Low Back Pain Triage: Identification of Serious Spinal Pathology

Presented by: Dr Debra Shirley  
Specialist Musculoskeletal Physiotherapist

Will commence LIVE from Sydney, Australia at 7:30pm AEST

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Dr Debra Shirley
• Specialist Musculoskeletal Physiotherapist and Fellow of the Australian College of Physiotherapy.
• Senior Lecturer in Musculoskeletal Physiotherapy.
• Director of Social Inclusion at the Faculty of Health Sciences at the University of Sydney.
• Extensive experience in teaching musculoskeletal physiotherapy at entry level and postgraduate Masters in Manipulative Physiotherapy.
• Presented on international manipulative physiotherapy courses at the University of Birmingham and the DVMT in Germany.
• Member the NSM Physiotherapy Council and previously served as Deputy President of The NSM Physiotherapy Registration Board and as a Director of the Australian Physiotherapy Council.
Learning Outcomes

1. Describe a selection of specific/serious pathology affecting the lumbar spine that need to be differentiated from non-specific low back pain.

2. Identify the information (red flags) from the history and physical examination that might signal the risk of a specific/serious pathology.

3. Evaluate the diagnostic utility of red flags and discuss how this influences clinical reasoning.

4. Discuss when it is necessary to refer a patient for further medical evaluation.

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Diagnostic Triage for LBP

Idiopathic = non-specific
Spinal nerve/nerve root compromise

Acute
Chronic
Syndrome
Idiopathic / NSLBP

~90%


Serious Pathologies

- Fracture
- Cancer
- Infection
- Inflammatory conditions - eg ankylosing spondylitis
- Cauda equina syndromes
- Myelopathy
Red flags for possible serious spinal pathology

- Consider prompt referral (less than 4 weeks)
- Presentation under age 20 or onset over 55
- Non-mechanical pain
- Thoracic pain
- Past history - carcinoma, steroids, HIV
- Unwell, weight loss
- Widespread neurological symptoms or signs
- Structural deformity

Cauda Equina syndrome

- Immediate referral
- Sphincter disturbance
- Gait disturbance
- Saddle anaesthesia

Age and Red Flags

- Older age: Pre-test probability of a GP patient with back pain having cancer -
  <50 years - 0.14%
  >50 years - 0.56%
- Back pain in young person < 20, potential red flag conditions (cancer, inflammatory back disease, stress fracture)

Red Flags

- Significant weight loss
- Fevers
- IV drug use
- Constant pain, nocturnal pain
- Pre-existing Carcinoma
- Additional symptoms in other systems
- Neurological impairment
- Severe, highly localised pain

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**Special Questions (all conditions)**

- General health
- PH Cancer
- Unexplained weight loss
- Recent X-rays or investigations
- Medications
- Oral steroids (osteoporosis)
- Other Joints

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**Specific pathology/Serious Spinal Pathology**

Henschke et al 2008

- Many suggested but none with good sens and spec in isolation and poorly investigated
- >80% prevalence of one red flag
- 11/1172 (serious pathologies, 8 fractures)
- 6/11 identified by clinician RIF
- Mean age for sample population was 44

**Conclusion**

- Most patients at least 1 red flag finding
- Individually red flags uninformative

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**Fracture**

- Traumatic fracture: in normal bone, should be significant history of trauma, eg fall from a height or MVA
- Low trauma fracture (fragility fractures): fall from standing height, slip, trip or fall
  - Suggests osteoporosis
- Fracture after 50 should have bone density test

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**Debate: “Time to Lower the Red Flags?”**

Underwood 2009

- Clinicians should consider a small number of disorders
- CE syndrome
- Major IA pathology
- Focal infections
- Fractures
- Time as a diagnostic tool for the remainder
- Concern screening will lead to increased costs from investigations

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Osteoporosis

- Decrease density of bone, increase risk of fracture
- Risk factors
  - Female, post-menopausal
  - Increasing age male and female
  - Family history
  - Medical conditions eg liver, kidney disease, RA, thyroid/parathyroid disease
  - Drugs: steroids, alcohol

