# Blood Vessels Part II: Arteries

A circulatory system lab activity using
Visible Body's Anatomy and Physiology

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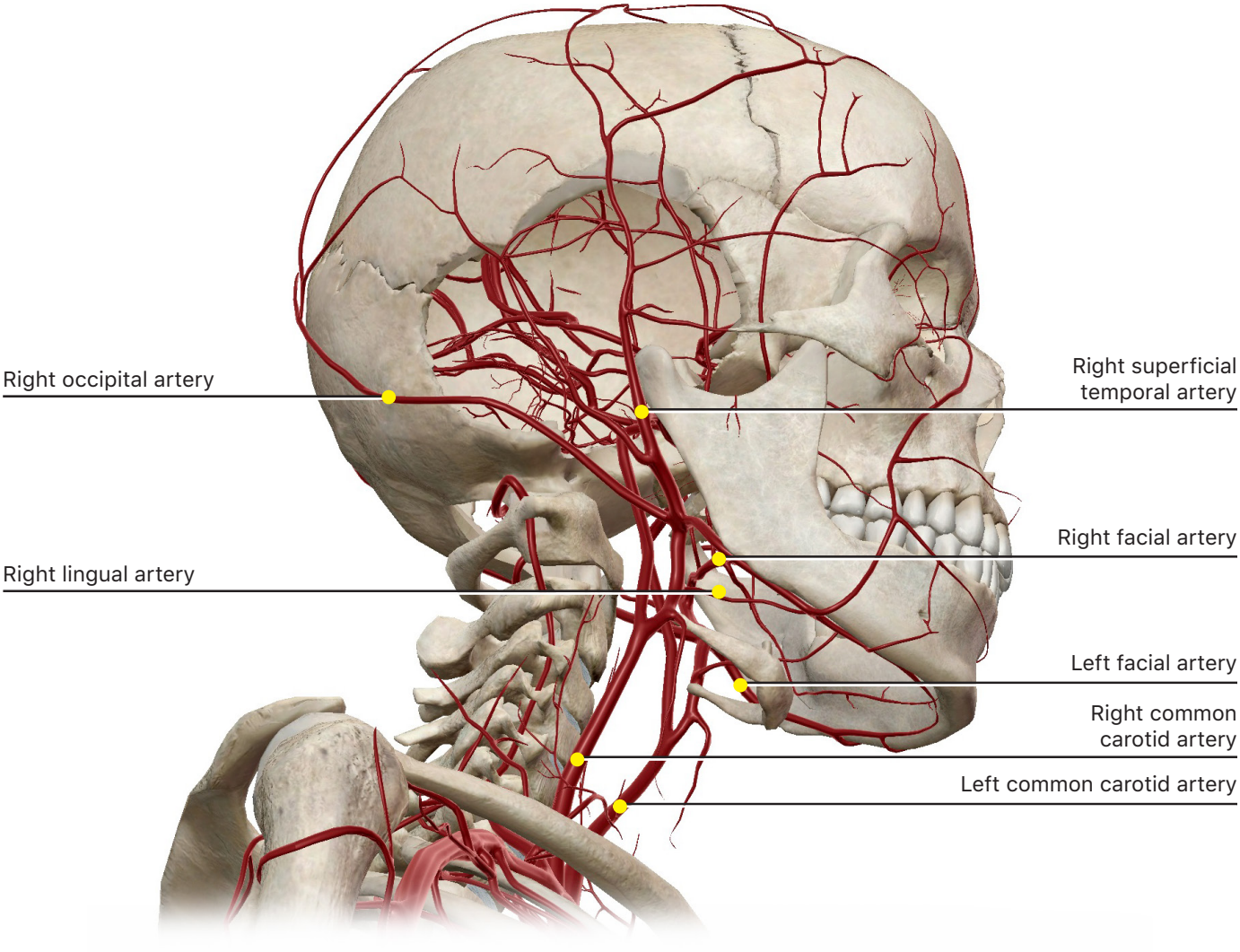
University of British Columbia Okanagan**

## IN-LAB EXERCISES

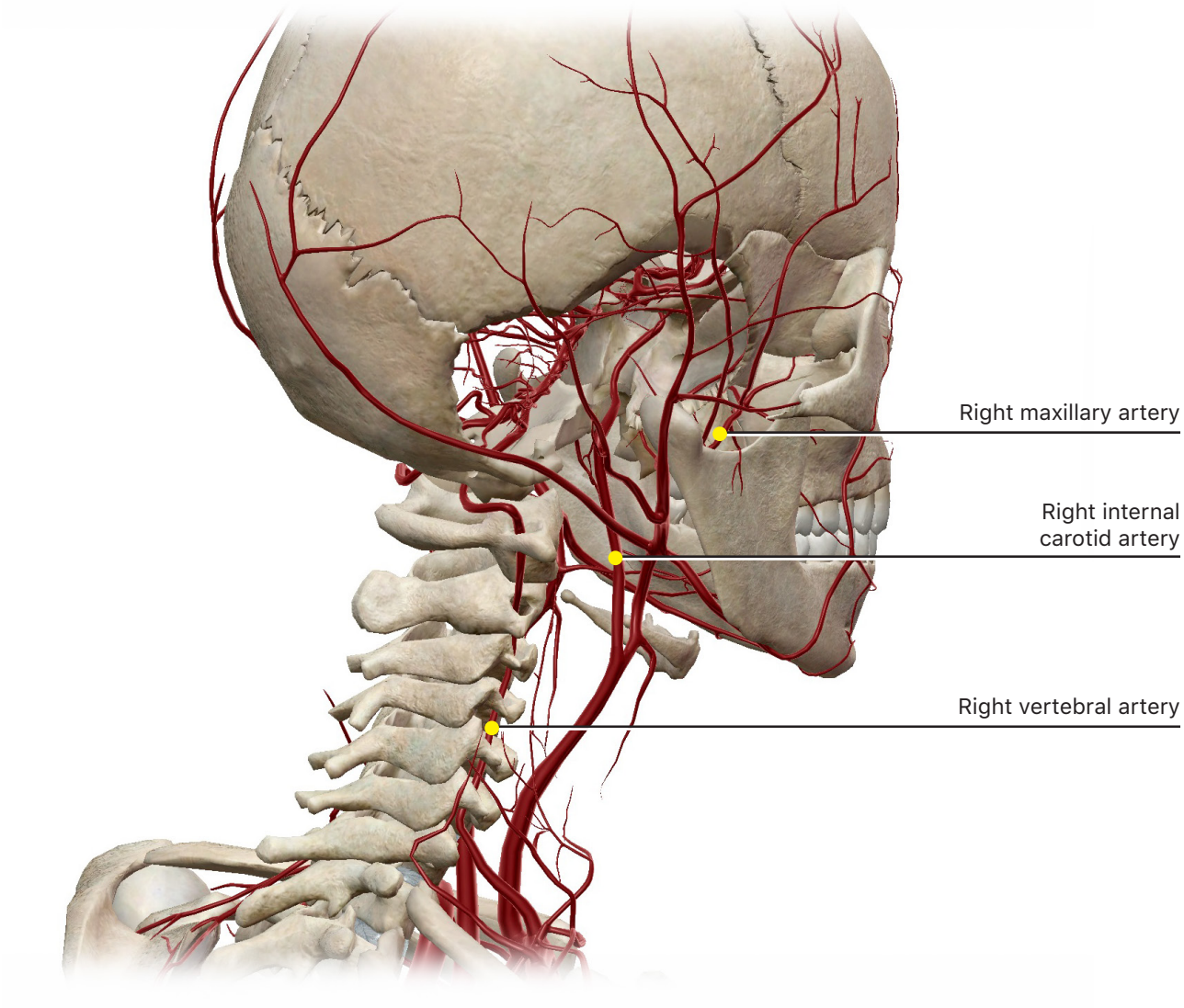
### E. Arteries of the Head, Neck, and Brain

1. Explore the 3D anatomical view in Module 30.18 Superficial Arteries of the Head and Neck (formerly 30.17) and complete the following table.



| Artery | Originates from: | Supplies the: |
|---|---|---|
| **Left common carotid** | | |
| **Right common carotid** | | |
| **External carotids** | | |
| **Facial** | | |
| **Lingual** | | |
| **Superficial temporal** | | |
| **Occipital** | | Occipital region of the scalp and the sterno-mastoid muscles in the neck (not shown) |

2. Explore the 3D anatomical view in Module 30.19 Deep Arteries of the Head and Neck (formerly 30.18).



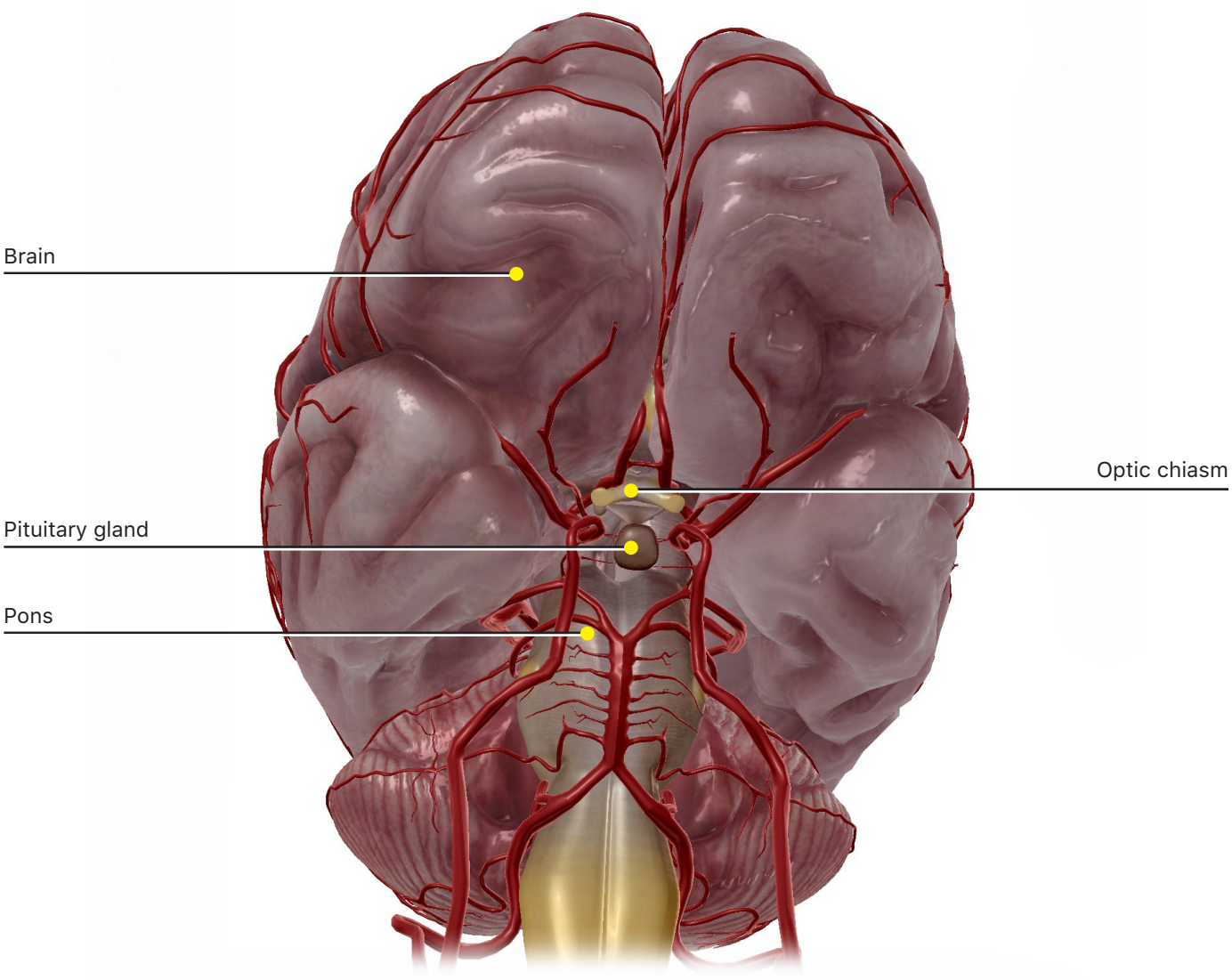

a. Complete the following table.

| Artery | Originates from: | Supplies the: |
|---|---|---|
| **Internal carotid** | | |
| **Maxillary** | | |
| **Vertebral** | | Upper spinal cord, brain stem, and posterior brain (not shown) |

b. Select vertebral from the left-side menu and note the path of the paired **vertebral arteries** within the cervical spine. Select vertebral again to show the cervical vertebrae. The vertebral artery travels though the upper _____ cervical vertebrae through _____ in the transverse processes of each vertebra.

Note the sharp turns made by the vertebral artery as it passes from the neck into the skull through a hole in the occipital bone called the _____. Neck injuries, over extension, or manipulation can easily damage the vertebral artery. This damage may reduce blood flow or cause an **aneurysm**. **Thromboses** can also form here because of high turbulence at the sharp angles.

3. Explore the 3D anatomical view in Module 30.20 Circle of Willis I (formerly 30.19) and answer the following questions.



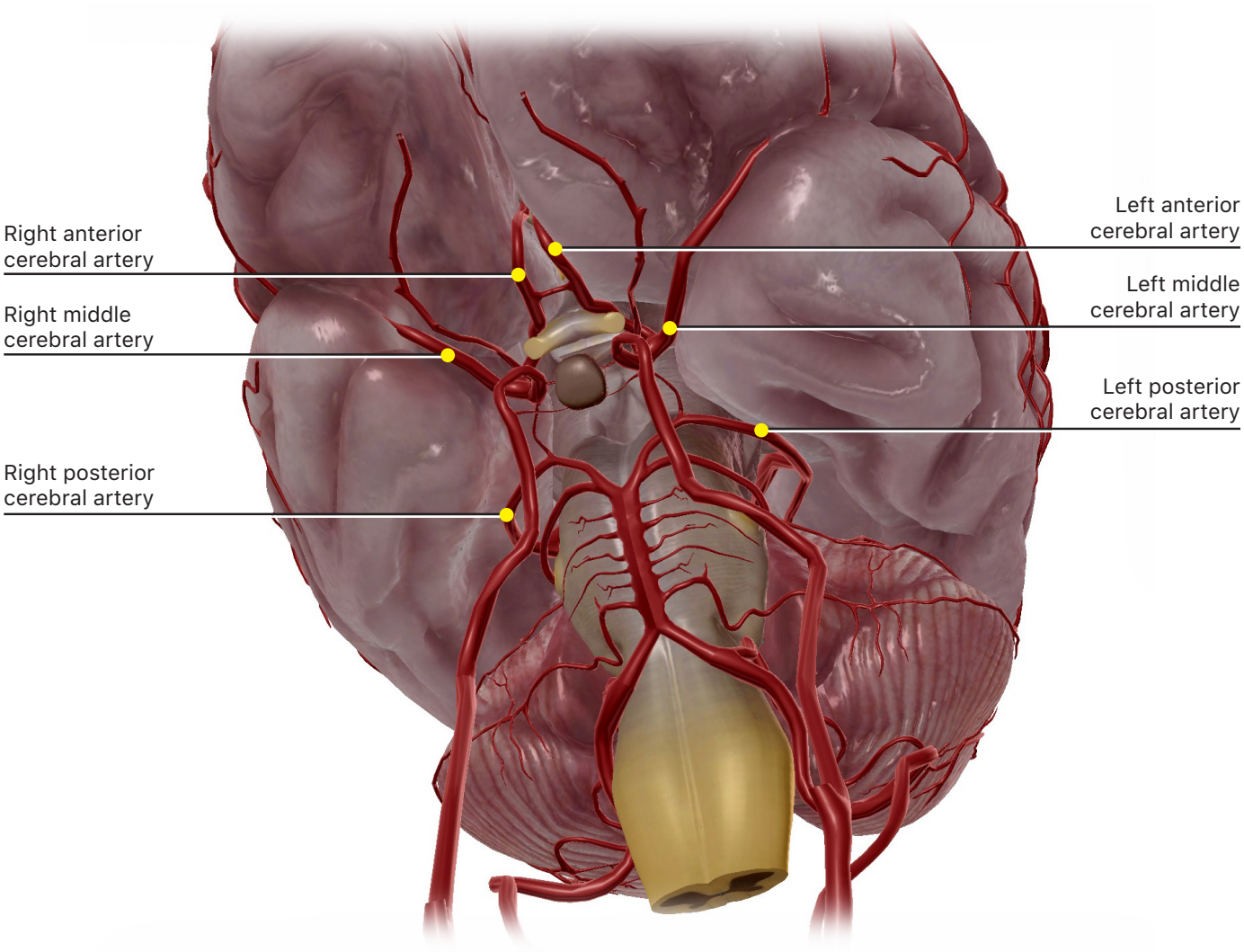
a. Select the **circle of Willis** from the left-side menu. The circle of Willis provides blood to the _____.

b. Because it is an anastomosis, it can supply _____ if one route is blocked.

c. The circle of Willis surrounds the _____ gland and the optic _____.

d. Select the branches of circle of Willis from the left-side menu. Note that they supply all regions of the brain. Use the Fade Others button to see the widespread branching within the brain. (Cerebellar supply is not shown).

4. Explore the 3D anatomical view in Module 30.21 Circle of Willis II (formerly 30.20) and answer the following questions.



a. The three main segments of the circle of Willis that supply the cerebrum are the:

i.

ii.

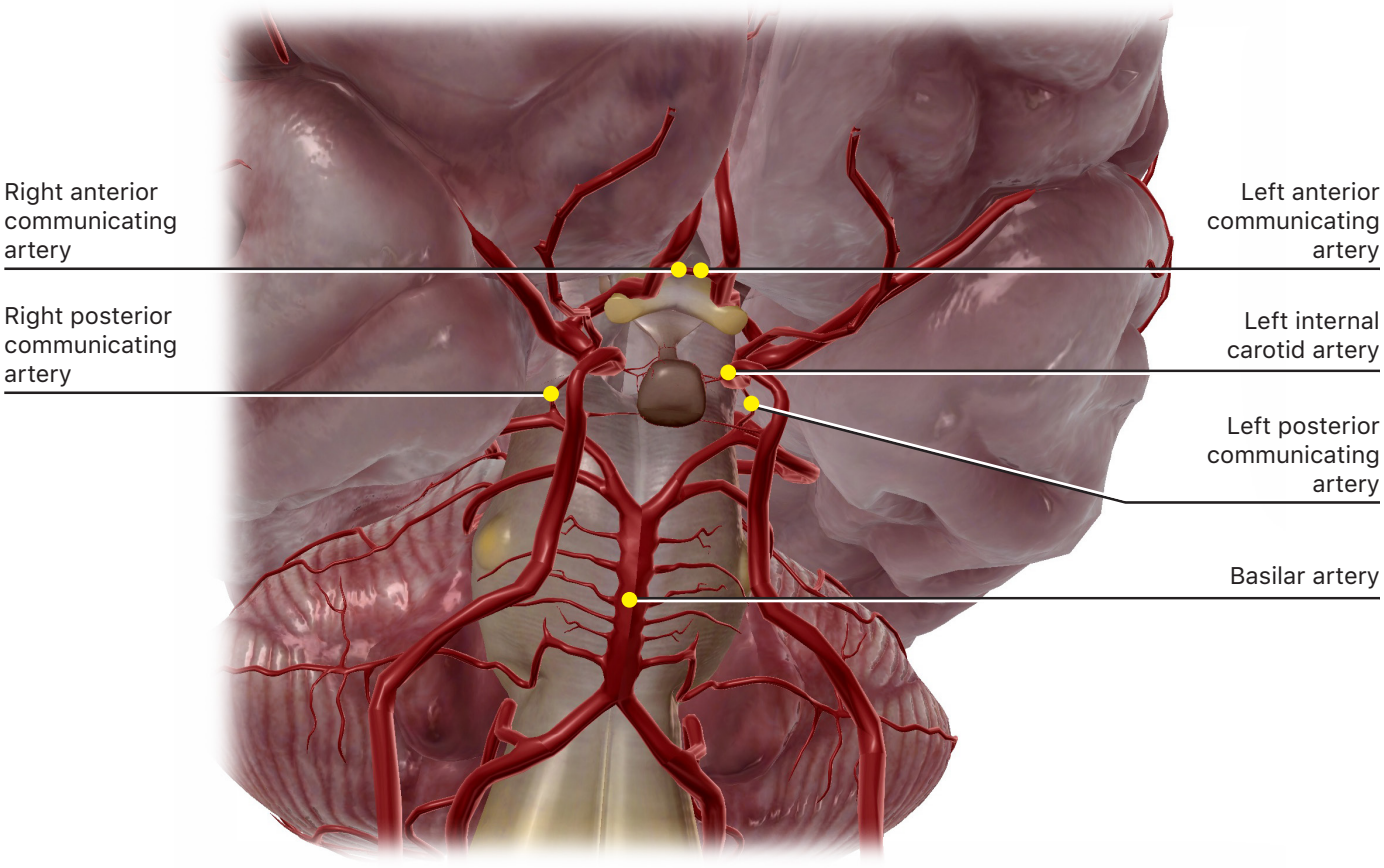
iii.

b. Select anterior cerebral (ACA) from the left-side menu. Note the position of the **anterior cerebral arteries**, and then select one of the frontal lobes and use the Hide button to hide it. Now, select one of the anterior cerebral arteries again. (Do not select the term "anterior cerebral artery" from the menu, or the lobe will reappear.) Follow the course of this artery. It joins the _____ to the _____.

c. Select middle cerebral (MCA) from the left-side menu. The **middle cerebral artery** arises from the _____. Use the Hide Others button to hide the other structures in the view and observe the arch of the middle cerebral artery as it travels through the parietal lobe.

d. Select posterior cerebral (PCA) from the left-side menu. The right and left branches of the **posterior cerebral artery** travel posteriorly around the _____ and end just above the cerebellum.

5. Explore the 3D anatomical view in Module 30.22 Circle of Willis III (formerly 30.21) and answer the following questions.




a. Select anterior communicating from the left-side menu. The **anterior communicating segment** connects the right and left _____.

