Radiography

A short guide to the Radiography

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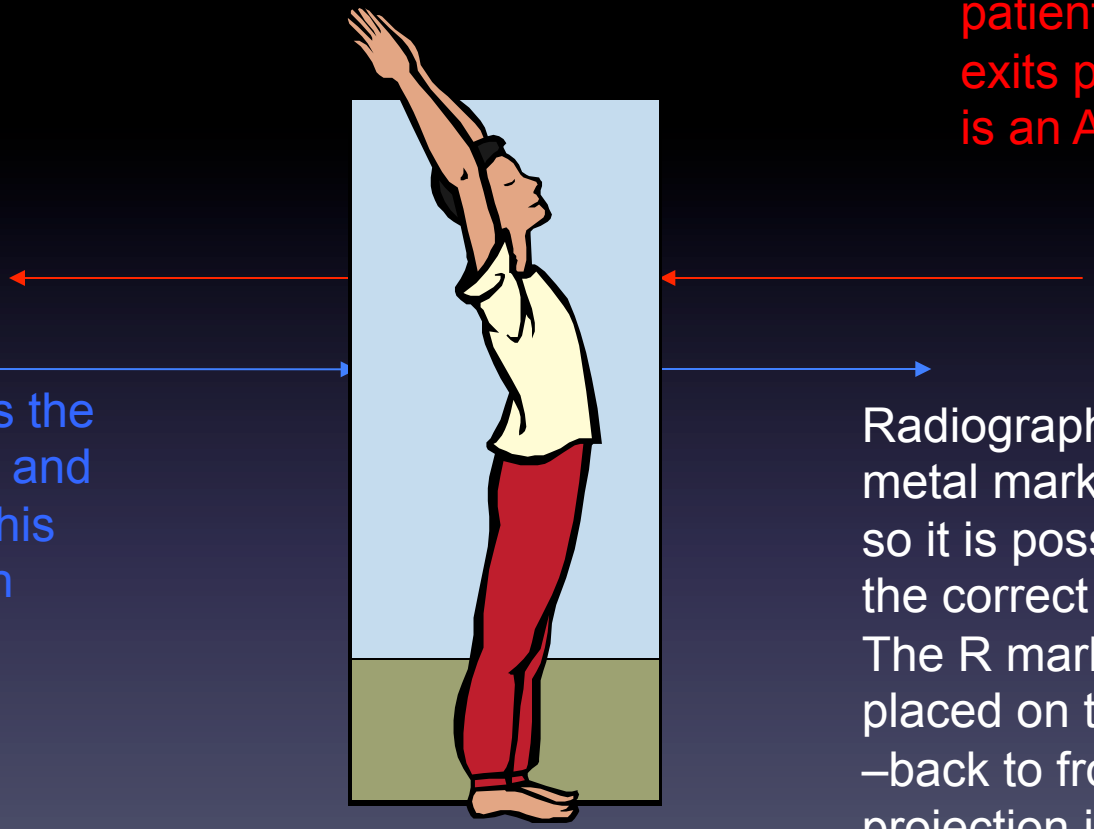
In radiography, the anatomical orientation of the patient is variable and therefore relies on correct anatomical markers on the resultant image to make image interpretation possible. The entry and exit point of the radiation beam depends on whether a projection is anteroposterior (AP) or posteranterior (PA)

X-ray beam enters the patient anteriorly and exits posteriorly. This is an AP projection

