

VASCULAR LEARNING SYSTEM

Module 3: Imaging
and Film Reading

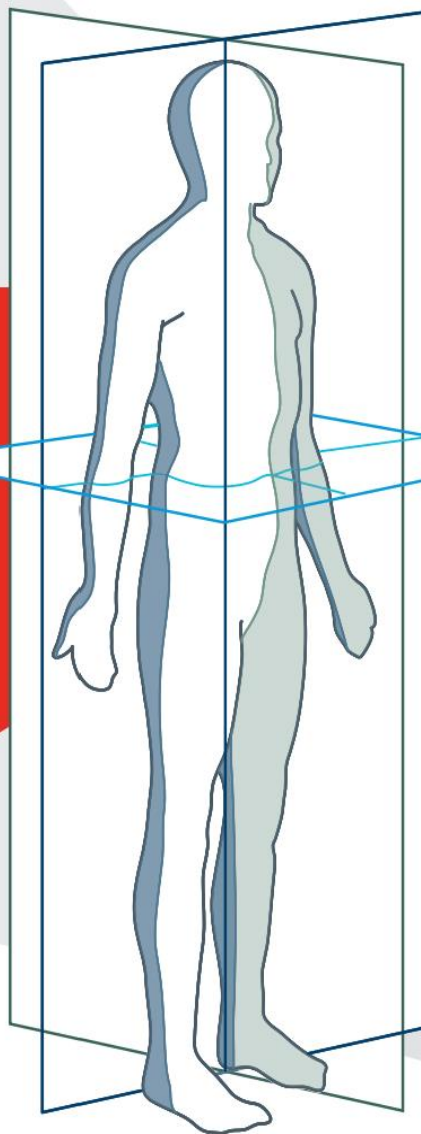


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Section 1: Anatomical planes and positioning

GLOSSARY

Absolute – Referring to a position that is free from limitation, qualification, condition or restriction. When used as an adjective, it means final and not liable to modification; it is independent.

Relative – Referring to a position that requires reference to external conditions for its specific nature to be understood; it is dependent.

Overview

When diagnosing or evaluating vascular disease, physicians often need to use imaging to visualize the patient's heart, blood vessels and other anatomical structures.

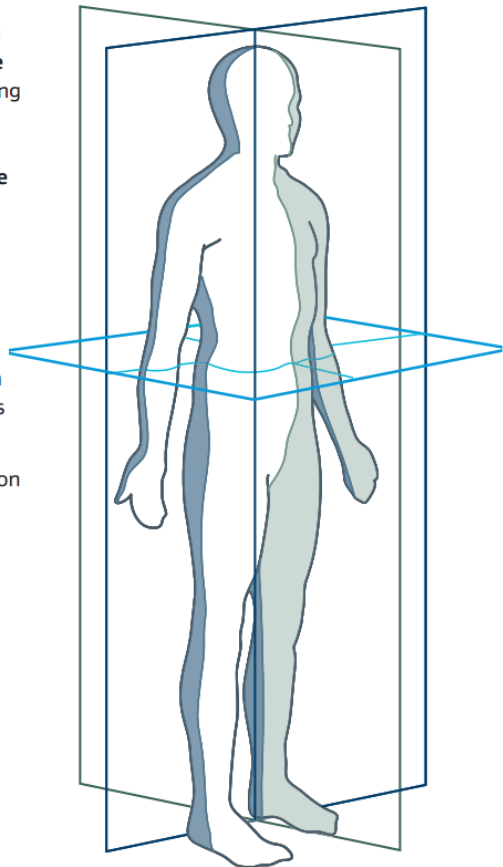
But when viewing images, it can be challenging to describe a structure's position, since general directions – left, right, up and down – depend on the viewer's perspective.

That's why physicians use standardized terminology to precisely identify locations in a patient's body and describe imaging orientations. Developing knowledge of these terms is necessary to have clear and clinically accurate discussions with customers.

Some of these terms define positioning that is **absolute** (a position that is unchanging regardless of the viewer's reference point), while other terms refer to **relative** positioning (dependent on the reference point).

In this section, we will look at the most common terms related to:

- Anatomical planes, which divide the body into sides
- Anatomical positions, which describe the location of structures



GLOSSARY

Right anterior oblique (RAO) –

A position for imaging the patient's right anterior side from an oblique angle.

Left anterior oblique (LAO) –

A position for imaging the patient's left anterior side from an oblique angle.

Oblique angle – Any angle that is not a right angle (i.e., not 90 degrees) or multiple of right angles; any acute or obtuse angle is an oblique angle. An example of an oblique angle is one that is 95 degrees.



