

## Normal anatomy on a PA chest X-ray

The following seven PA chest radiographs are identical and show the normal chest anatomy.

### Normal anatomy 1 (Figure 4)

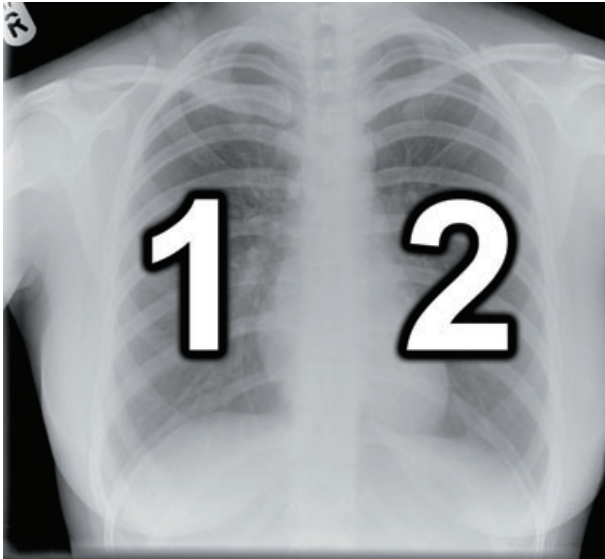


Figure 4

Remember, as you look at a chest X-ray, the left side of the radiograph is the patient's right side, and the right side of the radiograph is the patient's left side.

1. The patient's **RIGHT SIDE**.
2. The patient's **LEFT SIDE**.

**Note:** A good way to remember this is to imagine that the patient is always facing towards you. This is true for both PA and AP films.

### Normal anatomy 2 (Figure 5)

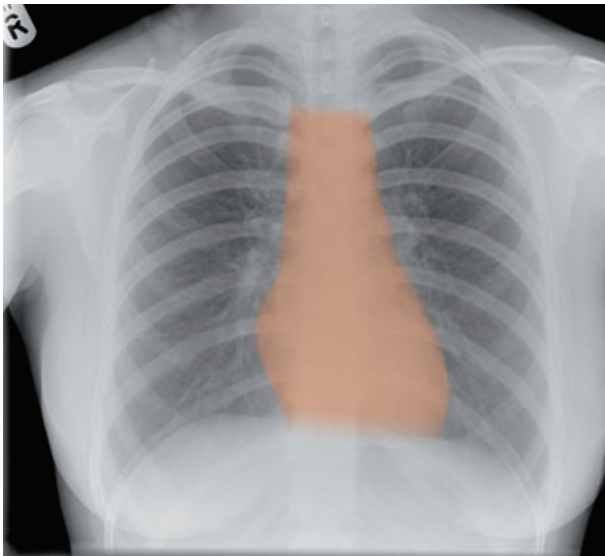


Figure 5

#### **The mediastinum**

The mediastinum is the central compartment of the thoracic cavity. It is marked in orange.

It contains the heart, the great vessels, oesophagus, trachea, phrenic nerve, vagus nerve, sympathetic chain, thoracic duct, thymus and central lymph nodes (including hilar lymph nodes).

