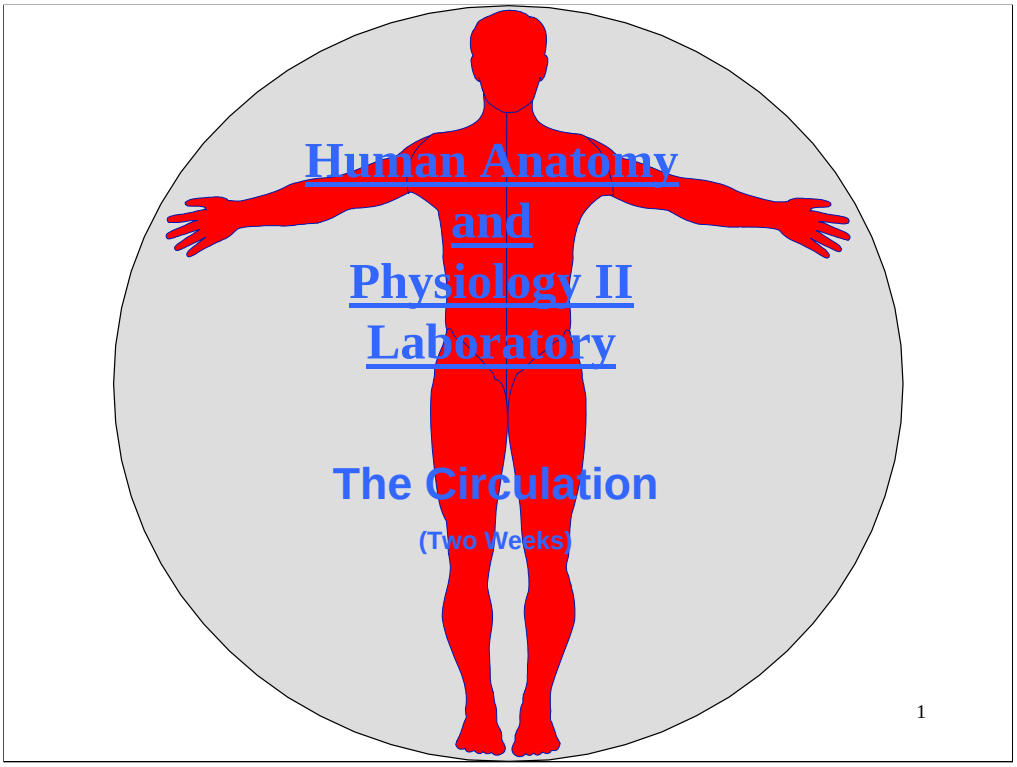
Mpeg 4 for iPod

mp3



This lab involves two weeks work studying the vasculature of the human body. Both weeks involve the exercise in the lab manual entitled "*Anatomy of the Blood Vessels*".

1) In the **first week** you will look at blood vessel histology and complete the relevant portion of the Review Sheet for the exercise , As an alternate your instructor may have you submit a drawing of the blood vessels from the Virtual Microsocpe or other histology site.

2) In the **second week** you will study the vessels of the lower body and complete that portion of the Review Sheet.

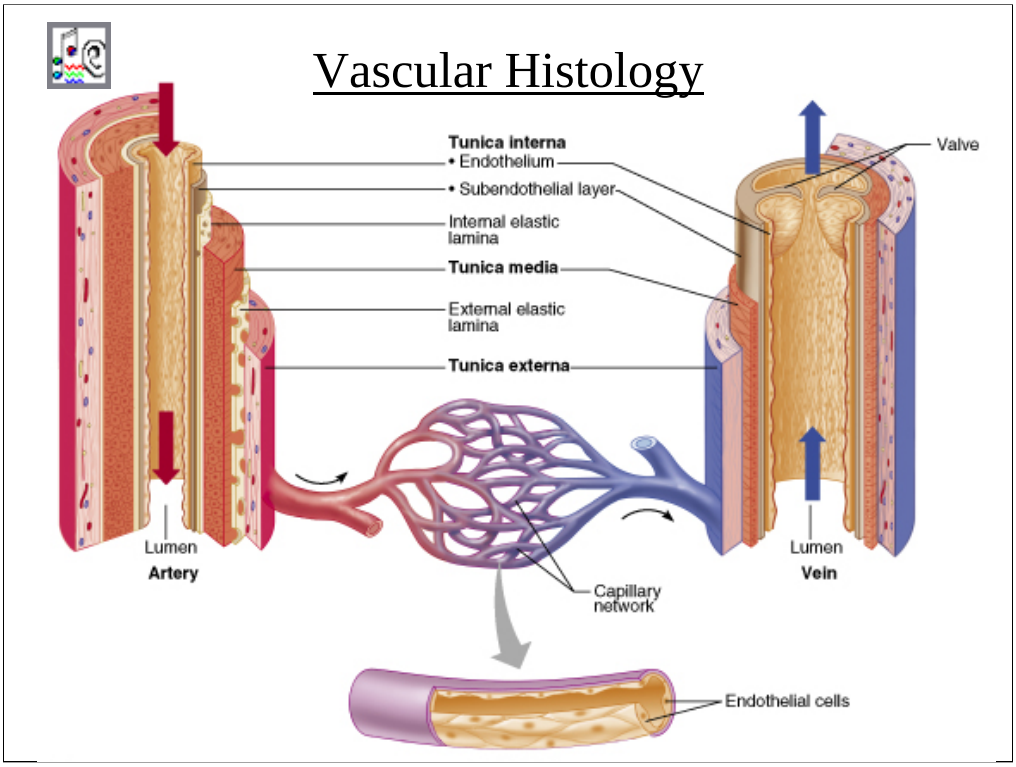
Also take the related quizzes on the upper and lower vessels.

