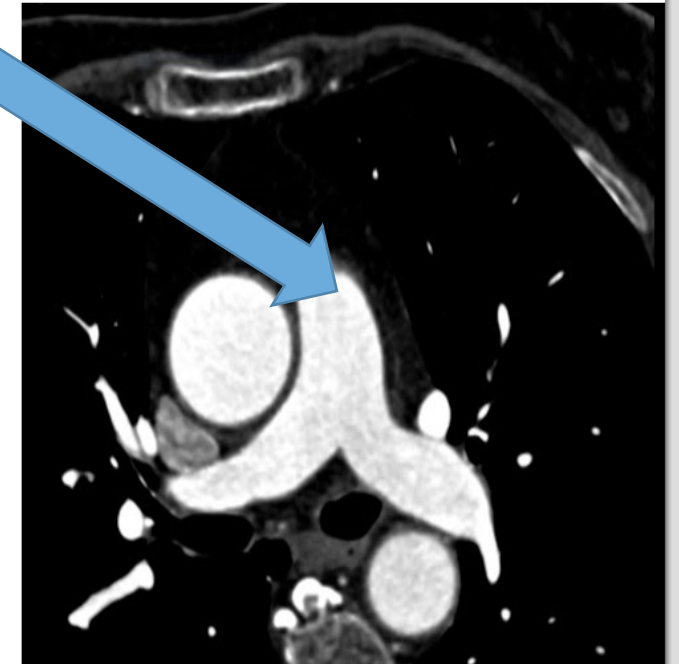
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Pulmonary Artery

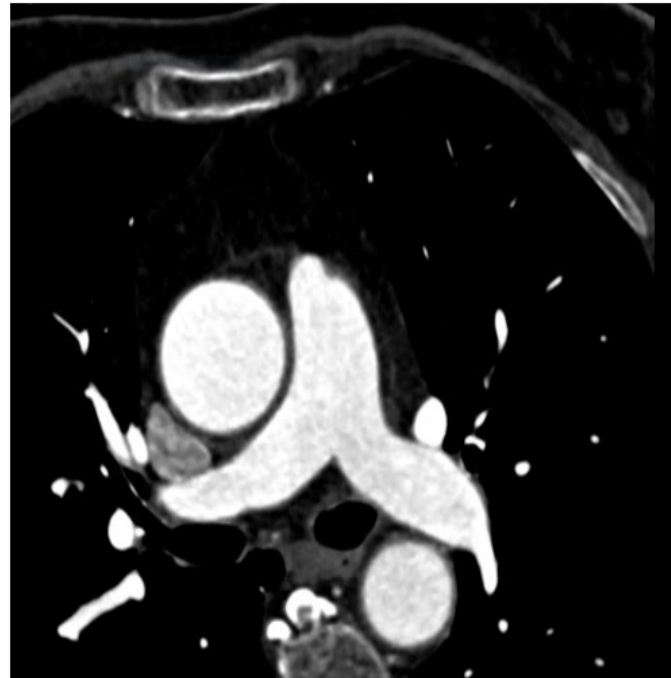


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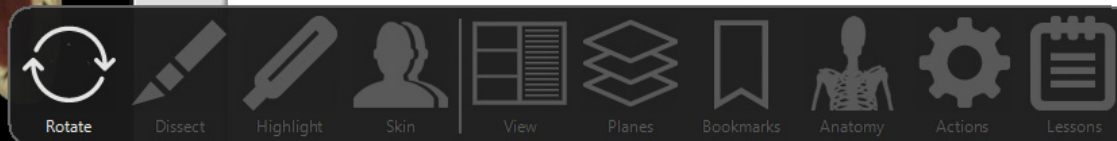
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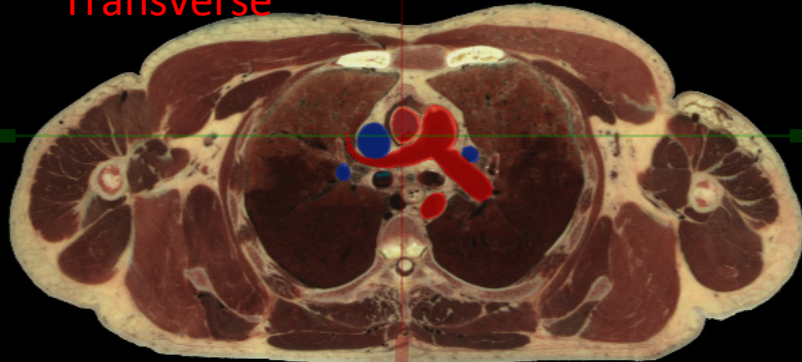
New innovations in teaching cardiac anatomy: Illustrating CT Scans with VH Dissector