### Normal anatomy 3 (Figure 6)

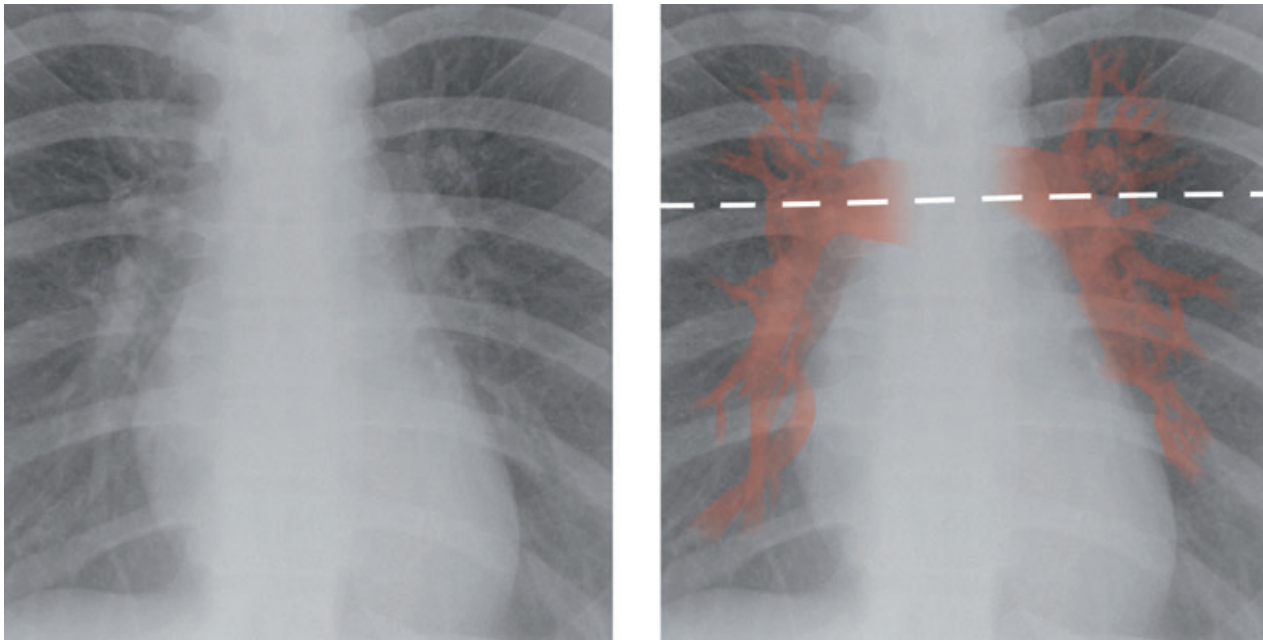


Figure 6

#### **Normal pulmonary vascular patterns**

The normal lung vascular pattern has the following features:

- **arteries** and **veins** branching **vertically** to upper and lower lobes
- **the upper lobe vessels have a smaller diameter than the lower lobe vessels** on an **erect CXR**.

The two images above are identical and show mediastinum and pulmonary vascular markings of a normal chest radiograph. The white dotted line is the level at which the pulmonary vessels enter and leave the lungs. The vessels are marked in red and you can see that the vessels branching upwards (the vessels above the white dotted line) are generally smaller than the vessels branching downwards (the vessels below the white dotted line). This is due to the effects of gravity.

**Note:** The opposite can occur in pulmonary venous hypertension, i.e. the vessels branching upwards become larger than the vessels branching downwards.

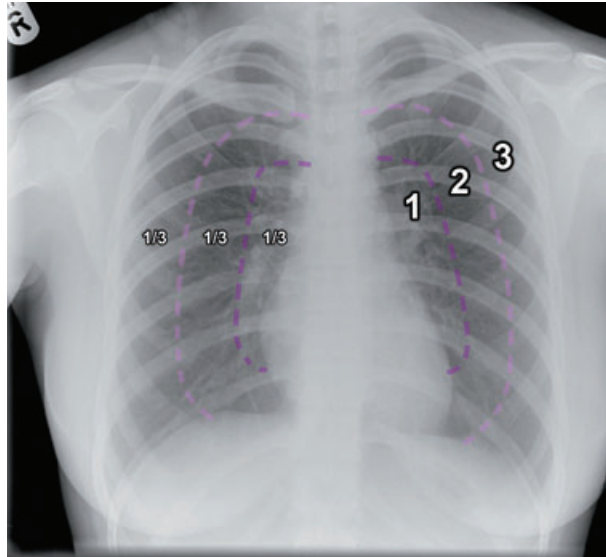
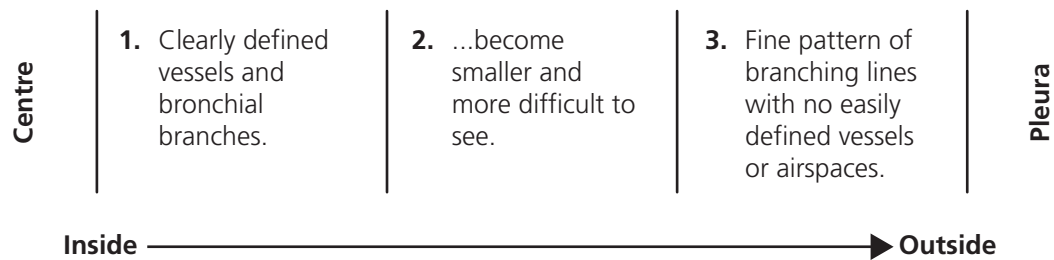
**Normal anatomy 4** (Figure 7)

