Population Covered By The Guidance

This pathway provides guidance on the imaging of adult patients with suspected acute spinal cord compression.

Date reviewed: April 2018

Date of next review: April 2021

Published: June 2018

Quick User Guide

Move the mouse cursor over the **PINK** text boxes inside the flow chart to bring up a pop up box with salient points.

Clicking on the **PINK** text box will bring up the full text.

The relative radiation level (RRL) of each imaging investigation is displayed in the pop up box.

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>RRL</th>
<th>EFFECTIVE DOSE RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>None</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Minimal</td>
<td>&lt; 1 millisieverts</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>1-5 mSv</td>
</tr>
<tr>
<td></td>
<td>Medium</td>
<td>5-10 mSv</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>&gt;10 mSv</td>
</tr>
</tbody>
</table>

Pathway Diagram
Cervical Spinal Stenosis

1a

Image 1a and 1b (Magnetic Resonance Imaging): Severe spinal stenosis at C3/4 with complete effacement of the CSF space around the cord (arrow). There is high signal within the cord distal to the stenosis which may reflect cord oedema. Mild spinal stenosis at C5/6 and C6/7 (arrows) are also present.

1b

Teaching Points

- A detailed history and thorough clinical examination is required prior to imaging
- Patients should be urgently assessed by a senior clinician, which includes emergency or medical physicians and surgeons
MRI is the first line modality in the assessment of suspected spinal cord compression
If MRI is contraindicated, CT +/- myelography may be an alternative

Magnetic Resonance Imaging

- The imaging modality of choice for the investigation of suspected spinal cord or cauda equina compression 1-3
- T1- and T2- weighted sagittal images are generally used with axial images also obtained through identified regions of interest 4
- Gadolinium contrast is preferred for visualisation of intradural and column metastases 3-6 although tumour can be detected in many cases without gadolinium 3
- MRI is widely accepted as the best modality to evaluate spinal cord compression although there is a paucity of recent studies on the accuracy of current MRI technology for diagnosing spinal cord compression from metastatic and degenerative disc disease
- In metastatic disease, one third of patients have multilevel disease so the whole spine should be imaged 3, 7, 8
- Advantages:
  - Non invasive
  - It can identify bone lesions without epidural extension, intramedullary metastases and sometimes leptomeningeal disease
  - Excellent soft tissue contrast resolution
  - The entire spine can be imaged and multiple sites of compression identified 9-11
- Contraindicated with ferromagnetic prostheses such as some pacemakers, aneurysm clips, cochlear implants or ocular foreign bodies. Claustrophobia and the long scanning time may not be tolerated by some patients

Computed Tomography and Myelography

- If MRI is contraindicated or unavailable then computed tomography (CT) may be an alternative 12
- CT can also be useful in surgical planning to evaluate for spinal instability
- CT without myelography shows bony infiltration or vertebral collapse from tumour but is not sensitive for detecting cord compression 3
- A study found a sensitivity and specificity of 89 percent and 92 percent respectively for CT when compared to MRI for the detection of metastatic spinal cord compression 13
- There is evidence that CT is comparable to MRI for detecting disc herniation 14-16 which is the most common cause of spinal cord compression
- CT myelography may be of use when metal prostheses result in artefact obscuring the area of interest
- CT myelography is an invasive procedure that involves the intrathecal administration of contrast medium followed by computed tomography at the level of thecal sac impingement 17
- Limitations: 4
  - Associated small risk of exacerbating the neurological deficit
  - May be contraindicated in the presence of raised intracranial pressure and coagulopathy

References

Date of literature search: March 2018
The search methodology is available on request. Email

References are graded from Level I to V according to the Oxford Centre for Evidence-Based Medicine, Levels of Evidence. Download the document


Information for Consumers

<table>
<thead>
<tr>
<th>Information from this website</th>
<th>Information from the Royal Australian and New Zealand College of Radiologists’ website</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consent to Procedure or Treatment</td>
<td>Computed Tomography (CT)</td>
</tr>
<tr>
<td>Radiation Risks of X-rays and Scans</td>
<td>Contrast Medium (Gadolinium versus Iodine)</td>
</tr>
<tr>
<td>Computed Tomography (CT)</td>
<td>Gadolinium Contrast Medium</td>
</tr>
<tr>
<td>Magnetic Resonance Imaging (MRI)</td>
<td>Iodine-Containing Contrast Medium</td>
</tr>
<tr>
<td>Myelogram</td>
<td>Magnetic Resonance Imaging (MRI)</td>
</tr>
<tr>
<td></td>
<td>Radiation Risk of Medical Imaging During Pregnancy</td>
</tr>
<tr>
<td></td>
<td>Radiation Risk of Medical Imaging for Adults and Children</td>
</tr>
<tr>
<td></td>
<td>Myelogram</td>
</tr>
</tbody>
</table>

Copyright

© Copyright 2018, Department of Health Western Australia. All Rights Reserved. This web site and its content has been prepared by The Department of Health, Western Australia. The information contained on this web site is protected by copyright.

Legal Notice

Please remember that this leaflet is intended as general information only. It is not definitive and The Department of Health, Western Australia can not accept any legal liability arising from its use. The information is kept as up to date and accurate as possible, but please be warned that it is always subject to change.
**File Formats**

Some documents for download on this website are in a Portable Document Format (PDF). To read these files you might need to download Adobe Acrobat Reader.