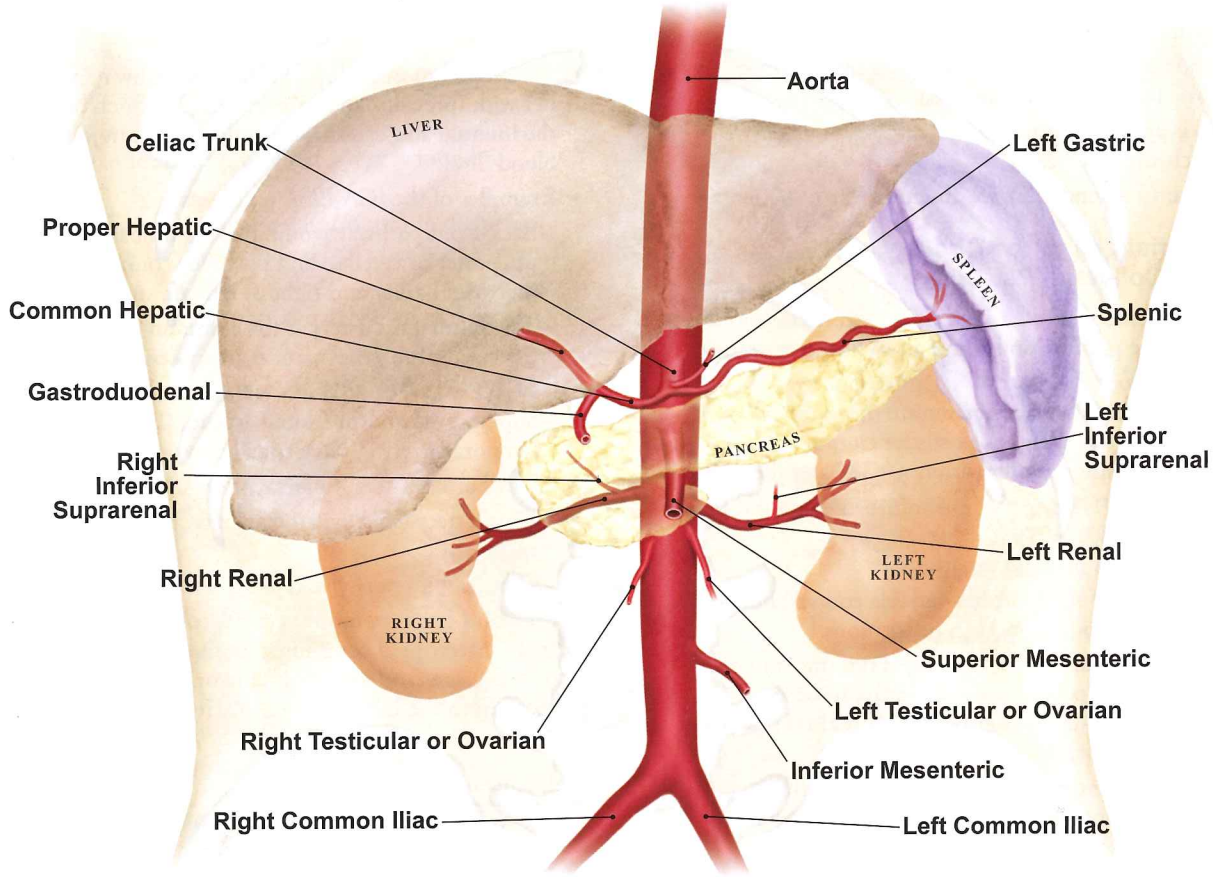
Anatomy

Abdominal Vasculature

Abdominal Arterial System



Abdominal Arterial Anatomy

- The abdominal aorta begins as the descending aorta and crosses the diaphragm.
- The abdominal aorta bifurcates into the right and left common iliac arteries at the level of the umbilicus.
- The abdominal aorta has five main branches:
  - **Celiac artery**: (also known as the celiac trunk or celiac axis) supplies the liver, gallbladder, stomach, intestines and pancreas.
    - There are three branches of the celiac artery:
      - Splenic artery
      - Common hepatic artery
      - Left gastric artery

In some cases, the SMA and celiac trunk have a common origin off the abdominal aorta.

