Approach to Chronic Back Pain

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Back pain

• Most common questions patients ask me in my office:
  • “Why is it bothering me?”
  • “Is there anything that can be done?”
Objectives

• Background
• Anatomy
• Etiology
• Treatments

Background

• In United States –

• Approximately 10 million Americans are disabled from chronic low back pain
• 250 million workdays are lost per year due to chronic low back pain
• Annual incidence of 10-15% of adult population suffer moderate intensity low back pain
  – Typically self limited with > 90% recover over 3 months
  – Remainder 10% have intensive demands and utilize significant healthcare resources

Costs

• Low back pain – 5th most common reason for physician visits

• In 1998:
  – Total incremental direct healthcare costs due to low back pain were $26.3 billion dollars
  – Indirect costs from days lost from work: approximately 2% of US work force compensated for back injuries per year.

• Approximately 5% of patients with low back pain disability account for 75% of costs associated with low back pain


Timing

• Low back pain categorized –
  – Duration, location, etiology

• Acute – 2-4 weeks
• Subacute - < 12 weeks
• Chronic - > 12 weeks

**Evaluation**

- **Focused history**
  - Back pain
  - With or without leg pain
  - Other associated symptoms

- **Assess risk factors**
  - Medical comorbidities
  - Psychological factors

- **Focused physical examination**
  - Neurological deficits


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**Evaluation**

- *Eradication* of back pain is rare

- **Psychological evaluation**
  - Back pain is multifactorial
  - Emotional, cognitive, behavioral, social and employment

Anatomy

- Spine is composed of 30 vertebra
  - Tripod structure: 2 facets and 1 disc
- Spine consists of the muscles, tendons and ligaments
- Pain can come from ANY of the structures

Objectives

- Background ✔
- Anatomy ✔
- Etiology
- Treatments
Etiology

- Disc herniation
- Spinal stenosis
- Degenerative spondylolisthesis
- Spondylolysis with spondylolisthesis
- Lumbar sprain or strain
- Degenerative changes
- Fracture
- Tumor
- Infection

Nonspecific back pain

- Lumbar strain or sprain
- Degenerative changes

- Patient education imperative
  - Condition is self limited
  - Remain active

Approach

• Multidisciplinary approach
  – Physical therapist
  – Pharmacological treatment
  – Nonpharmacological treatment
  – Cognitive behavioral therapy
  – Invasive interventions


Physical therapy

• Physical therapy
  – Reconditioning
  – Strengthening
  – Range of motion
  – Low impact aerobic activity
  – Williams’s flexion exercises, McKenzie exercises
  – Aqua therapy
  – Heat/cold modalities
  – Bracing

### Adjunctive therapies

<table>
<thead>
<tr>
<th>Adjunctive therapies</th>
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<tbody>
<tr>
<td>Acupuncture</td>
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<tr>
<td>Transcutaneous electrical nerve stimulation (TENs)</td>
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<tr>
<td>Massage therapy</td>
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<tr>
<td>Behavioral therapy/biofeedback</td>
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<td>Yoga/traction</td>
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### Medications

<table>
<thead>
<tr>
<th>Pharmacologic management</th>
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<tbody>
<tr>
<td>Nonsteroidal anti-inflammatory drugs (NSAIDs)</td>
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<tr>
<td>Nonopioid analgesics</td>
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<tr>
<td>Tylenol, tramadol</td>
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<tr>
<td>Opioid analgesics</td>
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<tr>
<td>Antidepressants</td>
</tr>
<tr>
<td>Tricyclic antidepressants</td>
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<tr>
<td>Affect serotonin and noradrenaline</td>
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<td>Muscle relaxants</td>
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<tr>
<td>Gabapentin</td>
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Procedures

• Invasive procedures
  – Epidural steroid injections
  – Facet joint injections
  – Trigger point injections
  – Radiofrequency procedures
  – Sacroiliac joint procedures


• Surgery typically not beneficial for nonspecific back pain
Etiology

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Disc herniation

- Extrusion of disc material with compression of nerve

- Presentation includes:
  - Leg pain in the distribution of nerve that is under compression
  - With or without complaints of weakness in myotomal distribution
Disc herniation

• Physical examination findings:
  – Assess straight leg raise
  – Assess sensation
  – Assess strength

Disc herniation...Treatment

• Nonoperative treatment
  – No significant weakness on examination
  – Physical therapy
  – Medications
  – Injections

• Typically 6 weeks
Disc herniation

- Operative treatment
  - Microdiscectomy

Lumbar spinal stenosis

- Compression of the caudal nerve roots

- Etiology
  - Degenerative
  - Congenital

- Anatomy
  - Disc protrusion
  - Ligamentum flavum hypertrophy
  - Facet hypertrophy
Lumbar stenosis

- Presentation includes:
  - *Neurogenic claudication*
  - Buttock and leg pain and/or paresthesias with standing/walking
  - Decreased walking tolerance
  - Improvement with sitting or forward flexion

- Red flags for cauda equina:
  - Bowel incontinence
  - Overflow urinary incontinence
  - Weakness bilateral lower extremities
  - Saddle anesthesia
### Lumbar stenosis