There are also video clips available of cadaver dissection of the blood vessels.

Click on the sound icon for the audio file (mp3 format) for each slide.

There is also a link to a dowloadable mp4 video which can be played on an iPod.

Vascular Histology



Both arteries and veins possess three layers: the outer tunica adventitia, made of connective tissue, the tunica media composed of smooth muscle and, in large arteries also elastic tissue, and the tunica interna, composed of a thin endothelium. Only the endothelium remains as the capillary wall.

Vascular Hierarchy

Elastic arteries – the aorta and its major branches.

Muscular arteries – distribute blood within the organs and tissues.

Arterioles – small arteries which lead to capillaries

Capillaries – thin-walled vessels which allow transport to and from tissues.

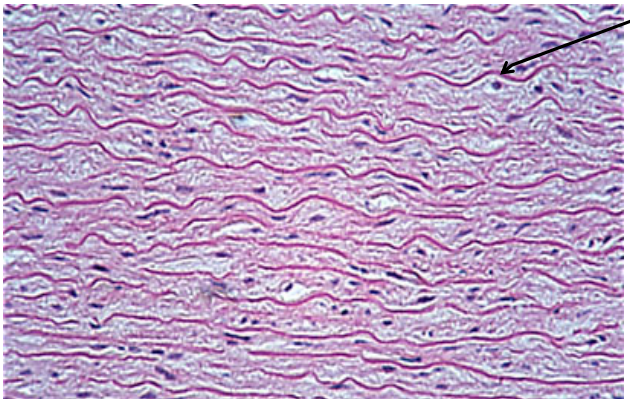
Venules – small veins which drain the capillaries

Veins – return blood to the heart.

3

Here is the hierarchy of vessels beginning with the largest arteries leaving the heart.

Tunica Media in a Large Elastic Artery



Elastic fibers dominate the tunica media in the aorta and other elastic arteries.

4

Elastic tissue abounds in the tunica media of the aorta and other elastic arteries. It is this elastic tissue which provides the recoil one feels when taking the pulse, and this recoil helps to damp of the pulse pressure to keep blood flow continuous.

A Medium Size Artery

Tunica adventitia: connective sheath

Tunica media: smooth muscle

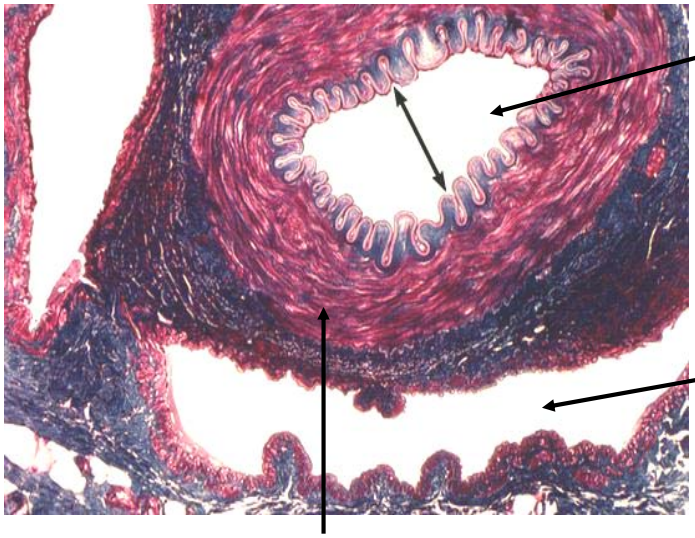
Tunica interna: endothelial lining.

Internal elastic membrane: a fenestrated elastic lamina, part of the tunica intima

5

As arteries get smaller along the hierarchy the elastic tissue diminishes, except for a prominent elastic membrane between the tunica media and the thin endothelium of the tunica interna.

Artery and Vein Comparison



Artery- note the firmly open shape and the distinctive internal elastic membrane.