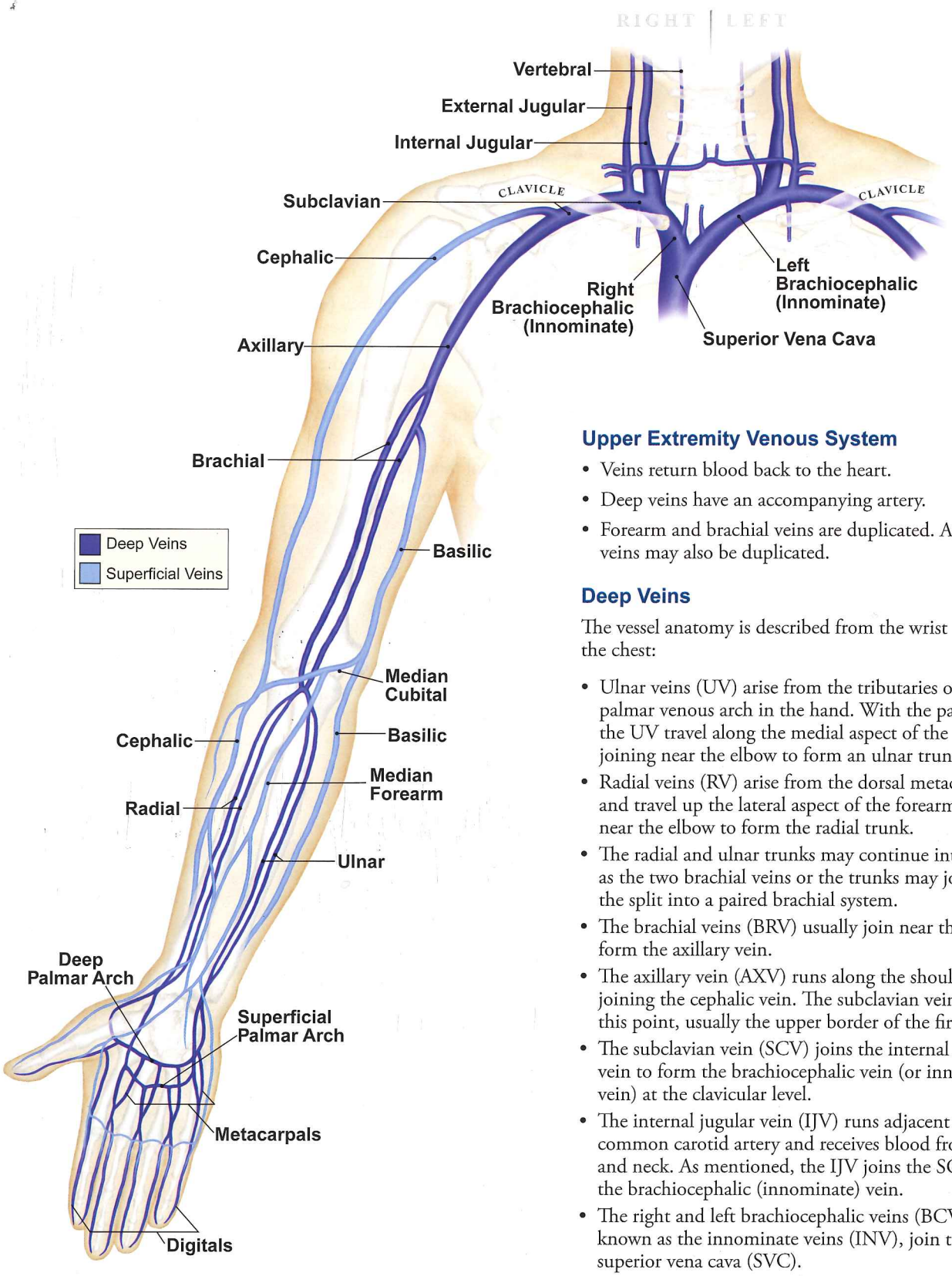
  - **Superior mesenteric artery** (SMA): originates approximately 1 cm inferior to the celiac trunk. The SMA supplies the intestines and pancreas.
  - **Renal arteries** (right and left): supplies the kidneys and adrenal glands.
  - **Inferior mesenteric artery** (IMA): supplies the colon and rectum.
- For the purposes of the ultrasound examination, the abdominal aorta is divided into three regions:
  - Proximal aorta: diaphragm to the origin of the superior mesenteric artery
  - Mid aorta: superior mesenteric artery to the renal arteries
  - Distal aorta: renal arteries to the aortic bifurcation

Some labs use alternative terms, dividing the aorta into the suprarenal, juxtarenal and infrarenal aorta.

- The average diameter of the abdominal aorta is 2.0 cm (range: 1.1-3.0 cm).
- The aorta normally decreases (tapers) in diameter from the diaphragm to the aortic bifurcation.

Anatomy

Upper Extremity Venous



Upper Extremity Venous System

- Veins return blood back to the heart.
- Deep veins have an accompanying artery.
- Forearm and brachial veins are duplicated. Axillary veins may also be duplicated.

