Back pain in Primary Care

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1

SESSION OBJECTIVES

- Develop skills in taking a structured history in a patient presenting with back pain
- Recognise yellow flags and how to manage
- Recognise red flags and able to safety net or refer appropriately.
- Use a case study approach to explore current treatment options and differential diagnosis

2

3

Epidemiology

- 60 – 90% of adults experience back pain at some point in their life.
  - incidence age 35- 55 y.o.
  - 90% resolve in 6 weeks
  - 7% become chronic
  - M/ F equally affected
- 85% never given precise pathoanatomical disease
- 5th Leading reason for medical office visits
- 2nd to respiratory illness as reason for symptom-related GP visits

4

What elements of history and physical exam should clinicians incorporate into evaluation?

Key elements

- Sensory loss? Muscle weakness?
- Limited range of motion in the legs and feet?
- Characterize the pain level

3 categories of back pain

- Nonspecific low back pain
- Back pain associated with radiculopathy or spinal stenosis
- Other specific systemic or spinal causes of back pain

Identify any features indicating serious underlying cause

Identify radiculopathy (compressed nerve in the spine)

Identify any psychosocial factors

5

Uncomplicated Low Back Pain

A diagnosis based on exclusion of specific pathology

Generally classified by the duration of the pain

- Acute: < 1 month
- Subacute: 1-3 months
- Chronic: > 3 months

Majority (> 85%) of low back pain in primary care

Acute low back pain

- Rapid improvement in the first month in most patients
- High recurrence rate up to 1/3
- **Chronic low back pain** (7-10%)

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5

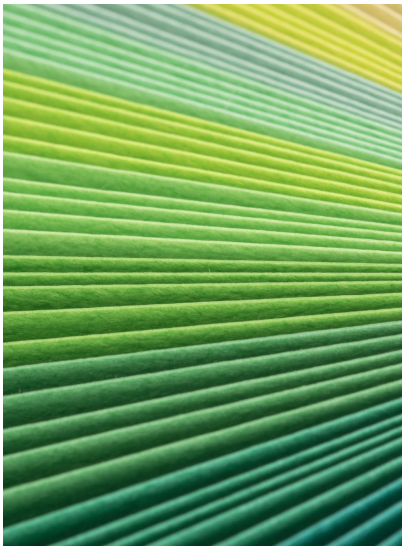
6

What is the anatomic source of LBP?

Controversial

Possible sources

- Discs
- Facet (Zygapophysial) Joints
- Sacroiliac Joints
- Ligaments
- Muscles



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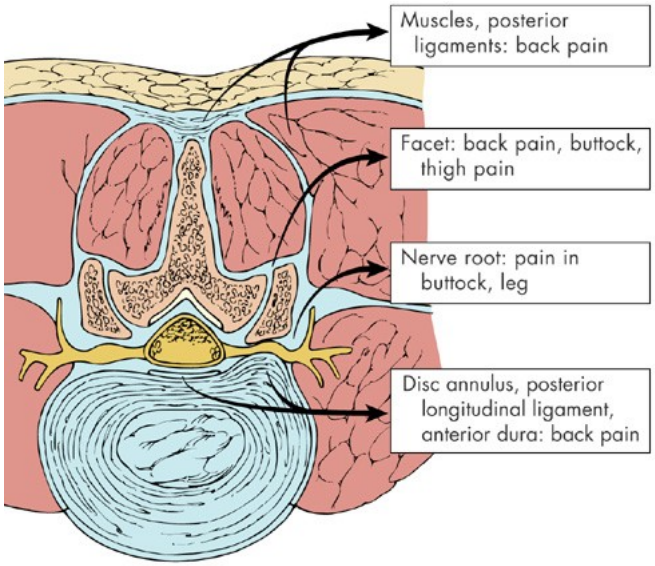

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Back Pain in the Primary Care Clinic

- 90% of low back pain is "mechanical"
  - Injury to muscles, ligaments, bones, disks
  - Spontaneous resolution is the rule
  - *Nonmechanical causes uncommon but don't miss them!*
  - Spondyloarthropathy
  - Spinal infection
  - Osteoporosis
  - Cancer
  - Referred visceral pain

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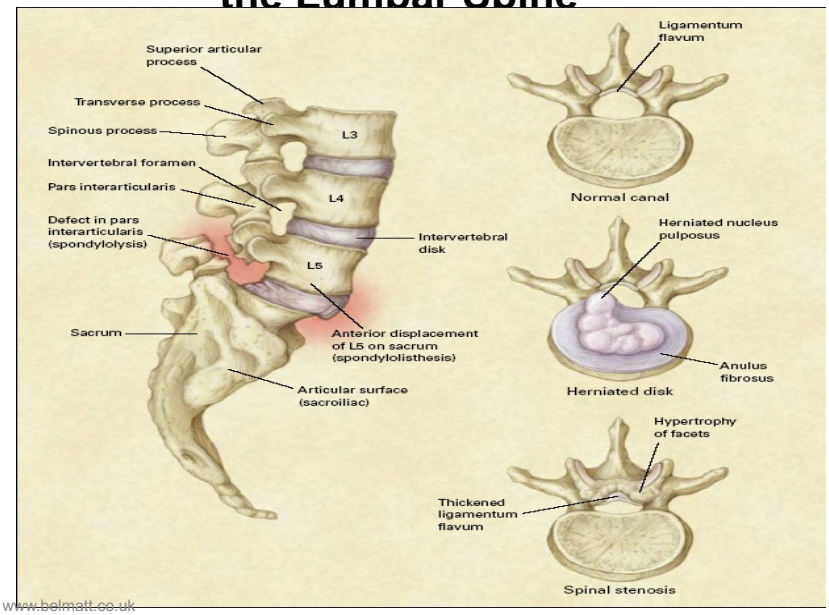
Common Pathoanatomical Conditions of the Lumbar Spine



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Case History 1

An obese 65-year-old man presents complaining of back pain that began 5 days ago while shoveling snow. The pain becomes worse when he stands

On exam: The spine is nontender, and pain increases with forward bending. Straight leg raising test is negative, and he has no neurologic deficits