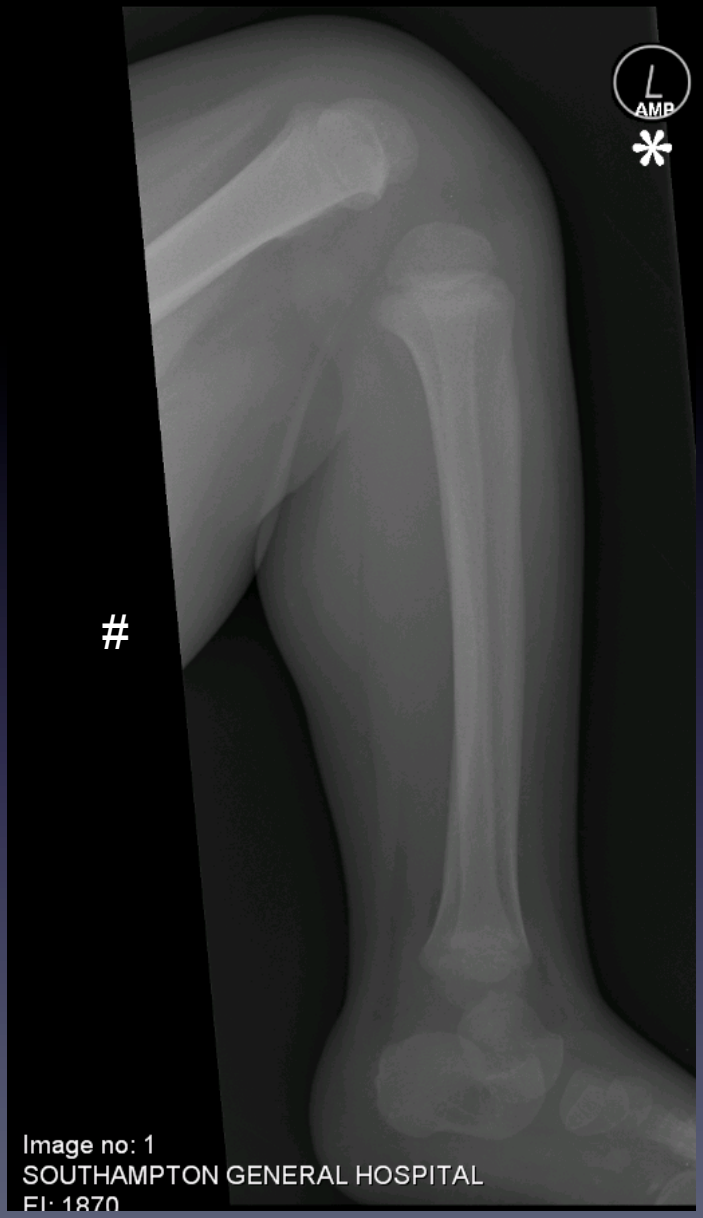


X-ray beam enters the patient posteriorly and exits anteriorly. This is an PA projection

Radiographers apply R or L metal markers to all images so it is possible to identify the correct side at all times. The R marker is always placed on the right side –back to front if the projection is PA and the L to the left side.

There is a specific technique for every part of the body. There are then adaptations of these techniques if the patient is unable to tolerate the routine position.

For most skeletal radiography
there must be 2 images taken at 90 degrees
to each other.



One view is generally 1 view to few as this tibia and fibula lateral radiograph show. There is no obvious fracture visible on this film.

However this AP view demonstrates a Spiral fracture of the distal tibia.

One of the most common x-ray requests is for Chest X Rays. How these are imaged varies, depending on the mobility of the patient.

The PA CXR

Where possible CXRs should be taken PA erect.
This has the following benefits:

1. Reduced dose to eyes, thyroid and breast
2. The heart is closer to the imaging detector and therefore less magnified.
3. Heart size can only be assessed accurately on a PA image.
4. Patient can roll their shoulders forward and move the scapulae from the lung fields
4. Patient is less likely to be lordotic
5. Patient is more comfortable and less like to move