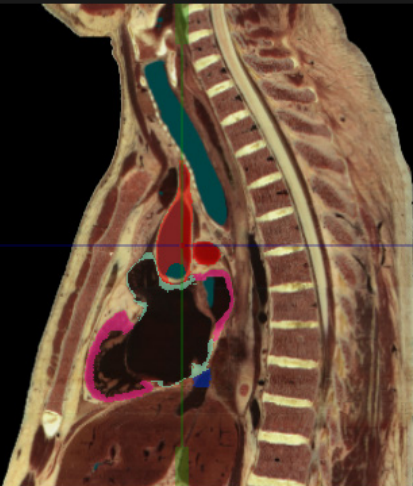
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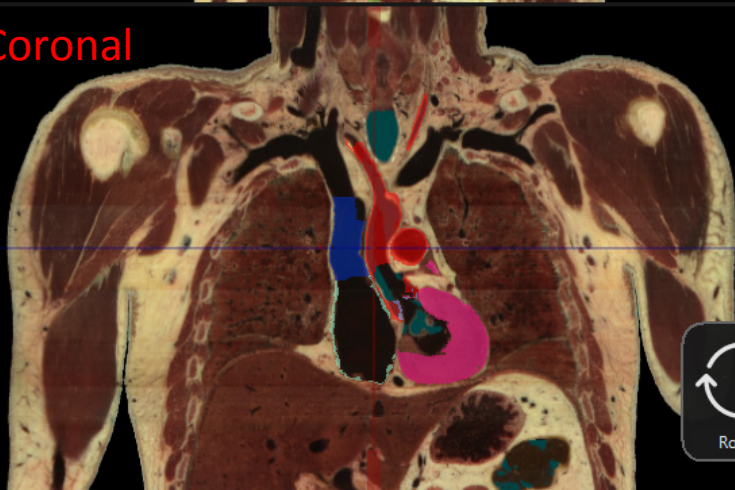
Transverse