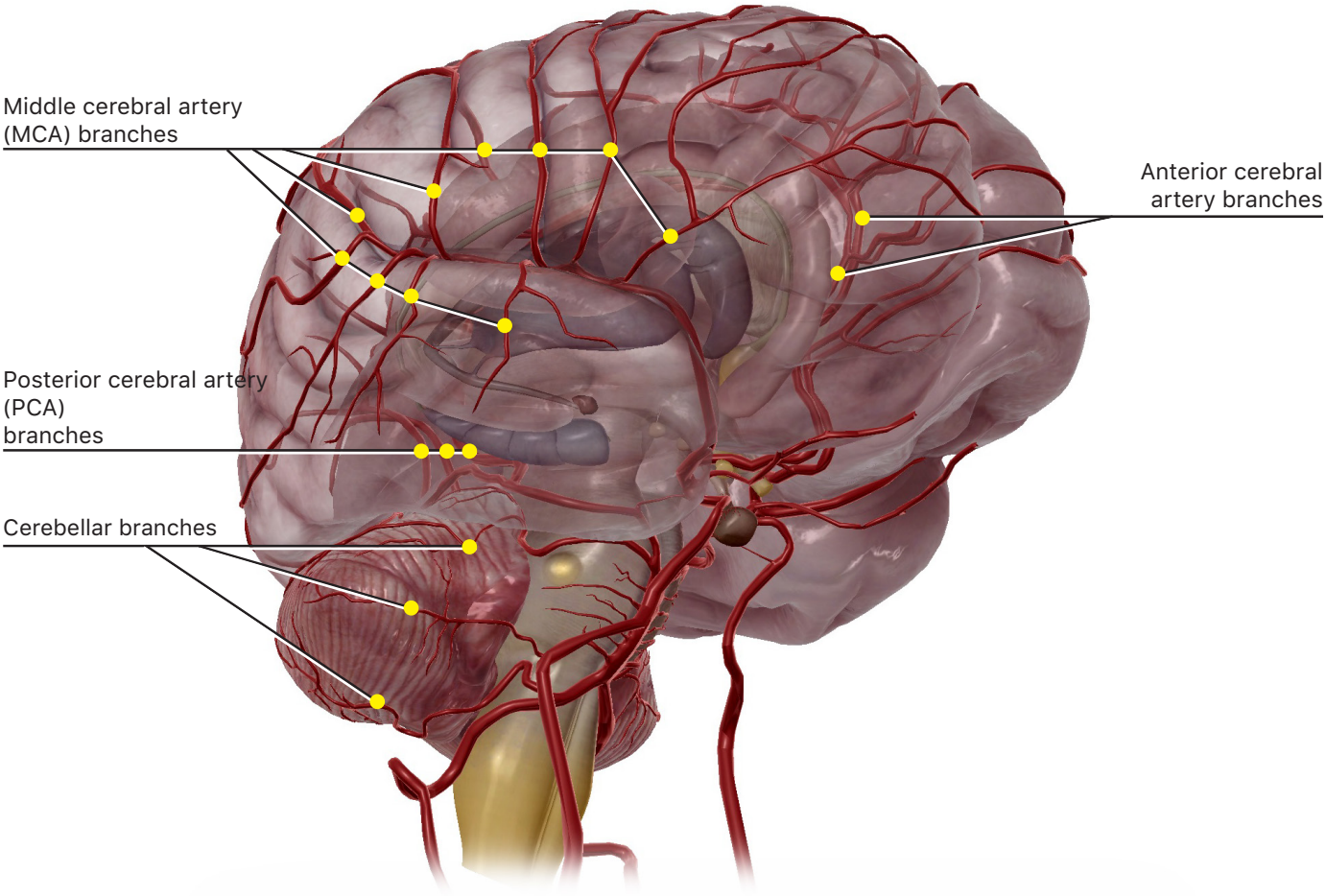
b. What does the term **collateral circulation** mean?

c. Select posterior communicating from the left-side menu. The **posterior communicating arteries** connect which two segments?

d. Select basilar from the left-side menu. The **basilar artery** is formed by the joining of the two _____, and it gives rise to the _____. Several tiny arteries branch from the basilar artery to supply a region of the brain stem called the _____. These are the _____.

e. Select internal carotid, cerebral part from the left-side menu. Zoom in to see the path and shape of the **internal carotid artery**. It connects the _____ to the _____.

6. Explore the 3D anatomical view in Module 30.23 Arteries of the Brain (formerly 30.22) and answer the following questions.




a. The anterior, middle, and posterior cerebral arteries branch to supply the brain. Which set of branches are between the two hemispheres of the brain?

b. Which set of branches supplies the outer surface of the brain?

c. Which set of branches supplies posterior regions of the cerebrum?

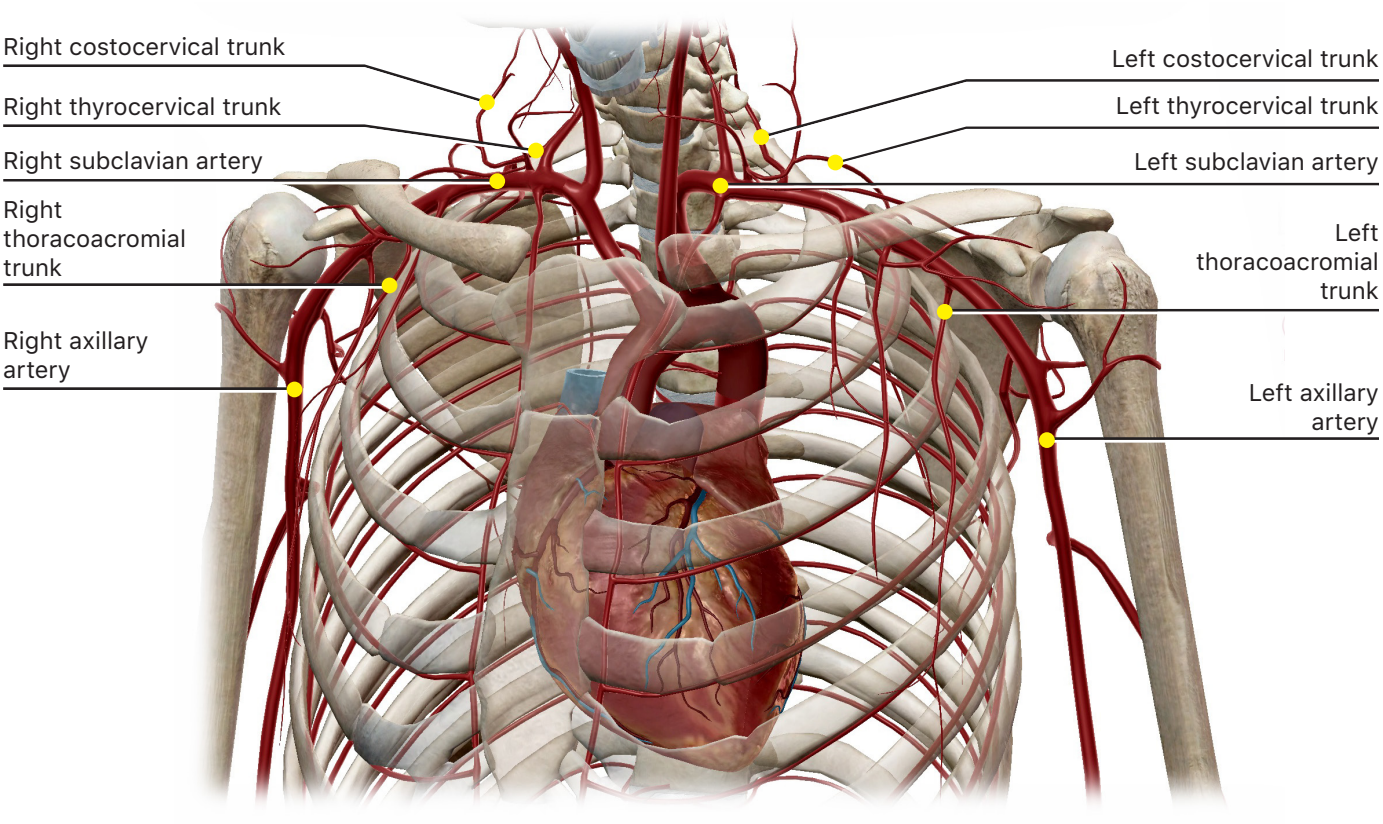
d. Select cerebellar from the left-side menu.

i. Which region of the brain is supplied by these branches?

ii. Two of these **cerebellar arteries** arise from the _____ and the third arises from the _____.

## F. Arteries of the Upper Limb, Forearm, and Hand

1. Explore the 3D anatomical view in Module 30.24 Arteries of the Upper Limb I (formerly 30.23).

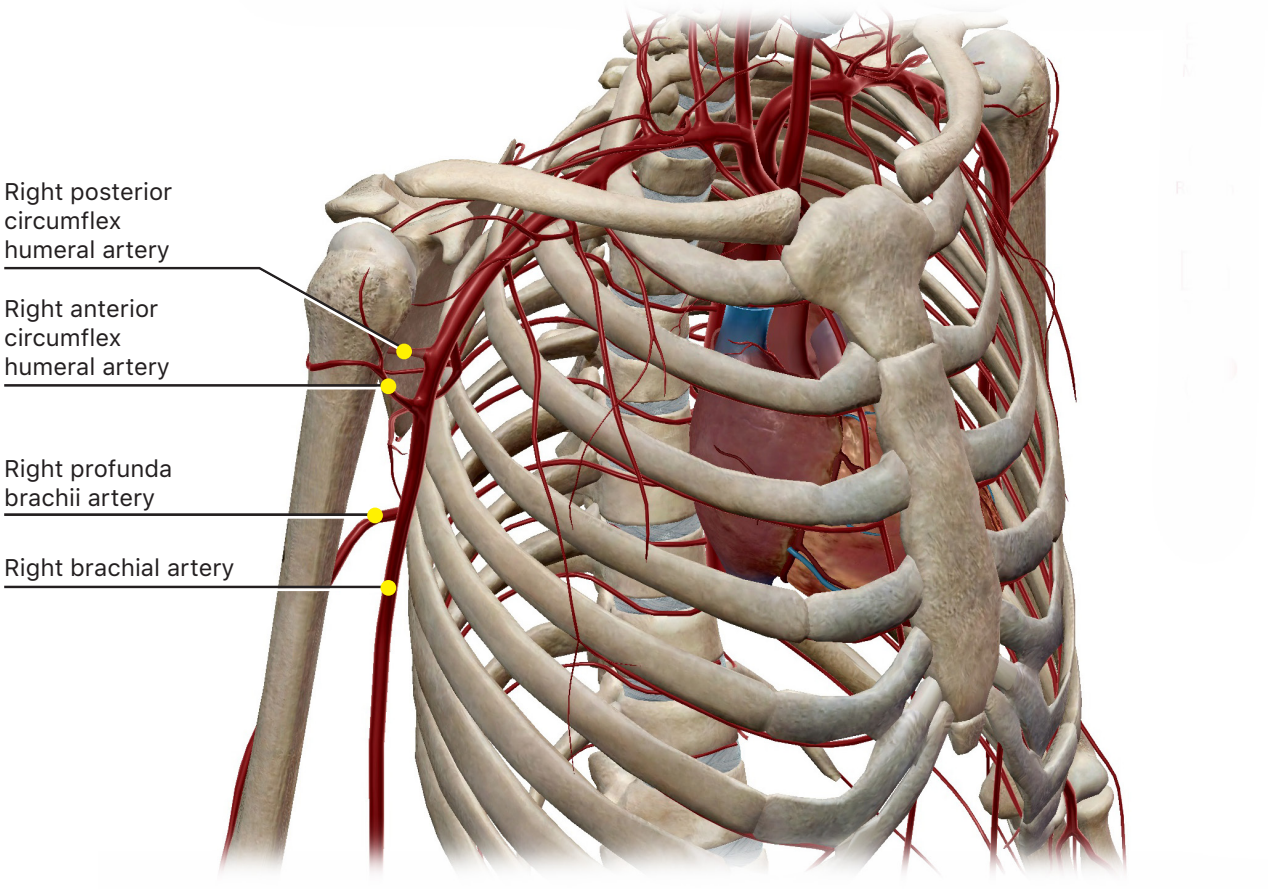



a. Complete the following table.

| Artery | Originates from: | Supplies the: |
|---|---|---|
| **Left subclavian** | | |
| **Right subclavian** | | |
| **Axillary** | | |
| **Thoracoacromial trunk** | | Serratus anterior, pectoralis major, and axilla (not shown) |
| **Costocervical trunk** | | |
| **Thyrocervical trunk** | | |

b. How did the **subclavian arteries** get their name?

2. Explore the 3D anatomical view in Module 30.25 Arteries of the Upper Limb II (formerly 30.24).



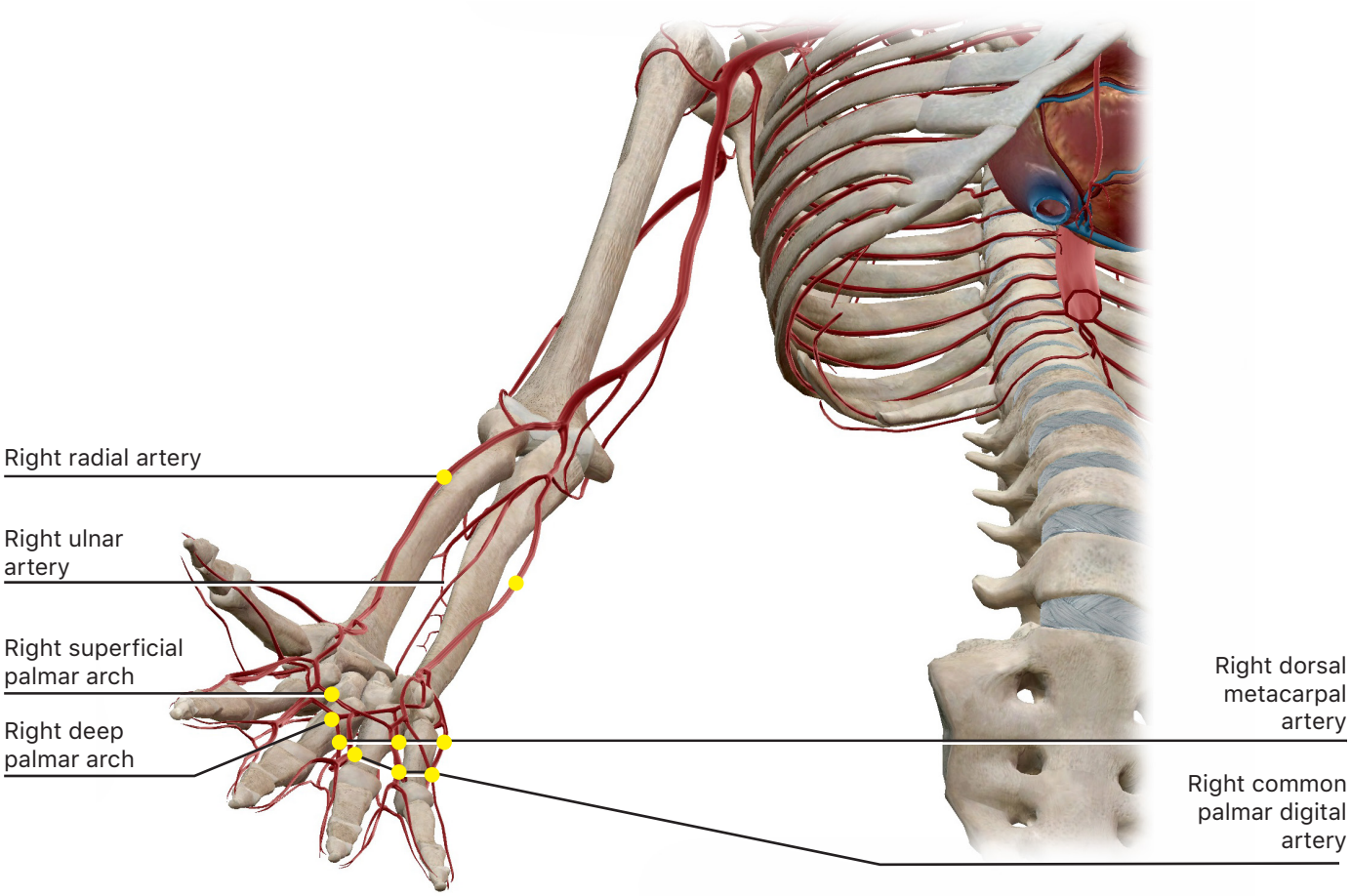

a. Complete the following table.

| Artery | Originates from: | Supplies the: |
|---|---|---|
| **Anterior and posterior circumflex humeral** | | |
| **Brachial** | | |
| **Profunda brachii** | | |

b. Which of these arteries is commonly used to measure arterial **pulse** and blood pressure?

c. What are the two terminal branches of the **brachial artery**?

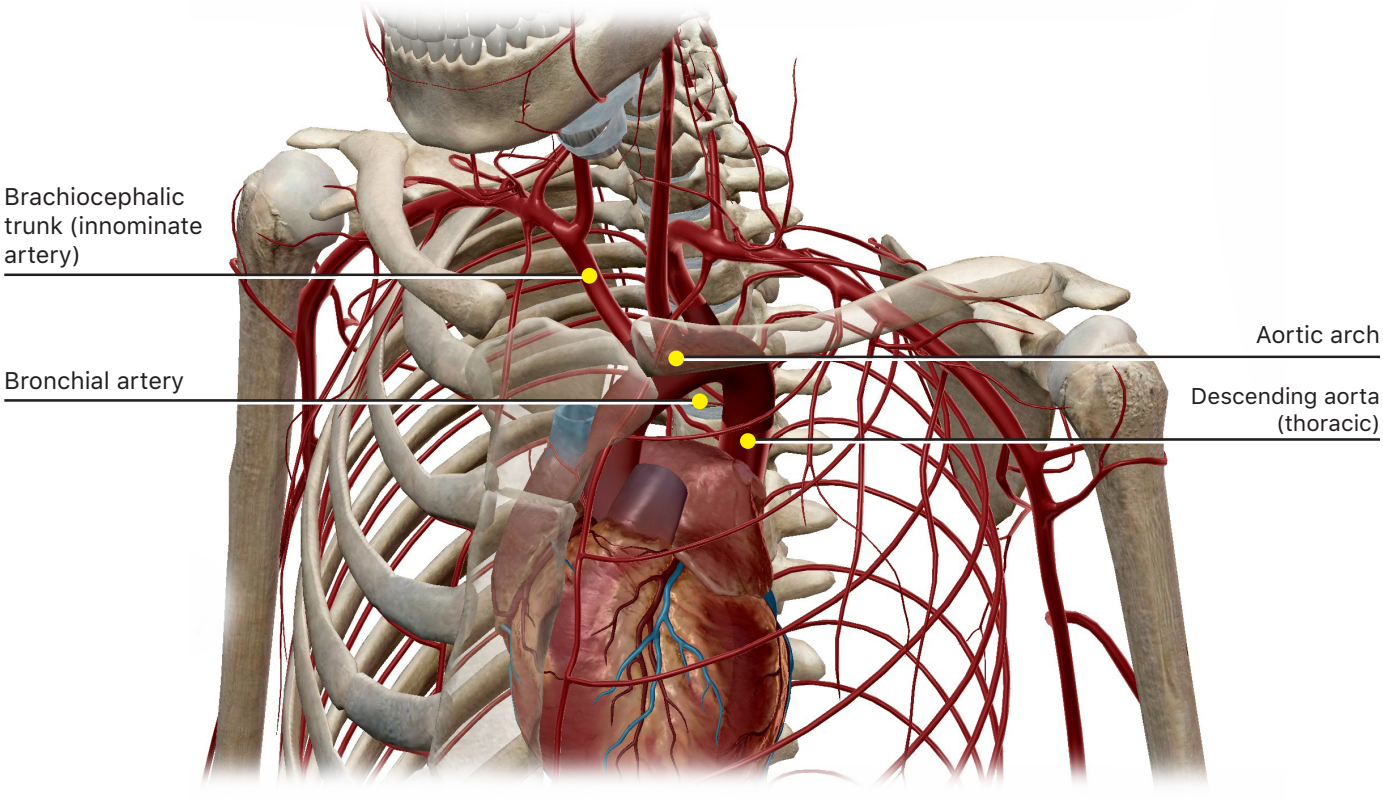
3. Explore the 3D anatomical view in Module 30.26 Arteries of the Forearm and Hand (formerly 30.25) and complete the following table. Rotate the view and select various arteries to complete this table.




| Artery | Originates from: | Supplies the: |
|---|---|---|
| **Radial** | | |
| **Ulnar** | | |
| **Deep and superficial palmar arches** | | |
| **Metacarpal** | | |
| **Digital** | | |

## G. Arteries of the Thorax, Abdomen, and Intestines

1. Explore the 3D anatomical view in Module 30.27 Arteries of the Thorax (formerly 30.26) and answer the following questions.



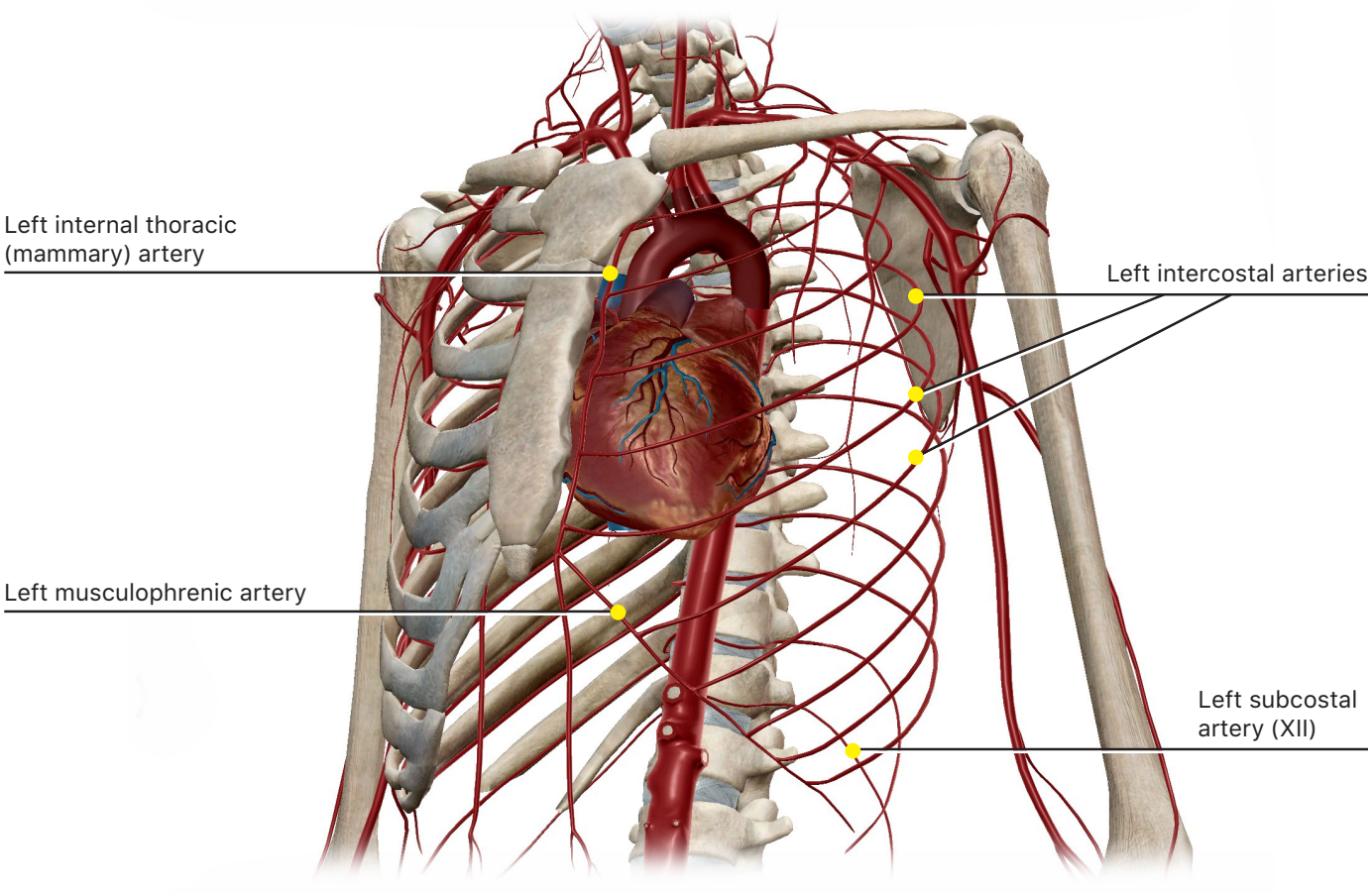

a. Select the aortic arch from the left-side menu. The aortic arch is one of the great vessels. It has three main branches: the _____, the _____, and the _____.

b. Select the **brachiocephalic trunk** from the left-side menu. This is also called the _____ artery. It is the first and _____ branch of the aortic arch. It divides to form which two arteries?

c. The thoracic aorta is a continuation of the _____. It supplies blood to the _____.

d. The two categories of branches from the thoracic aorta are the _____ and _____ branches.