10

11

Assessment of Function

98% disc herniations: L4-5; L5-S1

Impairment: Motor and Sensory L5-S1

L5: Weakness of ankle and great toe dorsaflexion
S1: Decrease ankle reflex
L5 & S1: Sensory loss in the feet

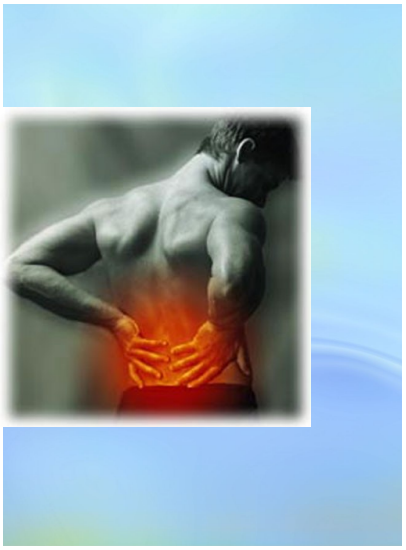
12

Low Back Pain

SECOND MOST COMMON CAUSE OF MISSED WORK DAYS

LEADING CAUSE OF DISABILITY BETWEEN AGES OF 19-45

NUMBER ONE IMPAIRMENT IN OCCUPATIONAL INJURIES



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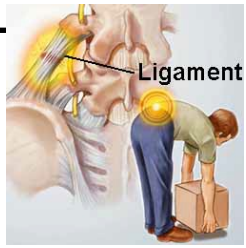
Low Back Pain



Most episodes of LBP are self limited

These episodes become more frequent with age

LBP is usually due to repeated stress on the lumbar spine over many years ("degeneration"), although an acute injury may cause the initiation of pain

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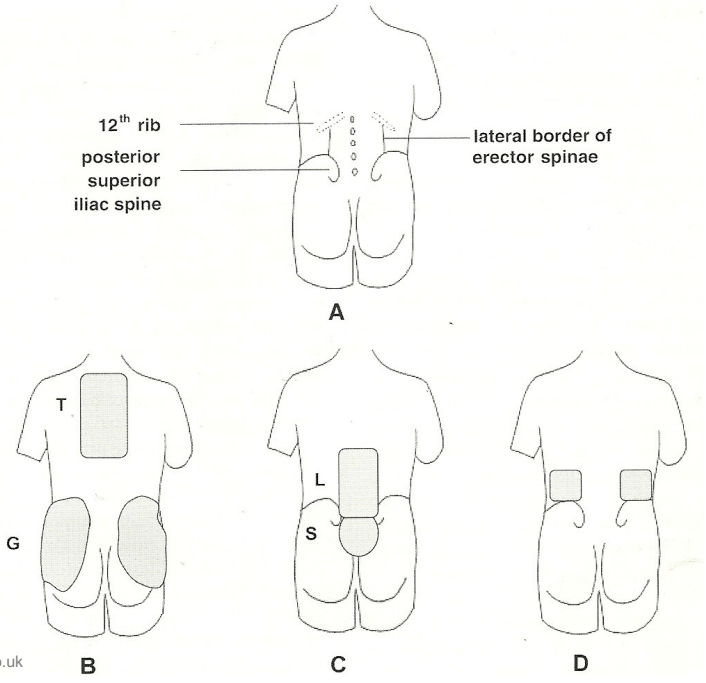

15

Management of Acute LBP: Watchful Waiting

- Patient education
  - Spontaneous recovery is the rule
  - Those who remain active despite acute pain have less future chronic pain
  - Exercise has Prevention Power: Muscle strengthening and endurance exercises
- Rest: 2 to 3 days or less
- Analgesics to permit activity: paracetemol, NSAIDs, ?codeine
- Reassess if pain worsens

- Eur Spine J. 2018 Nov;27(11):2791-2803. doi: 10.1007/s00586-018-5673-2. Epub 2018 Jul 3.
- **Clinical practice guidelines for the management of non-specific low back pain in primary care: an updated overview.**
- Oliveira CB, Maher CGPinto RZ, Traeger AC, Lin CC[2], Chenot JF, van Tulder M, Koes BW.

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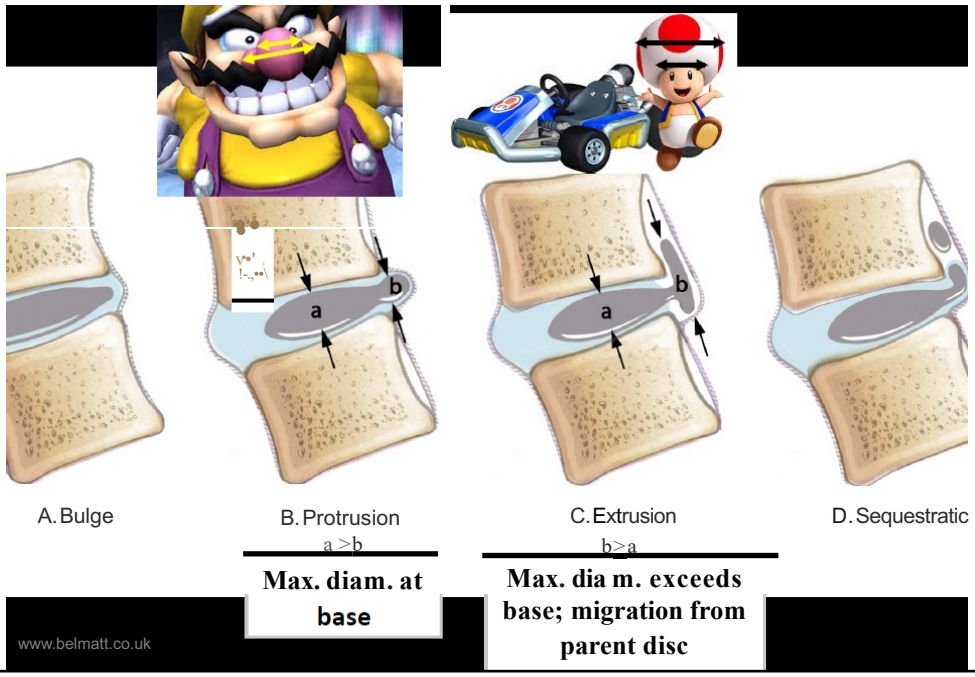