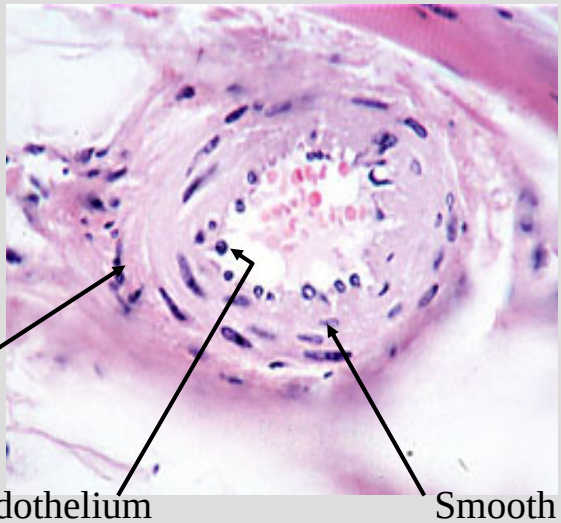
Vein - note the thin collapsed wall.

Tunica media

6

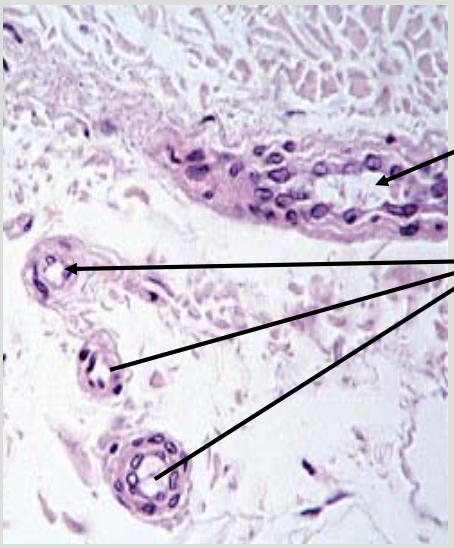
The internal elastic membrane can be clearly seen in this slide stained with PAS. This stain highlights the carbohydrate-containing connective tissues with blue, and other tissue red. Note how thin and collapsed the vein is, hardly thick enough to pick out the layers.

An Arteriole



Arterioles have lost most of the adventitia and smooth muscle layers, and have no elastic tissue. The smooth muscle they do have is instrumental in regulating blood flow into subsequent capillaries.

Arterioles



This is a venule, based on its size and thickness.

Arterioles vary in size and amount of smooth muscle. Their smooth muscle functions in vasoconstriction.

8

Venules receive blood from the capillary beds on its way back to the heart. They are about the same thickness as arterioles, but a little larger in diameter.

Capillary

Red blood cells work their way through the capillary in single file.

9

Capillaries are extremely small had have extremely thin walls. Red blood cells can only make their way through one at a time. Can you identify the tissue these capillaries are found in?

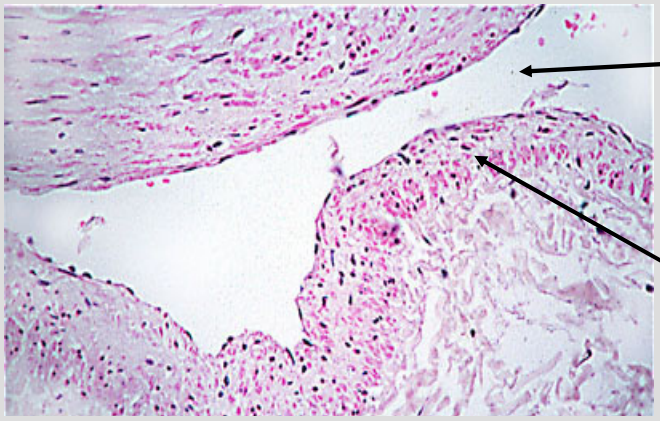
A Medium Vein

Note the thin tunica media and absence of elastic lamina.

10

On the way back to the heart now, venules lead to small veins such as this one. Veins have little tunica media and are larger overall in diameter than arteries at the comparable level of branching. This provides for a low-resistance conduit back to the heart.

A Medium Vein in L.S.



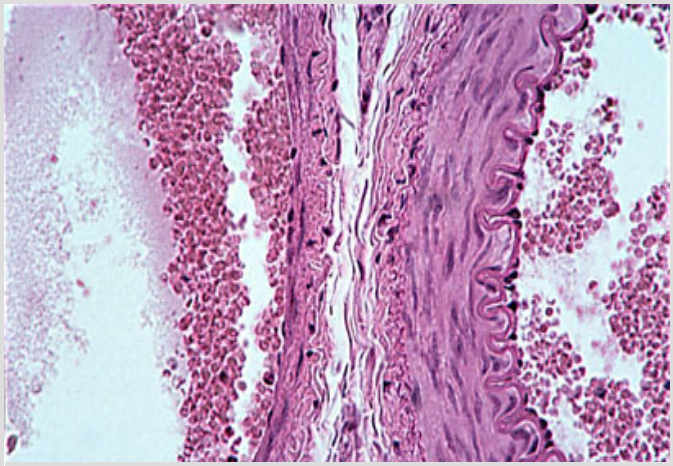
Note the elongated collapsed lumen.

Tunica media cells are cut in cross section.

11

Veins continue to get larger in diameter as they approach the heart, but not much thicker.