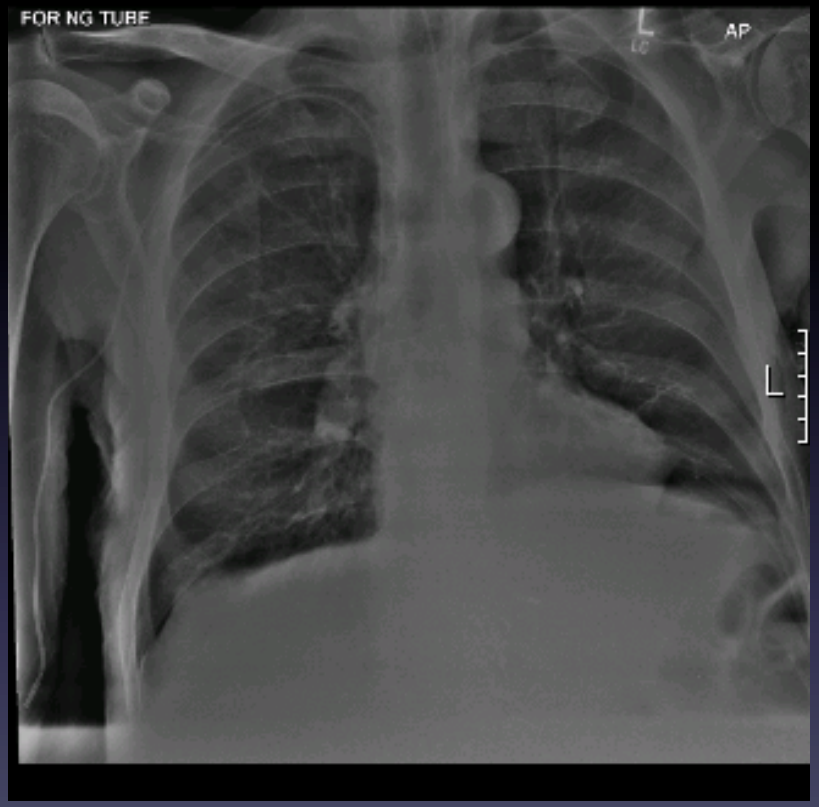
AP CXR

The Patient must lean against or lie on the imaging plate. This is very uncomfortable, especially for the frail patients.

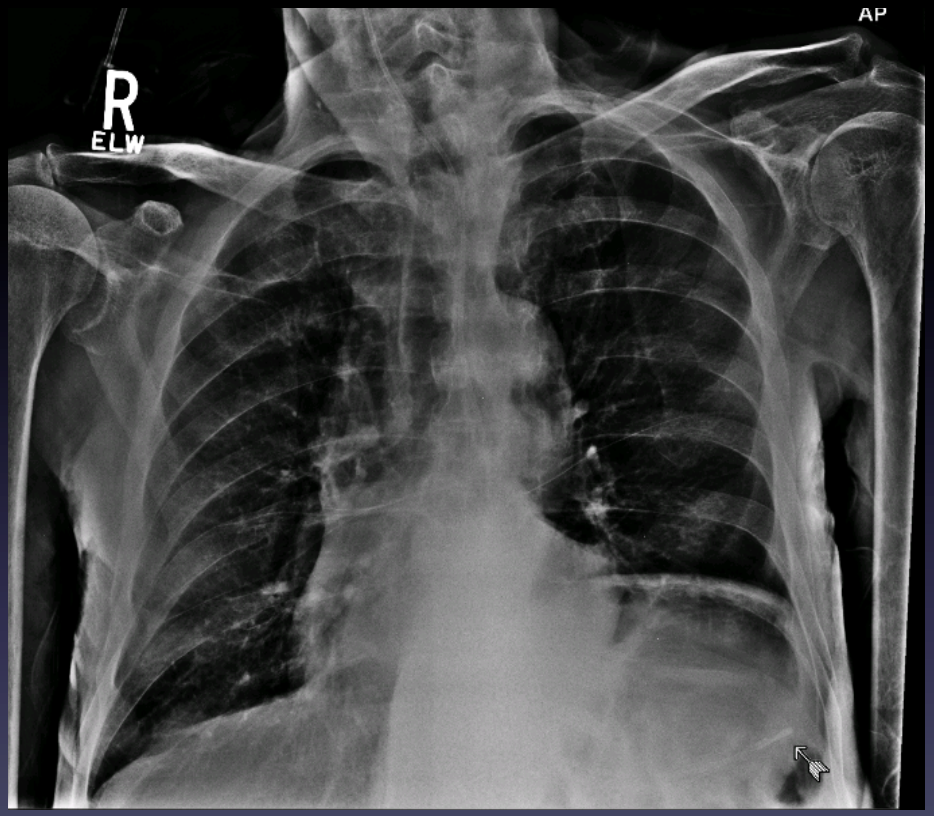
There should be distance of 180cm from the x-ray tube to the imaging plate to reduce magnification and unsharpness of the image. This can be harder to achieve for AP CXRs, especially portable ones as there may not the space for this larger
distance.

Patients are often lordotic on AP x-rays as they lean backwards onto the imaging plate. They may also be rotated as it is very uncomfortable.