MAKE THE LINK

As you will see, knowledge of angles is critical to

the success of any endovascular procedure. Angles and their application are important for anatomical assessment and measurement, device placement and visualization as well as for the identification of procedural complications. Developing knowledge in this area will help you respond to physicians' requests for help with device selection and technical support.

Right anterior oblique (RAO) and left anterior oblique (LAO)

As you can see below, the terms **right anterior oblique (RAO)** and **left anterior oblique (LAO)** describe the body's anterior side from an **oblique** right or left angle. Later on, these terms are discussed along with cranial or caudal to describe the angles of imaging equipment during a surgical procedure.

Imagine a patient lying on a table and you are standing at their feet, looking cranial. As you can see in image one, the imaging equipment is angled such that it will capture the patient's right anterior side from an oblique angle. In image two, the imaging equipment has been positioned to capture the patient's left anterior side from an oblique angle.

Image 1: Right anterior oblique (RAO)

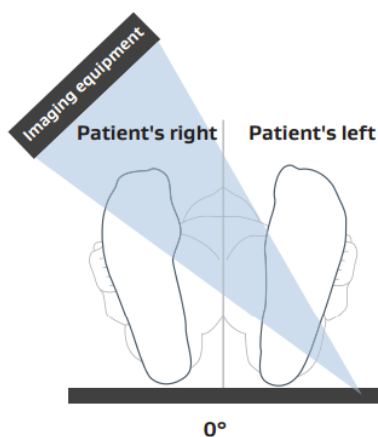
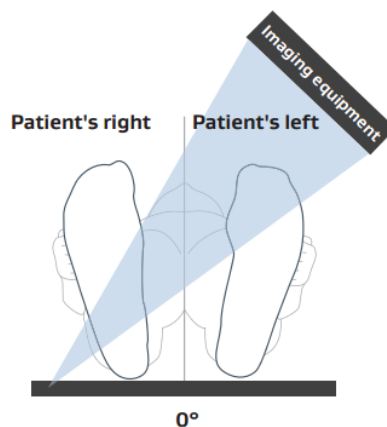


Image 2: Left anterior oblique (LAO)



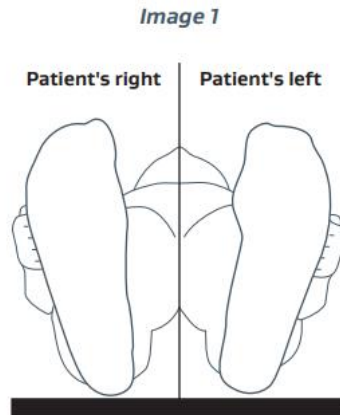
We have come to the end of this section. Review the summary table and complete the *Check-in* that follows before moving on to learn about imaging modalities.

The C-arm and the use of angles

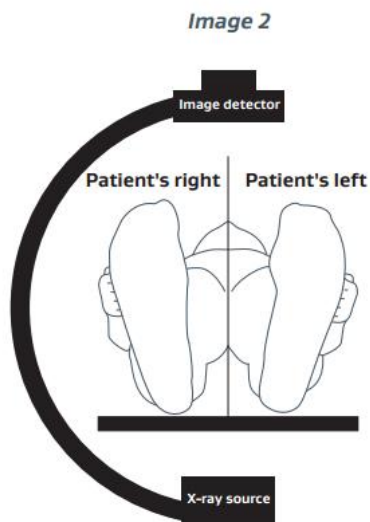
How the C-arm produces images from multiple angles is due to a design that allows it to be manipulated from RAO/LAO angles as well as anterior/posterior (A/P) angles. Since RAO/LAO and A/P can be difficult to visualize, let's look at examples for each, starting with RAO/LAO.

RAO/LAO

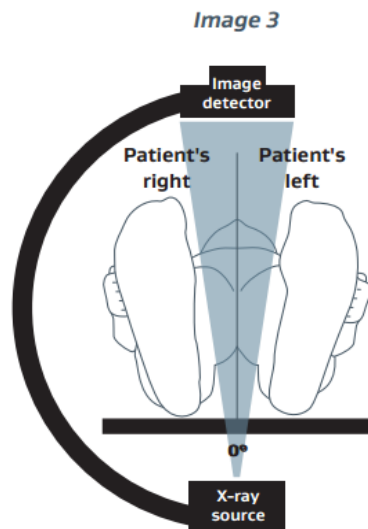
Imagine a patient lying on an operating table, and you are standing facing the patient's feet (image 1).



Now, imagine the C-arm is set up as illustrated in image 2. The x-ray source is located at the bottom, while the image detector is at the top of the unit.



The direction of the x-ray moves from the source to the detector (image 3).



If the detector is rotated counter-clockwise towards the patient's right, the RAO view will be produced (image 4). Conversely, if the detector is rotated clockwise towards the patient's left, the LAO view will be produced (image 5).