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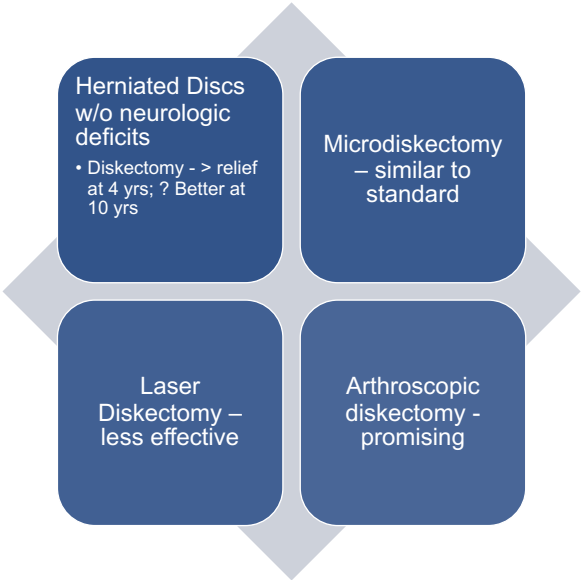
Therapy: Non-specific LBP

- NSAIDS
- Muscle relaxants
- Use on schedule than p.r.n.
- Spinal manipulation/ P.T.(effects limited)
- Delay referral until pain persists >3 weeks
  - 50% will improve b/f this time period
- Rapid return to normal activities
- Avoid heavy lifting, trunk twisting, vibrations
- Alternative Tx: acupuncture and massage
- Surgery- ineffective unless:
  - sciatica, pseudoclaudication, spondylolisthesis

17

18

Long Term Outcomes



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19

What factors are associated with development of low back pain?

- Work that requires heavy lifting; bending and twisting; or whole-body vibration, such as truck driving
- Physical inactivity
- Obesity
- Arthritis or osteoporosis
- Pregnancy ØAge >30 years ØBad posture
- Stress or depression
- Smoking

20

Should clinicians advise patients about preventing low back pain?

- Strategies to decrease risk for low back pain
  - Maintain normal body weight
  - Exercise
  - Avoid activities that can injure the back
- There's insufficient evidence to recommend routine preventive interventions in the primary care setting

What psychological therapies are effective?

- Cognitive behavioral therapy
  - Best evidence for use in subacute or chronic low back pain
- Other psychological therapies
  - Evidence less conclusive
  - Most effective when targeted at those with psychosocial risk factors for chronic disabling low back pain
  - Intensive inter- / multidisciplinary therapy consisting of physical, vocational, and behavioral interventions more effective than standard care
  - Important treatment option

Are specific preventive measures effective for prevention?

- Certain jobs increase the risk for low back pain
  - Jobs that require heavy lifting and other physical work
- Interventions that might help prevent it
  - Educational interventions
  - Mechanical supports
  - Post-treatment exercise program to prevent recurrence
- Low back pain is a common cause of lost work days and the need for workers' compensation.

23

CLINICAL BOTTOM LINE: Prevention…

- Prevention may include
  - Regular exercise and maintenance of fitness Educational interventions
  - Worksite prevention programs
  - Mechanical supports.
- But evidence is insufficient to support the use of specific preventive interventions

24

First Episode Acute LBP: Red Flags for Emergent Surgical Consultation

- Cauda equina syndrome
  - Bilateral sciatica, saddle anesthesia, bowel/bladder incontinence
- Abdominal aortic aneurysm
  - Pain pattern is variable
  - Bruits
  - +/- pulsatile abdominal mass
- Significant neurologic deficit
  - If they can't walk, they can't be sent home

Case 1: Lower Back Pain Recurrence

- The patient reports he got over that last "attack" in less than a week but has had low back pain ever since. He now returns 2 years later because of another attack of acute back pain after chopping wood
- On exam: Spine motion is limited because of guarding and muscle spasm. Straight leg raising test is negative and neurologic exam is normal

LBP Recurrences: Key Points

- Goal of evaluation is to identify features that discriminate between "benign" cases and disorders that require further diagnostic studies
  - As before, recommend minimal rest, analgesics, and resumption of usual activity as soon as possible
  - Again, advise that most episodes resolve spontaneously
  - But if neurologic deficit develops, further evaluation mandatory

27

When the Patient Does Not Improve...

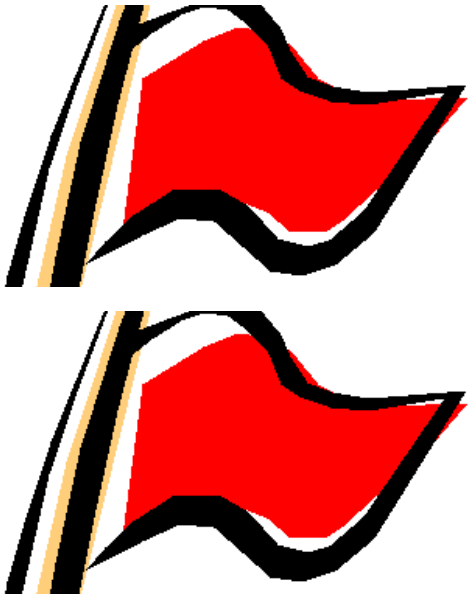
- The patient returns in 6 weeks because the pain has not decreased. His legs feel "heavy," and he has had some incontinence in the last week
- On exam: He now has bilateral weakness of ankle dorsiflexion, absent ankle jerks, and saddle anesthesia

27

28

RED FLAGS

- Fever, weight loss
- Intractable pain—no improvement in 4 to 6weeks
- Nocturnal pain or increasing pain severity
- Morning back stiffness with pain onset before age 40
- Neurologic deficits



28

29

What Should I Be Worried About?