2. Explore the anatomical view in Module 30.28 Arteries of the Thorax II (formerly 30.27) and answer the following questions.




a. Which group of arteries is found in the spaces between the ribs?

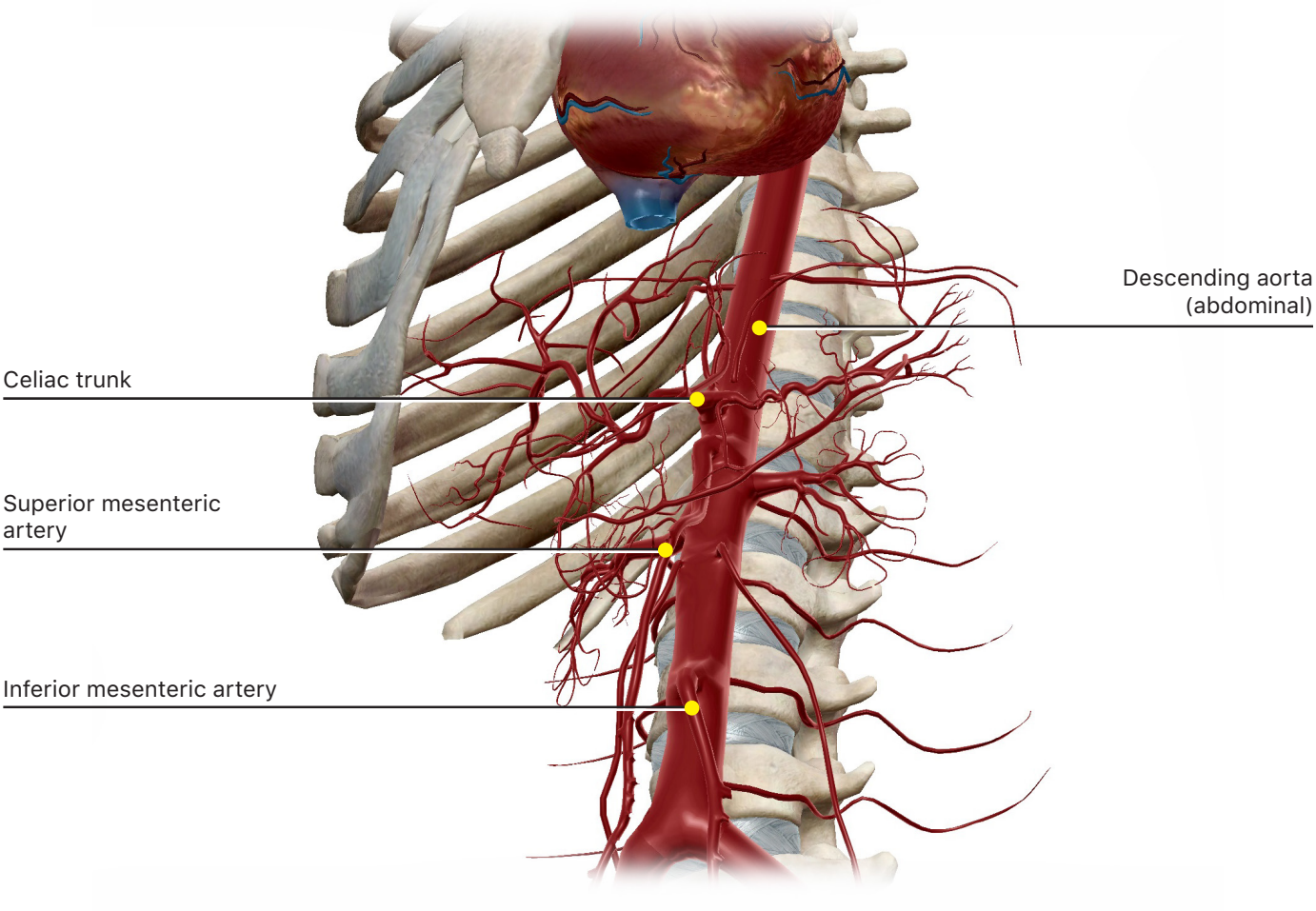
b. Which pair of arteries is found below the twelfth (lowest pair of) ribs?

c. Which pair of arteries travels along the lateral surface of the sternum?

i. These arteries originate from the _____ arteries.

d. Which pair of arteries are found behind the cartilage of the false ribs?

3. Explore the 3D anatomical view in Module 30.29 Branches of the Abdominal Aorta I (formerly 30.28) and answer the following questions.




a. The abdominal aorta is a continuation of the _____.

b. What are the unpaired **visceral branches** of the abdominal aorta?

i. These all arise from the _____ surface of the abdominal aorta.

c. What are the paired visceral branches of the abdominal aorta?

i. These all arise from the _____ surface of the abdominal aorta.

d. What are the **parietal branches** of the abdominal aorta?

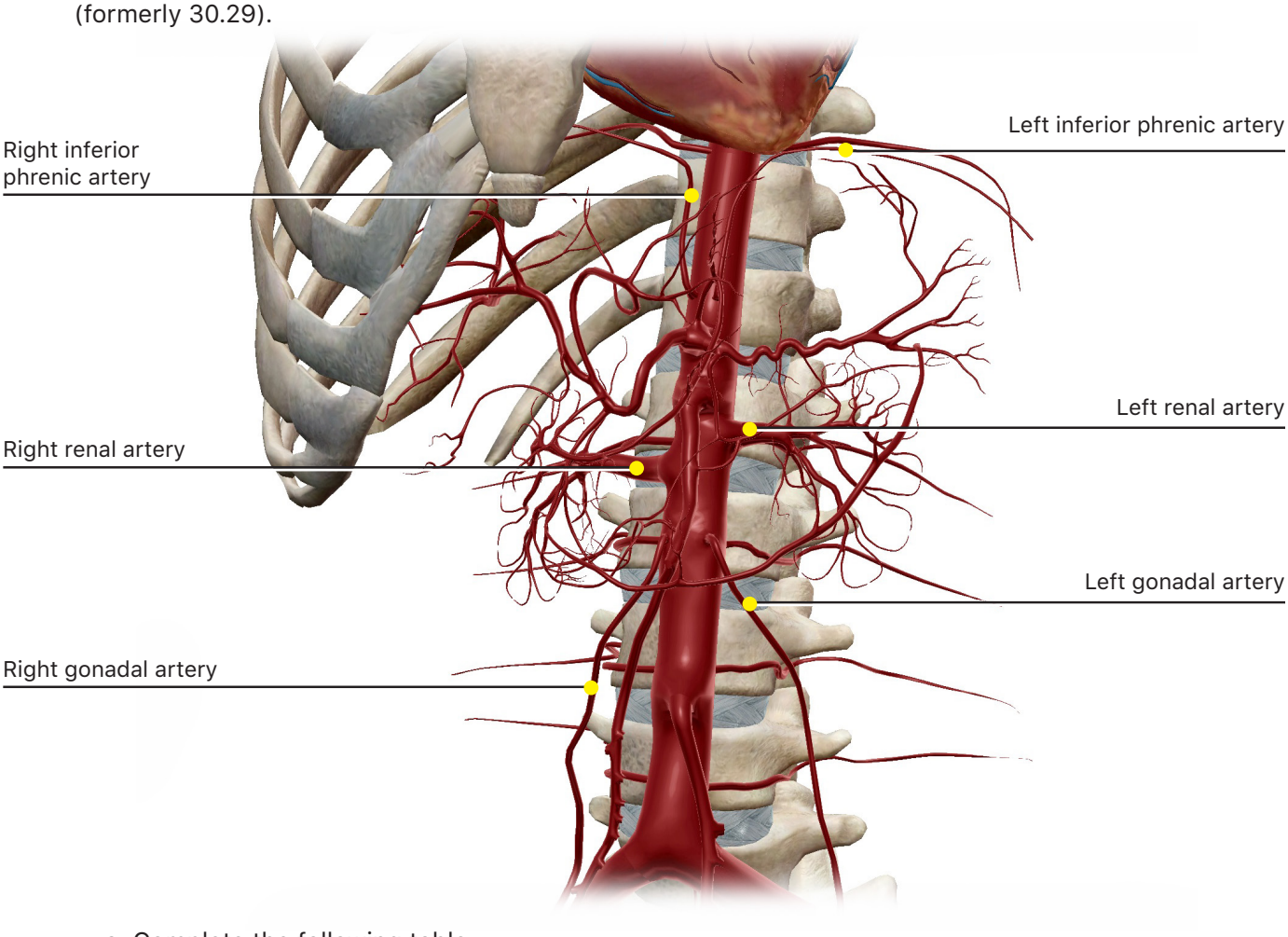
e. Select the **celiac trunk** from the left-side menu. The celiac trunk divides into three large branches: the _____, _____, and _____.

i. Which organs are supplied by these branches?

f. Select superior mesenteric from the left-side menu. Which organs are supplied by the **superior mesenteric artery**?

g. Select inferior mesenteric from the left-side menu. Which organs are supplied by the **inferior mesenteric artery**?

4. Explore the 3D anatomical view in Module 30.30 Branches of the Abdominal Aorta II (formerly 30.29).

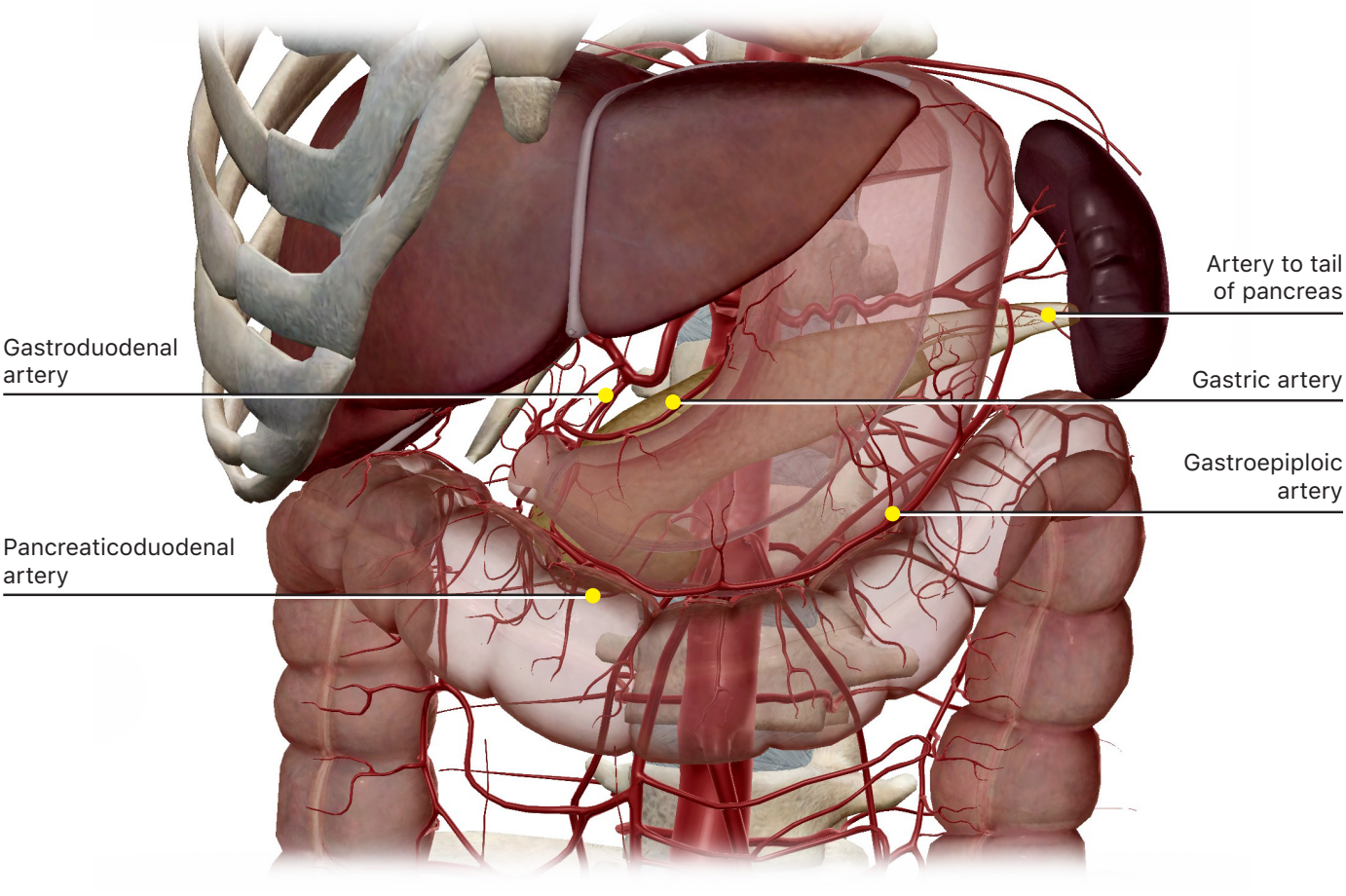



a. Complete the following table.

| Artery | Supplies the: |
|---|---|
| **Renal** | |
| **Gonadal (male)** | |
| **Gonadal (female)** | |
| **Median Sacral** | |
| **Inferior phrenic** | |
| **Lumbar** | |

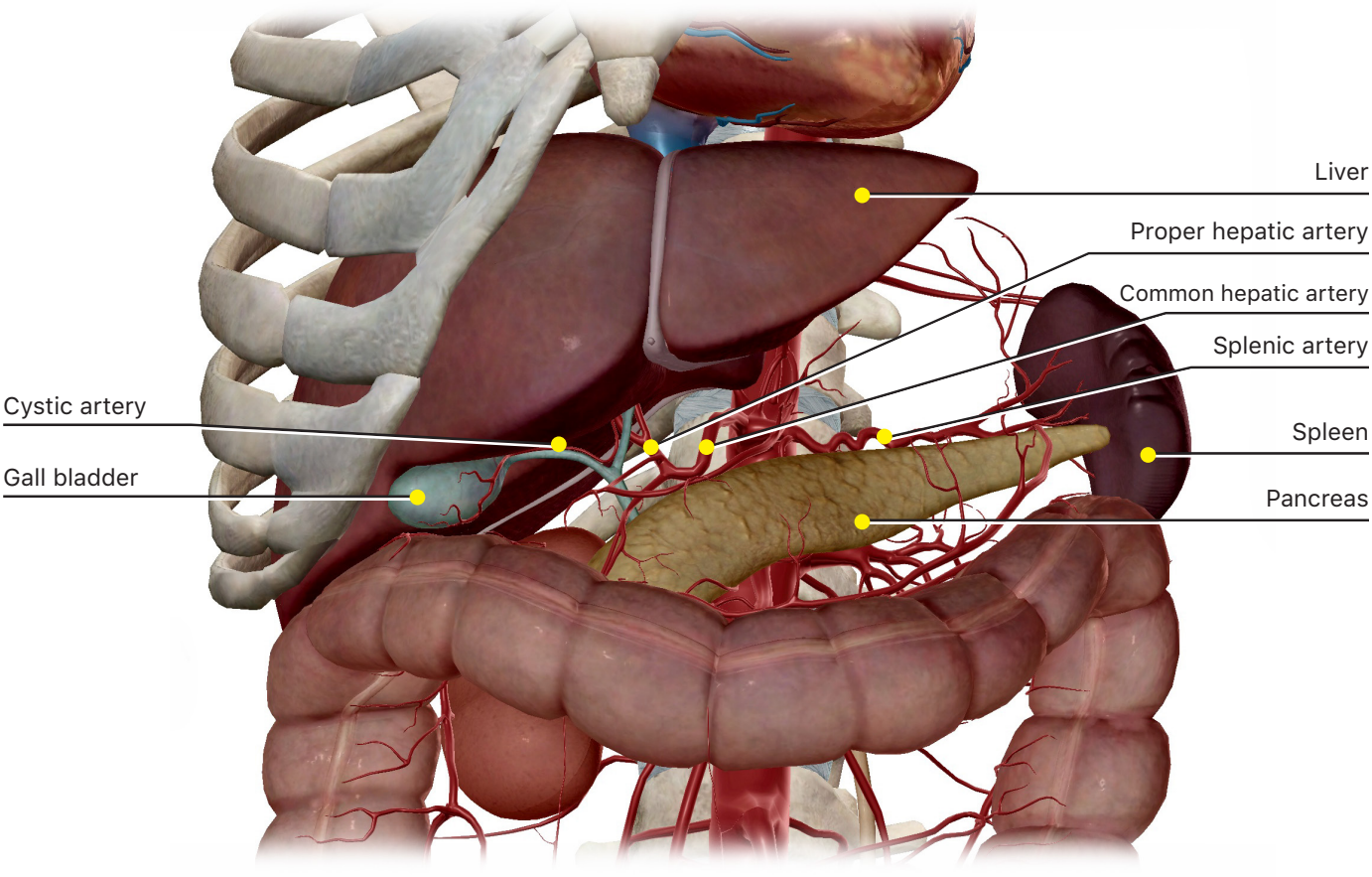
b. The **gonadal arteries** are called the _____ in females and the _____ in males.

5. Explore the 3D anatomical view in Modules 30.31 Arteries of the Abdomen I (formerly 30.30) and 30.32 Arteries of the Abdomen II (formerly 30.31) and complete the following table.




| Artery | Supplies the: |
|---|---|
| **Gastric** | |
| **Gastroepiploic** | |
| **Pancreaticoduodenal** | Duodenum and pancreas (not shown) |
| **Gastroduodenal** | |
| **Artery to tail of pancreas** | |

6. Explore the 3D anatomical view in Module 30.32 Arteries of the Abdomen II (formerly 30.31) and answer the following questions.



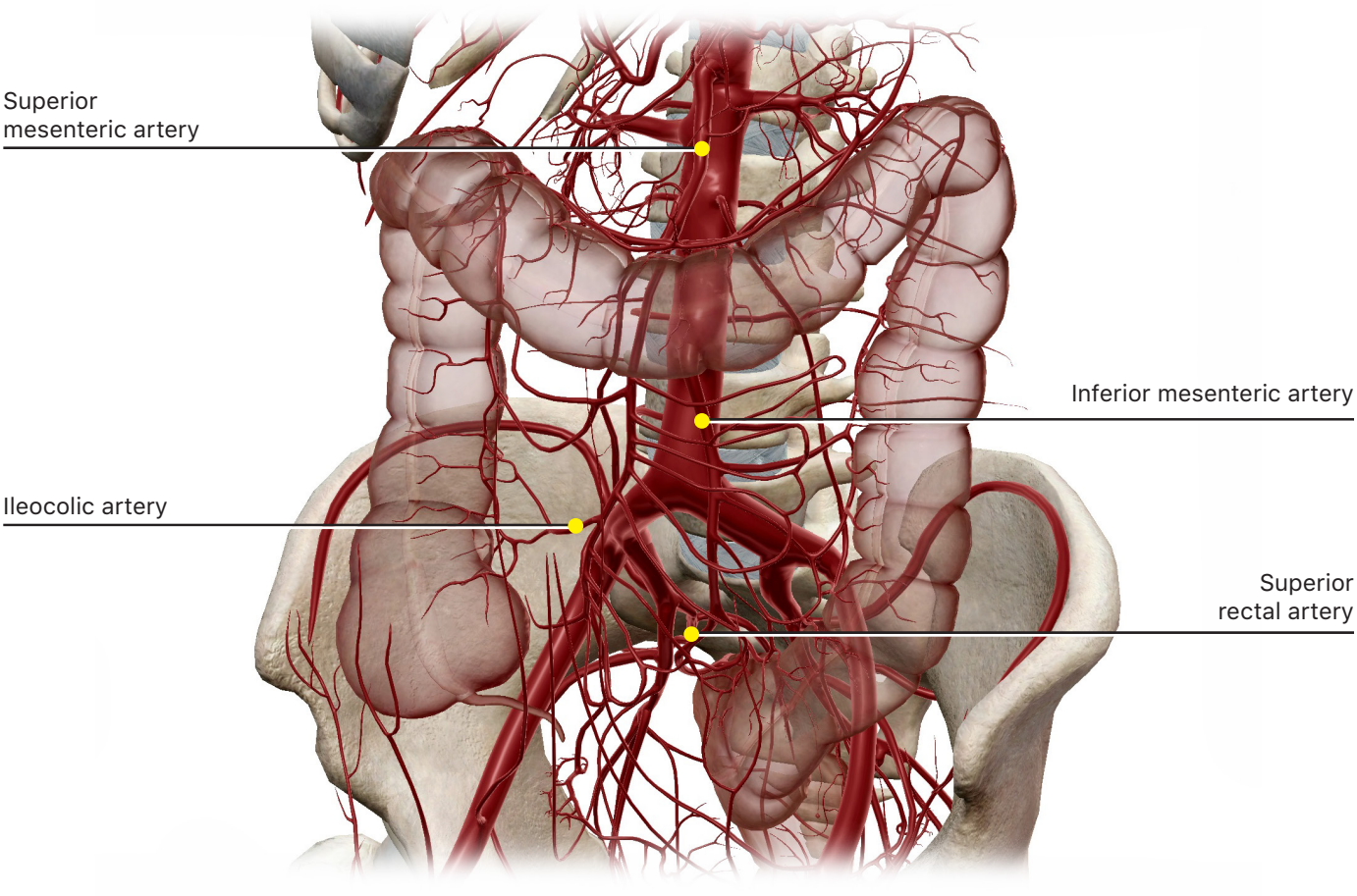

a. The **common hepatic artery** is one of the branches of the _____.

b. What are the two divisions of the common hepatic artery and what organs does each division supply?

c. Select cystic from the left-side menu. The **cystic artery** supplies the _____.