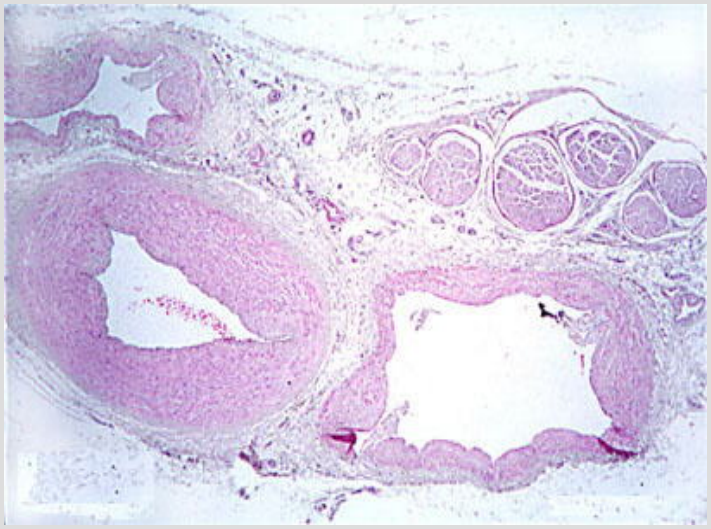
Comparison of Artery and Vein



12

A comparison of a medium artery and vein illustrates the differences. Thicker wall for artery, more tunica media and an internal elastic membrane.

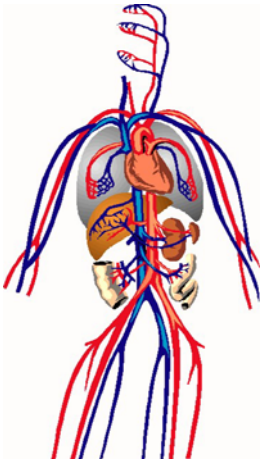
Artery, Vein, and Nerve



13

Another comparison, at low power, of artery and vein. Notice the nerve bundles in the upper right of slide. Nerves often travel along with arteries and veins, surrounded by a common connective tissue sheath, as a **neurovascular bundle**.

The Blood Vessels



14

The following slides illustrate the major vessels of the human body. Your lab manual contains tables of these vessels as well. Use ADAM according to the instructions in your lab manual to study the blood vessels.

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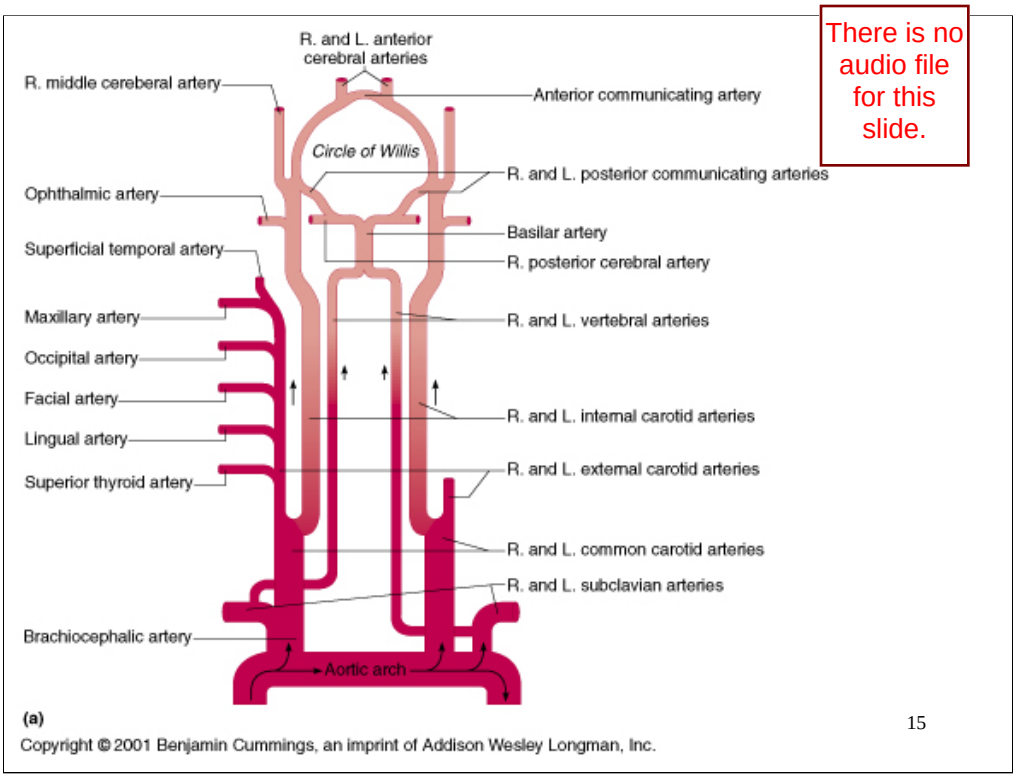

This and the slides which follow illustrate the major arteries and veins. Use the terms list in the lab manual as a guide to the ones you will be responsible for. Use ADAM according to the directions in the lab manual to study the vessels, and view the cadaver videos.