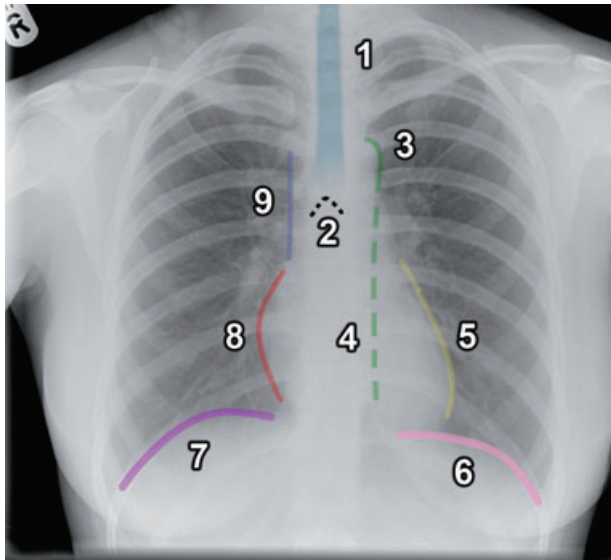
Figure 7

**Normal lung markings**

The lung markings are actually blood vessels in the lungs. They are visible on a chest radiograph as the X-rays are absorbed by the iron in the blood. If each lung is divided into thirds, from the inside to the outside, you can appreciate how the normal lung markings change:



**Normal anatomy 5** (Figure 8)

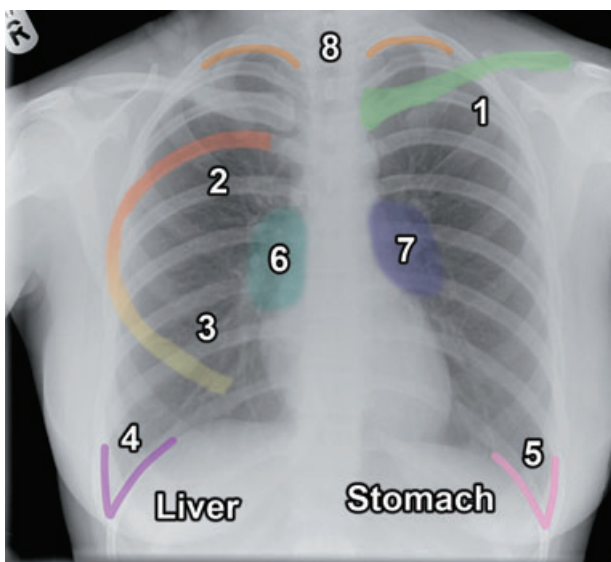


- 1. Trachea (light blue)
- 2. Carina – spinal level T5 (black dotted line)
- 3. Aortic arch/knuckle (green)
- 4. Descending thoracic aorta (green dotted line)
- 5. Left ventricle (yellow)
- 6. Left hemidiaphragm (pink)
- 7. Right hemidiaphragm (purple)
- 8. Right atrium (red)
- 9. Superior vena cava (blue)