- Herniated disk
- Spinal stenosis
- Cauda equina syndrome
- Inflammatory spondyloarthropathy
- Spinal infection
- Vertebral fracture
- Cancer
- Referred visceral pain, eg, abdominal aneurysm, pancreatic cancer, GU cancer

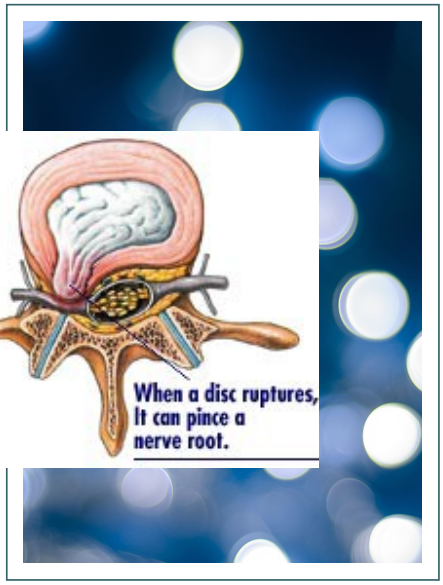
29

30

Disc Herniation – Physiology

Tears in the annulus

Herniation of nucleus pulposus



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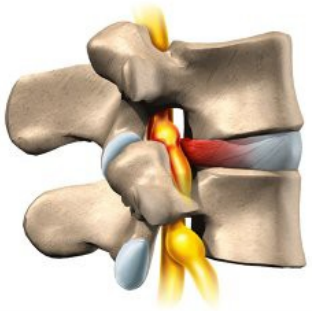
Disc Herniation – Physiology

Compression of the nerve root inthe foramen leads to pain



Lumbar Disc Herniation – Treatment

Conservative Tx.

- Moderate bed rest
- Spinal manipulation
- Physical therapy
- Medication
  - NSAIDs
  - Muscle relaxants
  - Rarely narcotics

Surgical Tx.

"Microdiscectomy"

Less than half of an inch incision

Go home the same or next day

Good results in up to 90% of cases

33

Lumbar Spinal Stenosis

- Insidious onset
- Chronic low back pain that progresses to buttock, thigh and leg pain.
- Fatigue, heaviness or pain in the legs with ambulation (Neurogenic claudication)

34

Neurogenic vs. Vascular Claudication

SYMPTOMS	NEUROGENIC	VASCULAR
Back Pain	Common	Uncommon
Pain Relief	Sitting or flexed posture	Not positional
	Standing and resting usually insufficient	Pain relief while standing
	Often slow (>5 mins)	Almost immediate
Ambulatory tolerance	Variable	Fixed
Uphill vs. Downhill	Downhill more painful (extended posture)	Uphill more painful
Bicycle ride	No pain	Pain

35

Lumbar Spinal Stenosis

Most common exam findings

- Loss of lumbar lordosis with limited extension
- Trunk is flexed forward in standing and walking. (“Simian Posture”)
- No significant tenderness to palpation
- Negative SLR
- Normal motor exam despite the report of weakness

35

36

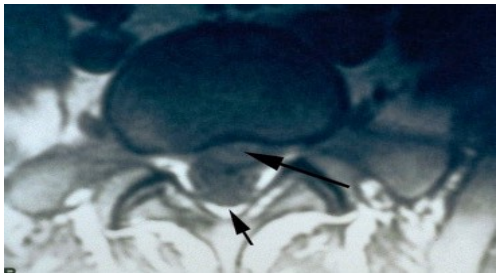
Management of Spinal Stenosis: Controversial and Evolving

- Symptoms of pseudoclaudication without neurologic deficits:
  - Epidural corticosteroids
  - Progressive exercise program
  - Surgical decompression
    - May relieve leg symptoms
    - May not relieve back pain
- With neurologic deficits: Call the surgeon

36

What If He Had Disk Herniation?

- MRI image shows a protruding disk (arrow) that compresses the thecal sac (short arrow)



Therapy: Herniated Disks

- If no evidence cauda equina or progressive neurologic deficit: Treat non-surgically minimum one month
- Treat similar to non-specific LBP Limited narcotics
- Epidural steroids (helps in some)

- If severe pain or neuro deficits persist: CT/ MRI / consider for surgery

- Discectomy
- Improved relief vs. non-surgery at 4 yrs./ ? 10yrs. Percutaneous and laser less effective Arthroscopic techniques comparable to surgery

39

Why Not to Get an Operation for a Herniated Disk?

- Spontaneous recovery is the rule: 90% resolve over 6 weeks
- Predominant symptoms usually leg pain and tingling with less severe or no back pain
- Long-term outcome of pain relief no different with or without surgery

40

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Case Study

- A 32-year-old man complains of severe low back pain of gradual
- onset over the past few years. The pain is much worse in the
- morning and gradually decreases during the day. He denies fever or weight loss but does feel fatigued
- On exam: There is loss of lumbar lordosis but no focal tenderness or muscle spasm. Lumbar excursion on Schober test is 2 cm. No neurologic deficits

41

How to Diagnose Inflammatory Back Disease

- History
  - Insidious onset, duration >3 months
  - Symptoms begin before age 40
  - Morning stiffness >1 hour
  - Activity improves symptoms
  - Systemic features: Skin, eye, GI, and GU symptoms
  - Peripheral joint involvement
  - Infections

42

How to Diagnose Inflammatory Back Disease

- Physical examination
  - Limited axial motion in all planes
  - Look for signs of infection
    - *Staph, Pseudomonas, Brucella*, and TB
  - Systemic disease (AS, Reiter's, psoriasis, IBD)
    - Ocular inflammation
    - Mucosal ulcerations
    - Skin lesions

Testing Spinal Mobility: Schober's Test

- 10 15 cm
- Two midline marks 10 cm apart
- starting at the posterior superior iliac spine (dimples of Venus)
- Re-measure with lumbar spine at maximal flexion
- Less than 5 cm difference suggests pathology

Ankylosing Spondylitis

- The earliest clinical features
  - Gradual onset in males < 30 years old
  - Morning stiffness
  - Improvement with exercise
  - Not relieved by bed rest
- Schober test
- Chest expansion <2.5 cm (late stage)
- Plain films typically normal in early stages
- 76% chance of ACS and 50% chance of VTE in these patients.