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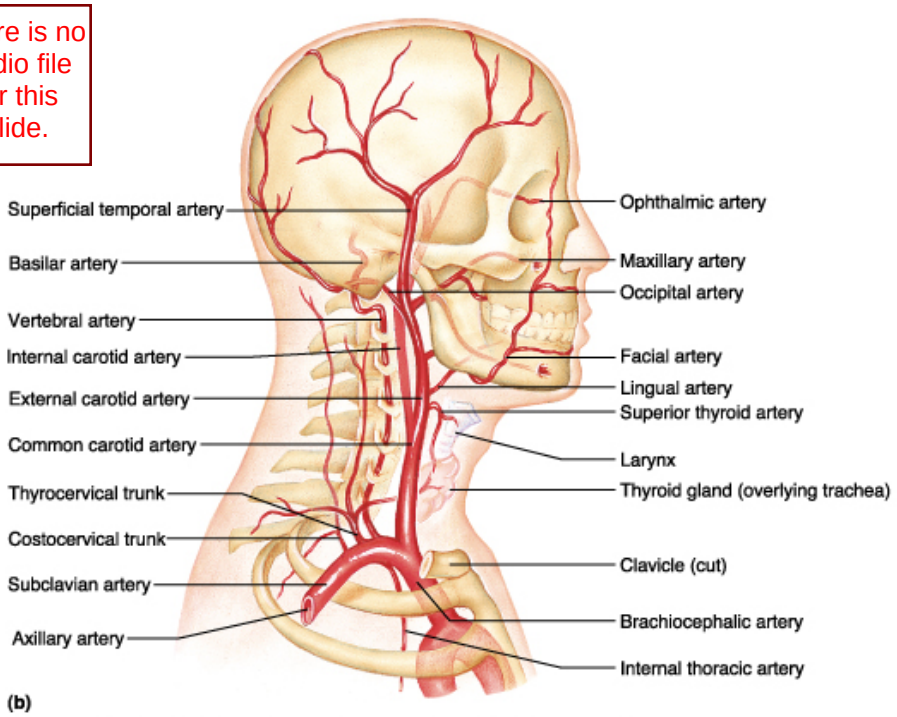

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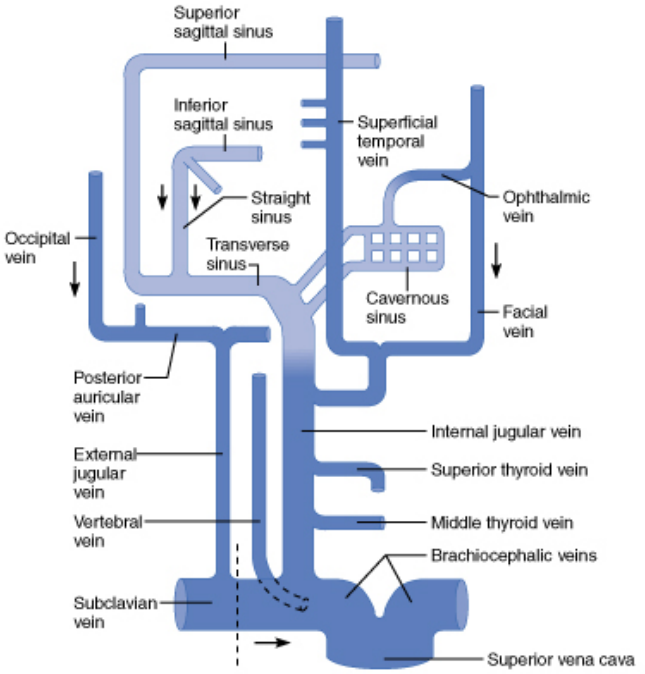

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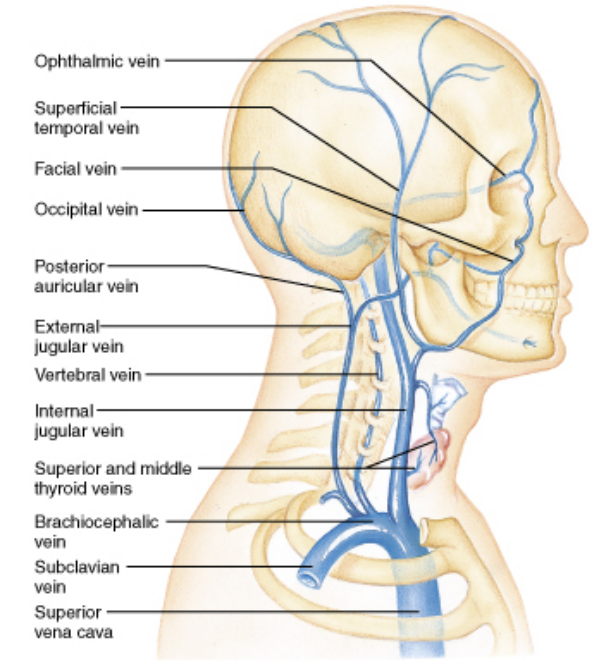

