Back pain: time to get it right?

Introduction to back pain
Burden of back pain
Questions
Why we have the problem
Possible solutions
Questions

Back pain 101

Back pain is not new

Back pain is not new

Edwin Smith Papyrus ~1600 BC

Case 48 a pulled vertebra

• Treatment
  - You have to put him stretched out. You have to make for him...
Back is complex
Pain-sensitive structures

- facet joints
  - joint capsule
  - synovium
  - periosteal bone
- disc - outer fibres of annulus
- vertebrae
- ligaments
- muscles
- nerves & their coverings

### Diagnosis in primary care

- Non-specific (85%)
- Sciatica (4%)
- Canal stenosis (3%)
- Fracture (5%)
- Serious disease (1%)
- Visceral (2%)

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**TABLE 1. Differential Diagnosis of Low Back Pain.**

<table>
<thead>
<tr>
<th>Differential Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lumbar strain, sprain (79%)</td>
</tr>
<tr>
<td>Degenerative processes of discs and facet, usually age-related (38%)</td>
</tr>
<tr>
<td>Disc herniation (33%)</td>
</tr>
<tr>
<td>Spondylolisthesis (3%)</td>
</tr>
<tr>
<td>Osteoporosis, compression fracture (4%)</td>
</tr>
<tr>
<td>Spinal stenosis (2%)</td>
</tr>
<tr>
<td>Paraspinal abscess (1%)</td>
</tr>
<tr>
<td>Congenital anomalies (1%)</td>
</tr>
<tr>
<td>Sympathetic ganglia</td>
</tr>
<tr>
<td>Ankylosing spondylitis</td>
</tr>
</tbody>
</table>

**Non-malignant, non-surgical causes (less than 5%)**

- Neuritis (57%)
- Multiple myeloma
- Hypertrophic lumbago
- Osteoarthritis
- Spondylolisthesis
- Sympathetic ganglia
- Strain/sprain
- Ankylosing spondylitis
- Congenital anomalies

**Musculoskeletal causes (less than 5%)**

- Neuritis (57%)
- Multiple myeloma
- Hypertrophic lumbago
- Osteoarthritis
- Spondylolisthesis
- Sympathetic ganglia
- Strain/sprain
- Ankylosing spondylitis
- Congenital anomalies

**Vascular causes (less than 5%)**

- Disease of pelvic veins
- Thrombosis
- Embolism
- Arterial insufficiency
- Aortic aneurysm
- Carotid stenosis
- Thromboembolic disease
- Post thrombotic syndrome
- Inflammatory disease
- Septic arthritis

**Other causes (less than 5%)**

- Nerve root compression (cauda equina)
- Nerve root compression (radiculopathy)
- Myelopathy
- Syringomyelia
- Intramedullary tumors
- Intramedullary lesions
- Intramedullary lesions (low back pain)
- Neurovascular disease (compressive)
- Nephritis disease of bone

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Deyo, New Eng J Med 2001
Diagnosis in primary care

Non-specific (97.8%)
Sciatica (1.2%)
Canal stenosis (0%)
Fracture (0.7%)
Serious disease (0.3%)
Visceral (0%)

Henschke et al. Arthritis & Rheumatism 2009

Similar initial primary care management

Diagnostic work-up and/or referral

Acute Non-Specific LBP

First line care
• Advice
• Simple analgesics
• Review

Second line care
• Medicines
  – Compound analgesics
  – NSAIDs
  – Muscle relaxants or opioids
• Physical therapies
  – Spinal manipulation
  – Heat wrap therapy

Do not routinely order imaging
Avoid bed rest

Persistent Non-Specific LBP

Simple
• Advice
• Simple analgesics
• Physical therapies
  – Spinal manipulation
  – Heat wrap therapy

Complex
• Advice
• Complex medicines
• Physical therapies
  – Spinal manipulation
  – Exercise
  – Yoga
  – Acupuncture
• Psychological therapies
• Multidisciplinary pain clinic

Do not routinely order imaging
Avoid bed rest

Back pain burden

› Prevalence
  - Point prevalence ~25%
  - 1 month prevalence ~50%
  - Life time prevalence ~80%