Sagittal



Coronal



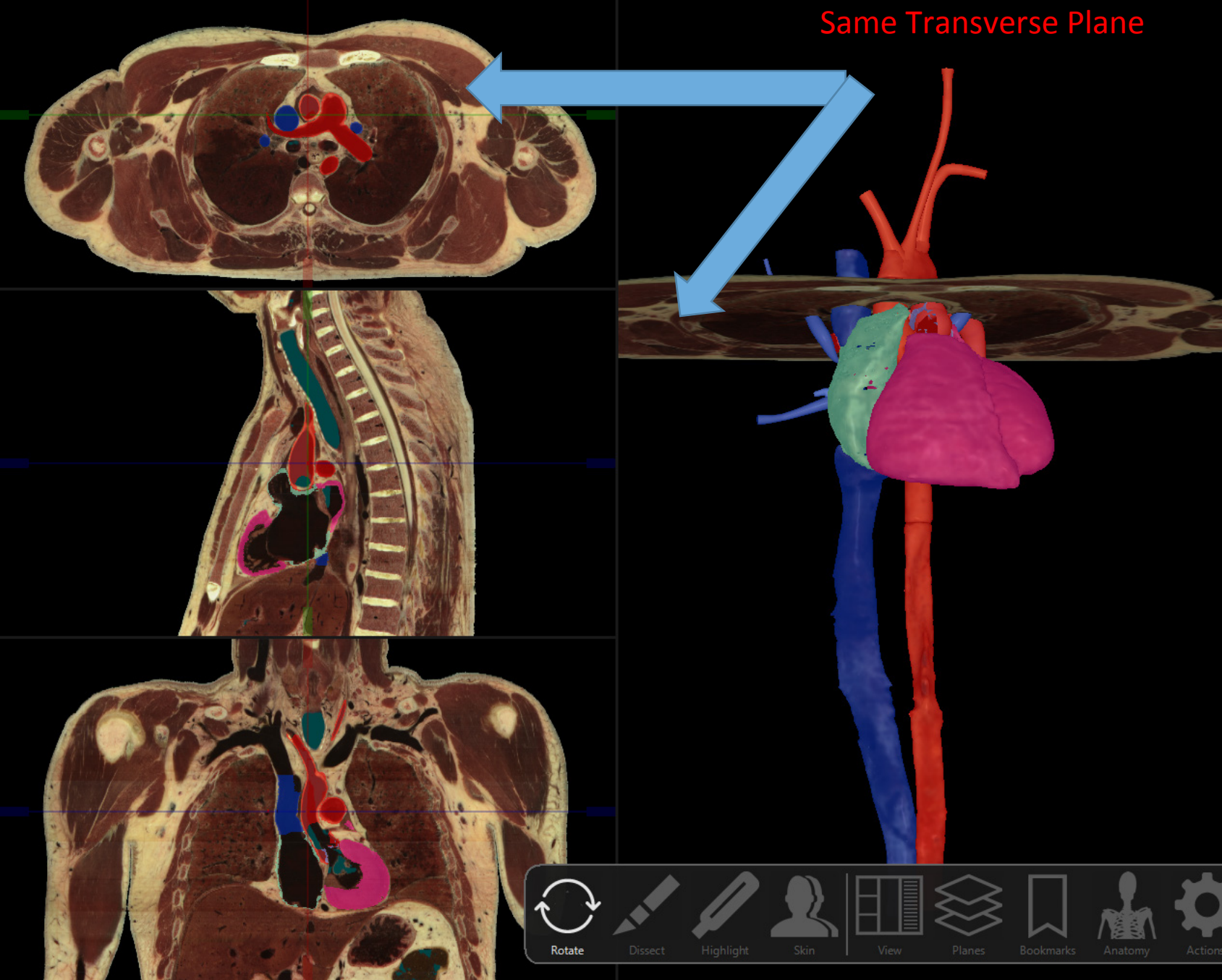
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