Introduction to the Upper Limb

Learning Objective
After completing this lesson, you will be able to identify some of the muscles of the arm, as well as the major vessels and nerves that supply them.

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

1 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 arm (the cross sections are numbered in the lower left corner; you should be close to 484)
   - Explore the anatomy of the arm 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 (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

3 Take a closer look by centering the arm in the dissection area:
   - Use the “Zoom” control, located in the toolbar below the dissection area, to enlarge the dissection
   - Select the “Move” tool and drag the dissection with your mouse to reposition it
   - Dissect the superficial veins of the upper limb to cleanup the image

4 Identify the muscle of the biceps brachii by highlighting them:
   - Select the “Index” tab
   - Enter “biceps” into the search box
   - Select the “Biceps brachii - Right” from the list
   - Click the “Add & Highlight” button (the cross sections are in standard radiologic orientation so the right biceps brachii is highlighted on the left side)

What four other muscles make up this part of the arm?

1. __________________________  3. __________________________
2. __________________________  4. __________________________

5 Isolate the arteries that feed the biceps by simplifying the dissection:
   - Click the “Clear” button in the upper right to clear the dissection area
   - Select the “Systems” tab
   - Expand the “Skeletal system” using the icon to the left of it
   - Select the “Bones of the upper limb” and click “Add”
   - In the “Regions” tab, expand “Upper limb” using the icon to the left of it
   - Select “Arteries” under “Upper limb” and click “Add & Highlight”
   - Expand “Muscles” and add the “Biceps brachii”

Add, remove and highlight groups of structures with the Systems, Regions and Tissues tabs
6 Find structures passing between the muscles of the arm:
- Select the “Rotation” tool from the toolbar below the dissection area
- Rotate to a posterior view by clicking in the dissection area and dragging the mouse to the left or right
- Notice how the brachial artery is posterior and medial to the biceps. In the cross section, you can see that the brachial artery is sandwiched between the biceps, brachialis and triceps muscles
- Enlarge the cross section of the right arm using the zoom control

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

Besides the brachial artery, what other structures pass through this space between the muscles? (Ignore the superficial veins)
1. __________________________  3. __________________________
2. __________________________  4. __________________________

7 Visualize some nerves of the upper limb:
- Clear the dissection
- Add the bones of the upper limb using the systems tab as before
- In the “Tissues” tab expand the “Nervous (Peripheral Nervous System)” section
- Find the Radial and Ulnar nerves, add and highlight both nerves
- Rotate until the medial aspect of the right arm is in view and center the view on the right elbow
  (Notice how the Radial nerve wraps around the back of the Humerus, and the Ulnar nerve wraps around the Medial epicondyle of the Humerus at the elbow)
- Move the transverse plane until the ulnar nerve is visible as it passes the elbow
- Follow the nerve inferiorly as it courses around the elbow by holding down the command (Mac) or ctrl (PC) key while pressing the down arrow key to move 1mm at a time through the cross sections
  (Notice how close this nerve is to the skin, striking this nerve causes the “funny bone” sensation)

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

Follow the radial and ulnar nerves down to the hand. Which digit (thumb or pinky) would be affected by: 1) a serious facture in the middle part of the humerus? 2) epicondylitis (tennis elbow)?
(Hint: Nerves and arteries tend to supply structures that lie close to where they terminate.)
1. __________________________  2. __________________________

8 Examine an advanced anatomical concept, the Quadrangular Space:
- Click the “Reset” button to reset the dissection
- Rotate to a left posterolateral view and center the view on the left shoulder
- Dissect the skin, subcutaneous tissue and superficial veins
- Remove the Deltoid muscle, and the Lateral and Medial heads of the triceps
- Select the “Highlight” tool from the toolbar
- Click on the the Humerus, Teres minor muscle and tendon, Long head of the triceps and the Teres major muscle to highlight them
  (Notice the small patch of un-highlighted structures in the middle of these muscles; this is the “Quadrangular Space”.

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

Which two structures pass through this space?
1. __________________________  2. __________________________