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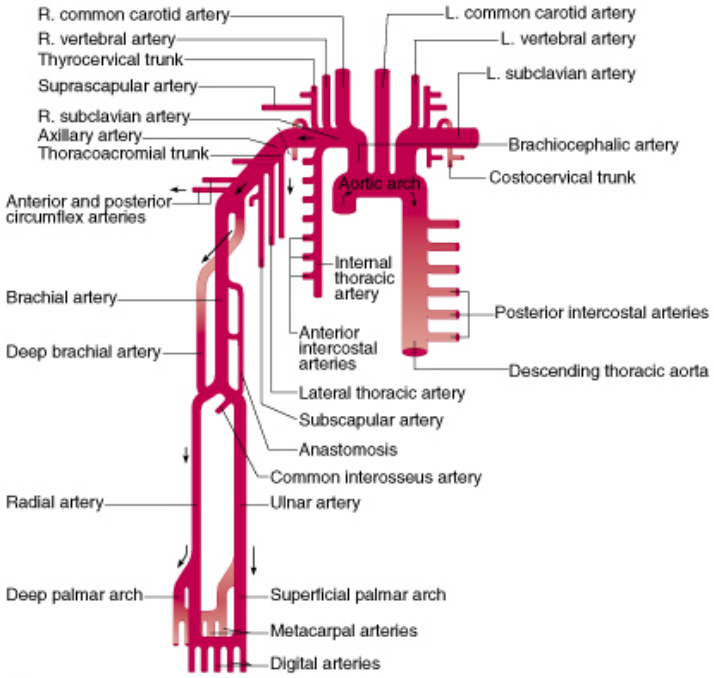

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19

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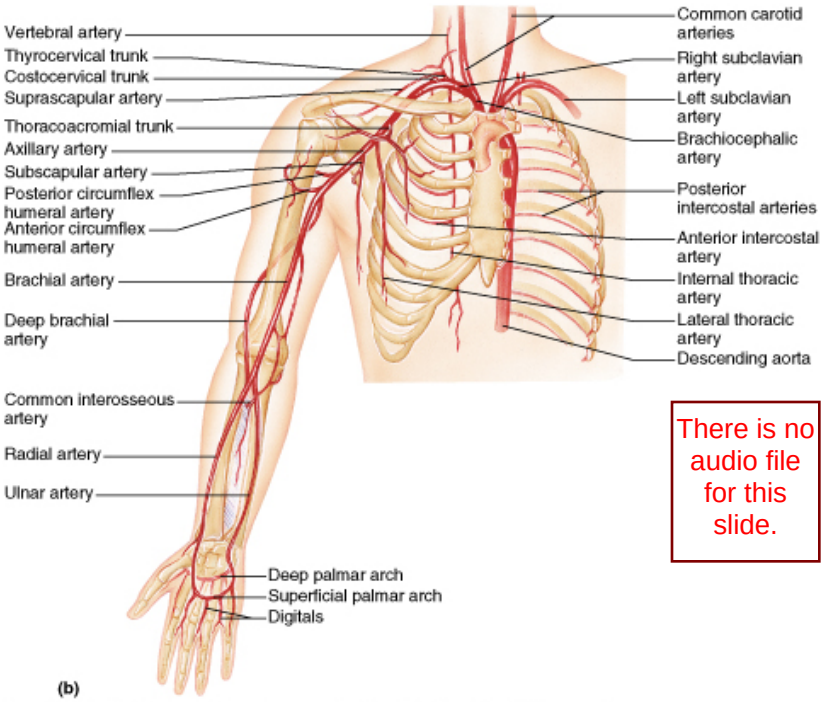

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20

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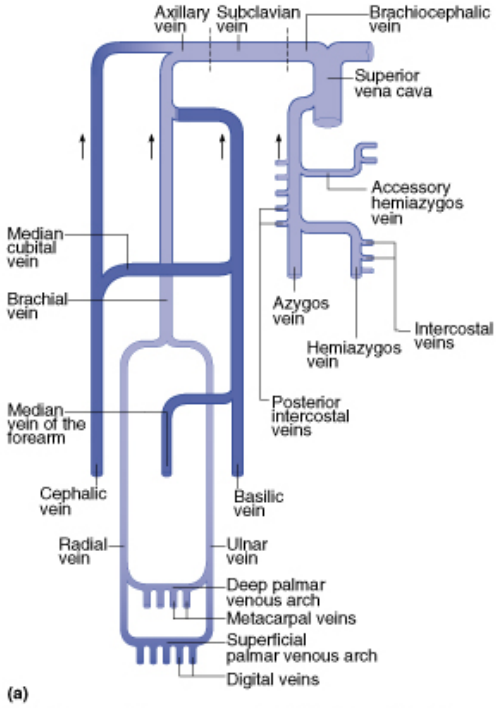
The dark blue vessels are the superficial veins, just under the skin.
Because they are not surrounded by skeletal muscles, they do not benefit from the muscular pump, and blood flow in them is sluggisth.