- Wang R, Ward MM. Epidemiology of axial spondyloarthritis: an update. Curr Opin Rheumatol. 2018 Mar;30(2):137-143.
- https://www.ncbi.nlm.nih.gov/books/NBK539753/

Ankylosing Spondylitis: X-Ray Changes

Management of Inflammatory Back Pain

- Stretching and strengthening exercises
- Conditioning exercises to improve cardiopulmonary status
- Avoid pillows
- NSAIDs
- Sulfasalazine
- Methotrexate
- New "biologics" under study

van der Heijde D, Ramiro S, Landewé R, Baraliakos X, Van den Bosch F, Sepriano A, Regel A, Ciurea A, Dagfinrud H, Dougados M, van Gaalen F, Géher P, van der Horst-Bruinsma I, Inman RD, Jongkees M, Kiltz U, Kvien TK, Machado PM, Marzo-Ortega H, Molto A, Navarro-Compàn V, Ozgocmen S, Pimentel-Santos FM, Reveille J, Rudwaleit M, Sieper J, Sampaio-Barros P, Wiek D, Braun J. 2016 update of the ASAS-EULAR management recommendations for axial spondyloarthritis. Ann. Rheum. Dis. 2017 Jun;76(6):978-991

47

Disc Herniation – Physiology

- Tears in the annulus
- Herniation of nucleus pulposus

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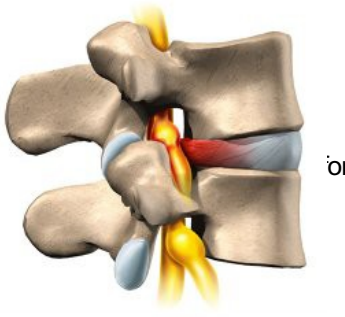
48

Disc Herniation – Physiology

- Compre
  leads to



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48

Lumbar Disc Herniation – Treatment

Conservative Tx.

- Moderate bed rest
- Spinal manipulation
- Physical therapy
- Medication
  - NSAIDs
  - Muscle relaxants
  - Rarely narcotics

Surgical Tx.

"Microdiscectomy"

Less than half of an inch incision

Go home the same or next day

Good results in up to 90% of cases

Case Study

A 40-year-old woman complains of continuous and increasing back pain for 3 months that worsens with movement. She has noted nightly fevers and chills. She is in a methadone maintenance program

On exam she is exquisitely tender over L4 and the right sacroiliac joint with paravertebral muscle spasm. No neurologic deficits. Old needle tracks in both arms

Lab: Hb 11.5 mg%, WCC 9,000, ESR 80 mm/h

51

Red Flags for Spinal Infections

Historical clues	Fever, rigors Source of infection: IV drug abuse, trauma, surgery, dialysis, GU, and skin infection
Physical exam clues	Focal tenderness with muscle spasm Often cannot bear weight Needle tracks
Lab clues: Mild anemia, elevated ESR, and/or CRP	

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51

- Acute infection
  - Bacterial
  - Fungal
- Chronic infection
  - Bacterial
  - Fungal
  - Tuberculosis
  - Brucellosis

LBP: Spinal Infections

Sites of spinal infection

Vertebral osteomyelitis

Disk space infection

Septic sacroiliitis

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52

Case Study

A 60-year-old man complains of the insidious onset of low back pain that worsens when he lies down, so he sleeps in a recliner. There is a remote history of back injury. He has lost 10kg in the past 6 months

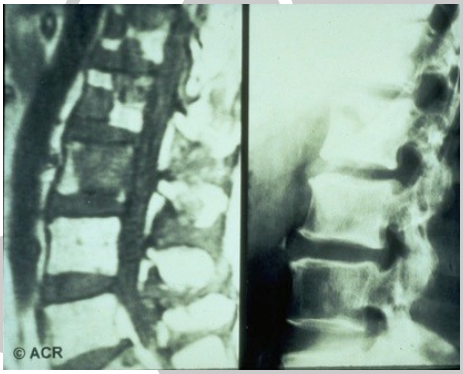
On exam he has lumbar spine tenderness but no neurologic deficits

Laboratory: Hb 9 mg%, WCC 9,000,

ESR 110 mm/h, monoclonal spike on serum protein electrophoresis

Multiple Myeloma

- Red flags for spinal malignancy
  - Pain worse at night
  - Often associated local tenderness
  - FBC, ESR, protein electrophoresis if ESR elevated



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Follow-up

The patient improved markedly after chemotherapy and bone

marrow transplant.

Key point: Nocturnal back pain, weight loss, and ESR >100 mm/h suggests malignancy

55

56

Canc er

- **Past history of cancer** is by far the single strongest indicator
  related low back pain.
  - Metastatic (Prostate, Lung, Breast)
  - Multiple myeloma
  - Lymphoma
- Increases post test probability from 0.7% to 9%
- Not including nonmelanoma skin CA

56

57

Case Study

- An 82-year-old woman experienced sudden sharp low back pain
- while gardening that has persisted and worsened. The pain does not radiate
- On exam: She is grimacing in pain; vital signs are normal; thoracic kyphosis, loss of lumbar lordosis, and palpable muscle spasm

57

58

Approach to Acute Back Pain in the Elderly

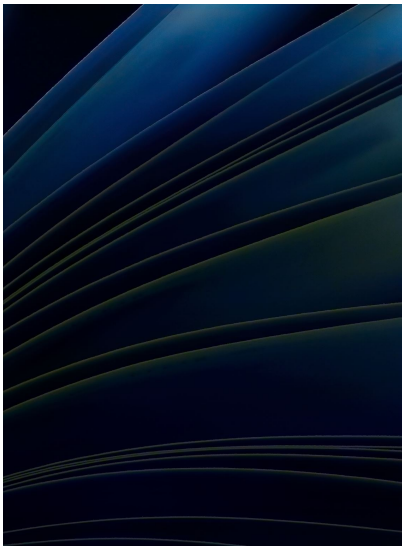
History and physical exam

Immediate x-ray

Screening laboratory tests

FBC

Sedimentation rate (protein electrophoresis if elevated)



