



## RED FLAGS

- These clinical features may help to increase the yield of cervical spine radiography and have been adapted from criteria proposed for low back pain, as many risk factors are common to both presentations. [1-4](#)
  - Unexplained weight loss.
  - Fever.
  - Compromised immune system.
  - History of cancer.

- Intravenous drug use.
  - Suspected/Diagnosed rheumatological condition.
  - Age >70.
  - Severe headaches.
  - Dysphagia, nausea, vomiting.
- There is no convincing evidence that the sensitivity and specificity of these red flags is sufficient to exclude serious underlying disease but they may help to reduce unnecessary use of plain radiography.

## PLAIN RADIOGRAPHY

- Frequently but often inappropriately used for the investigation of neck pain.
- The majority of patients with non-traumatic neck pain have either normal cervical spine radiographs or age related degenerative changes that do not necessarily correlate with the presence or severity of pain. [1](#)
- Plain radiographs are probably unnecessary in patients with neck pain unless there are significant risk factors or red flags for serious underlying disease or symptoms have persisted for greater than 6 weeks. [1,5](#)

## MAGNETIC RESONANCE IMAGING

- In general has some advantages over CT including. [6](#)
  - Better soft tissue contrast.
  - Can distinguish different parts of the disc from each other eg nucleus pulposus and annulus fibrosus.
  - Offers better visualization of the vertebral marrow and the spinal canal including spinal cord and intrathecal nerve roots.
  - Uses no ionising radiation.
  - Multiplanar imaging.
- Some disadvantages compared to CT include:
  - Cannot directly visualise cortical bone.
  - Limited availability.
  - Expensive.
  - Has a number of contraindications including pacemaker, cochlea implant, ocular foreign bodies etc.
- Two studies have shown MRI to be more sensitive than bone scan for the detection of vertebral bone metastases. [7,8](#)

- MRI is useful for investigation of spinal infections. In one study it had a sensitivity of 96% and a specificity of 92% for the detection of spinal infections, more accurate than both plain radiography and bone scan. [9](#)

## COMPUTED TOMOGRAPHY AND CT MYELOGRAPHY

- Like other imaging tests, CT abnormalities including herniated discs and degenerative changes are detected in asymptomatic individuals resulting in a low specificity.
- CT can give better images of cortical bone and it may be more reliable than MRI for detecting facet joint degenerative changes. [10](#)
- There is no good evidence regarding the accuracy of CT for metastases, osteomyelitis, or compression fractures of the cervical spine. [1](#)
- In general some advantages of CT over MRI include:
  - Provides superior bony detail of the spine, particularly the facet joints and the posterior elements
  - Less sensitive to patient movements
  - Less expensive
  - More widely available
  - Less claustrophobic
- Multidetector CT allows rapid scanning at a higher resolution compared to single slice CT. The quality of 2D and 3D reformatted images from multidetector CT is a significant improvement over single slice CT which is important for understanding spatial relationships and may visualise abnormalities not present on axial images. [11](#)
- CT myelography is an invasive procedure that involves injecting the thecal sac with iodinated contrast material. MRI is the preferred first line investigation of suspected radiculopathy or spinal stenosis and the main role of CT myelography is as an alternative if MRI is unavailable or contraindicated.

## REFERENCES

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#### Website

For more information go to [www.imagingpathways.health.wa.gov.au](http://www.imagingpathways.health.wa.gov.au)

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