› Recurrence
  - ~1/3 within 12 months

Back pain burden

Prevalence of LBP
165 studies 54 countries

<table>
<thead>
<tr>
<th>GENDER</th>
<th>Median Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>33.7%</td>
</tr>
<tr>
<td>Male</td>
<td>25.9%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>URBANICITY</th>
<th>Median Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural</td>
<td>31.1%</td>
</tr>
<tr>
<td>Urban</td>
<td>25.3%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ECONOMY</th>
<th>Median Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low income</td>
<td>18.2%</td>
</tr>
<tr>
<td>Middle income</td>
<td>21.4%</td>
</tr>
<tr>
<td>High income</td>
<td>30.3%</td>
</tr>
</tbody>
</table>

How much low back pain have you had during the past week? (tick one)
- None: 0.2%
- Very mild: 2.7%
- Mild: 9.5%
- Moderate: 38.0%
- Severe: 41.4%
- Very severe: 8.0%

During the past week, how much did low back pain interfere with your normal work (including both work outside the home and housework)? (tick one)
- Not at all: 6.2%
- A little bit: 16.6%
- Moderately: 23.8%
- Quite a bit: 36.2%
- Extremely: 17.2%

If you had to spend the rest of your life with the symptoms you have right now, how would you feel about it? (tick one)
- Very dissatisfied: 73.8%
- Somewhat dissatisfied: 20.2%
- Neither satisfied nor dissatisfied: 3.0%
- Somewhat satisfied: 1.1%
- Very satisfied: 1.8%

Back pain is not trivial
Back pain is not trivial

Back pain costs

- Health care costs
  - $1.0 billion (Walker 2001)
  - $4.8 billion (Arthritis & Osteoporosis Victoria 2013)
- Non-health care costs
  - Indirect costs $8 Billion (Walker 2001)
- Older Australians
  - Most common condition keeping older Australians out of workforce
  - Quadruples your odds of being out of workforce if you are aged 45-64 years old
  - Reduces Australia’s GDP by $3.2 billion (Schofield 2008)

Burden

Disability adjusted life years

The WHO global burden of disease (GBD) measures burden of disease using the disability-adjusted life year (DALY). This time-based measure combines years of life lost due to premature mortality and years of life lived in states of less than full health.
### Why is back pain such a problem?

<table>
<thead>
<tr>
<th>Risk factors &amp; Triggers</th>
<th>•</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tissue involved</td>
<td>?</td>
</tr>
<tr>
<td>Disease</td>
<td>?</td>
</tr>
<tr>
<td>Effective prevention</td>
<td>✓</td>
</tr>
<tr>
<td>Effective treatments</td>
<td>✓</td>
</tr>
</tbody>
</table>

### Incomplete understanding

<table>
<thead>
<tr>
<th></th>
<th>Back pain</th>
<th>Ischaemic Heart Disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk factors &amp; Triggers</td>
<td>✓</td>
<td>✓ ✓ ✓</td>
</tr>
<tr>
<td>Tissue involved</td>
<td>?</td>
<td>✓ ✓</td>
</tr>
<tr>
<td>Disease</td>
<td>?</td>
<td>✓ ✓</td>
</tr>
<tr>
<td>Effective prevention</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Effective treatments</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

### Disability adjusted life years

<table>
<thead>
<tr>
<th>Year</th>
<th>Total DALYs (M)</th>
<th>Change (M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>152.0</td>
<td>-3.2</td>
</tr>
<tr>
<td>2002</td>
<td>154.0</td>
<td>2.0</td>
</tr>
<tr>
<td>2003</td>
<td>150.0</td>
<td>-3.2</td>
</tr>
<tr>
<td>2004</td>
<td>156.0</td>
<td>3.2</td>
</tr>
<tr>
<td>2005</td>
<td>136.0</td>
<td>-10.0</td>
</tr>
<tr>
<td>2006</td>
<td>133.0</td>
<td>-2.3</td>
</tr>
<tr>
<td>2007</td>
<td>130.0</td>
<td>-2.3</td>
</tr>
<tr>
<td>2008</td>
<td>127.0</td>
<td>-2.3</td>
</tr>
<tr>
<td>2009</td>
<td>124.0</td>
<td>-2.3</td>
</tr>
<tr>
<td>2010</td>
<td>121.0</td>
<td>-2.3</td>
</tr>
</tbody>
</table>

### Research investment is inadequate

<table>
<thead>
<tr>
<th>The problem</th>
<th>The investment</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Most burdensome condition</td>
<td>- 0.5% NHMRC funding 2003-2012</td>
</tr>
<tr>
<td>- $4.8 billion pa health care costs</td>
<td>- $2.6 million pa NHMRC funding</td>
</tr>
<tr>
<td>- Most common condition keeping older Australians out of workforce</td>
<td>- Reduces GDP by $3.2 billion</td>
</tr>
</tbody>
</table>