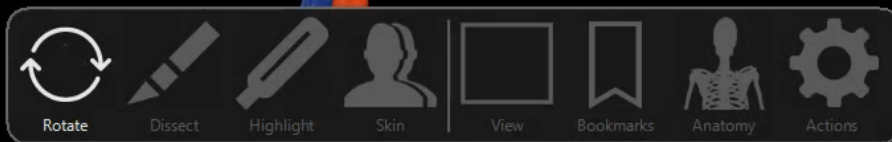
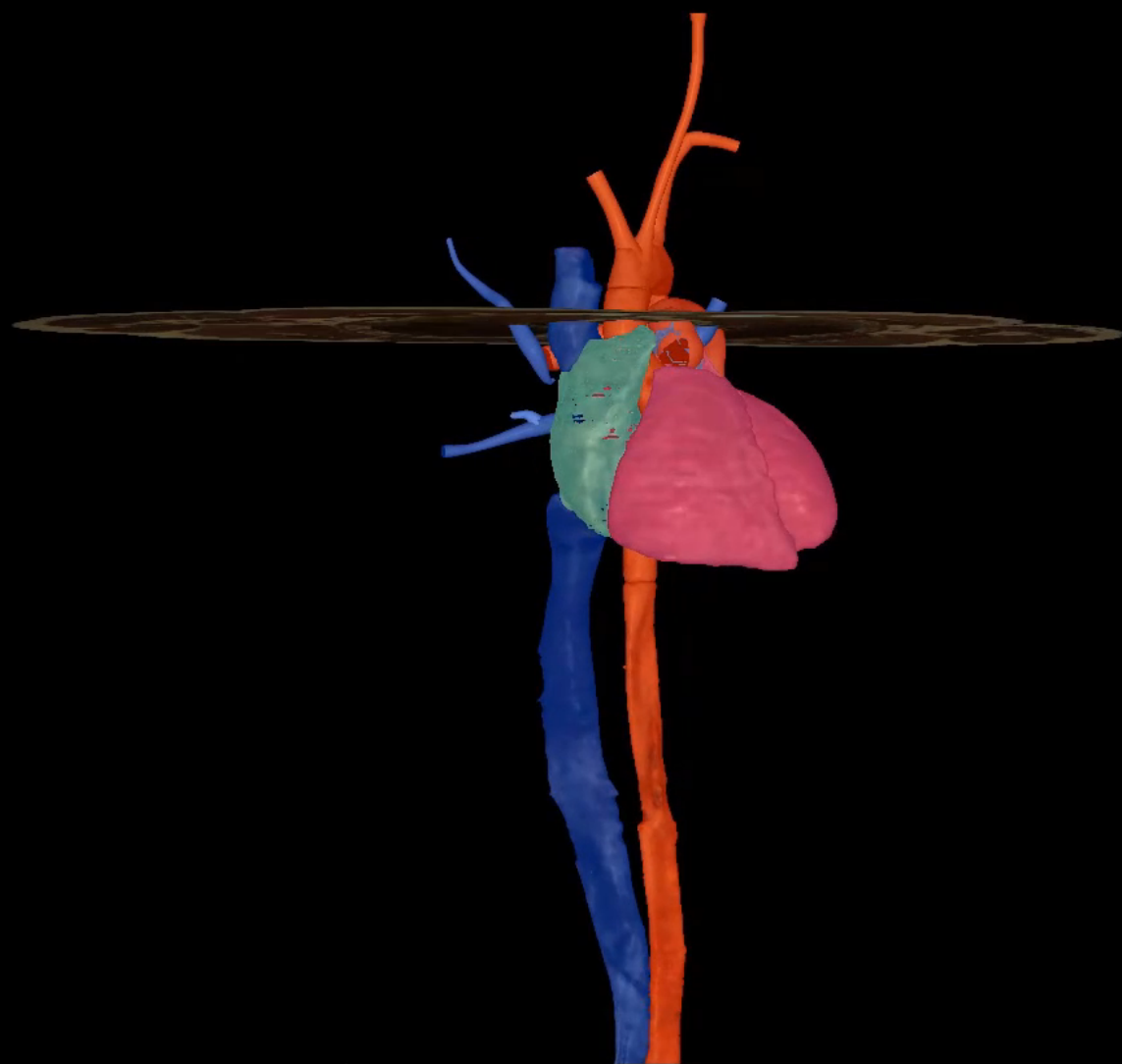
Illustrating CT Scans with VH Dissector

