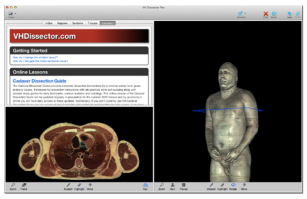
Introduction to the Abdomen

Learning Objective

After completing this exercise, you will be able to identify the muscles of the abdominal wall as well as identify major abdominal organs and their blood supply.

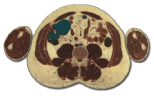


1 Start by setting the screen view:

- Select "Classic" from the "Views" drop down menu in the upper-left corner of the screen
- Reset the dissection by clicking the "Reset" button in the upper-right corner of the screen

2 Set the cross section through the area we want to explore:

- Drag the reference plane in the dissection area by its blue border to the middle of the abdomen (*the cross sections are numbered in the lower left corner, you should be close to 699)*
- Explore the anatomy of the abdomen by moving your mouse over the cross section *(structures are identified at the top of the cross section area)*



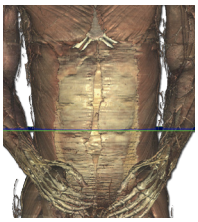
3 Skin the cadaver to reveal the anatomy below:

- Select the "Dissect" tool from the toolbar below the dissection area *(turns blue when selected)*
- Click on the skin to remove it *(now you see the fat and other subcutaneous tissue)*
- Remove the fat just like the skin

Use the tools and controls in the toolbar below each area to manipulate the corresponding dissection or cross-section

4 Take a closer look by magnifying the abdomen in the dissection area:

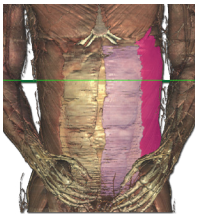
- Use the "Zoom" control, located in the toolbar below the dissection area, to enlarge the diessection
- Select the "Move" tool and drag the dissection with your mouse to reposition it if necessary



5 Identify the external oblique muscle by highlighting it:

- Select the "Index" tab
- Enter "external oblique" into the search box
- Select the "External Oblique - Left" from the list
- Click the "Add & Highlight" button *(the cross sections are in standard radiologic orientation so the left oblique is highlighted on the right side)*

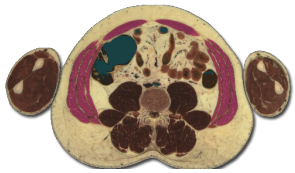
Locate specific structures with the Index tab



Which other three muscles form the anterior abdominal wall?

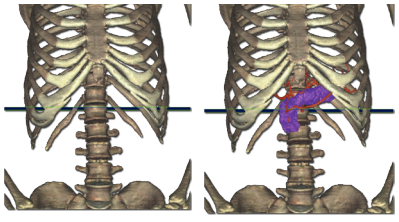
1. _____ 2. _____

3. _____



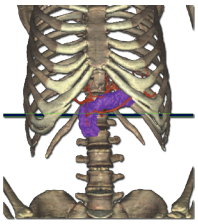
6 Isolate the arteries that feed the pancreas by simplifying the dissection:

- Click the "Clear" button to clear the dissection area
- Select the "Systems" tab
- Select "Skeletal system" and click the "Add" button
- In the "Regions" tab, expand the "Abdomen and Pelvis" using the icon to the left of it
- Expand "Arteries" followed by the "Abdominal aorta"
- Select the "Celiac trunk" and click "Add & Highlight"
- Search the index to add and highlight the pancreas



Add, remove and highlight groups of structures with the Systems, Regions and Tissues tabs

7 Follow the celiac trunk as it branches:

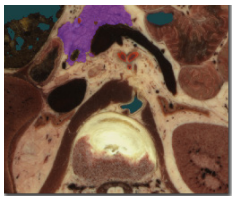


- Locate the celiac trunk in the dissection
  (it is just inferior to the pancreas, in the mid-line)
- Drag the transverse plane down to where the celiac trunk is visible
- Zoom in on the cross section using the zoom control
- Follow the artery superiorly by holding down the command (Mac) or ctrl (PC) key while pressing the up arrow key to move 1mm at a time through the cross sections

Move the cross section 1mm at a time by holding the command (Mac) or ctrl (PC) key while pressing the up or down arrow keys

Name the three branches of the Celiac trunk?

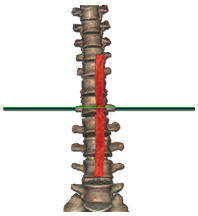
(Hint: follow the artery superiorly until it branches)



1. _____ 2. _____

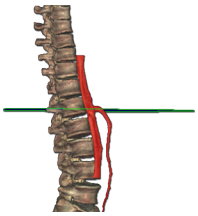
3. _____

8 Visualize a more advanced anatomical concept, Nutcracker syndrome:



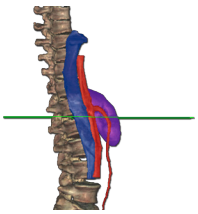
- Click the "Clear" button to clear the dissection
- In the "Systems" tab, expand the "Skeletal system" and add the "Vertebral column"
- Add and highlight the abdominal aorta *(hint: use the index tab)*
- Zoom out and center the vertebral collumn in the view
- Select the "Rotate" tool located in the toolbar below the dissection area
- Rotate to a left anterolateral view by clicking in the dissection area and dragging the mouse to the left or right

Rotate the dissection using the left or right arrow keys while holding the command (Mac) or ctrl (PC) key
Alternately, use the rotation tool below the dissection area



- Set the cross section through the L1 vertebra *(cross section 599)*
- Select the "Highlight" tool from the toolbar
- Highlight the Superior Mesenteric Artery by clicking on the structure

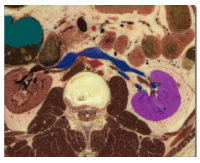
Highlight structures or de-highlight a structure with the highlight tool



- Locate and highlight the Inferior vena cava and the left kidney in the cross section
- Follow the Mesenteric artery down in the cross section
  (*The angle between the Abdominal aorta and the Superior mesenteric artery is where the condition known as "Nutcracker Syndrome" takes place, when the Superior mesenteric artery is pulled inferiorly, compressing the structures passing through the angle between the two arteries)*

Which major structure passes under the Superior mesenteric artery?

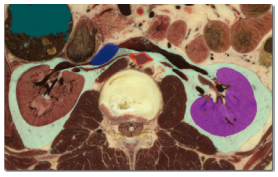
(Hint: This structure courses from the left kidney to the inferior vena cava, and is compressed in Nutcracker Syndrome, leading to kidney damage and possibly failure)



1. _____

Bonus: What structure normally separates the Superior mesenteric artery from the underlying structures?

(Loss of this can lead to Nutcracker Syndrome)



1. _____

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