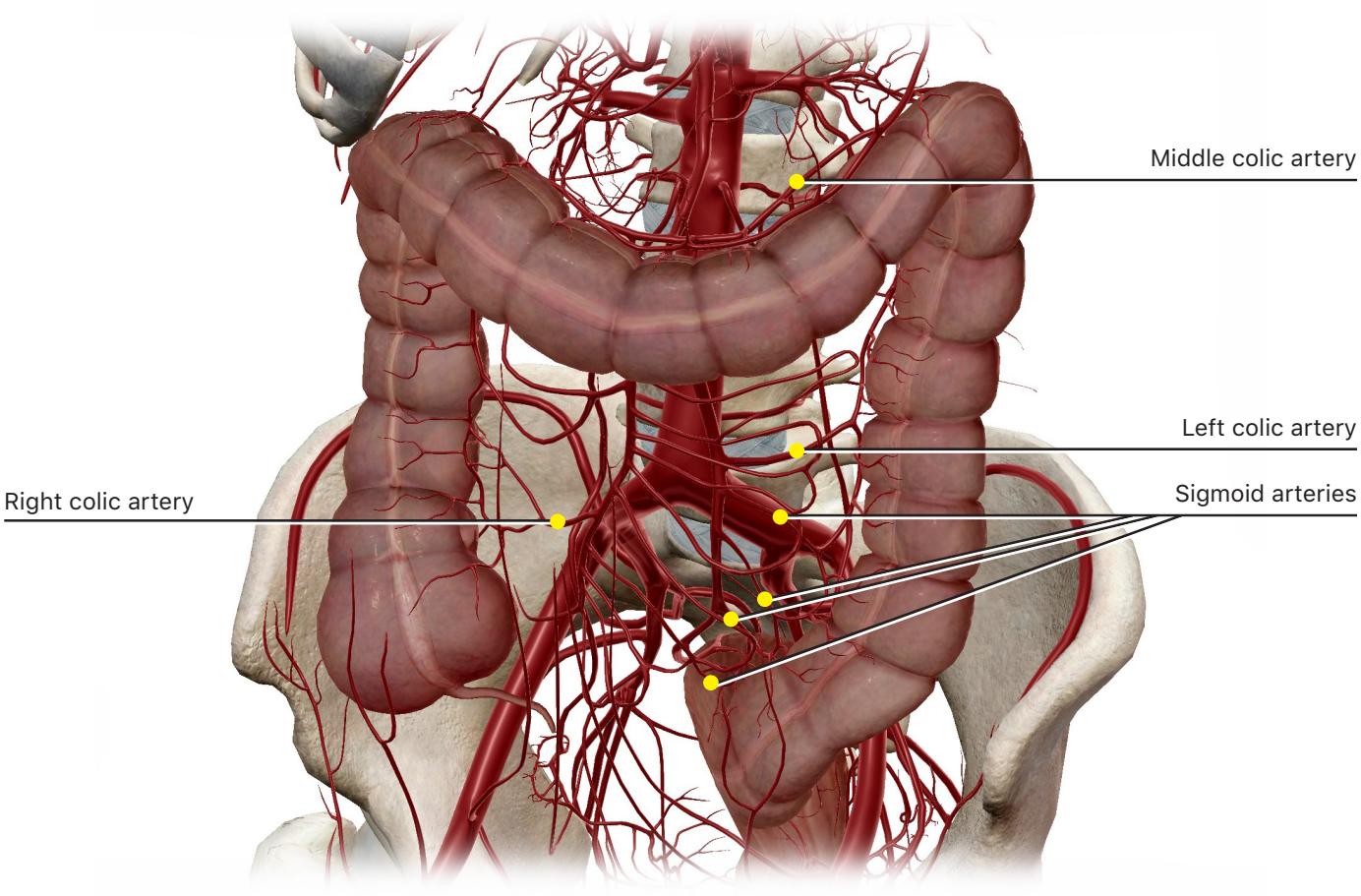
d. Select splenic from the left-side menu. The **splenic artery** is the largest branch of the _____. Which organs are supplied by the splenic artery?

7. Explore the 3D anatomical view in Module 30.33 Arteries of the Intestines I (formerly 30.32) and complete the following table.




| Artery | Originates from: | Supplies the: |
|---|---|---|
| **Superior mesenteric** | | |
| **Inferior mesenteric** | | |
| **Ileocolic** | | Large and small intestines (not shown) |
| **Superior rectal** | | |

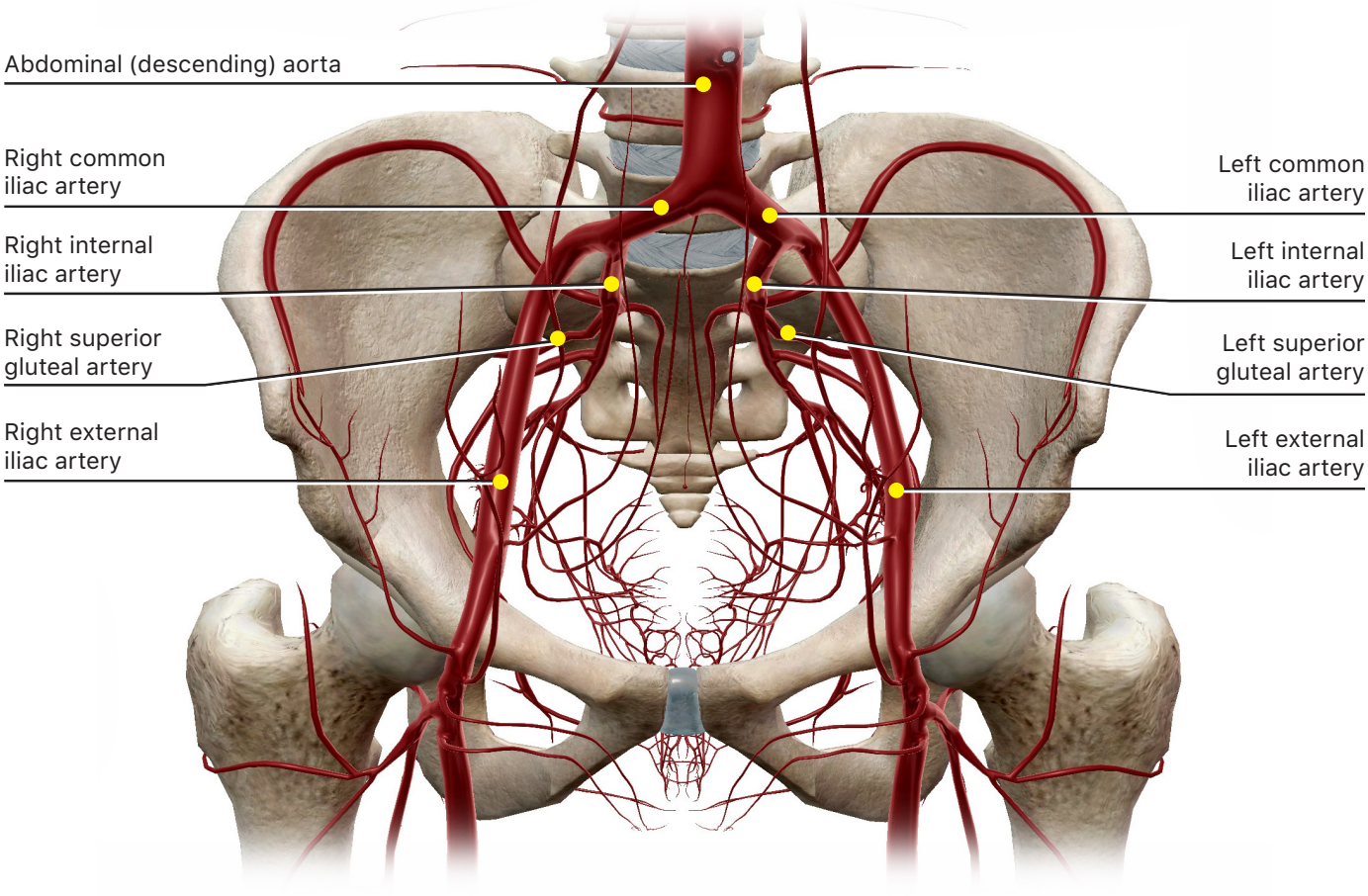
8. Explore the 3D anatomical view in Module 30.34 Arteries of the Intestine II (formerly 30.33) and complete the following table.




| Artery | Originates from: | Supplies the: |
|---|---|---|
| **Left colic** | | |
| **Right colic** | | |
| **Middle colic** | | |
| **Sigmoid** | | |

## H. Arteries of the Pelvis, Leg, and Foot

1. Explore the 3D anatomical view in Module 30.35 Arteries of the Pelvis I (formerly 30.34) and answer the following questions.

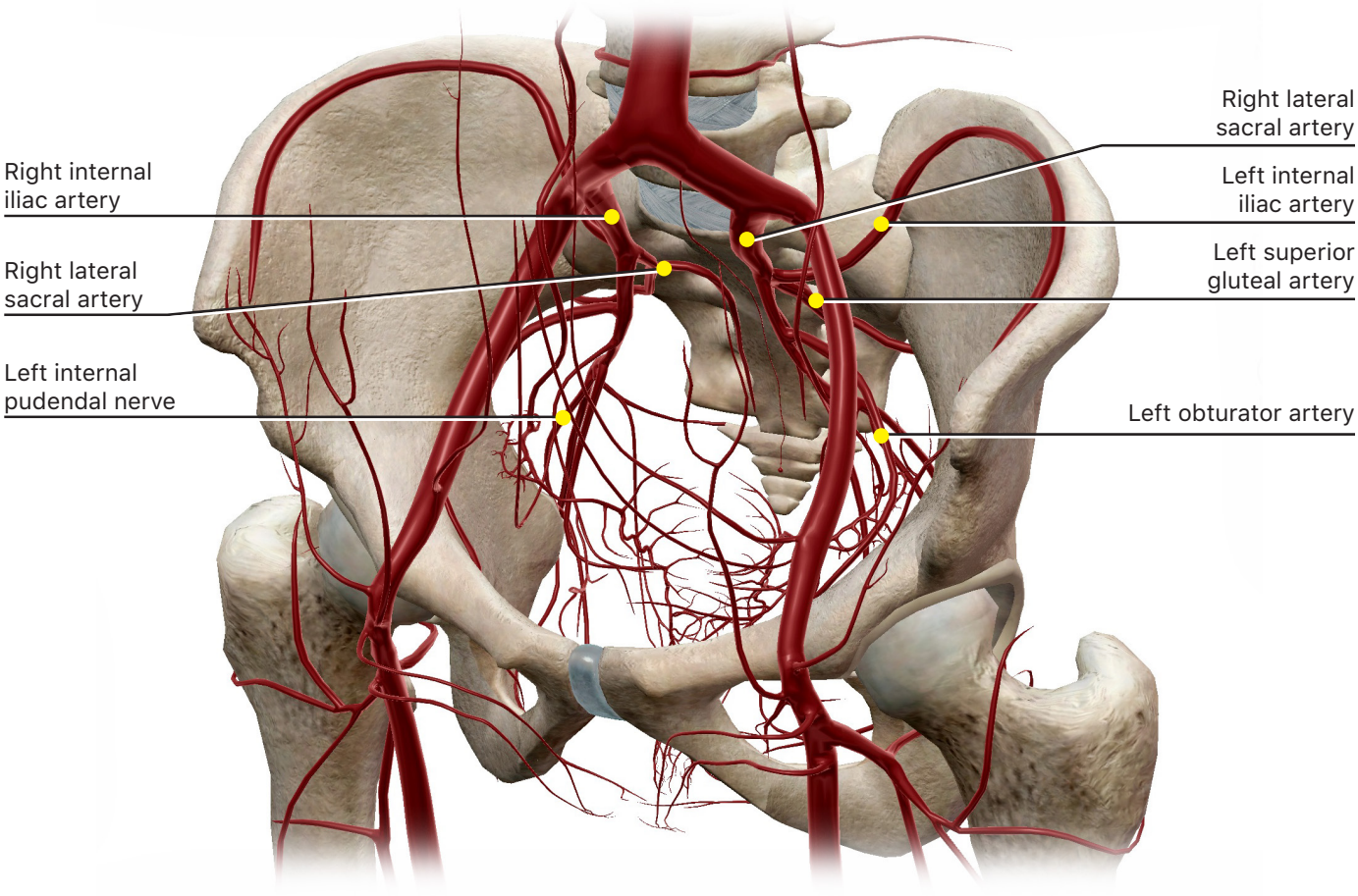



a. All the arteries of the pelvis are branches from the _____.

b. The paired branches arising from the aorta at the level of the fourth lumbar vertebrae are the _____ arteries.

c. What are the three branches of the **common iliac artery**?

2. Explore the 3D anatomical view in Module 30.36 Arteries of the Pelvis II (formerly 30.35) and answer the following questions.

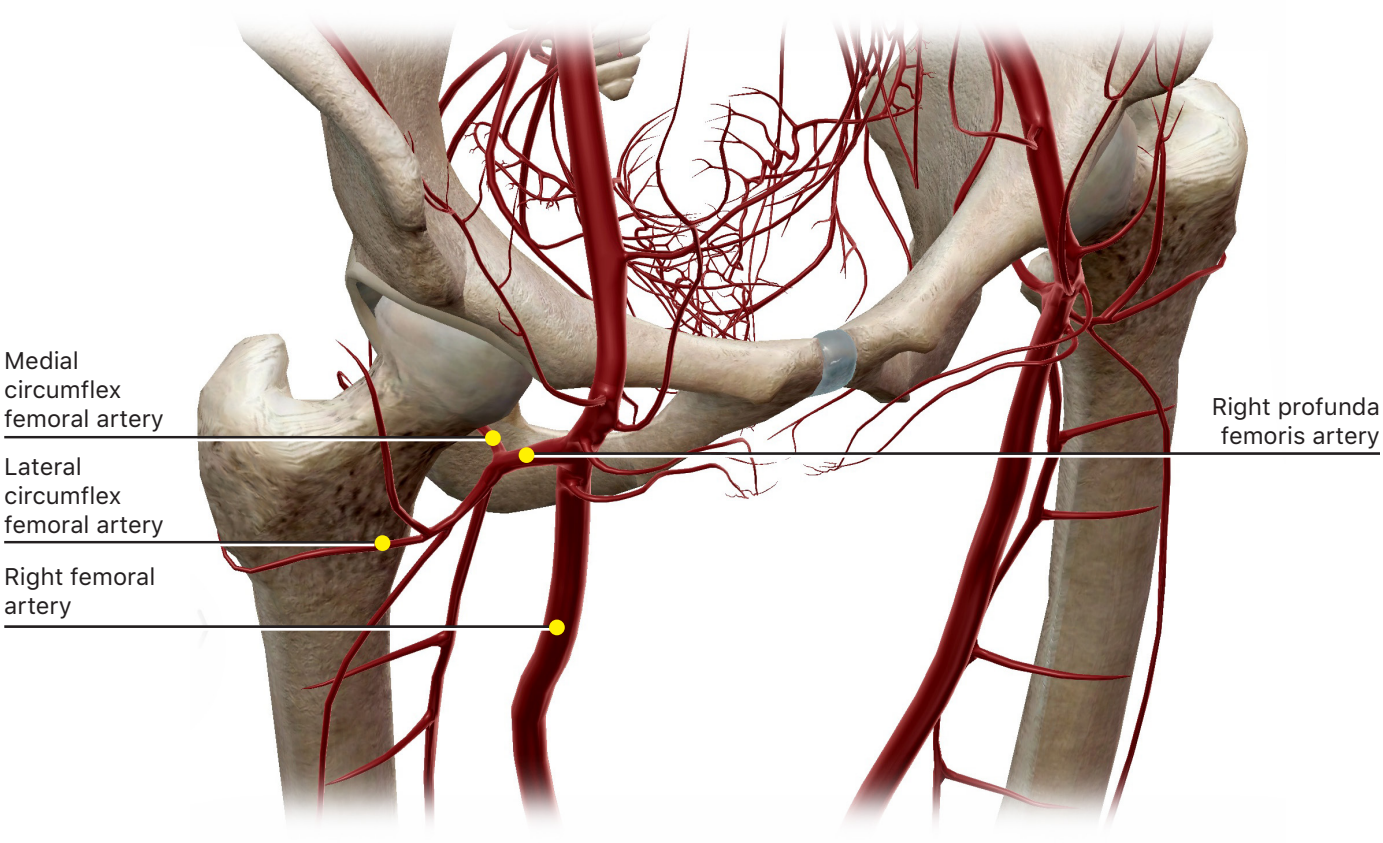



a. The **internal iliac arteries** divide into _____ branches and _____ branches. These branches supply the _____.

b. What are the three posterior branches?

c. What are the two anterior branches?

3. Explore the 3D anatomical view in Module 30.37 Arteries of the Upper Leg (formerly 30.36) and answer the following questions.



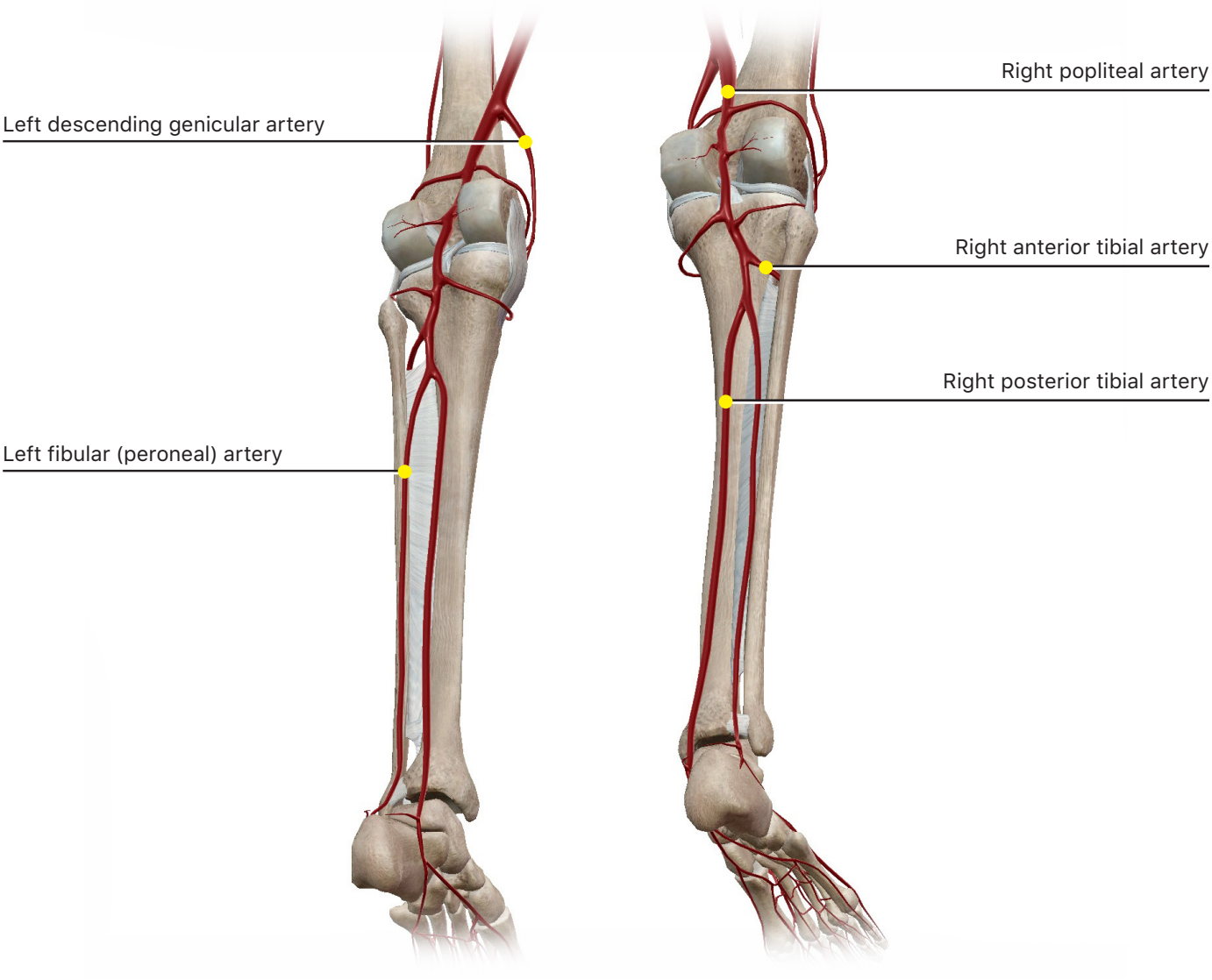

a. Which artery is the main trunk supplying the lower limb?

i. This artery is a continuation of the _____.

b. Complete the following table.

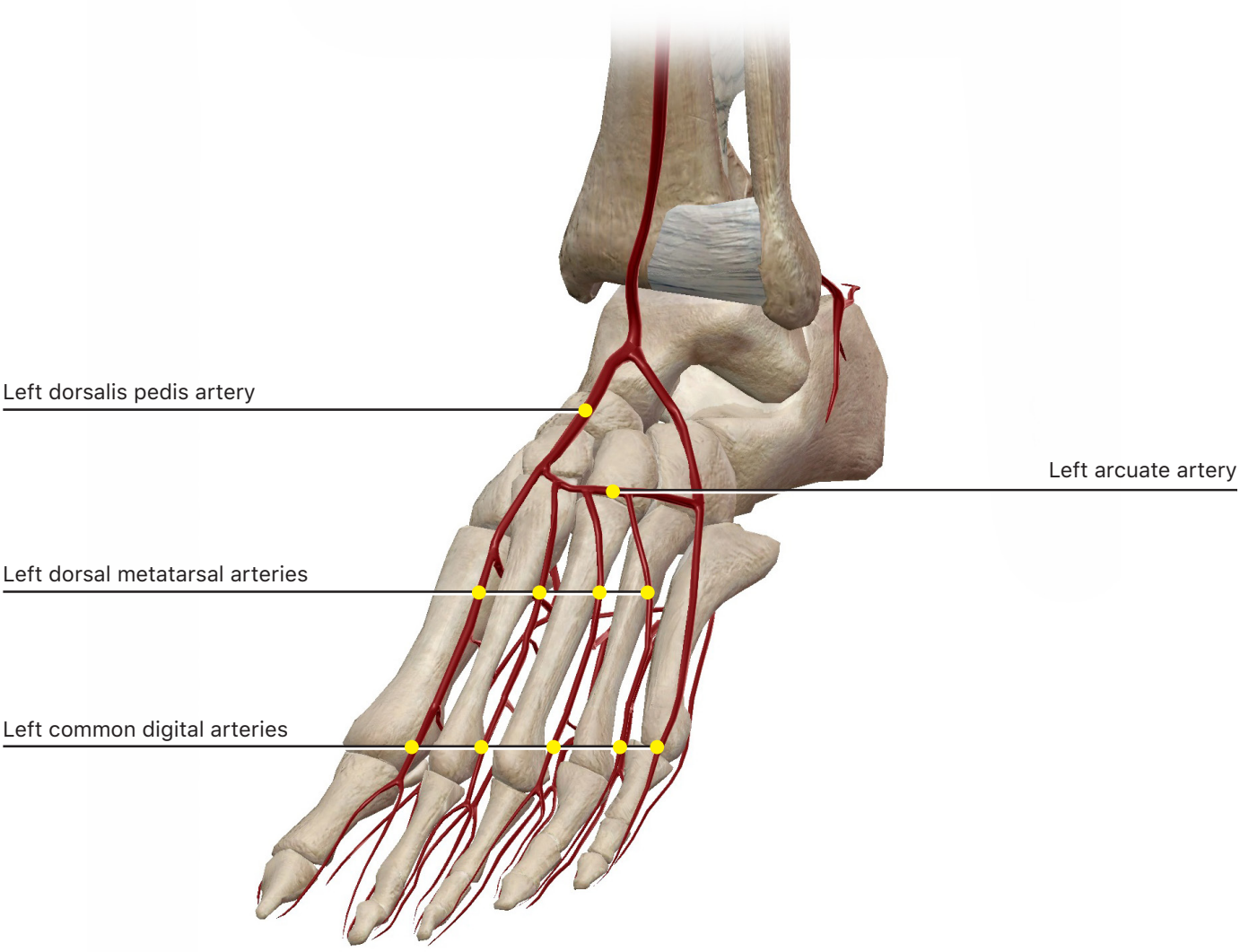
| Artery | Originates from: | Supplies the: |
|---|---|---|
| **Profunda femoris** | | Deep structures of the thigh, including the femora (not shown) |
| **Medial circumflex femoral** | | Thigh (not shown) |
| **Lateral circumflex femoral** | | Thigh (not shown) |

4. Explore the 3D anatomical view in Module 30.38 Arteries of the Lower Leg (formerly 30.37) and complete the following table.



