

Self-assessment: 59251

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North Z (2024) How to interpret chest radiographs (X-rays): a systematic approach.

Nursing Times [online]; 120: 6.

1. What is the most common imaging test conducted by the NHS in England?

Radiograph [correct]

Ultrasound

Fluroscopy

Magnetic resonance imaging (MRI)

Computerised tomography (CT)

Feedback

More than 45 million imaging tests were reported in England on NHS patients between September 2022 and August 2023. Of these, plain radiographs (or X-rays) remain the most common of all imaging tests performed within the NHS, with 21.9 million being requested through primary and secondary care.

2. Chest X-rays are used to aid diagnosis of which organ systems? (Select all that apply)

Cardiovascular [correct]

Respiratory [correct]

Digestive

Nervous

Reproductive

Feedback

Chest radiographs remain the first line of investigation for most patients who present with injury, shortness of breath, infection, pleural effusions or potential cancer, with chest radiographs used to aid the diagnosis, treatment and management of a range of cardiovascular and respiratory disease processes. Chest radiographs

are also used to assess how patients are responding to treatments such as antibiotics or diuretics, as well as monitor the progression of disease such as lung cancers.

3. Which of these are more likely to show up as radiopaque (whiter) on an X-ray? (Select all that apply)

Bone [correct]

Consolidation (infection/fluid) [correct]

Cartilage

Heart [correct]

Alveoli

Feedback

The density of organs, structures and tissue will affect how X-ray energy is absorbed. The denser the material (such as bone), the more X-rays are absorbed and therefore appear whiter (radiopaque) in colour on the chest radiograph. The opposite is true of less dense structures (such as alveoli and soft tissues) which appear darker (radiolucent) on the radiograph. The golden rule is: the more dense the structure, the more radiopaque it will appear on the chest radiograph.

4. An X-ray beam directed from behind the patient towards the front of their chest is known as what projection (view)?

Posterior anterior [correct]

Anterior posterior

Lateral

Oblique

Axial

Feedback

There are two projections, or views, likely to be seen in clinical practice; posterior anterior (PA) and anterior posterior (AP). In the PA view, the X-ray beam is directed from behind the patient towards the front of their chest (posterior to anterior). In the AP view, the X-ray beam is directed from the front (anterior) of the patient towards their back.

5. What should always be checked before interpretation of an X-ray begins? (Select all that apply)

Patient's full name [correct]

Patient's height and weight

Patient's date of birth [correct]

Patient's NHS or hospital number [correct]

Feedback

Chest radiographs are often now viewed digitally on a screen or mobile device so before beginning interpretation it's important to ensure that the patient's first and last name, date of birth, unique identification number (NHS or hospital number) belongs to the patient you are assessing or consulting with.

6. What does the mnemonic RIPE stand for?

Rotation, Inspiration, Projection and Exposure [correct]

Right patient, Identification, Positioning and Exposure

Request, Identify, Position and Evaluate

Radiologist, Intensity, Patient and Evaluation

Feedback

Assessing the technical quality of a chest radiograph should always be carried out before any interpretation or intervention as a poor-quality radiograph could have significant implications for the patient. When assessing the technical quality of an X-ray, there are four things to consider: Rotation, Inspiration, Projection and Exposure (RIPE).

7. When assessing that adequate exposure of the X-Ray has been achieved, what structure should be visible behind the heart?

Vertebral bodies [correct]

Spinal cord

Spinal and vertebral arteries

The aorta

Feedback

To assess how well the X-rays have passed through the body, the vertebral bodies should be faintly visible through the heart (known as the cardiac shadow). If they are too clearly visible then the radiograph is over penetrated, and if the vertebral bodies are not visible at all then the film is under-penetrated, meaning the X-rays have not passed completely through the heart.

8. Consolidation, which is commonly observed on a chest radiograph, may be due to what? (Select all that apply)

Infection [correct]

Cancer [correct]

Aspiration [correct]

Pulmonary oedema [correct]

Haemorrhage [correct]

Feedback

Consolidation is a term given to an increase in the density of an area of the lung which may be due to cellular material (infection or cancer), fluid (aspiration or pulmonary oedema), blood (haemorrhage). To determine if the consolidation is acute or chronic, it is important to review previous chest radiographs to determine any previous presence.

9. The most commonly known type of pneumothorax is known as what?

Tension pneumothorax [correct]

Extended pneumothorax

Common pneumothorax

Complicated pneumothorax

Traumatic pneumothorax

Feedback

Tension pneumothorax is the most commonly known type of pneumothorax and occurs when air enters the pleural space but becomes trapped and compresses the lung. Once the pressure is great enough, it causes the lung to collapse.

10. When assessing the cardiothoracic ratio, the transverse diameter of the heart should not occupy what percentage of the overall thoracic diameter?

10%

20%

30%

40%

50% [correct]

Feedback

When assessing for cardiomegaly – a condition where the heart is enlarged - the heart must be located and assessed for size. This is done assessing the transverse (side to side) internal thoracic diameter – often called the cardiothoracic ratio. When assessing this, the transverse diameter of the heart should not occupy more than 50% of the overall thoracic diameter.