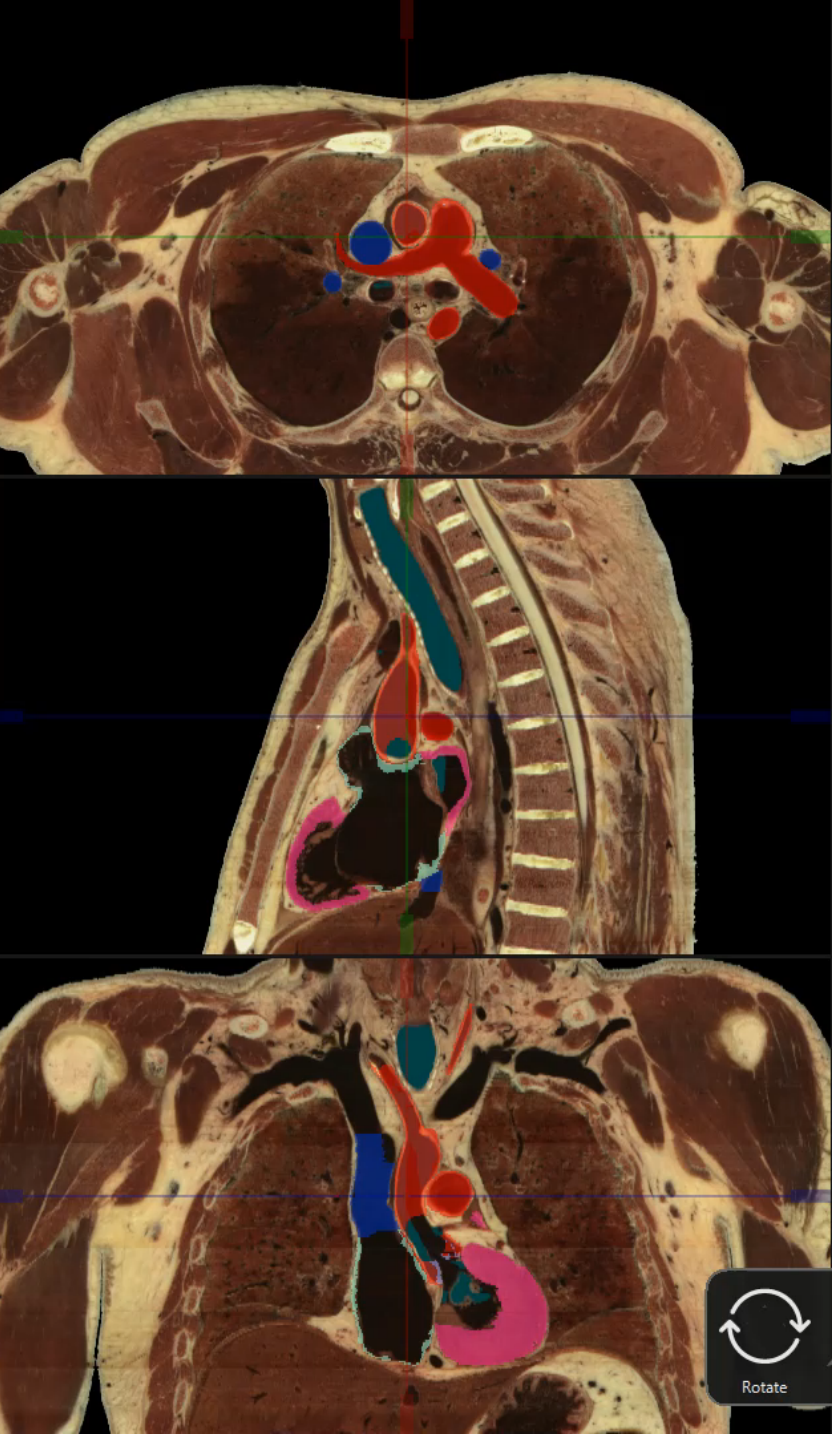


[Heart](#)

Same Transverse Plane





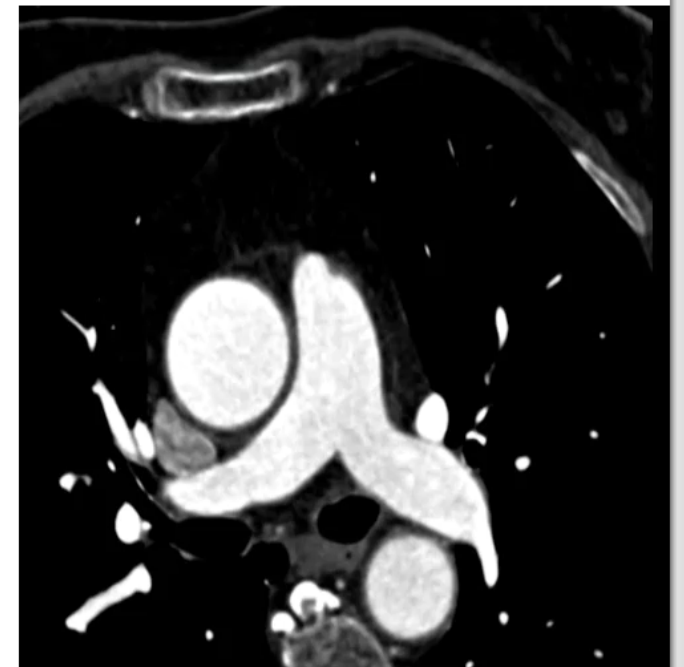


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New innovations in teaching cardiac anatomy:

Illustrating CT Scans with VH Dissector



[Heart](#)

Summary:

- Powerful tool:
- Links cross-sectional anatomy from CT, MRI and Ultrasound to a 3D anatomical model
- Allows the student to see the two dimensional cross sections in a 3D representation
- Allows the student to see the relationship of other structures in a 3-dimensional context.
- This evaluation can be done with any organ system.