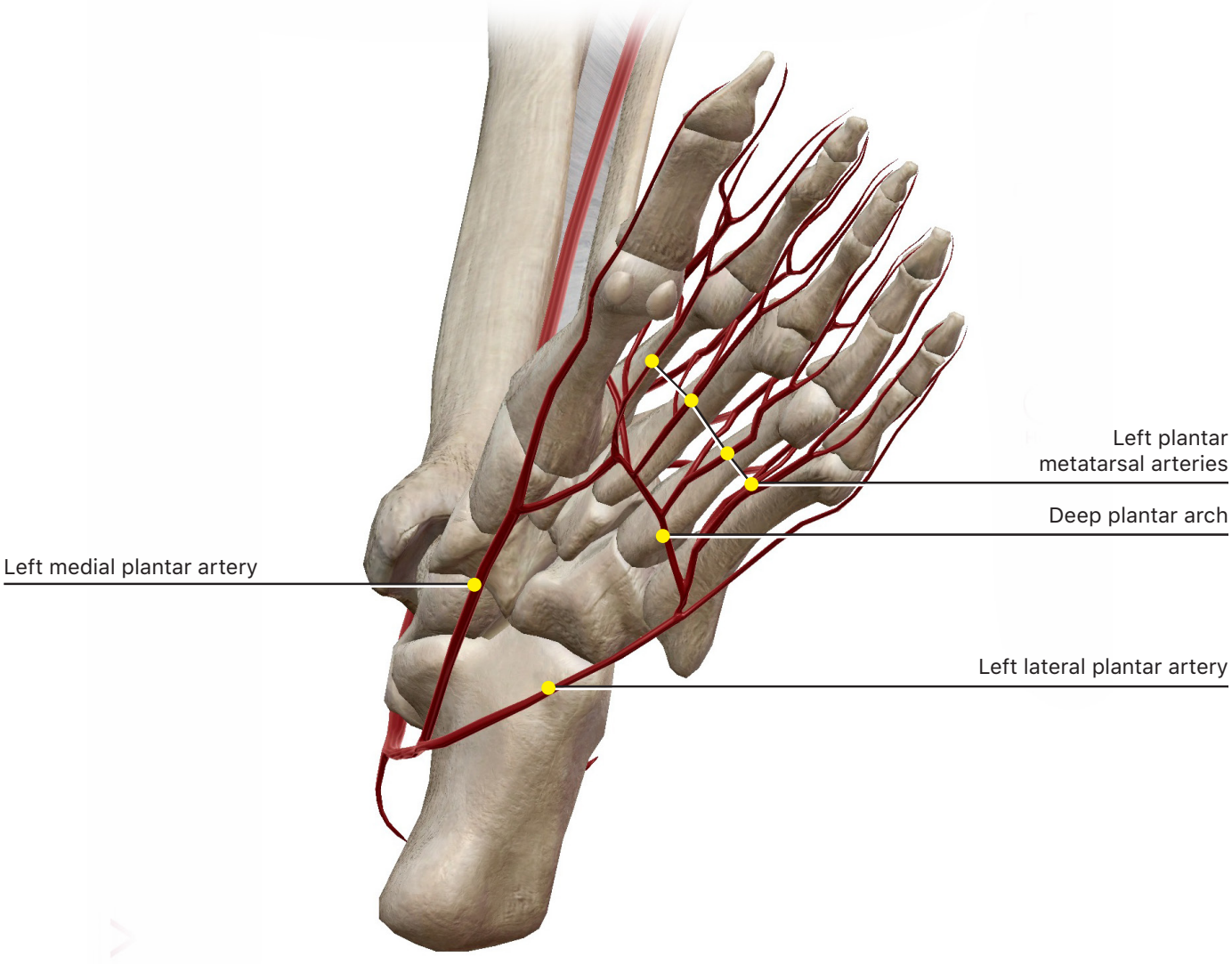

| Artery | Originates from: | Supplies the: |
|---|---|---|
| **Popliteal** | | |
| **Descending genicular** | | |
| **Fibular (peroneal)** | | |
| **Anterior tibial** | | |
| **Posterior tibial** | | |

5. Explore the 3D anatomical view in Module 30.39 Dorsal Arteries (formerly 30.38) and complete the following table.




| Artery | Originates from: | Supplies the: |
|---|---|---|
| **Dorsalis pedis** | | |
| **First dorsal metatarsal** | | |
| **Digital arteries** | | |
| **Arcuate** | | |

6. Explore the 3D anatomical view in Module 30.40 Plantar Arteries (formerly 30.39) and answer the following questions.




a. The **posterior tibial artery branches** into the _____ and the _____ near the calcaneus.

b. Which artery runs medially across the metatarsal bones?

c. The **plantar metatarsal arteries** arise from the _____.

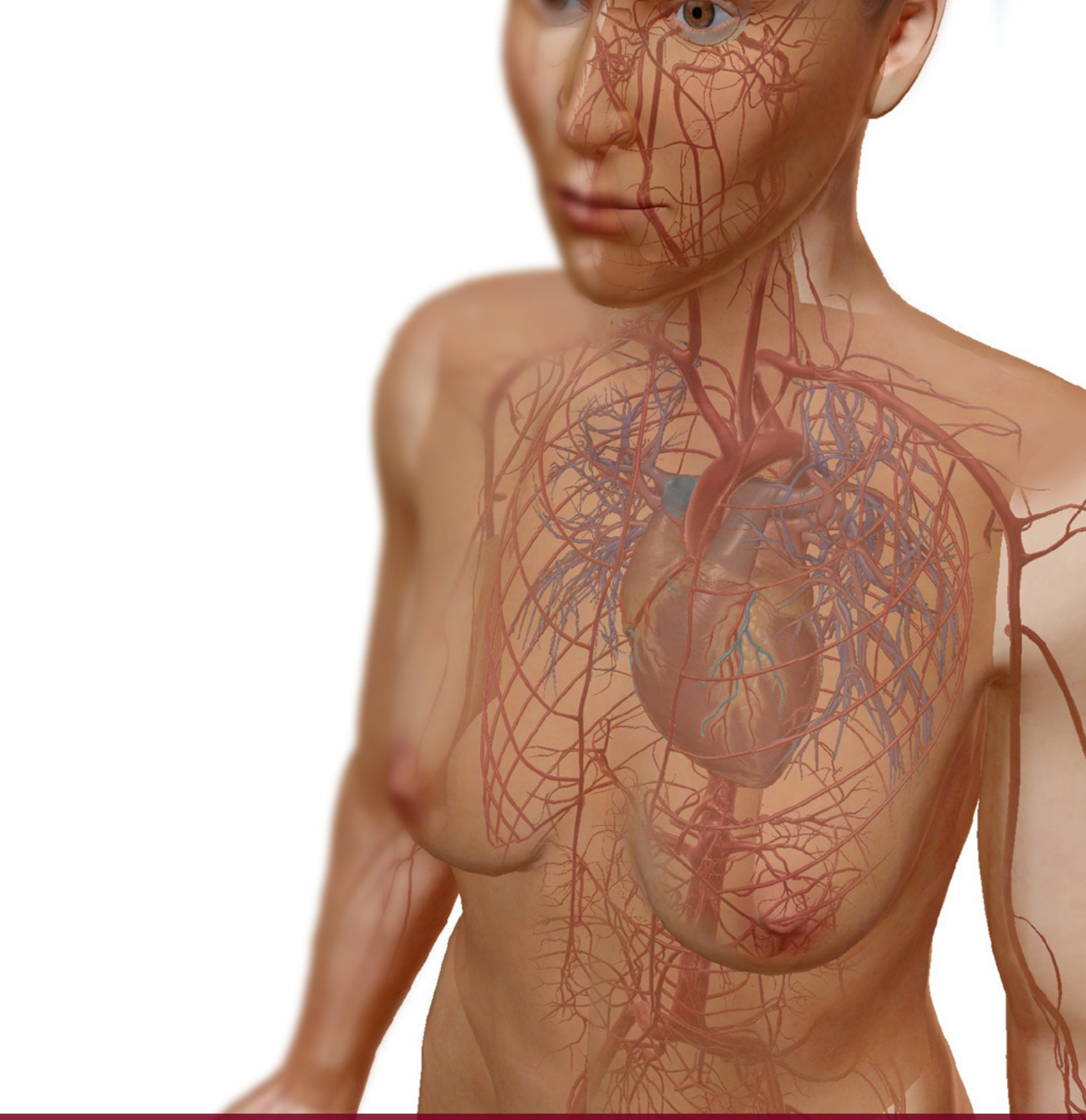
**PUTTING IT ALL TOGETHER**

1. During shock, more peripheral arterioles become dilated than usual. This causes large amounts of blood to enter the periphery. How does this affect overall blood pressure and why does this often cause people to faint?

2. What is a portal system and why is one used to bring blood from the intestines to the liver?

3. What is significant about the circle of Willis?

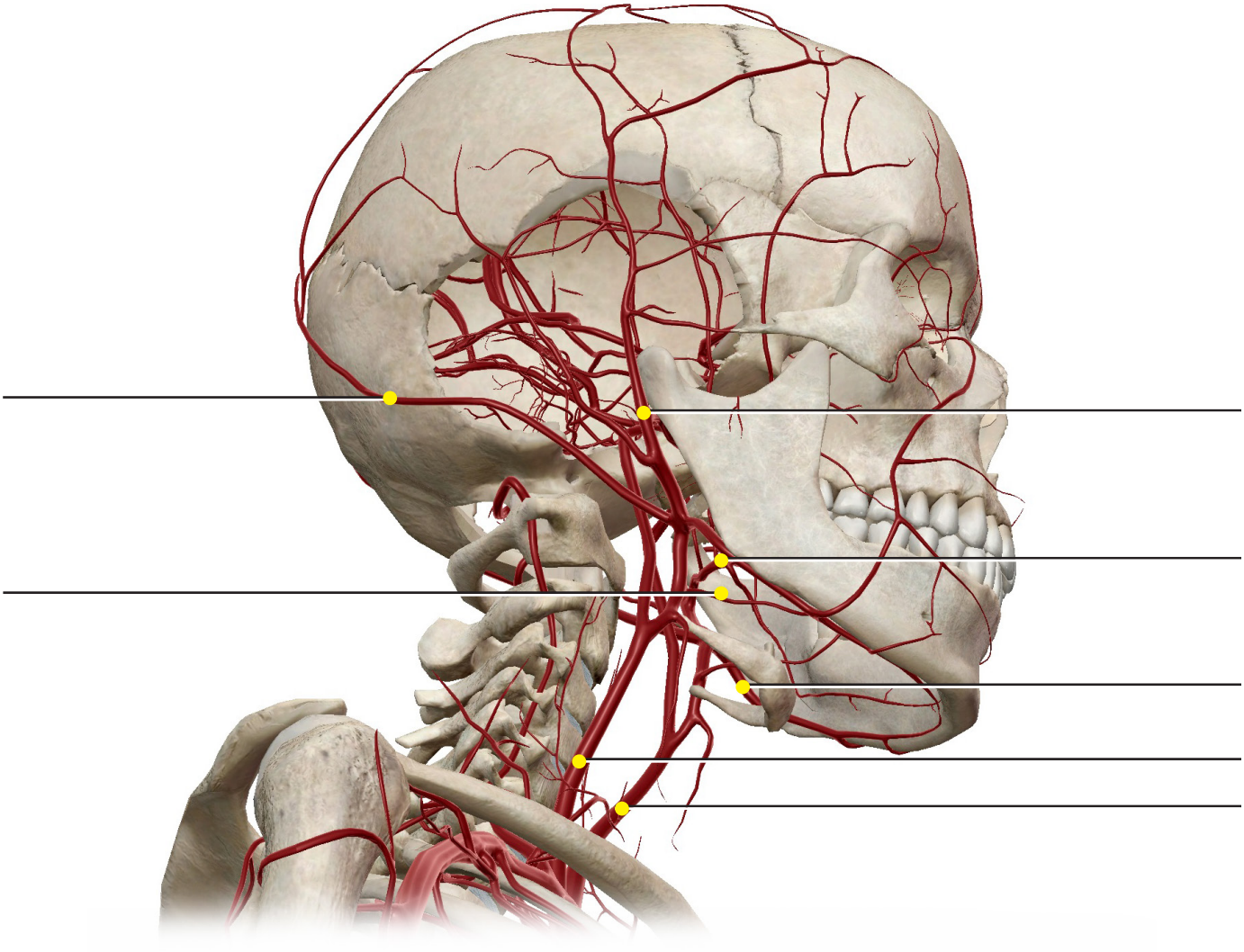
**TIME TO PRACTICE!**
**GO TO THE QUIZZES MENU AND COMPLETE CIRCULATORY SYSTEM QUIZ 30.B**



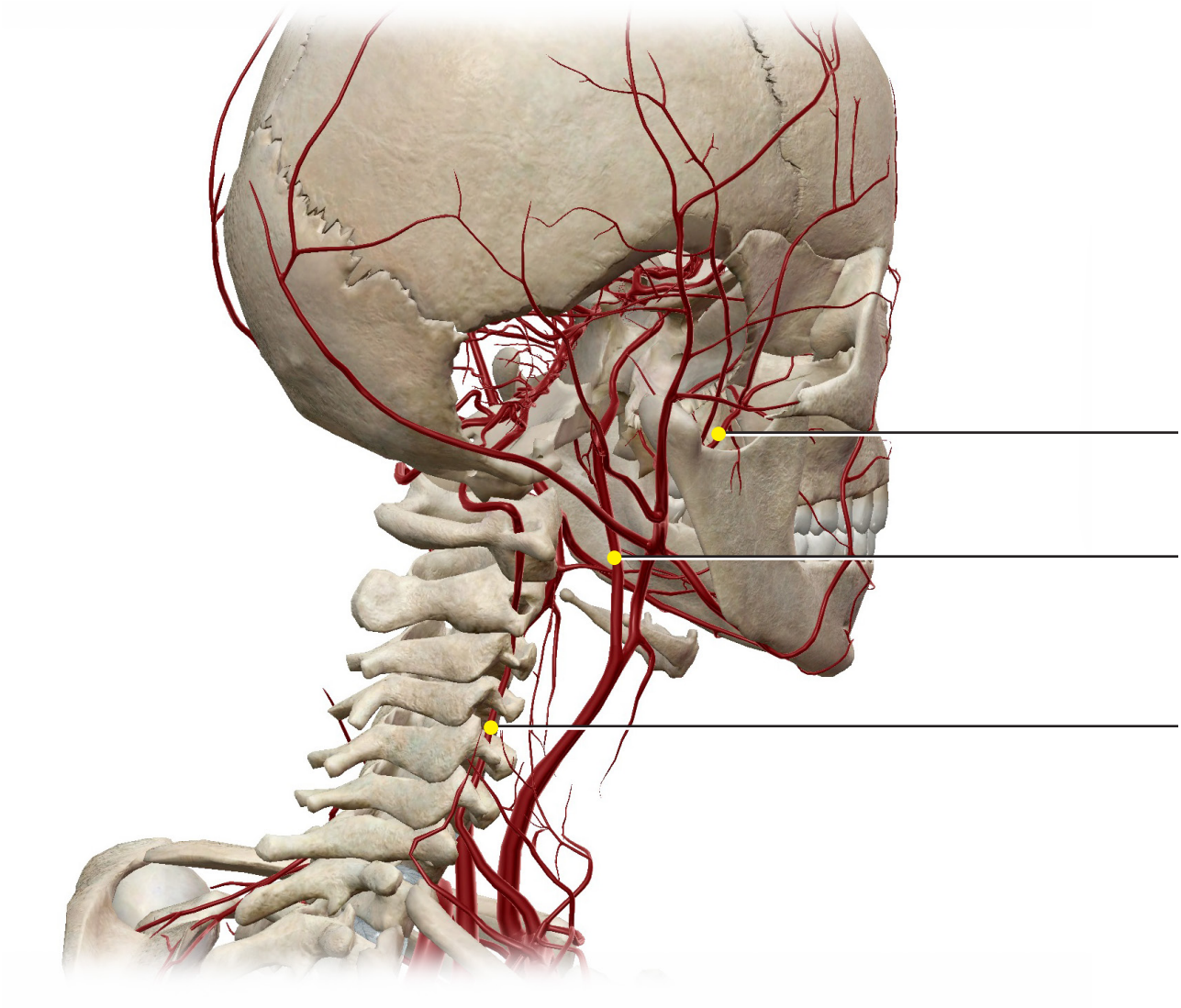
# Student Practice

Label all the structures on the following images.

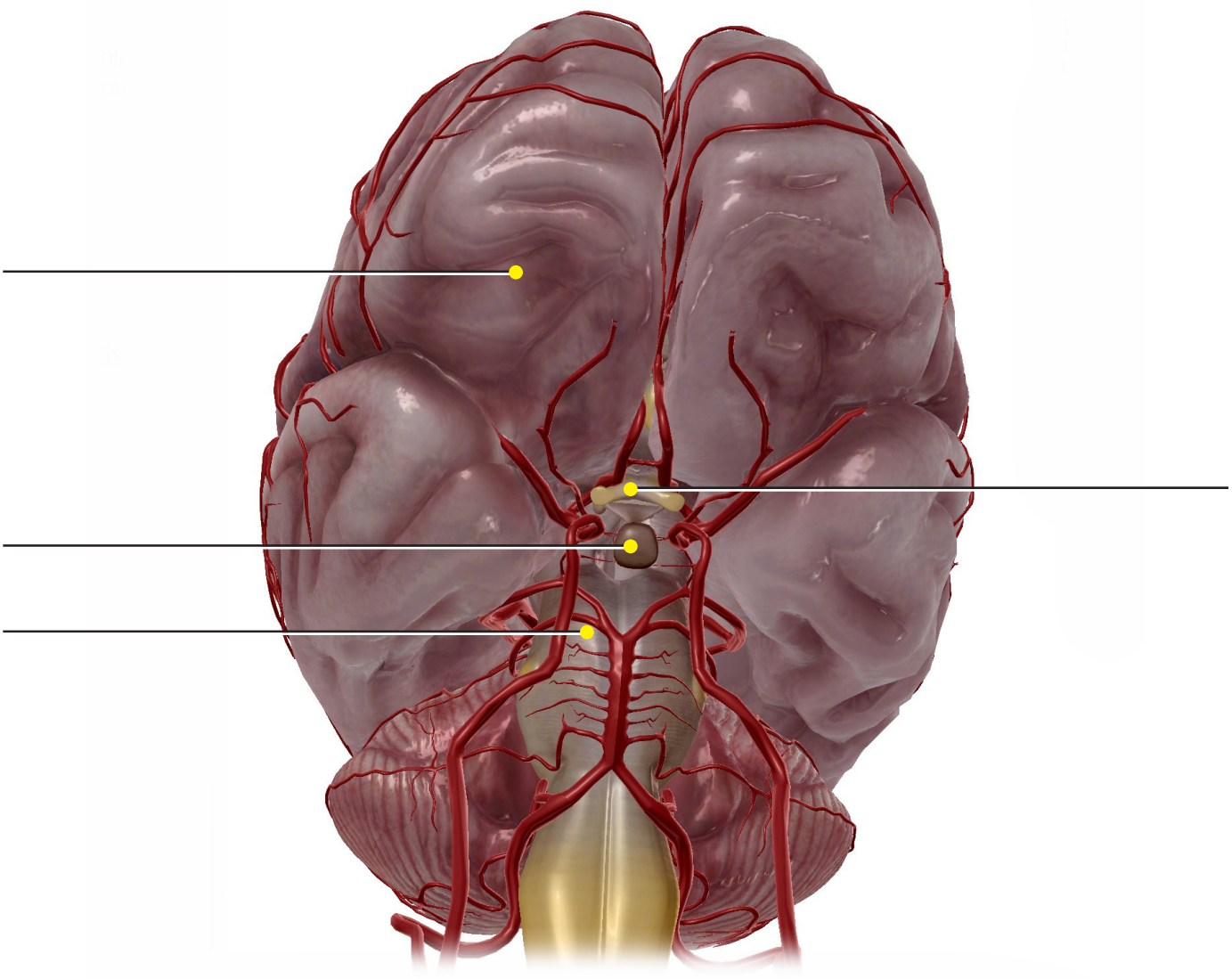
**Module 30.18 Superficial Arteries of the Head and Neck (formerly 30.17)**



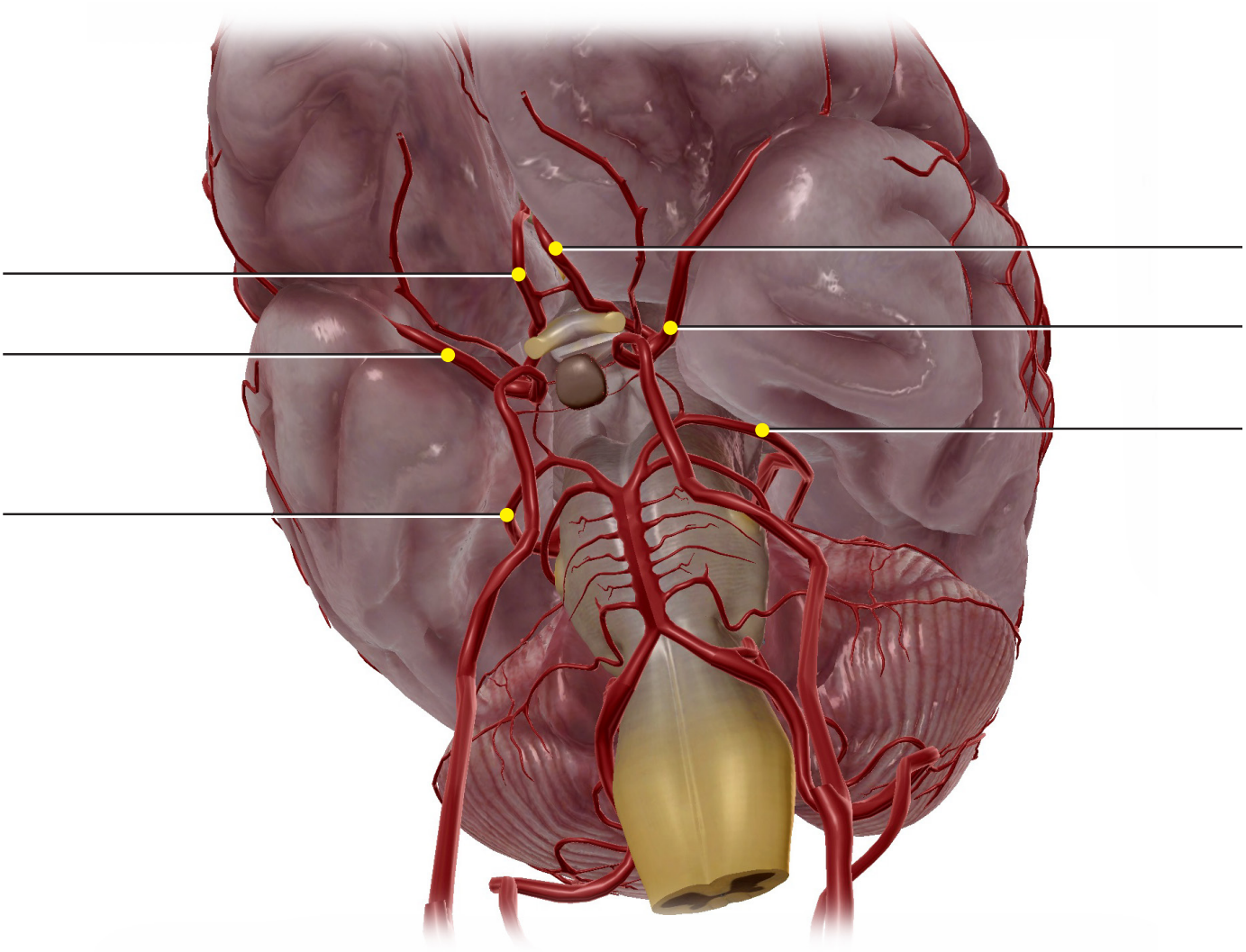
**Module 30.19 Deep Arteries of the Head and Neck (formerly 30.18)**