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59

Features of Acute Compression Fractures

- No early warning, often occurs with forward flexion during normal
- activity or with trivial trauma
- Severe spinal pain
- Marked muscle spasm
- Some relief with recumbency

60

Osteoporosis: Initial Evaluation

Universal: Hgb, ESR, calcium

Additional labs as indicated:

- TSH, PTH, 25-OH Vitamin D
- Serum protein electrophoresis
- Urine calcium
- Testosterone

61

Risk Factors for Osteoporosis

- Female sex, Caucasian, or Asian race
- Maternal hip fracture
- Estrogen or testosterone deficiency
- Corticosteroid excess
- Low body mass
- Life-long low calcium intake
- Sedentary life style or immobility
- Excessive alcohol intake
- Smoking

61

62

Osteoporosis: BMD Measures

- Indications
  - Establish baseline bone mineral density
  - Guide treatment decisions
  - Monitor therapy
- Methods
  - Dual energy x-ray absorptiometry (BEST IN CLASS)
  - Quantitative CT
  - Single energy x-ray absorptiometry
  - Quantitative ultrasound of bone

62

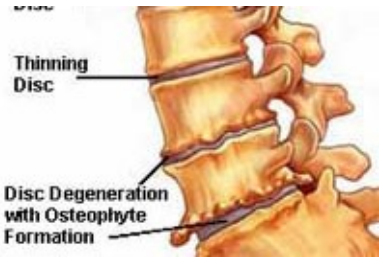
63

Long-Term Treatment of Osteoporosis

- Baseline: Measure bone mineral density and height
- Discuss hormone replacement or selective estrogen receptor modulator (SERM)
- Thiazide if hypercalciuric
- Begin calcium and vitamin D
- Recommend bisphosphonates
- Instruct on progressive walking and strengthening exercises

64

Disc Degeneration – Physiology



- With age and repeated efforts,
- the lower lumbar discs lose their
- height and water content ("bone on bone")
- Abnormal motion between the bones leads to pain

Disc Degeneration – Treatment

- **Conservative Tx.**
- Moderate bed rest
- Spinal manipulation
- Physical therapy
- Medication
  - NSAIDs
  - Muscle relaxants
  - Rarely narcotics

- Surgical Tx.
- Lumbar fusion
  - OR
- Replacement with artificial disc

Indications for Surgical Treatment

- Low back pain for at least 2 years
- Incapacitating
- Resistant to physical therapy and medication
- Positive MRI findings (degenerative changes) at L4-5 and/or L5-S1
- For selected cases:
  - Concordant pain on discography
  - Psychological evaluation

67

Nerve Root Pain

- Associated w/ Radiculopathy
- Sciatica
  - -herniated disk
  - -foramenal or spinal stenosis
  - -ligamentous hypertrophy
  - -other space filling lesions: cysts, tumor, abscess
  - -viral or immune inflammation
  - -can occur w/ peripheral nerve involvement
- Spinal stenosis
  - -neurogenic claudication (pseudo claudication)
    - 1 or both legs
  - -radiation to buttocks, thighs, lower legs
  - -pain increase with extension (standing, walking)
  - -pain decrease with flexion (sitting, stooping forward)

68

Straight Leg Raise

The straight leg raise test is positive if pain in the sciatic distribution is reproduced between 30° and 70° passive flexion of the straight leg. Dorsiflexion of the foot exacerbates the pain

What factors should lead clinicians to suspect nerve root involvement?

- Consider if patient presents with back & leg pain
  - The more distal the pain radiation, the more specific the symptom for nerve root involvement
  - Pain that radiates from the back through the buttocks to the legs (sciatica) is common
  - Severe or progressive motor deficits warrant urgent evaluation (regardless of origin)
  - Symptoms of vascular claudication (not stenosis): leg pain with exertion, rather than with changes in position

Treatment Sciatica

- Explain cause of the symptoms and reassure patients that symptoms usually diminish over time without specific measures
- Advise to stay active and continue daily activities; a few hours of bed rest may provide some symptomatic relief but does not result in faster recovery
- Prescribe drugs, if necessary, according to four steps: paracetamol; non- steroidal anti-inflammatory drugs; tramadol, paracetamol, or non- steroidal anti-inflammatory drug in combination with codeine; and morphine
- Refer to neurosurgeon immediately in cases of cauda equina syndrome or acute severe paresis or progressive paresis (within a few days)
- Refer to neurologist, neurosurgeon, or orthopaedic surgeon for consideration of surgery in cases of intractable radicular pain (not responding to morphine) or if pain does not diminish after 6-8 weeks of conservative care

71

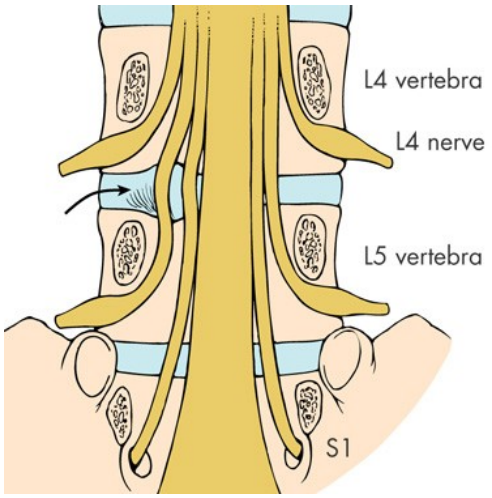
What factors should lead clinicians to suspect nerve root involvement?

- Symptoms of disk herniation
  - Weakness of the ankle and great toe dorsiflexors
  - Loss of ankle reflex or sensory loss in the feet
  - Symptoms of nerve root compression Leg pain is worse than back pain Straight leg-raising test result is positive
  - Neurologic symptoms in the foot are unilateral
- Neurologic compromise at upper motor neuron
  - Causes: tumor or central disk herniation

72

What factors should lead clinicians to suspect nerve root involvement?