These are AP erect images on the same patient

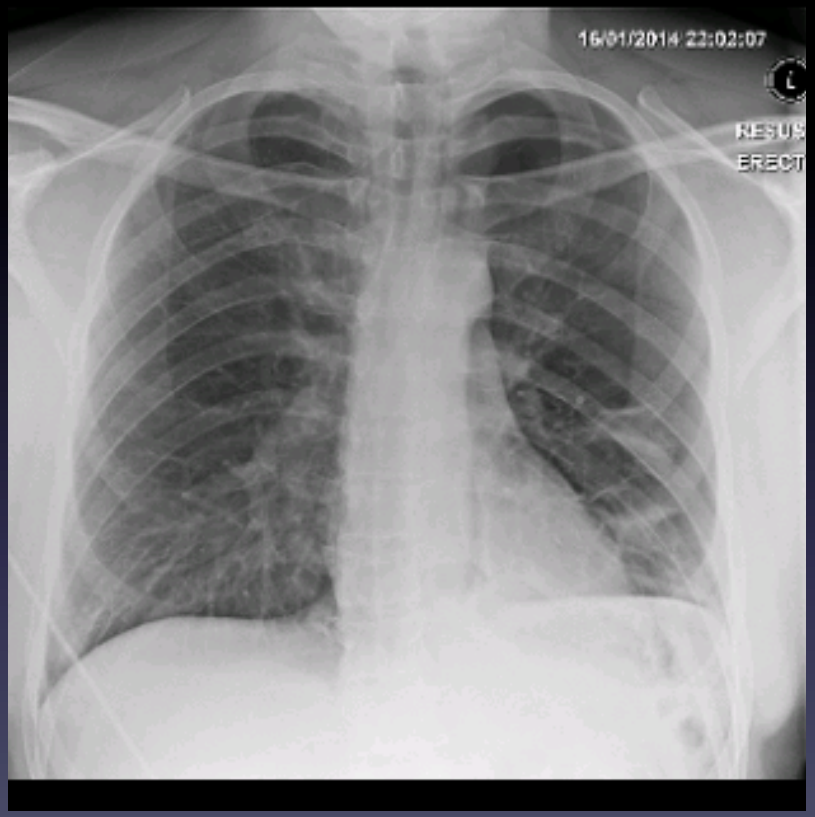


Lordotic CXR

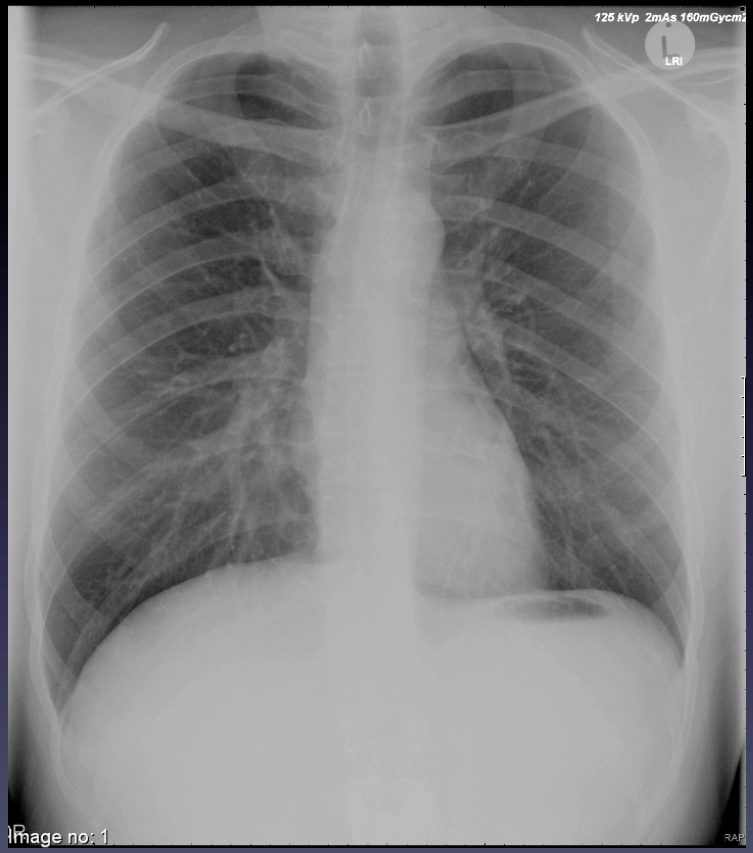


Rotated CXR

These are AP/PA CXRs on the same patient