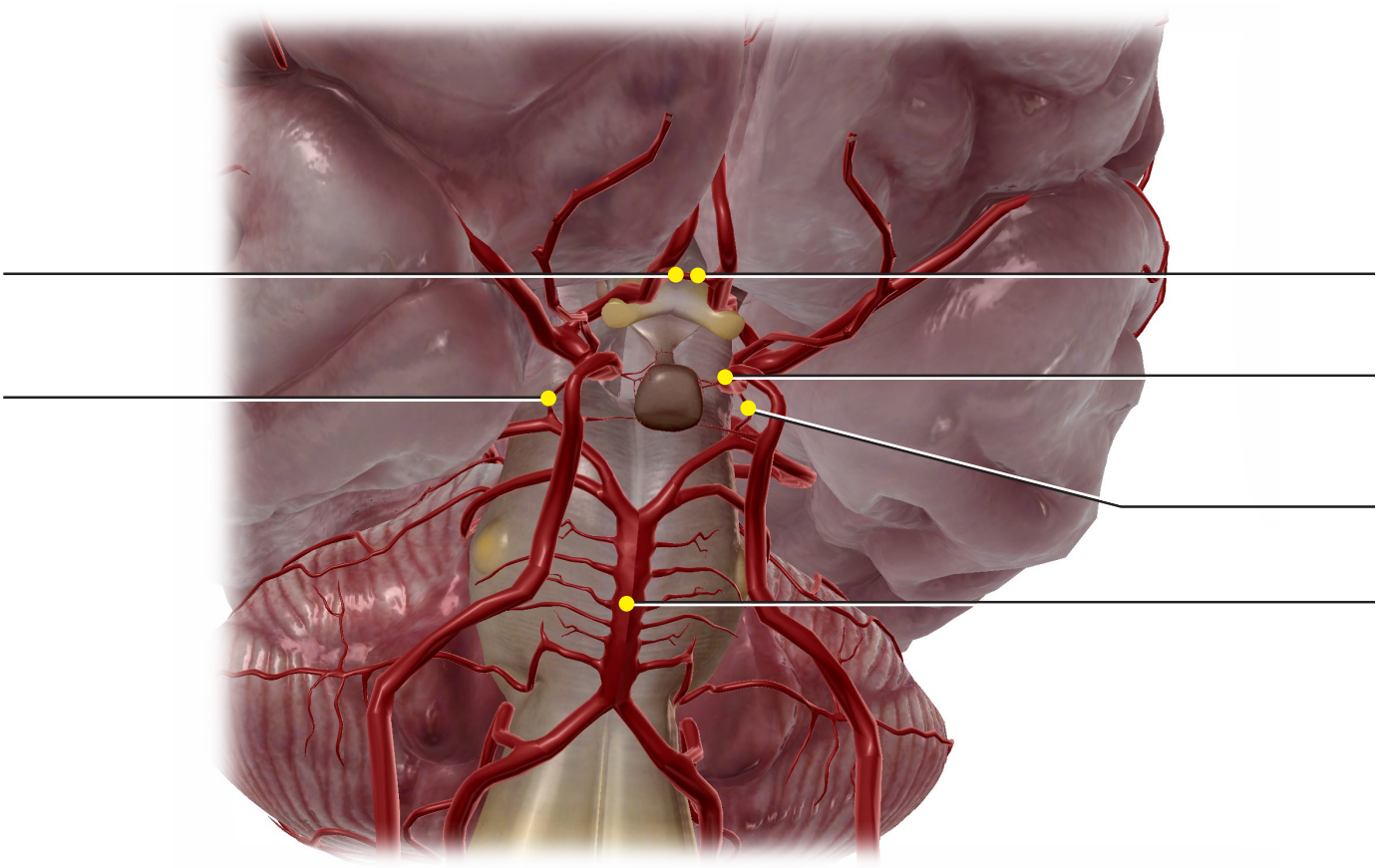
**Module 30.20 Circle of Willis I (formerly 30.19)**



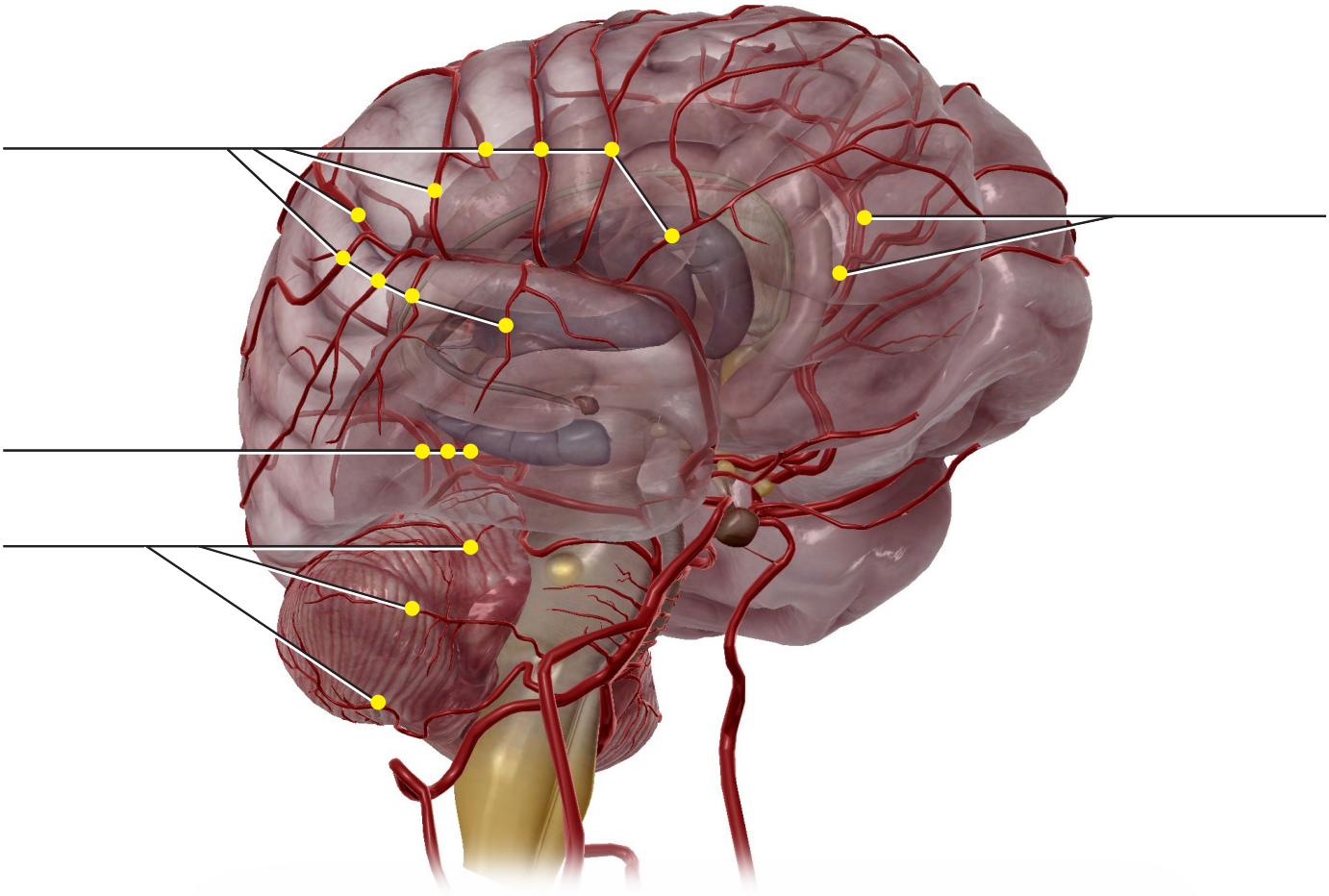
**Module 30.21 Circle of Willis II (formerly 30.20)**



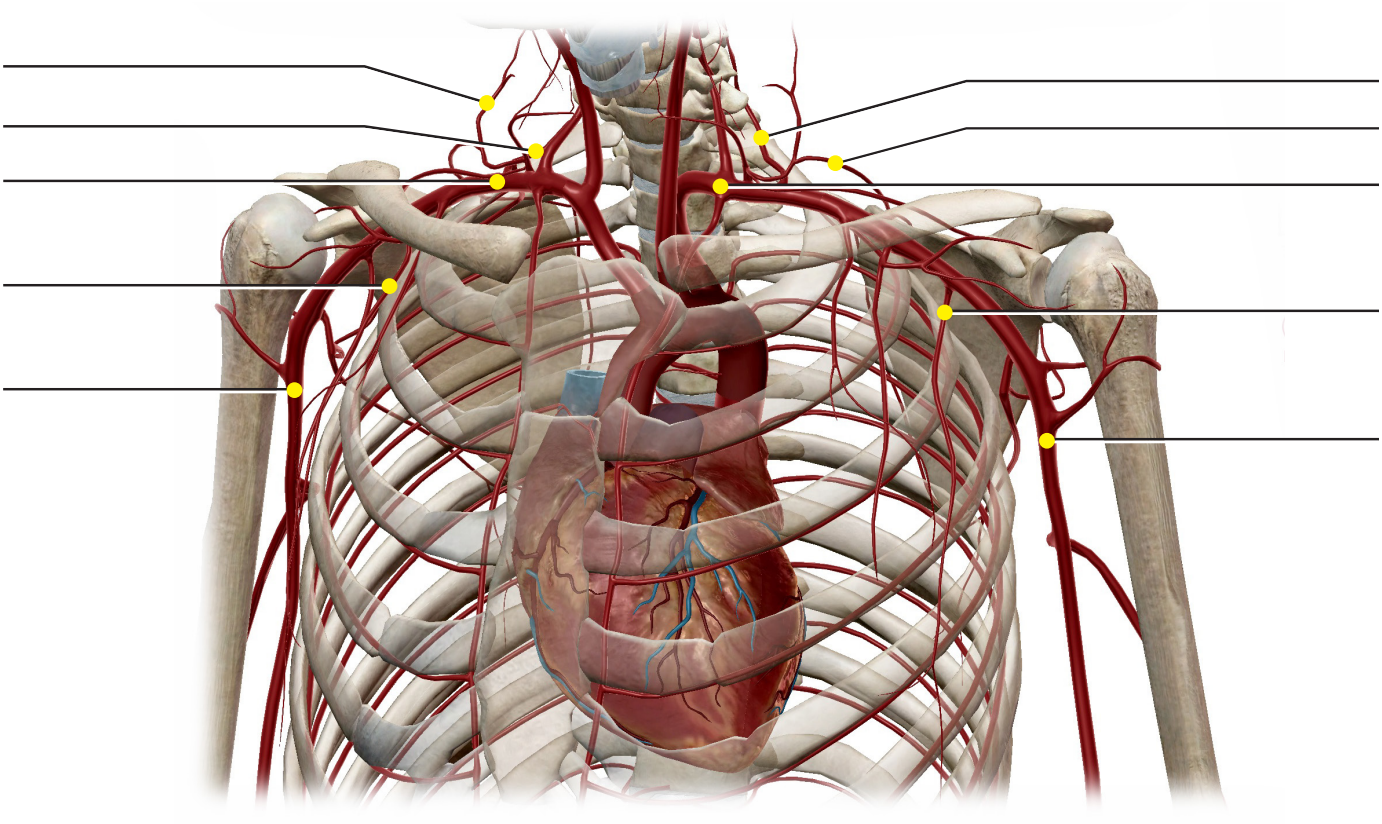
**Module 30.22 Circle of Willis III (formerly 30.21)**



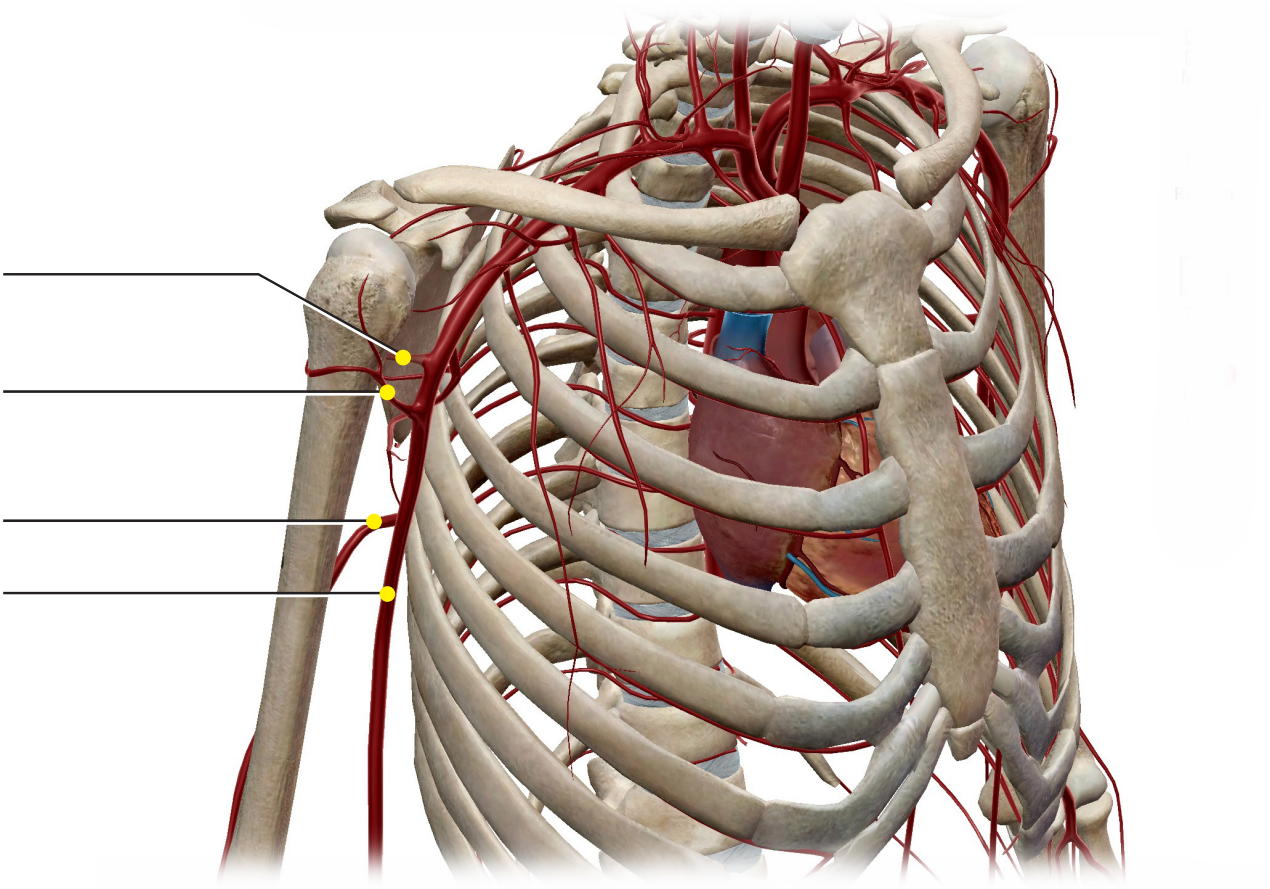
**Module 30.23 Arteries of the Brain (formerly 30.22)**



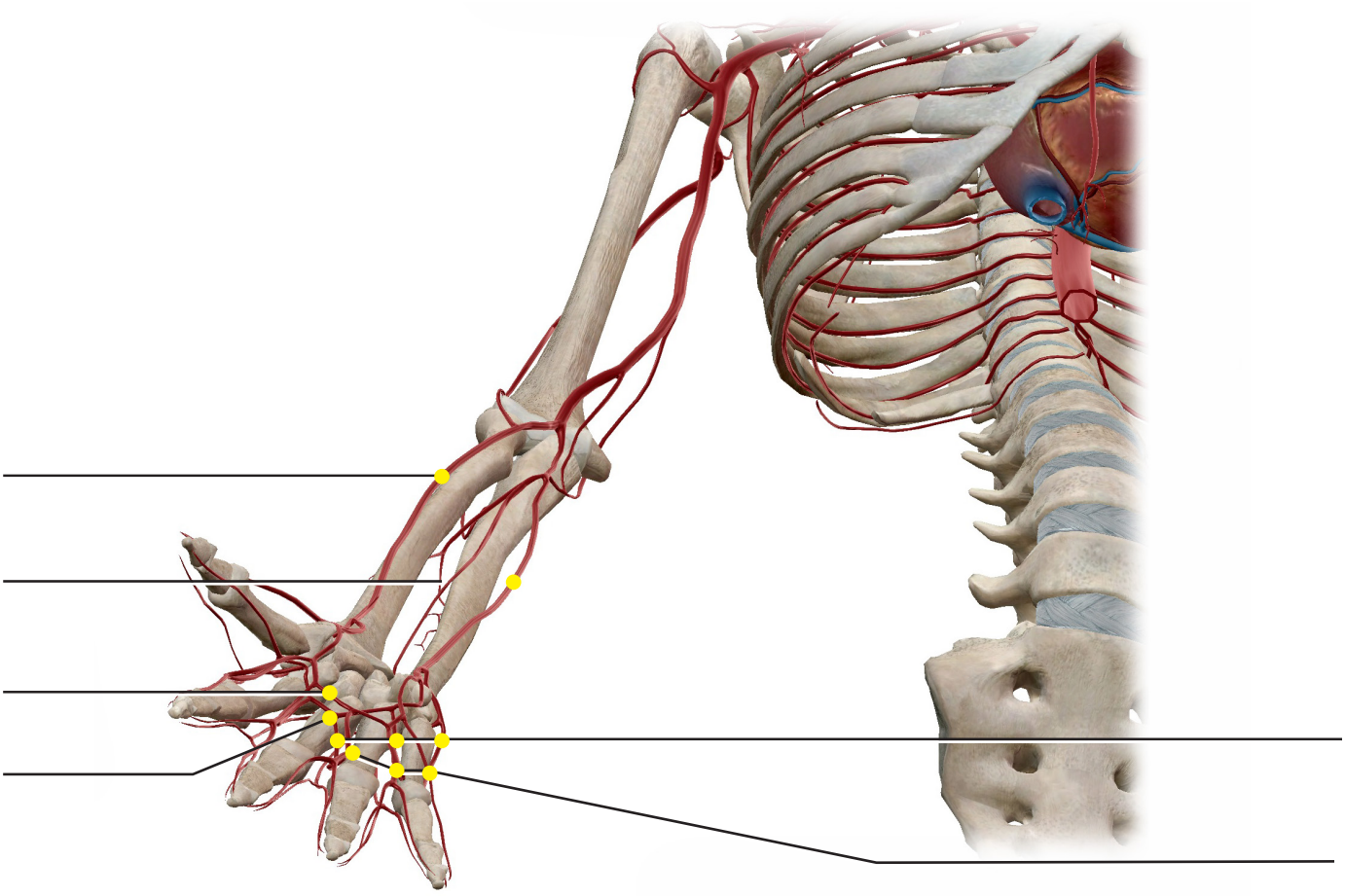
**Module 30.24 Arteries of the Upper Limb I (formerly 30.23)**



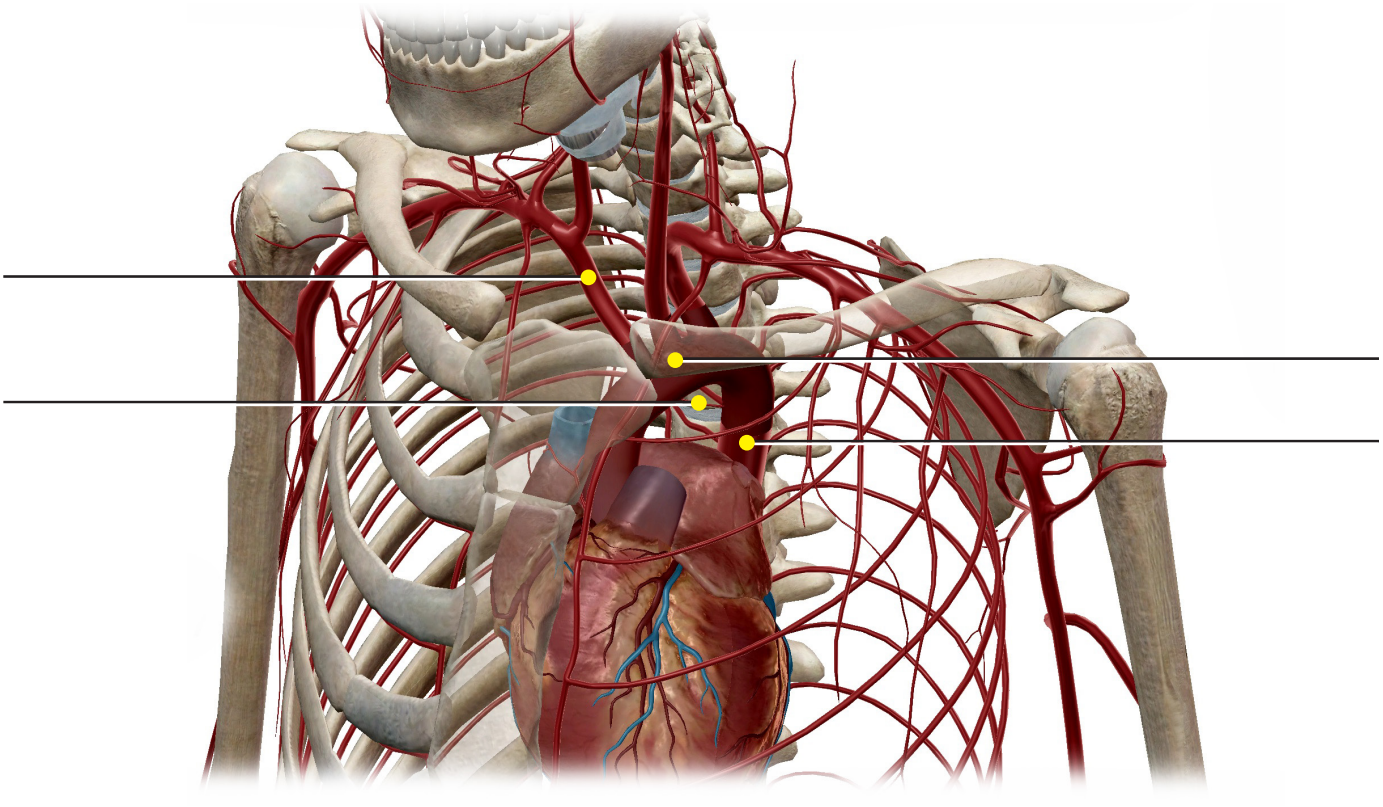
**Module 30.25 Arteries of the Upper Limb II (formerly 30.24)**