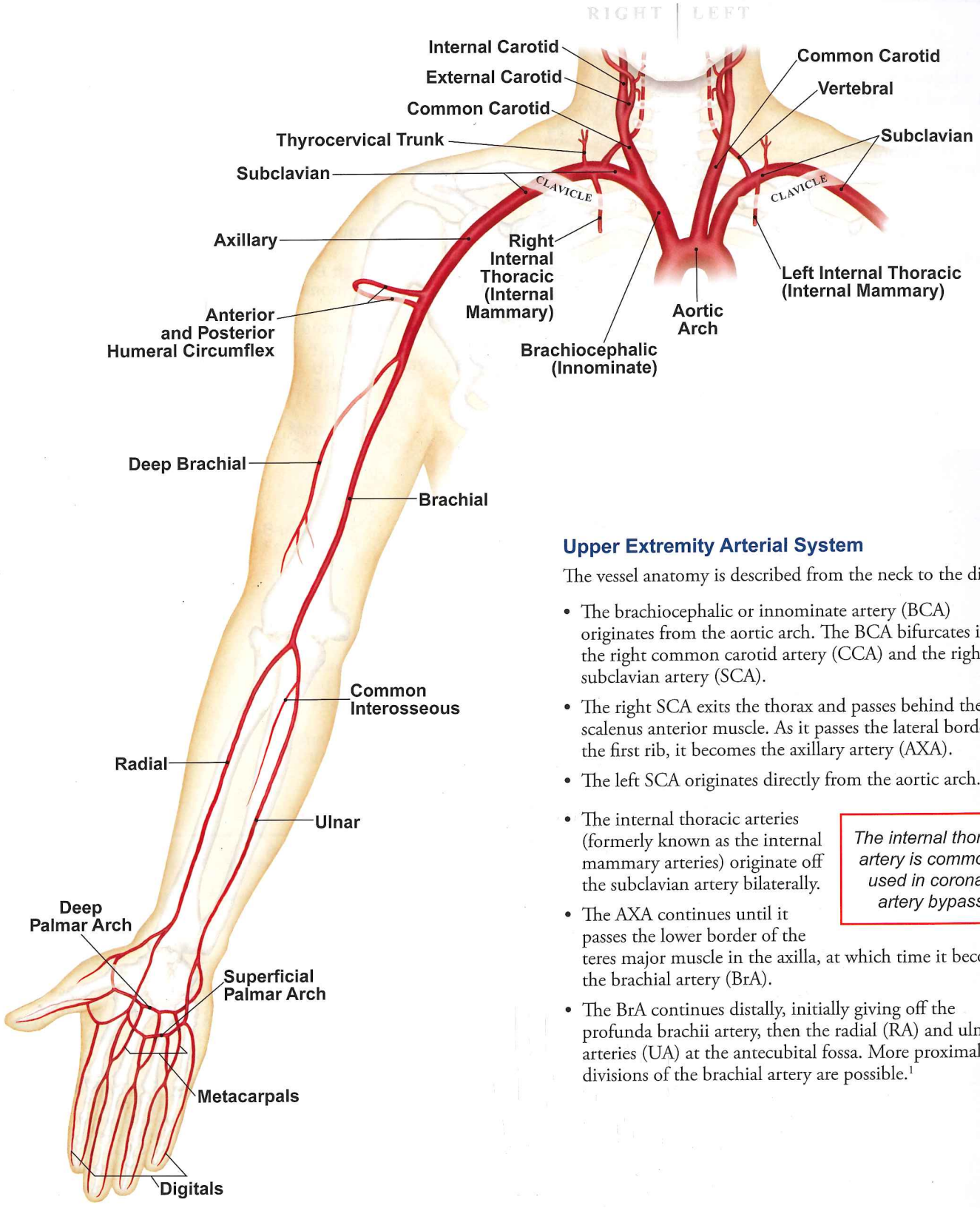
Deep Veins

The vessel anatomy is described from the wrist to the chest:

- Ulnar veins (UV) arise from the tributaries of the palmar venous arch in the hand. With the palm up, the UV travel along the medial aspect of the forearm, joining near the elbow to form an ulnar trunk.
- Radial veins (RV) arise from the dorsal metacarpal veins and travel up the lateral aspect of the forearm, joining near the elbow to form the radial trunk.
- The radial and ulnar trunks may continue into the arm as the two brachial veins or the trunks may join before the split into a paired brachial system.
- The brachial veins (BRV) usually join near the axilla to form the axillary vein.
- The axillary vein (AXV) runs along the shoulder until joining the cephalic vein. The subclavian vein begins at this point, usually the upper border of the first rib.
- The subclavian vein (SCV) joins the internal jugular vein to form the brachiocephalic vein (or innominate vein) at the clavicular level.
- The internal jugular vein (IJV) runs adjacent to the common carotid artery and receives blood from the face and neck. As mentioned, the IJV joins the SCV to form the brachiocephalic (innominate) vein.
- The right and left brachiocephalic veins (BCV), also known as the innominate veins (INV), join to form the superior vena cava (SVC).
- The SVC enters the heart at the right atrium.

Anatomy

Upper Extremity Arterial



Upper Extremity Arterial System

The vessel anatomy is described from the neck to the digits

- The brachiocephalic or innominate artery (BCA) originates from the aortic arch. The BCA bifurcates into the right common carotid artery (CCA) and the right subclavian artery (SCA).
- The right SCA exits the thorax and passes behind the scalenus anterior muscle. As it passes the lateral border of the first rib, it becomes the axillary artery (AXA).
- The left SCA originates directly from the aortic arch.
- The internal thoracic arteries (formerly known as the internal mammary arteries) originate off the subclavian artery bilaterally.
- The AXA continues until it passes the lower border of the teres major muscle in the axilla, at which time it becomes the brachial artery (BrA).
- The BrA continues distally, initially giving off the profunda brachii artery, then the radial (RA) and ulnar arteries (UA) at the antecubital fossa. More proximal divisions of the brachial artery are possible.[1]

The internal thoracic artery is commonly used in coronary artery bypass.