Increased Risk of Second Fracture

Prevalent vertebral fracture and new vertebral fracture in next year (Lindsay et al JAMA 2001)

- 1 prevalent fracture RR 2.6
- ≥1 RR 5.1
- ≥2 RR 7.3

Diagnosis of Osteoporotic Fracture

- Xray
- Bone scan will differentiate old vs new fractures
- Bone densitometry:
  - measure of bone density at hip and lumbar spine
  - Does not diagnose fracture
### Osteoporosis risk factors

- Establish amount of height loss since age 25 (+ tsp pain)
- Any fractures since age 45-50
- Area of pain
- Family history
- Weight loss
- Family history of op or hip fracture
- Early menopause hormone deficiencies etc

### Metastatic Cancer

- The skeleton is the most common organ affected by metastatic cancer
- Tumours arising from breast, prostate, thyroid, lung, and kidney spread to bone
- Rarer conditions: leukaemia, lymphoma, 1° bone tumours
- Bone pain from structural damage, rate of bone resorption, periosteal irritation and nerve entrapment

### Key findings / Red flags

- Age > 50
- Significant recent WL
- Previous malignancy
- Constant pain not relieved by postural change or rest.
- Pain present at night and disturbing sleep
- 50% clients with back pain from malignancy have an identifiable (or attributable) antecedent injury or trauma
Case 45 year old male

- Quality control manager
- Aggs: lying supine, coughing and sneezing, prolonged walking, and sitting >1 hour
- Ease: heat, Ibuprofen
- PM: ↑ pain, difficulty sleeping
- CH: 2/12 no incident, p&n 1/52
- PH: L LBP no limitation
- GH √ √, CE √ √, Nil other SQ

Case 45 year old male

- PE
- Slight antalgic gait
- Ext and LLF of L back and thigh
- Neuro L2 and L3 strength, Reflexes ✓ ✓
- L LSLR 45° thigh pain

FIGURE 3. Anterior–posterior radiograph of the lumbar spine demonstrating mottled lucencies overlying the left sacroiliac wing (oriented to the right in this image).
FIGURE 5. Bone scan revealing increased abnormal uptake compatible with metastatic disease throughout the spine, sacrum, and left hemipelvis. An anterior view is on the left and a posterior view is on the right.

Infection

- Pain is the most frequent symptom associated with osteomyelitis
- Muscle spasm is the most frequent sign
- Decreased active range of motion secondary to pain is also a consistent finding

Case 32 year old male PE

- Lateral shift to right
- LAROM but full passive ROM, no pain
- Paraspinal muscle tenderness
- Neuro NAD
- Slump +ve
- Segmental mobility forward and backward bending NAD
- X2/3 but no significant improvement

MRI and Xray - infection

- T1-weighted sagittal MRI image, there is decreased signal intensity (black) primarily of L2 and L3
- Xray shows loss of L2-3 disc space (white arrow). Infection has spread into epidural space (black arrow)
- Disc space infection and osteomyelitis
Infection as a cause of Back Pain

Suspected primarily on history

Cardinal feature is fever

Other important risk factors
- Previous infection (e.g., UTI)
- IVDU
- Skin lesions
- IV catheters and urinary catheters
- Occupational exposure

Lumbar Osteomyelitis

- Commonest organism (60% of cases): Staphylococcus aureus
- Gram negative organisms in elderly and from IVDU
- Workers in the meat processing industry: Brucellosis infection
- Tuberculous and fungal infections
  - Elderly
  - Immunocompromised individuals
  - May be present for years before diagnosis

Sepsis in other sites

- Discitis: Localised pain in back
- Sacroiliac joint: Pain in low back, buttock
- Any septic patient: red flags
  - Fever, sweats, night pain
  - IVDU, skin lesions
  - Invasive procedures (IV lines, Urinary catheters)
  - Recent infection