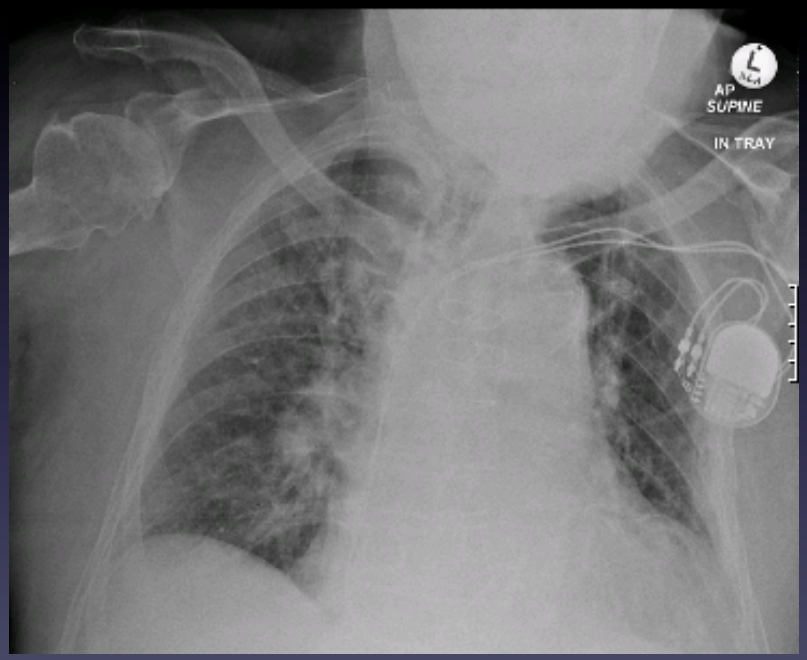
AP CXR



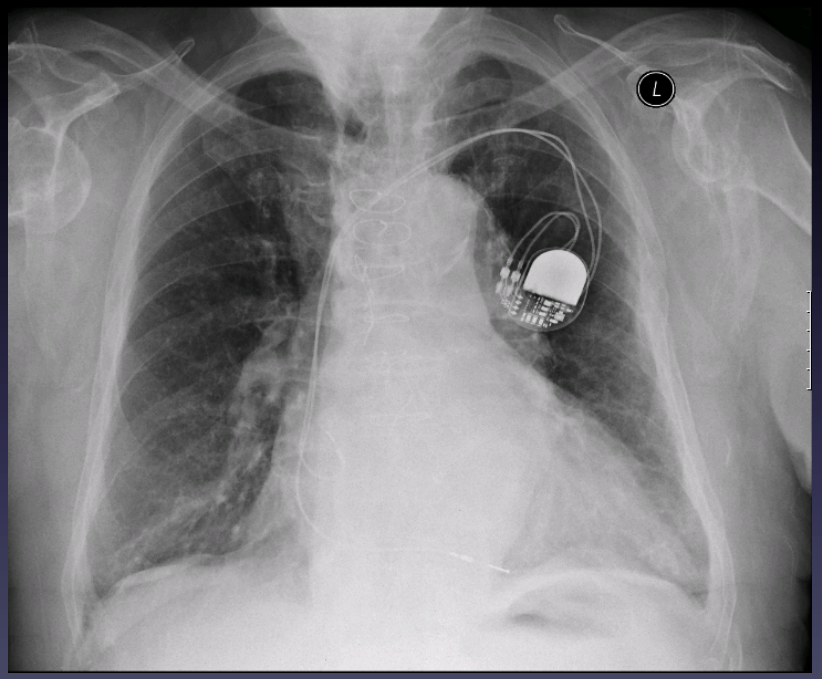
PA CXR

Supine CXR

Technically the poorest image quality the supine CXR is only done on patients who are unable to sit erect