- Spinal cord compression above conus medullaris
  - Weakness, decreased motor control, altered muscle tone, spasticity or clonus
  - Requires urgent specialist consultation
- Spinal cord compression below the conus medullaris
  - Cauda equina syndrome: bowel or bladder dysfunction, saddle anesthesia
  - Requires immediate imaging and surgical evaluation



Physical exam maneuvers that suggest herniated disk

- Straight-leg–raising test
  - Passive lifting of the affected leg by the examiner to an angle <60 degrees reproduces pain radiating distal to knee
- Crossed straight-leg–raising test
  - Passive lifting of the unaffected leg by the examiner reproduces pain in the affected (opposite) leg

75

Clues To Systemic Disease

- Age
- History of Cancer
- Fever
- Unexplained Weight Loss
- Injection Drug Use
- Chronic Infection Elsewhere
- Duration and Quality of Pain
  - -Infection and Cancer not relieved supine
- Response to previous therapy
- h/o inflammatory arthritis elsewhere

75

76

What serious underlying systemic conditions should clinicians consider?

- Compression fracture
  - Associated with older age, white race, trauma, prolonged corticosteroid use
- **Nonskin cancer**
  - q **Hx cancer: strongest risk factor for cancer-related back pain**
    - q **Also: unexplained weight loss, no relief with bed rest, pain lasting >1 month, increased age**
- **Ankylosing spondylitis**
  - q **≥4 of following: morning stiffness, decreased discomfort with exercise, onset of back pain before age 40, slow symptom onset, pain persisting >3 months**
- **Osteomyelitis**
  - q **History of IV drug use, recent infection, fever**

76

77

Is the classification by duration of symptoms clinically useful?

- Acute: Lasts <4 weeks
  - Often cause can't be determined
  - May be related to trauma or musculoligamentous strain
  - Usually resolves within 4 weeks with self care
- Subacute: Lasts 4–12 weeks

  Trasition period between acute and chronic back pain

  Improvement is not as pronounced as in the acute phase
- Chronic: Lasts >12 weeks

  Patients at risk for long-term pain or functional disability

  Episodes of pain may recur ("acute-on-chronic" symptoms)

78

Do standardized assessment instruments have a role in evaluation?

Use to measure the impact of low back pain

Pain severity doesn't always correlate with effects on function

Pain

10-point numerical rating scale

Function

Modified Roland–Morris scale

Oswestry Disability Index

STarT Back Screening Tool

79

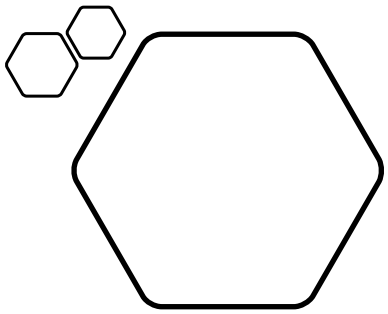
What psychosocial issues are important for clinicians to consider when evaluating patients with low back pain?

- Psychosocial distress associated with poor outcomes
  - Attention to this distress may benefit recovery
- Maladaptive coping strategies
  - Avoidance of work, movement, other activities due to fear
  - Catastrophizing (negative thoughts about the future)
- Waddell signs: nonorganic / psychological component
  - Nondermatomal distribution of sensory loss
  - Pain on axial loading; regional weakness / sensory change
  - Nonreproducibility of pain when the patient is distracted
  - Exaggerated and inconsistent painful responses

79

80

When should clinicians consider imaging?



- If history or physical suggests specific underlying cause
  - Neurologic deficits are severe or progressive
  - Serious underlying conditions are suspected
- If patients are candidates for surgery or epidural injection
  - Persistent low back pain
  - Signs or symptoms of radiculopathy or spinal stenosis
  - Use MRI (preferred) or CT

80

81

Imaging

- Plain Radiography limited to patients with:
  - -findings suggestive of systemic disease
  - -trauma
- Failure to improve after 4 to 6 weeks
- CT and MRI more sensitive for cancer and infections
- – also reveal herniation and stenosis
- Reserve for suspected malignancy, infection or persistent neurologic defecit

82

X ray

Asymptomatic degenerative changes

Finding of degenerative disc disease, spondylolisthesis or pars defect does not establish the cause of low back pain.

83

MRI

Recommended initial imaging study of choice in complicated low back pain

Cancer	Infection	Cauda equina syndrome	Severe or progressive neurologic deficit

Lumbar disc herniation

Lumbar spinal stenosis

83

84

MRI

- MRI often shows abnormal findings in asymptomatic patients.
- At age 42, disc bulges in 52% and protrusion in 27% of asymptomatic adults
- After age 60, these findings are even more common.
- Spinal stenosis in 25% of asymptomatic adults over 60 years.
- Shows tumors and soft tissues (e.g., herniated discs) much better than CT scan
- Almost never an emergency — Exception: Cauda equina syndrome

84

85

CT Scan

Shows bone (e.g., fractures) very well

Good in acute situations (trauma)

Sagittal reconstruction is mandatory

Soft tissues (discs, spinal cord) are poorly visualized

CT-myelogram adds contrast in the CSF and shows the spinal cord and nerves contour better

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86

Under what circumstances should clinicians consider electromyography and other laboratory tests?

- Possible cancer but negative lumbar radiography
  - Check erythrocyte sedimentation rate: high elevation associated with presence of cancer
- **Uncertainty about relationship of leg symptoms to anatomical findings on advanced imaging**
  - **Assess with electromyography and nerve conduction tests**
- **Possible myelopathy, radiculopathy, neuropathy, myopathy**
  - **Assess with electrophysiologic tests**
  - **Don't test patients with duration of symptoms < 4 weeks**
    - **Radiculopathy or neuropathy: results might be unreliable in limb muscles until > 3 to 4 wks limb symptoms**

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87

What psychosocial factors influence recovery?

- Depression
- Maladaptive coping behaviors
- Unemployment or job dissatisfaction
- Somatization disorder
- Psychological distress

- **Presence increases likelihood for delayed recovery**
  - **Stronger predictors of outcomes than physical exam findings or severity and duration of pain**
- **Targeted interventions**
  - **Supervised exercise therapy**
  - **Cognitive behavioral therapy**
  - q **Intensive multidisciplinary rehabilitation**

87

88

What advice should clinicians give to patients regarding level of activity and exercise?