- Physical examination findings:
  - Often normal physical examination

### Lumbar stenosis...Treatment

- Nonoperative treatment
  - No significant weakness on examination
  - Physical therapy
  - Medications
  - Injections

- Typically 6 weeks
### Lumbar stenosis

- Operative treatment
  - Laminectomy

### Degenerative spondylolisthesis

- Anterolisthesis of lumbar spine

  - Etiology
    - Degenerative
    - Congenital
    - Pathologic
    - Traumatic
    - Iatrogenic
    - Pars defect
Degenerative spondylolisthesis

- Presentation includes:
  - Start up pain
  - Leg pain secondary to radiculopathy
  - May have symptoms of neurogenic claudication
## Degenerative spondylolisthesis

- Physical examination findings:
  - Positive straight leg raise
  - Pain and/or paresthesias
  - Possible weakness

## Treatment

- Nonoperative treatment
  - No significant weakness on examination
  - Physical therapy
  - Medications
  - Injections

- Typically 6 weeks
**Degenerative spondylolisthesis**

- Operative treatment
  - Decompression with stabilization
  - Fusion is the biologic process

- Various surgical approaches
  - Posterior decompression with instrumented fusion
  - Lateral decompression with instrumented fusion
  - Anterior decompression with instrumented fusion
SPORTs trial

• Spine Patient Outcomes Research Trial
• Multicenter study with 13 sites
• 3 conditions studied
  – Disc herniations
  – Degenerative spondylolisthesis
  – Lumbar spinal stenosis
• Studied nonoperative vs. operative treatment
• Began March 2000

SPORTs trial

• Two armed study
  – Randomized arm
    • Patients watched shared decision making video and agreed to be put into randomized study
  – Observational arm
    • Patients unwilling to be randomized but did agree to participate in follow up evaluations
<table>
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<th>SPORTs trial</th>
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<tr>
<td><strong>Nonoperative treatments</strong></td>
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<tr>
<td>– Active physical therapy</td>
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<td>– Education with home exercise instruction</td>
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<td>– NSAIDS if tolerated.</td>
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<tr>
<td><strong>Operative treatments</strong></td>
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<tr>
<td>– Disc herniation: microdiscectomy or standard discectomy</td>
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<tr>
<td>– Lumbar spinal stenosis: posterior decompressive laminectomy</td>
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<tr>
<td>– Degenerative spondylolisthesis: Laminectomy with or without fusion</td>
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<tr>
<td>• With or without iliac crest autograft</td>
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<tr>
<td>• With or without instrumentation</td>
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SPORTs trial

- Objective outcome measures
  - SF-36
    - Physical function, mental health, general health, pain, physical limitations, emotional limitations, social functioning, vitality.
    - Higher scores indicate better outcomes
  - ODI
    - 10 questions: pain, getting dressed, lifting, walking, sitting, standing, sleeping, social, traveling, sexual activity
    - Higher scores indicate more disability

SPORTs trial

- Secondary outcomes measures
  - Preference based measures of current health
  - QALYs
  - Resource utilization
  - Direct inpatient costs
  - Direct outpatient costs
  - Indirect costs
## SPORTs trial...Summary

### Disc hernation
- Significant crossover in the randomized group
- Both treatment groups maintained improvement at 8 year period
- Patients who underwent surgery had significantly better self-reported outcomes than those with non-operative care in all categories except work status

### Degenerative spondylolisthesis
- Patients improve with surgery more than with non-operative care at 4 years period
- Use of instrumented fusion less clear in terms of overall benefit
- Surgery for spondylolisthesis is more invasive, associated with higher blood loss and more complications
SPORTs trial...Summary

• Lumbar spinal stenosis
  – Surgery was advantageous and results are persistent at 4 years period
  – Significant crossover in the randomized group

SPORTs trial...Secondary outcomes

• For each group, cost per QALY (quality-adjusted life year) gained for surgery compared to nonoperative care improved at 4 years
• QALY is a complex calculation based on multiple assumptions
• The SPORT trial has been a valuable study even though crossover has affected the design
SPORTs...Reference

- **SPORT Outcomes: Herniated Disc**
- **SPORT Outcomes: Degenerative Spondylolisthesis**
- **SPORT Outcomes: Spinal Stenosis**
- **SPORT Outcomes: Cost Effectiveness Analyses**

Etiology

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Additional...

• ...causes of back pain
  • Fracture
  • Tumor
  • Infection

Subacute L1 burst fracture

• 76 year old female who presents with 100% low back pain
• History reveals a fall 6 weeks ago with onset of back pain
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<tr>
<td>• 50 year old male who presents with 3 months history of low back pain and bilateral rib pain</td>
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<tr>
<td>• History reveals weight loss</td>
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Infection

• Typically insidious onset of back pain
• Risk factors predisposing to infection
  – Immunosuppression
  – Transplant
  – IV drug use

Summary

• Approach to back pain is multifaceted
• Identifying the etiology is important
• Education of the patient is necessary