Supine CXR



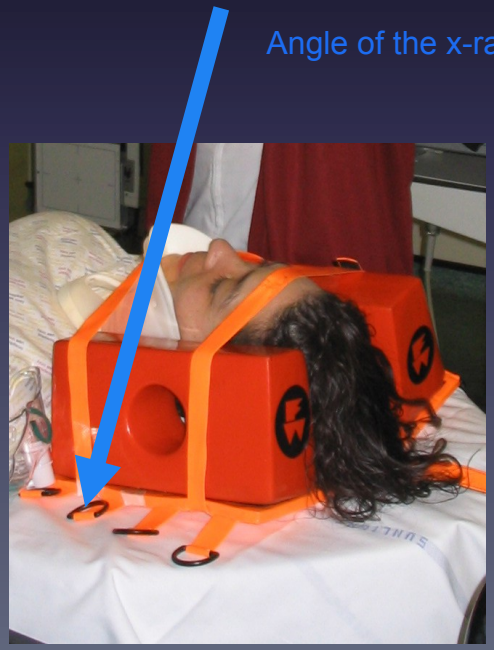
PA erect CXR on the same patient

The technically most challenging areas to image are;

- Lower cervical spine lateral projection to show C7/T1 junction. Many require a "swimmers" projection
- Body habitus is the most significant factor, although the patient must be compliant and able to move their shoulders
- Some patients require CT to demonstrate this area.

Continued……

- C1-2 of the cervical spine requires a odontoid peg projection.
- The position of the patients head is the determining factor of success – trauma patients are immobilised……
- Angulation of the x-ray tube compensates for the position of the patients head – unless the base of skull is superimposed over the peg…….



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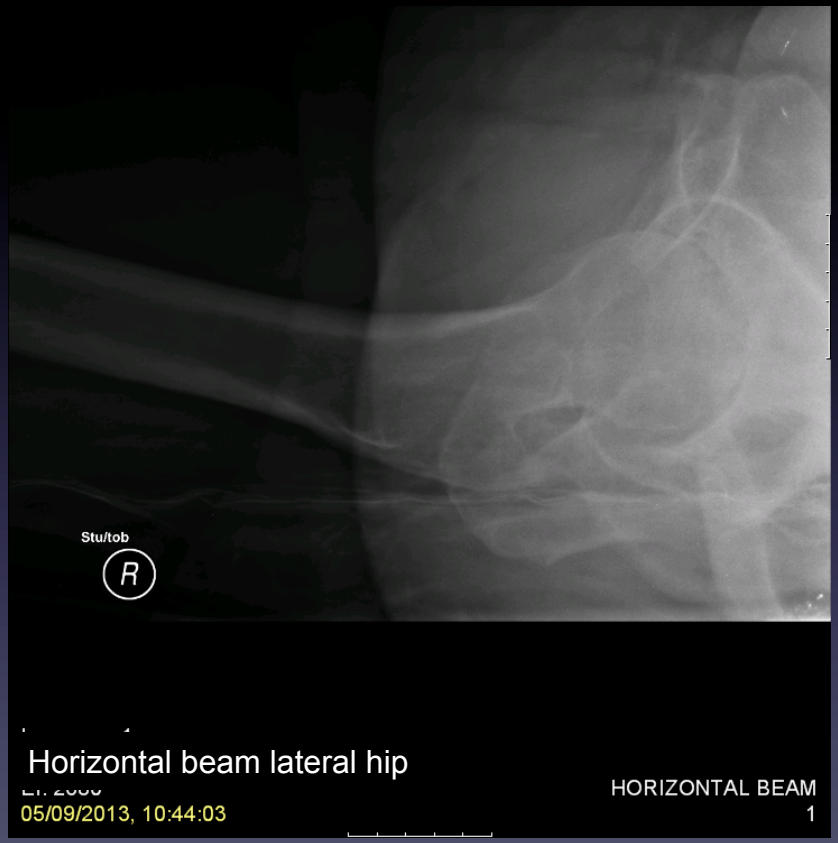
- Lateral horizontal beam hip used to demonstrate the femoral head and proximal femur in patients who are unable to lie on their affected side
- Patients must be compliant and body habitus will dictate whether the radiation output of the x-ray machine will be high enough to penetrate the patients leg and produce an image.

Lateral hips continued

Standard turned lateral hip technique



Horizontal beam lateral hip

The End