Prolonged inactivity is associated with worse outcomes

Minimize bed rest	Maintain activity levels as near to normal as possible	As long as warning signs of serious underlying pathologic conditions are lacking	ØMost patients with nonspecific occupational low back pain can return to work quickly	ØBack-specific exercises don't need to be started while patient is in acute pain

88

Are complementary-alternative medicine therapies effective?

- Interventions that probably have some benefit
  - Spinal manipulation
  - Massage
  - Acupuncture
- Possible benefit
  - Willow bark extract (salicin) and devil's claw
  - Unknown effectiveness Glucosamine and chondroitin
- Probably ineffective
  - Bipolar magnets, the Feldenkrais Method, reflexology

What other physical interventions are effective?

- Superficial heat
- Traction
- Transcutaneous electrical nerve stimulation
- Ultrasound
- Low-level laser therapy
- Interferential therapy
- Short-wave diathermy

➢ **RCTs have found little evidence of benefits**

Patient expectations and placebo effects may play a role

When should drug therapies be considered, and which drugs are effective?

- First-line drug therapy: acetaminophen or NSAIDs
- Adjunctive: short course muscle relaxants or opiates Use opioids with caution, assess risk before prescribing q
  Tramadol "dual-action" opioid agonist: affects neuro-
  - transmitters as well as weak μ-opioid receptor affinity
- Antidepressants that inhibit norepinephrine reuptake
  - Tricyclic or tetracyclic antidepressants, serotonin- norepinephrine reuptake inhibitors
- Depression common in chronic low back pain
  Antidepressants not appropriate for acute low back pain
- Anticonvulsants (carbamazepine, gabapentin, pregabalin)
  - Limited evidence of efficacy in treating radiculopathy

92

What are the indications for surgical intervention?

- Immediate referral: possible decompression or debridement
- qSuspected cord or cauda equina compression
- qSpinal infection
- **Less urgent surgical evaluation appropriate Worsening suspected spinal stenosis Neurologic deficits**
- **Intractable pain that resists conservative treatment**
  - **Role of surgery for chronic back pain without neurologic findings is less clear**

93

- Signs urgent surgical intervention may be needed
  - Bowel- or bladder-sphincter dysfunction
  - Diminished perineal sensation, sciatica, or sensory motor deficits
  - Severe, progressive, bilateral or unilateral motor deficits

Other signs surgical intervention may be needed

- **Weakness of the ankle and great toe dorsiflexors**
- **Loss of ankle reflex**
- **Sensory loss in the feet**
- **Persistent leg pain in addition to and more severe than back pain**

94

What are reasonable goals for clinicians and patients for treatment of low back pain?

Acute, nonspecific low back pain

- Control pain + maintain function
- Symptoms often diminish without treatment
- Most cases resolve within 4 to 6 weeks

Chronic low back pain

- Maintain function, even if complete resolution not possible
- Address psychosocial factors associated with chronicity
- Focus more on interventions that increase activity than on medical treatments

Most patients don't need surgery, even with herniated disks

95

How should clinicians follow patients with low back pain?

- Follow-up needed after 3 to 4 weeks if no improvement
- If recovery is delayed
  - Address patient response to treatment, any complications
  - Assess probability of transition to subacute / chronic pain
  - Reevaluate for possible underlying causes of back pain
  - Ensure that psychosocial factors are addressed

- **Symptoms of neurologic dysfunction or systemic disease should prompt additional evaluation**
- **Reinforce healthy lifestyle messages (staying active)**
- **Patient education helps prevent recurrence**

96

CLINICAL BOTTOM LINE: Treatment...

- Most acute nonspecific pain resolves w/o medical intervention Maintain normal activities as much as possible
- If symptoms persist, consider nondrug interventions Exercise, spinal manipulation, acupuncture, massage Psychological therapies
- If analgesia needed
  - First-line therapy: paracetemol or NSAIDs
  - Muscle relaxants / opiates: short course only, cautiously Antidepressants: may be helpful for chronic symptoms
- Urgent surgical referral indicated: if infection, cancer, acute nerve compression, or cauda equina syndrome suspected
- Nonurgent surgical referral: if back pain persists + symptoms suggest nonacute nerve compression or spinal stenosis

Waddell's Signs

- **Superficial tenderness**: Pain elicited from light touch on the skin
- **Simulation**: Back pain is produced by maneuvers that should not be painful such as axial loading of the head (1-2 lb) or passive rotation of shoulders and pelvis in the same plane.
- **Distraction**: Asymptomatic response to a test, such as straight- leg-raise, changes when the test is repeated while the patient is distracted.
- **Regionalization**: Ratchet like "giving way" weakness or non-neuroanatomic numbness
- **Overreaction**: Disproportionate response to routine examination such as collapsing, grimacing, guarding, groans, tremors or any other type of overreaction.

- (Behavioral response to examination, Not a proof of malingering,
- >3 signs suggest the presence of non-organic factors)

Prognosis

- **Psychosocial Risk Factors**
  - "Yellow Flags" and Waddell's signs are psychosocial risk factors of delayed recovery.
  - More predictive of outcome than severity of pain or any exam findings.
- **Duration of Symptoms**
  - The status of patients at 2 months may help predictor the outcome at 12 months.

"Yellow Flags"

- Previous history of disability
- Inconsistent findings
- Abnormal pain behavior
- Litigation
- Work dissatisfaction
- Attention seeking
- Preference for prolonged bed rest
- Depression
- Chemical dependency
- History of abuse
- Family history of chronic pain

Key Points About Acute Back Pain

- 90% of cases due to mechanical causes and will resolve spontaneously within 6 weeks to
- 6 months
- Pursue diagnostic work-up if any red flags found during initial evaluation
- If ESR elevated, evaluate for malignancy or infection
- In older patients initial x-ray useful to diagnose compression fracture or tumor*

Summary – Low Back Pain

- Be aware of "Red Flags."
- Identify specific diagnosis.
- Uncomplicated LBP is a diagnosis of exclusion.
- MRI for complicated and specific diagnosis.
- MRI for uncomplicated?
- Diagnostic Injections
- Don't forget the "Yellow Flags."

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103