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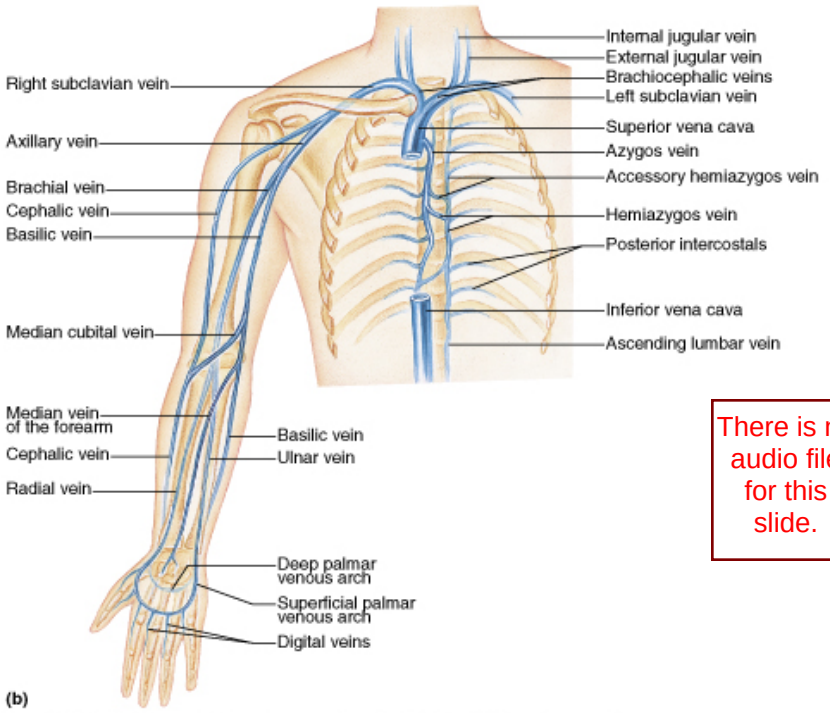

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22

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First Week Lab Protocol

1) Complete the portion of the Review Sheet for this exercise which relates to vascular histology and the blood vessels of the upper body.
2) As an alternative your instructor may have you submit a drawing of blood vessel histology from the Virtual Microscope or other histology site.
3) Take the quiz on vascular histology and the upper body vessels.
4) Use ADAM identify vessels of the head, neck, arms.
5) View the cadaver videos on the upper blood vessels.

23

There is no audio file for this slide.

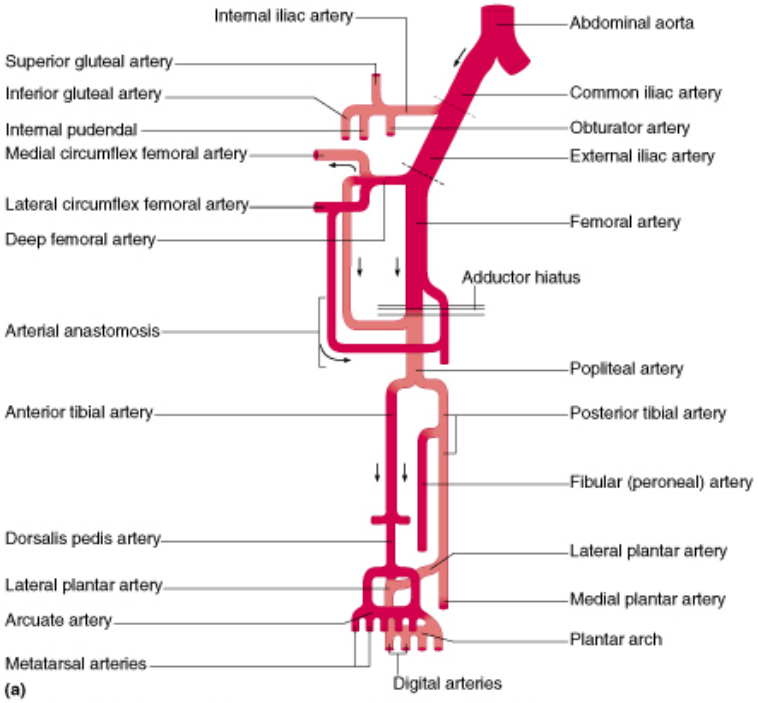
ADAM Interactive Anatomy

Atlas Anatomy, Region, Head and Neck, Arteries of Head and Neck (Lat), Veins of Head and Neck (Lat.), Cerebral Arterial Circle

Dissectible Anatomy, Male, Anterior, Window centered on neck, Layer Indicator 246

Atlas Anatomy, Region, Upper Limb, Arteries of the Upper Limb (Ant)

Dissectible Anatomy, Male, Anterior, Window centered on right arm, Layer Indicator, 5, superficial veins of the arm.