Figure 8

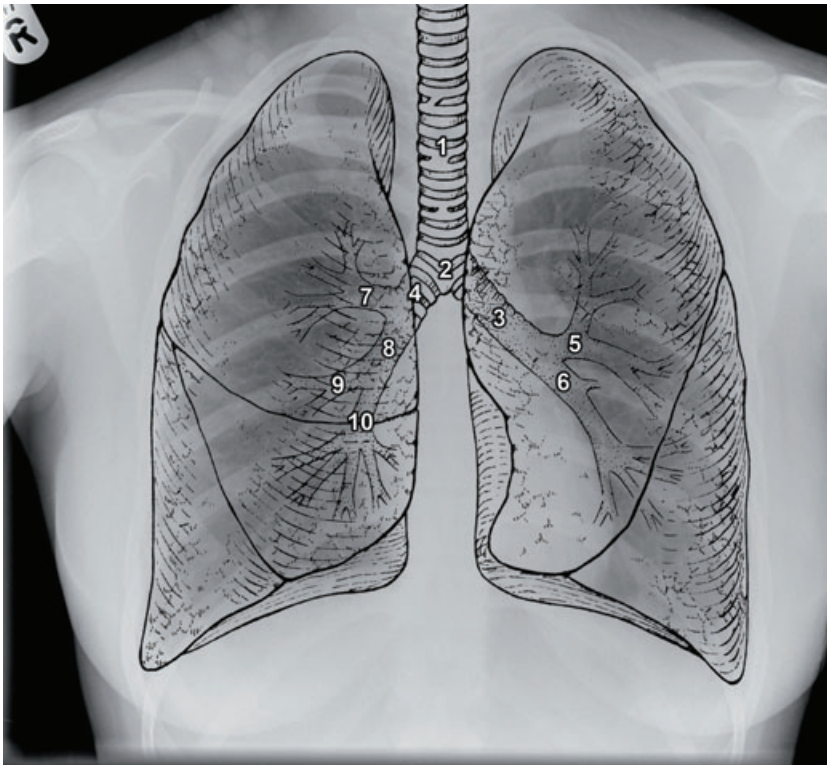
**Note:** The left ventricle forms the left heart border and the right atrium forms the right heart border. Neither the left atrium nor the right ventricle is visible on the normal chest radiograph. This is because the right ventricle lies anteriorly and the left atrium lies posteriorly, and they therefore have no definable border on a chest X-ray.

**Normal anatomy 6** (Figure 9)



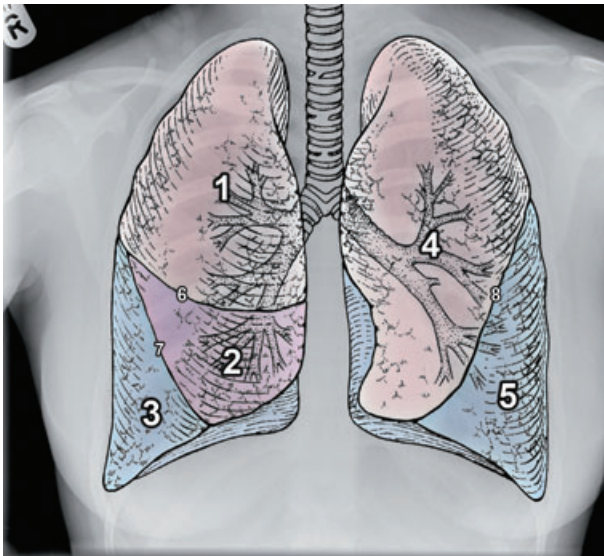
- 1. Clavicle (green)
- 2. Posterior rib (red)
- 3. Anterior rib (yellow)
- 4. Right costophrenic angle (purple)
- 5. Left costophrenic angle (pink)
- 6. Right hilum (containing the right hilar lymph nodes) (light blue)
- 7. Left hilum (containing the left hilar lymph nodes) (blue)
- 8. Lung apex (*pl.* apices) (orange)

Figure 9

**Normal anatomy 7** (Figure 10)

1. Trachea
2. Carina – spinal level T5
3. Left mainstem bronchus
4. Right mainstem bronchus
5. Left upper lobe bronchus
6. Left lower lobe bronchus
7. Right upper lobe bronchus
8. Intermediate bronchus
9. Middle lobe bronchus
10. Right lower lobe bronchus

Figure 10

**Normal anatomy 8** (Figure 11)

1. Right upper lobe (pink)
2. Middle lobe (purple)
3. Right lower lobe (blue)
4. Left upper lobe (pink)
5. Left lower lobe (blue)
6. Horizontal (lesser) fissure
7. Right oblique fissure
8. Left oblique fissure

The right upper lobe is separated from the middle lobe by the **horizontal (lesser) fissure**.

The middle lobe is separated from the right lower lobe by the **right oblique fissure**.

The left upper lobe is separated from the left lower lobe by the **left oblique fissure**.

Figure 11

**Note:** Remember the anatomy of the lungs. There is one middle lobe and it is in the right lung. As it is only found on the right side there is no need to describe it as 'right middle lobe'. You should simply call it the 'middle lobe'.