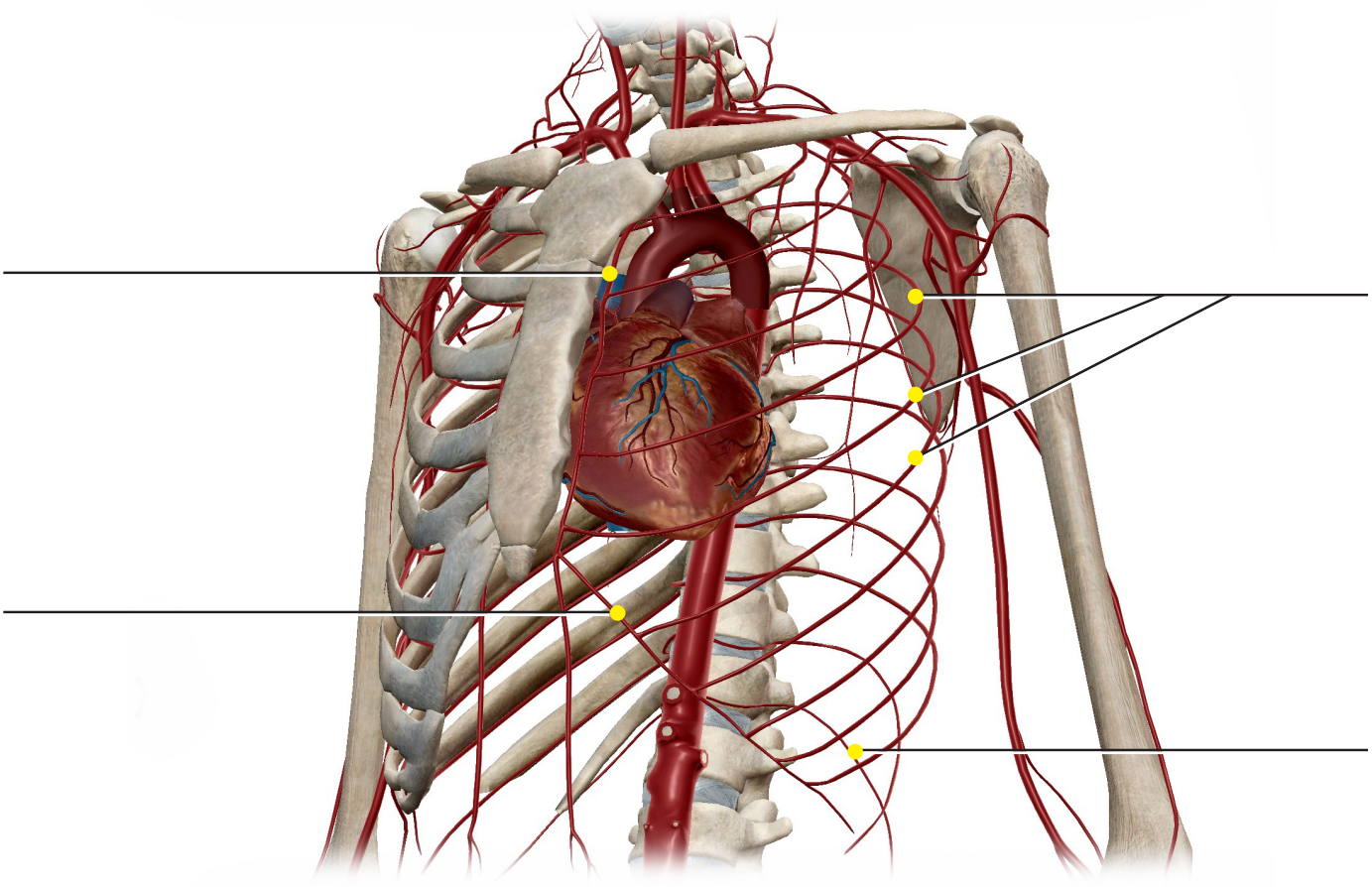
**Module 30.26 Arteries of the Forearm and Hand (formerly 30.25)**



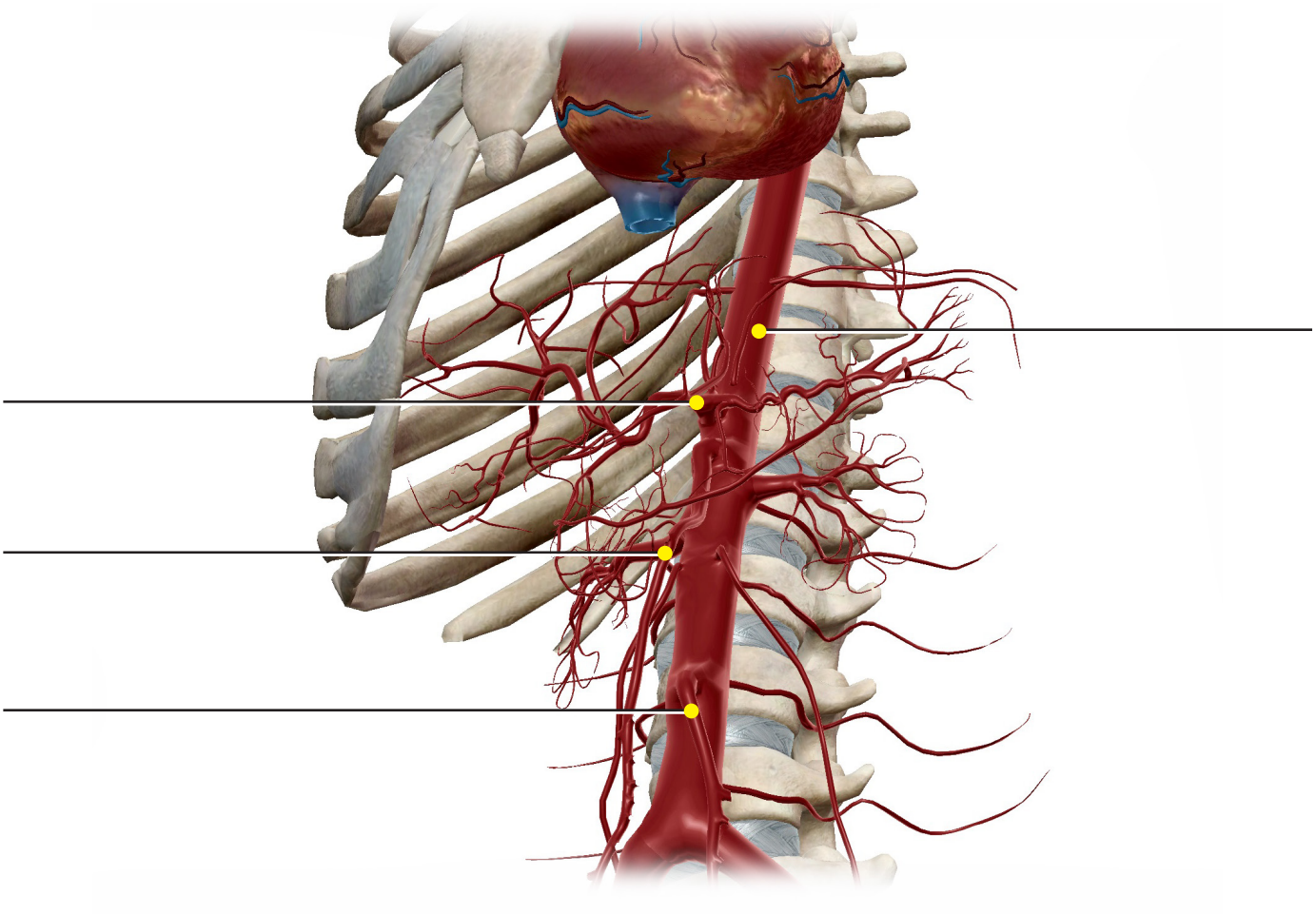
**Module 30.27 Arteries of the Thorax I (formerly 30.26)**



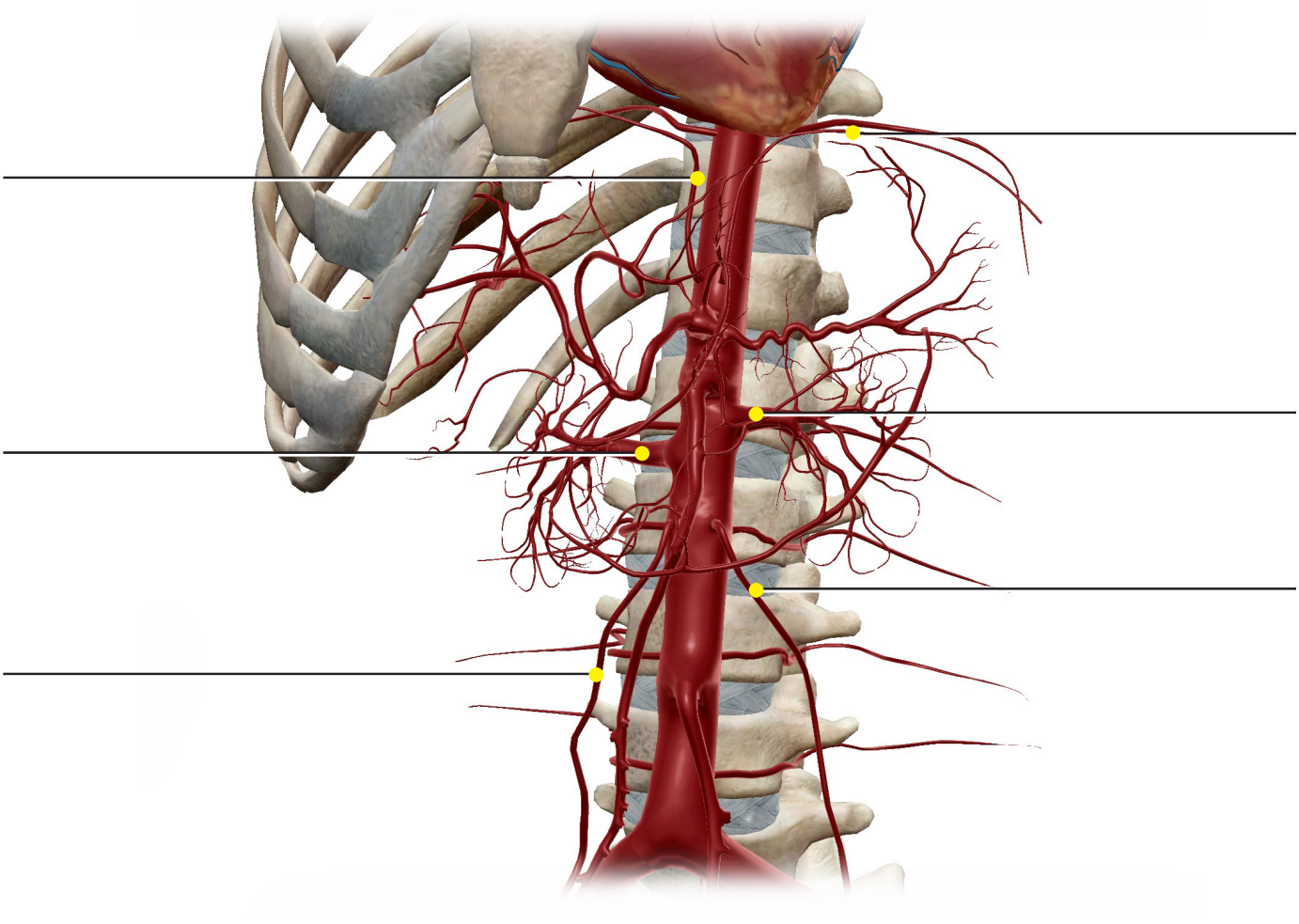
**Module 30.28 Arteries of the Thorax II (formerly 30.27)**



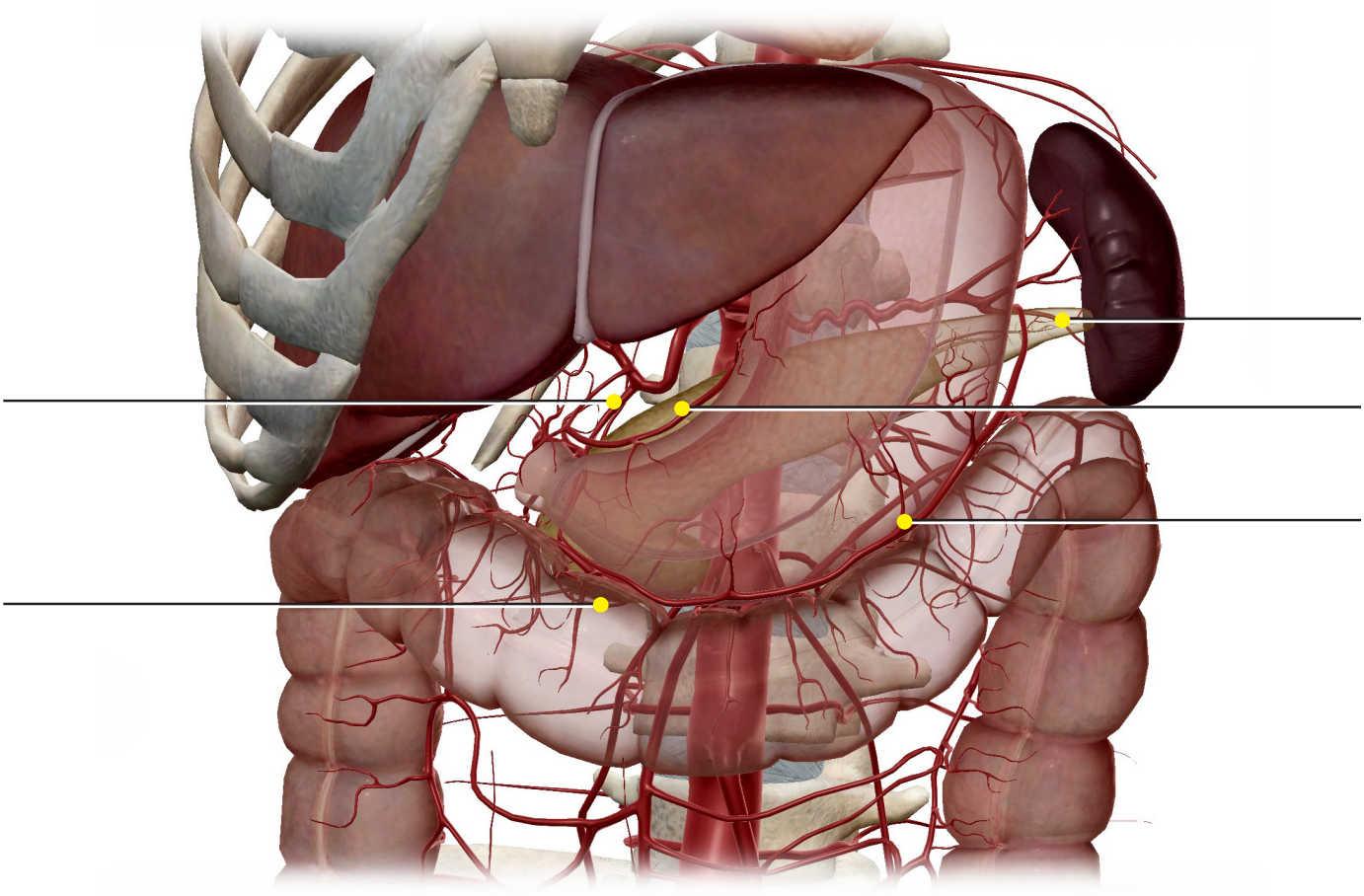
**Module 30.29 Branches of the Abdominal Aorta I (formerly 30.28)**



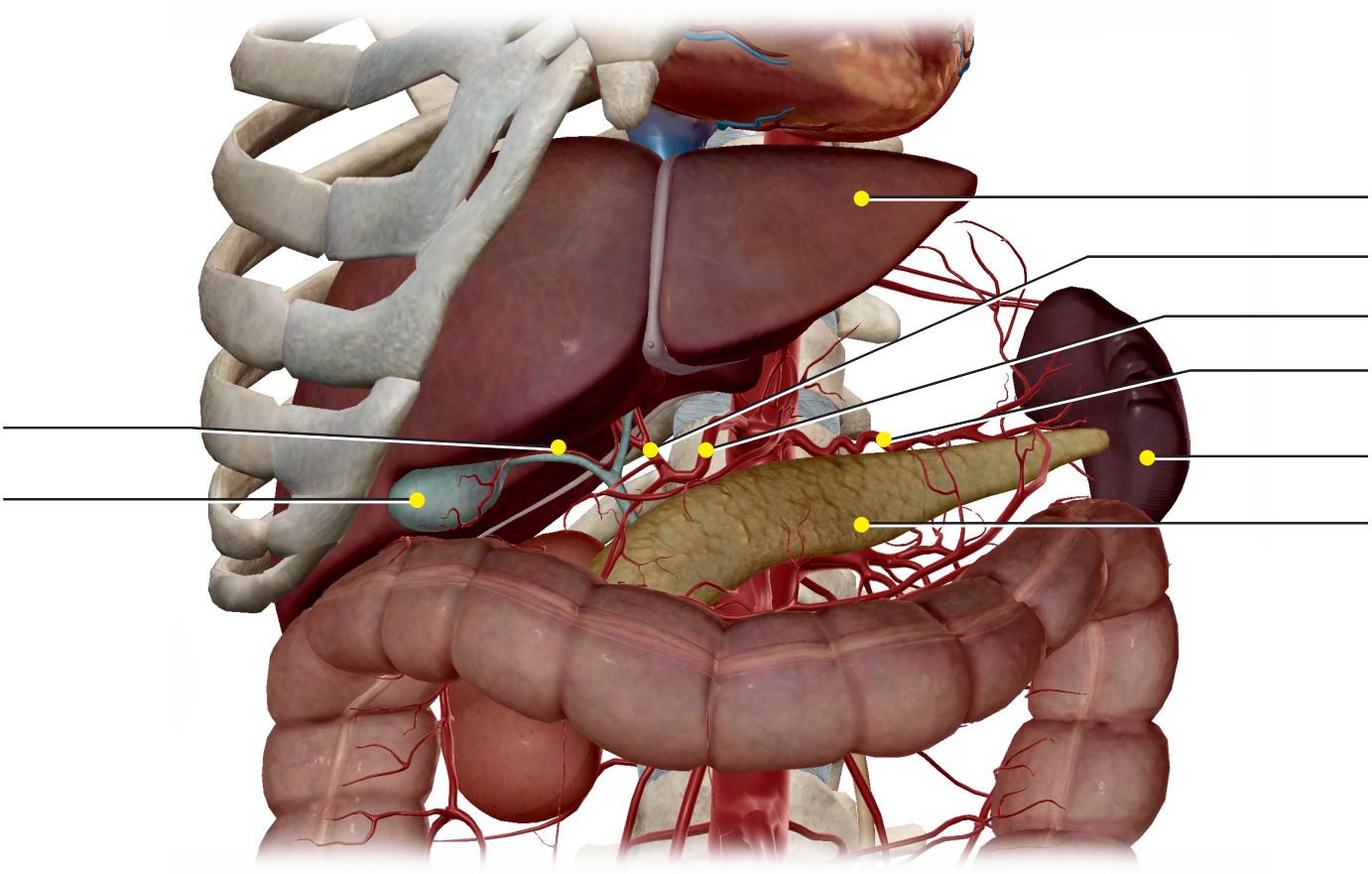
**Module 30.30 Branches of the Abdominal Aorta II (formerly 30.29)**



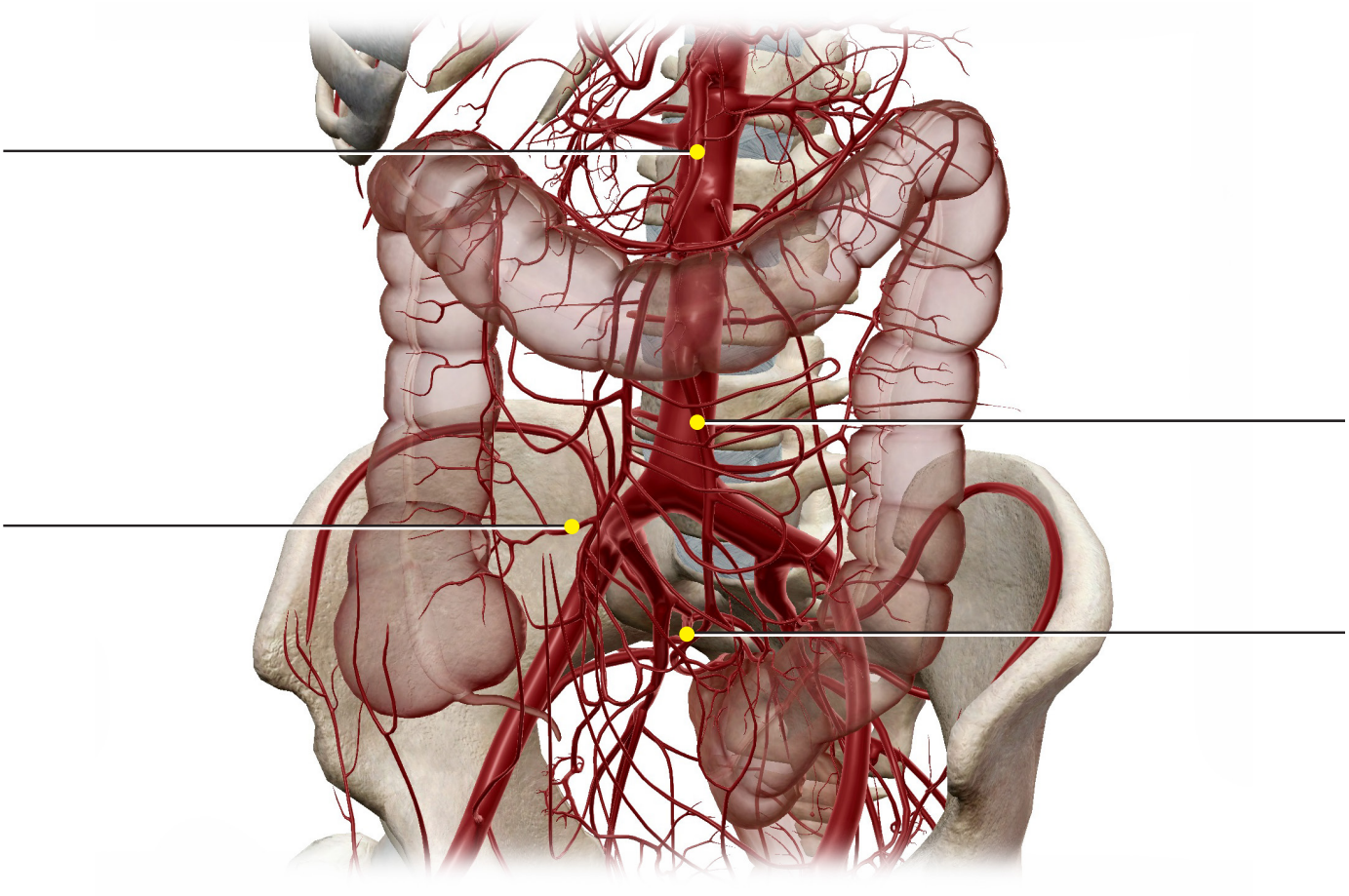
**Module 30.31 Arteries of the Abdomen (formerly 30.30)**