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25

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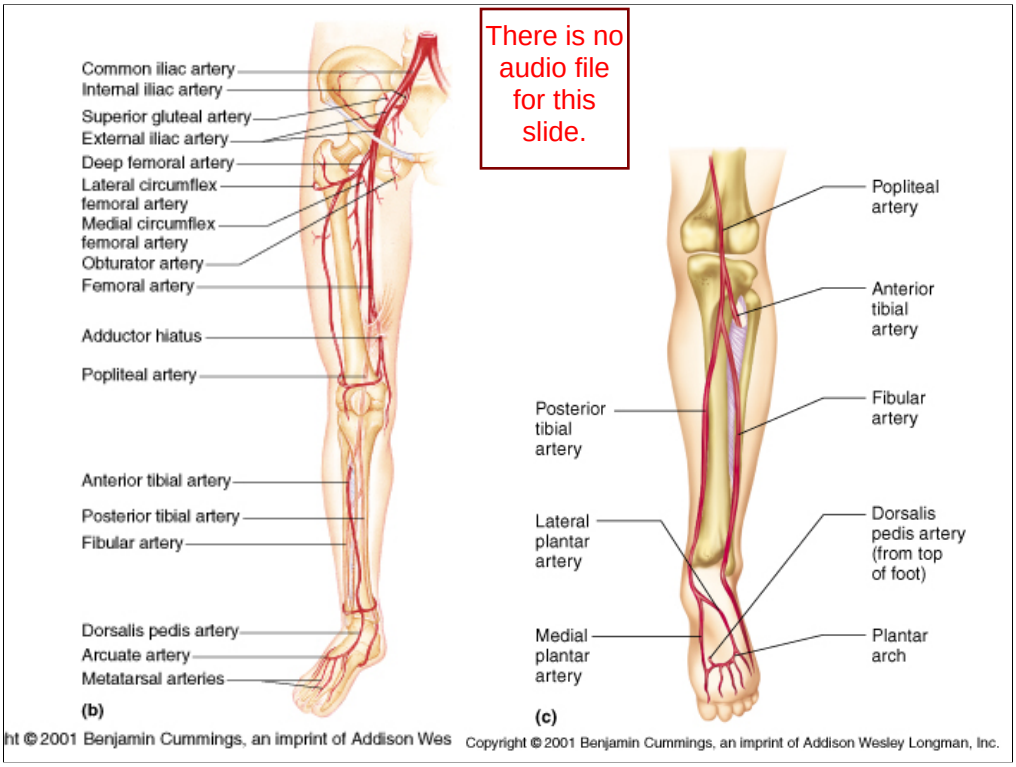

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The dark blue vessels are the superficial veins, just under the skin.
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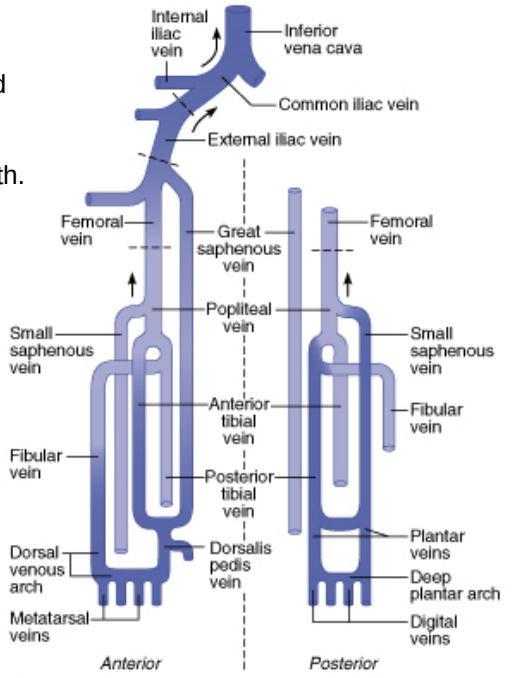

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27

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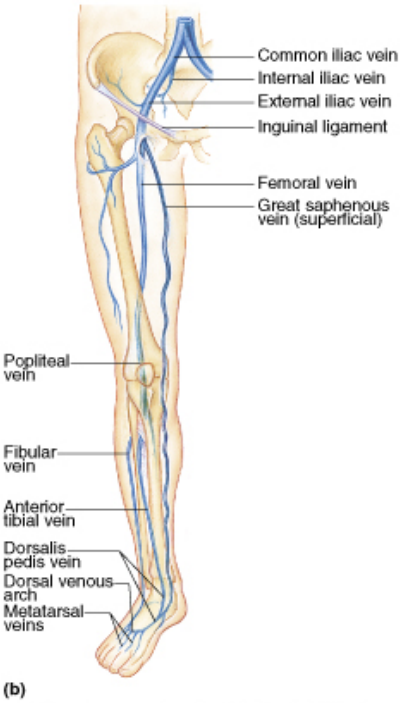

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28

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Second Week Lab Protocol

1) Complete the portion of the Review Sheet for this exercise which relates to the blood vessels of the lower body.
2) Take the quiz on the lower body vessels.
3) Use ADAM to identify vessels of the abdomen and legs.
4) View the cadaver videos on the lower blood vessels.

ADAM Interactive Anatomy

Go to the following:

Atlas Anatomy, Region, Lower Limb, Arteries of the Lower Limb (Ant).

Atlas Anatomy, Region, Lower Limb, Arteries of the Lower Limb (Post).

Dissectible Anatomy, Male, Anterior, Window centered on upper thigh, Layer Indicator 3, great spahenous vein

30