Septic Sacroiliitis

- Right sacroiliac joint: Increased sclerosis, joint space widening, irregular joint margin, left sacroiliac joint is normal.
- Joint aspiration: Staph aureus
- Symptoms include acute onset severe right lower back pain associated with high fever

Disease

- Ankylosing spondylitis
- Psoriatic arthritis
- Reactive arthritis (Reiters Disease)
- Ulcerative Colitis, Crohns disease: inflammatory bowel disease may have associated arthritis
- Juvenile ankylosing spondylitis
**AS Incidence and Prevalence**

- 0.5-2.0% prevalence
  - Higher in selected ethnic groups
- 5:1 male:female ratio
- Incidence 6-7 cases per 100,000 per year
- Natural history
  - Progression towards ankylosis - may be over many decades, some cases asymptomatic - found on x-rays

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**Ankylosing Spondylitis**

<table>
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<tr>
<th>Medical History</th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>LR+</th>
<th>LR-</th>
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<td>0.23</td>
<td>0.82</td>
<td>1.28</td>
<td>0.94</td>
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<tr>
<td>Onset &lt;40</td>
<td>1</td>
<td>0.07</td>
<td>1.08</td>
<td>0</td>
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<td>Pain not relieved supine</td>
<td>0.8</td>
<td>0.49</td>
<td>1.57</td>
<td>0.41</td>
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<td>Morning stiffness</td>
<td>0.64</td>
<td>0.59</td>
<td>1.56</td>
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<td>Pain duration &gt;3/12</td>
<td>0.71</td>
<td>0.54</td>
<td>1.54</td>
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**Case 32 year old female PE**

- Two of the four SIJ provocation tests (sacroiliac distraction and compression) were +ve
- Special tests (PABER), painful and limited hip flexion
- The positive slump test
- Full, pain-free LROM
- RX muscle energy motor control some improvement
- Worse after 3-4 visits, by 5th visit markedly worse, 1 am stiffness, difficulty getting dressed → refer

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**TABLE 1 Typical AJPs Follow-up in Patient’s Clinical Prognosis**

<table>
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<th>G auditing</th>
<th>Male (twin, 2001)</th>
<th>Female (twin, 1999)</th>
<th>Age</th>
<th>Year</th>
<th>Final Vis (2002)</th>
<th>Clinical</th>
<th>Comments</th>
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<td>Gender</td>
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**Sacroiliitis**

- Erosions
- Subchondral sclerosis
- Ankylosis
- Spine – Anterior erosions – Squaring – Syndesmophytes - anterior border to anterior border – Fusion – Bamboo spine

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**Spinal canal stenosis**

- Occurs in older individuals, >65
- Hypertrophic degenerative processes in spine

  - critical narrowing of spinal canal

  Due to combination of features
  - Osteoarthritic changes at facet joints
  - Degenerative disc bulges
  - Ligamentum flavum hypertrophy
  - Degenerative spondylolisthesis
Clinical Presentation

- Burning pain (neurogenic)
- No change to pulse
- No trophic changes
- T4 symptoms with spinal Ext
- T4 symptoms with spinal Fl
- T4 symptoms standing
- Symptoms may respond to rest

Red Flags in a child with back pain

- Progressive pain not responding to analgesia
- Pain that awakes the child at night
- Fever
- Weight loss
- Severe constipation
- Adoption of abnormal postures
- Development of scoliosis
- Reduction in mobility & abnormalities of gait
- Sphincter dysfunction

Spine injury in young athletes

- Lumbar spine # less common than c spine
- Compression fractures most common
- Disc herniation (associated with fracture of the ring apophyses)
- Spondyloysis (47% of adolescents with back pain), 85-95% L5

Summary
Red Flags requiring evaluation

- Back pain or symptoms not improving
- Steady pain irrespective of activity
- Symptoms increasing
- Development of new or progressive neurological deficits

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Part 2 of The LBP Triage: Assessment and Treatment of Spinal Nerve Compromise
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