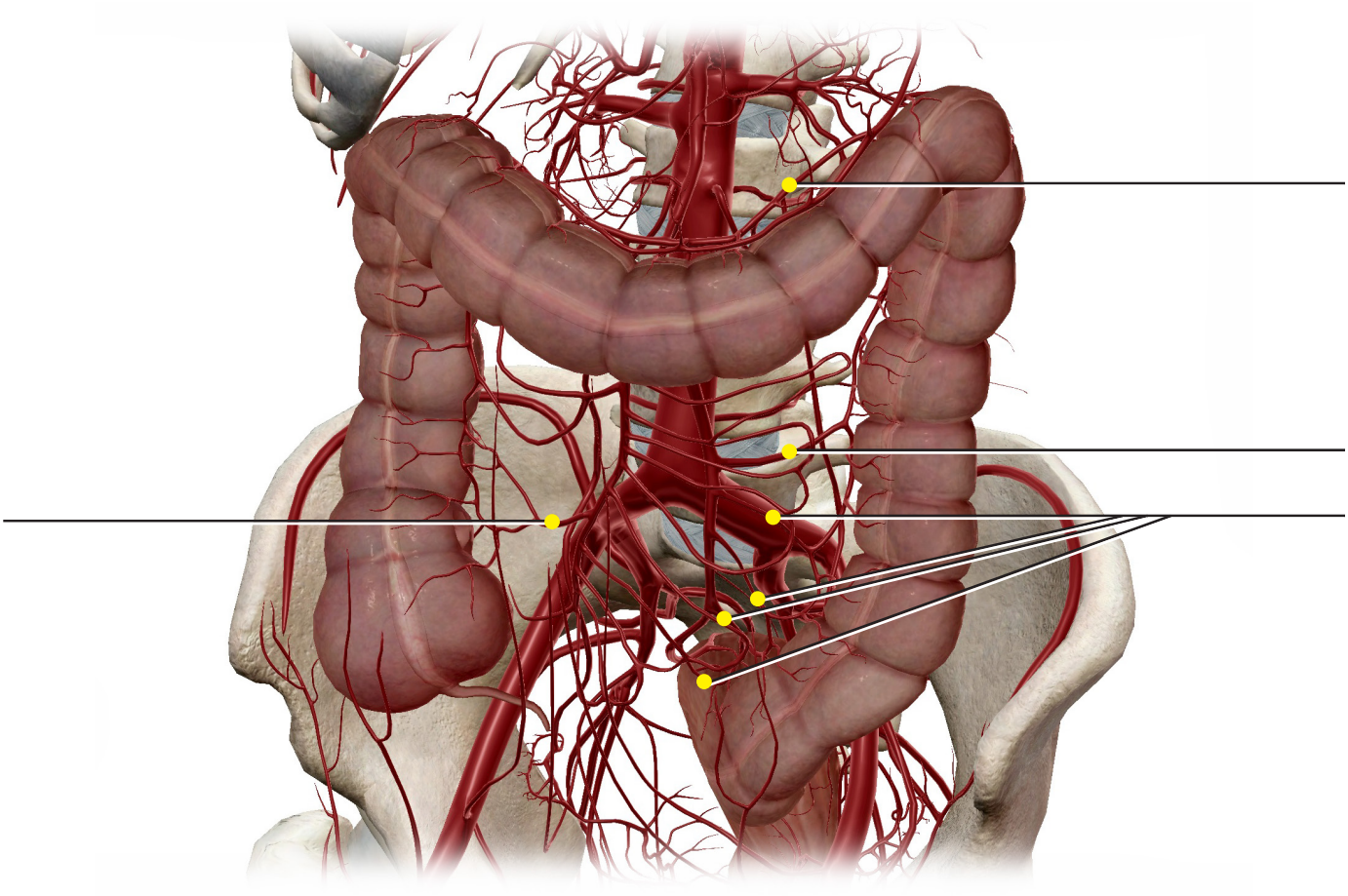
**Module 30.32 Arteries of the Abdomen II (formerly 30.31)**



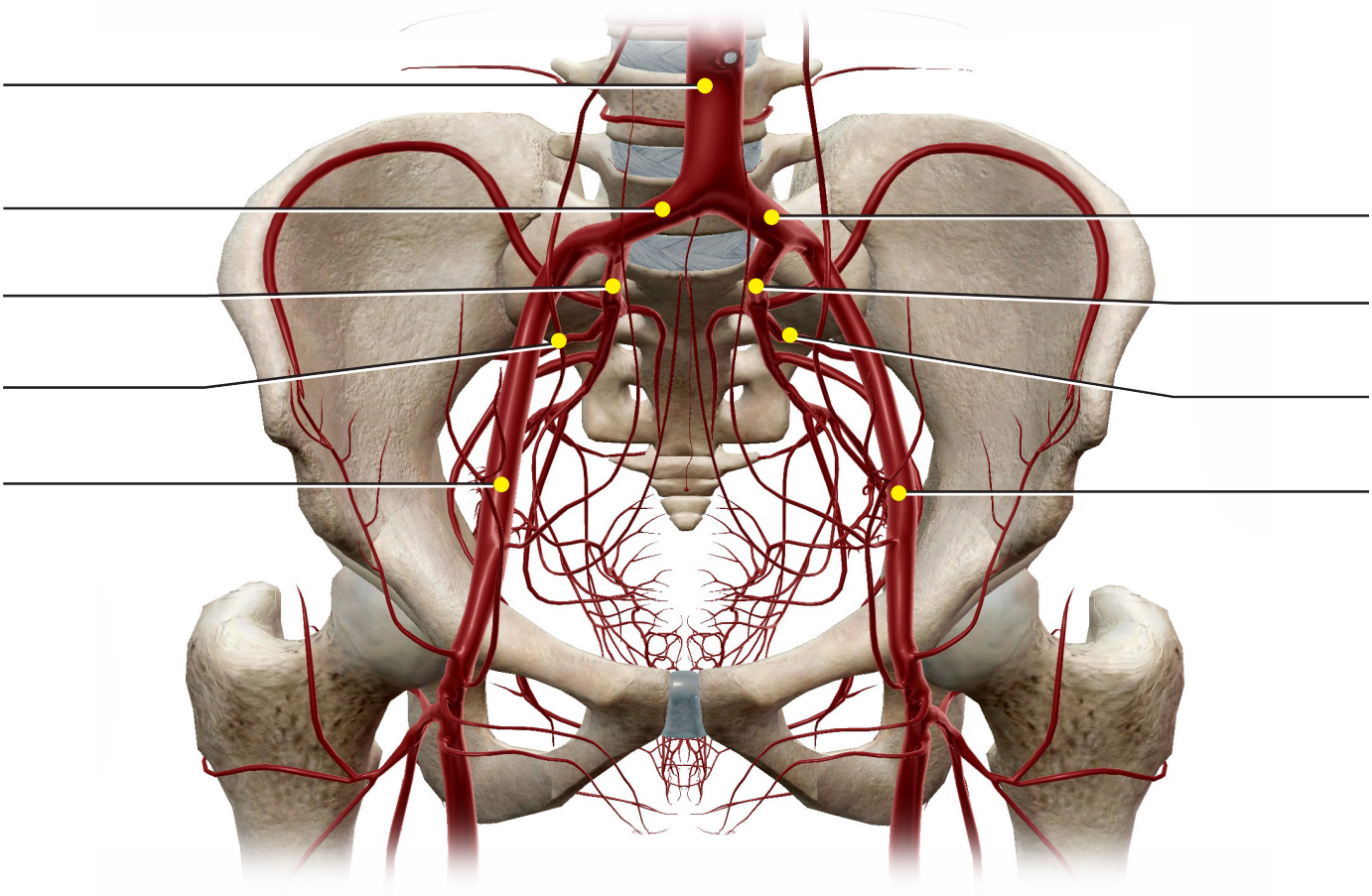
**Module 30.33 Arteries of the Intestines I (formerly 30.32)**



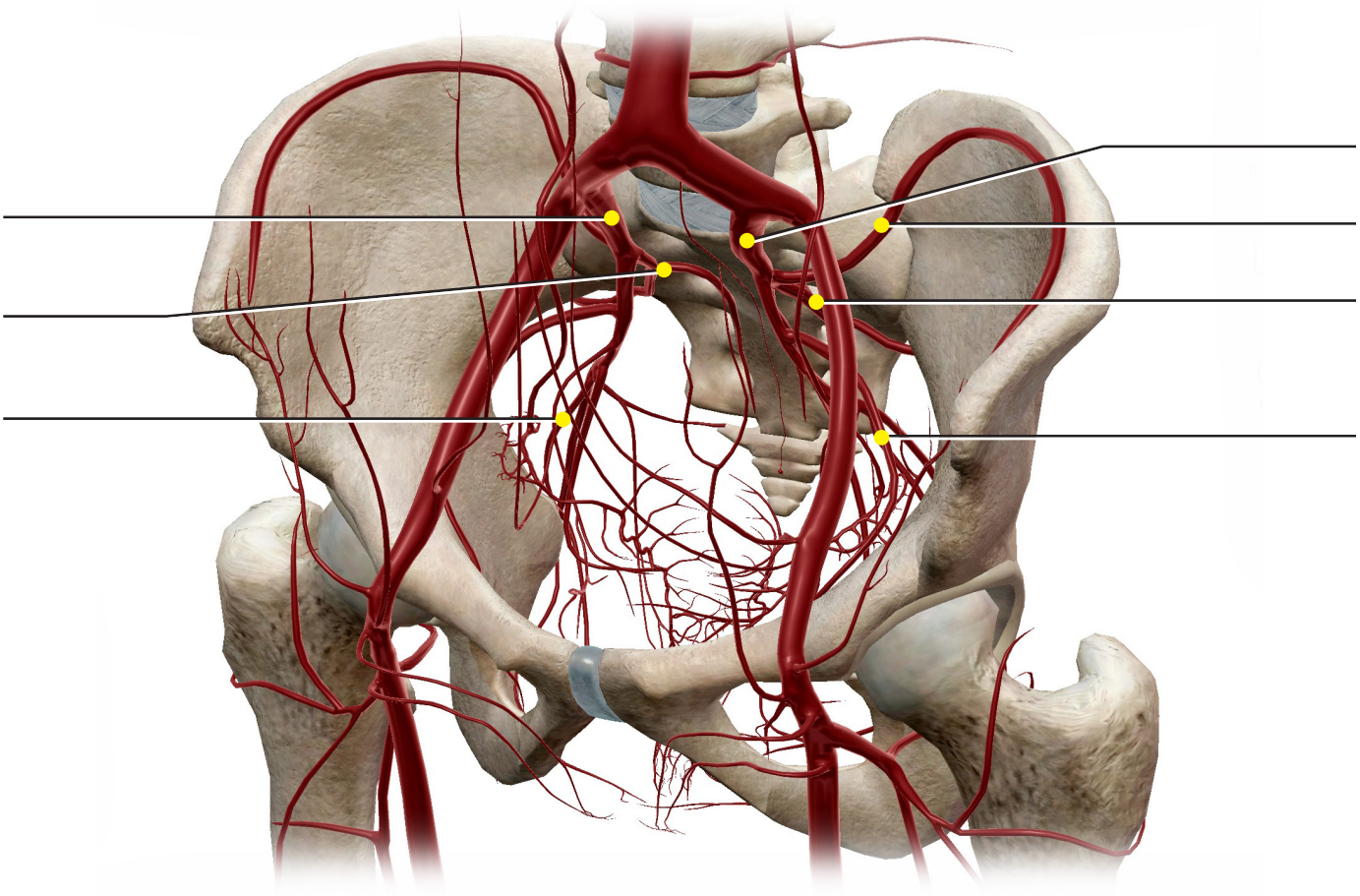
**Module 30.34 Arteries of the Intestines II (formerly 30.33)**



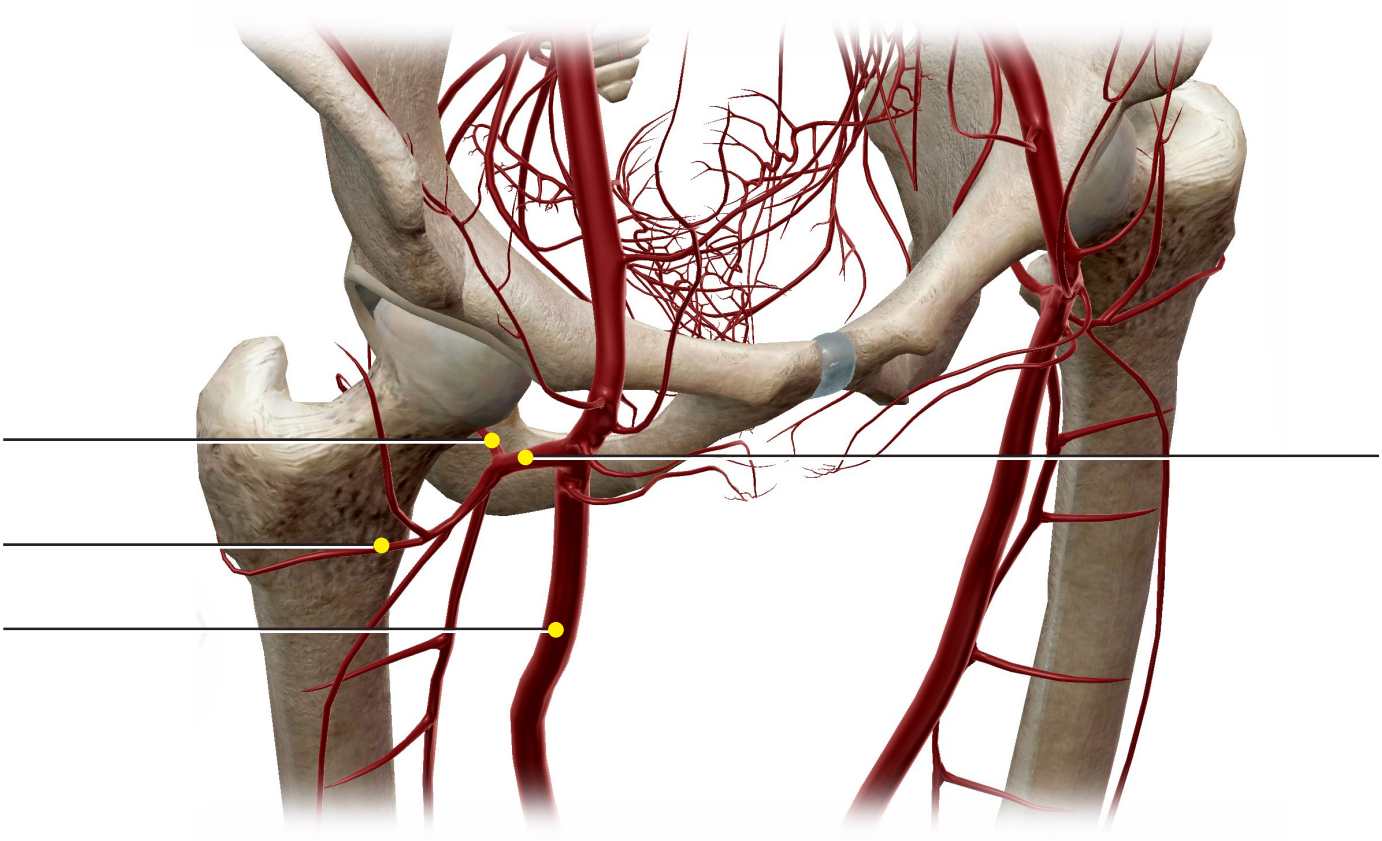
**Module 30.35 Arteries of the Pelvis I (formerly 30.34)**



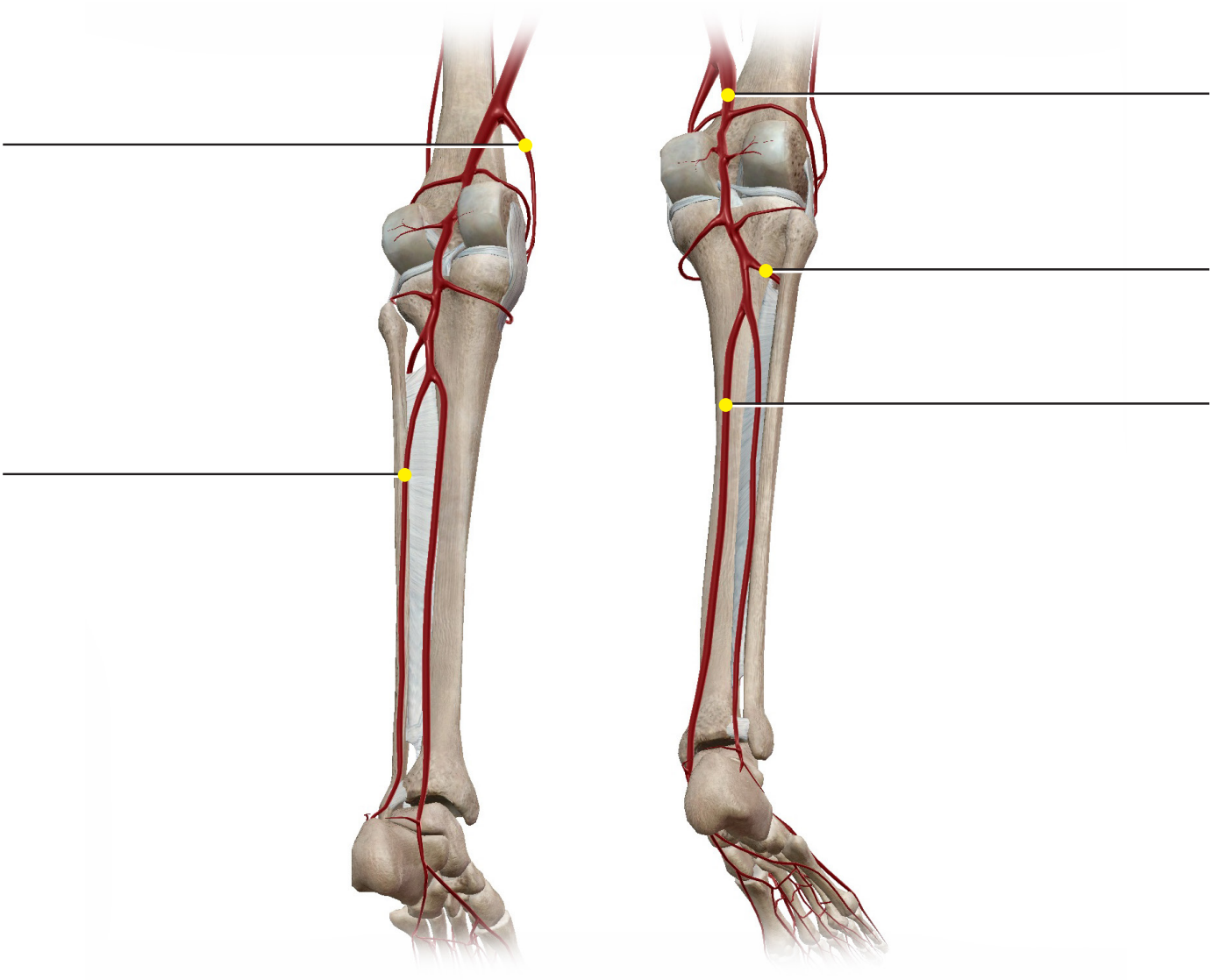
**Module 30.36 Arteries of the Pelvis II (formerly 30.35)**



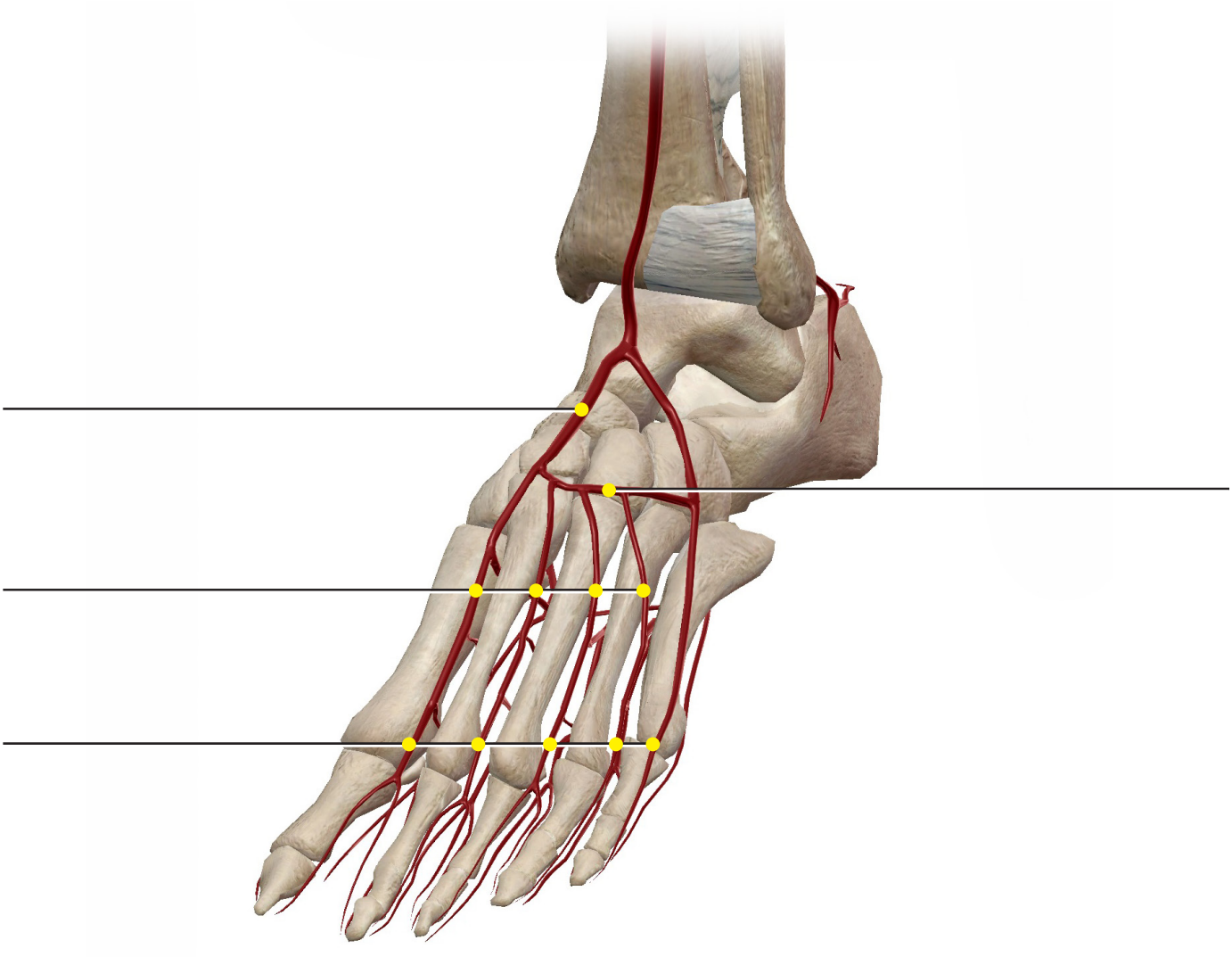
**Module 30.37 Arteries of the Upper Leg (formerly 30.36)**



**Module 30.38 Arteries of the Lower Leg (formerly 30.37)**



**Module 30.39 Dorsal Arteries of the Foot (formerly 30.38)**



**Module 30.40 Plantar Arteries of the Foot (formerly 30.39)**