### NHMRC Funding 2003-2012

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Funding (M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>$44M</td>
</tr>
<tr>
<td>2004</td>
<td>$155M</td>
</tr>
<tr>
<td>2005</td>
<td>$150M</td>
</tr>
<tr>
<td>2006</td>
<td>$15M</td>
</tr>
<tr>
<td>2007</td>
<td>$476M</td>
</tr>
<tr>
<td>2008</td>
<td>$33M</td>
</tr>
<tr>
<td>2009</td>
<td>$136M</td>
</tr>
<tr>
<td>2010</td>
<td>$15M</td>
</tr>
<tr>
<td>2011</td>
<td>$138M</td>
</tr>
</tbody>
</table>
Primary care
Management of 3,553 new cases of LBP by Australian GPs

Guideline message | Care provided
--- | ---
Do not routinely order imaging | • 25% referred for imaging
Provide advice | • 21% received advice
Begin with simple analgesics | • 18% got paracetamol
 | • 37% got NSAIDs
 | • 20% got opioids

6% got 4g/d paracetamol

Williams et al Arch Intern Med 2013

Surgical practice
3 most common surgical procedures 2010-2011

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Volume</th>
<th>Guideline advice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spinal rhizolysis</td>
<td>12,069</td>
<td>Evidence is insufficient to assess effects on health</td>
</tr>
<tr>
<td>Discectomy</td>
<td>5,885</td>
<td>Effective for sciatica (short term)</td>
</tr>
<tr>
<td>Facet joint injections</td>
<td>4,458</td>
<td>No benefit</td>
</tr>
</tbody>
</table>

Effective Use of OTC Analgesics

- 45% were using OTC analgesics.
- The majority were not taking adequate doses.

Instances (%) in which OTC analgesics were reported as being under-dosed, based on labeled instructions.

<table>
<thead>
<tr>
<th>Analgesic</th>
<th>50</th>
<th>71</th>
<th>106</th>
<th>76</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paracetamol</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ibuprofen</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aspirin</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Codeine</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Effective Use of OTC Analgesics

Consumer Back Pain Survey (n=570)

Initial Action Taken (%)

GP beliefs about back pain
3,631 Australian GPs

Interest in LBP n=599 | No Interest n=3232
--- | ---
Pts with acute LBP should be prescribed complete bed rest until the pain goes away | 17.8% | 9.2%
Ptes should not return to work until they are almost pain free | 24.5% | 15.8%
X-rays of the lumbar spine are useful in the work up of patients with acute LBP | 40.8% | 29.1%
Encouragement of physical activity is important in recovery | 95.7% | 97.2%

Buchbinder et al Spine 2009

Wilk et al Clin J Pain 2010

Wilk et al Clin J Pain 2010
Patients expect imaging

- Because it was pretty bad, so I figured I need an x-ray to see what it was. X-rays can isolate the problem. (P1)
- I thought an x-ray might show the cause in my spine. I think it helps. (P4)
- ... to find out what it is and try to fix it. (P7)

Hoffman et al. BMC Family Practice 2013
**Effects of media campaign**

<table>
<thead>
<tr>
<th></th>
<th>Vic-1997 (n=691)</th>
<th>Vic-2000 (n=562)</th>
<th>% Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pts should be prescribed complete bed rest until the pain goes away</td>
<td>23.9%</td>
<td>4.0%</td>
<td>19.9%</td>
</tr>
<tr>
<td>Patients should not return to work until they are almost pain free</td>
<td>32.5%</td>
<td>9.8%</td>
<td>22.7%</td>
</tr>
<tr>
<td>X-Ray pictures of lumbar spine are useful in investigation of acute (&lt;1 month) pain</td>
<td>39.6%</td>
<td>27.7%</td>
<td>11.9%</td>
</tr>
<tr>
<td>Encouragement of physical activity is important in recovery</td>
<td>91.0%</td>
<td>98.7%</td>
<td>7.7%</td>
</tr>
</tbody>
</table>

**Decision support**

**Back pain choices tool**

- The George Institute for Global Health
- NPS

**BACK PAIN CHOICES**

- Clinical assessment
- Management options
- Benefits and precautions
- Patient education
- Referral options

**Diagnostic Acute non-specific low back pain — first visit**

- General information
- Investigation
- Treatment
- Referral
Decision support

**Tools for patients**

Invest in research
Acknowledgements:

[Logos of Australian Government National Health and Medical Research Council and Australian Research Council]