Evaluation & Treatment of Back Pain in the Adult Patient in the Primary Care Setting.

William T. Crowe, RN, FNP-BC, MSN, MBA

Disclaimer

- I, William T Crowe, have relevant financial relationships to be discussed, directly or indirectly, referred to or illustrated with or without recognition within the presentation as follows:
  - None

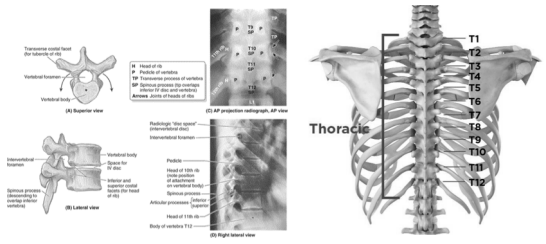
Objectives

- Review anatomy of the back
- Define elements of subjective history
- Define elements of objective exam
- Discuss current treatment regimens for various problems

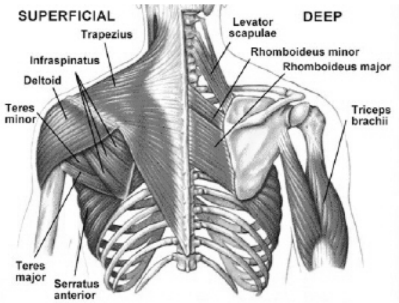
General

- Incidence - ~ 84% of US adults have reported LBP sometime in their life
- 2010 - back symptoms principal reason for 1.3% of office visits
- 2012 – low back pain 3.4% of ED visits

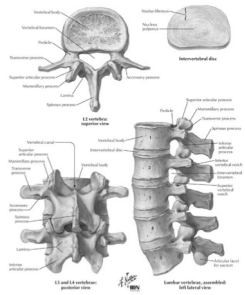
Anatomy – Thoracic Skeletal



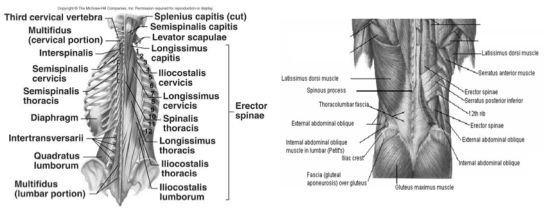
Anatomy – Thoracic Muscles



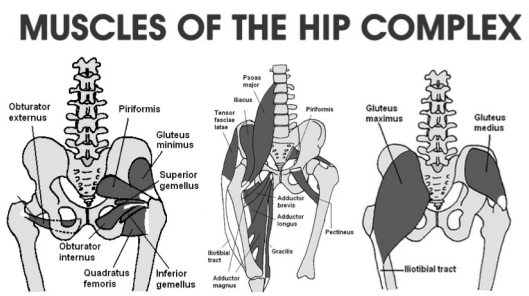
Anatomy – Lumbar Skeletal



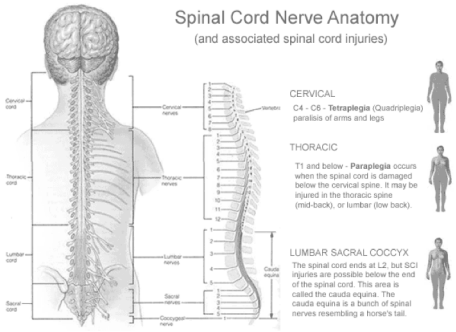
Anatomy – Lumbar Muscle



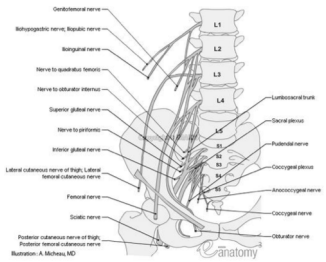
Anatomy – hip Muscles



Anatomy - Nerves



Anatomy - nerves



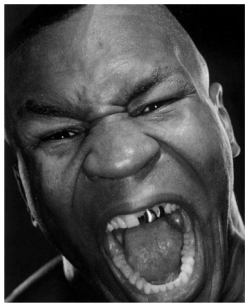
ROM

Average Healthy Ranges of Motion Measured from Anatomic Position

	Lumbar Spine (L1-L2 to L5-S1)	Thoracic Spine (T1-T2 to T12-L1)	Thoracolumbar Spine (T1-T2 to L5-S1)
Flexion	50 degrees	35 degrees	85 degrees
Extension	15 degrees	25 degrees	40 degrees
Right lateral flexion	20 degrees	25 degrees	45 degrees
Left lateral flexion	20 degrees	25 degrees	45 degrees
Right rotation	5 degrees	30 degrees	35 degrees
Left rotation	5 degrees	30 degrees	35 degrees

Subjective/History

- Where does it hurt?



Subjective/History

- Where does it hurt?
- When did it start?
- What happened?
- If injury, able to ambulate after?
- Previous injury

Subjective/History

- Alleviating v Aggravating factors
- Treatment to date
- Review of PMH/PSH/MEDS/DA

Pain assessment

- Visual analog scale

Pain assessment

- Objective
  - 1/4 – c/o pain only
  - 2/4 – c/o pain and has facial grimacing
  - 3/4 – Has facial grimacing and withdraws
  - 4/4 – will not allow palpation

Objective/Exam

- Observation
  - "can't see, can't treat"

Objective/Exam

- Observation
  - Gait

Objective/Exam

- Palpation
  - Seated
    - Vertebral tenderness
    - Paraspinal muscles
  - Standing (or seated)
    - SI joints
    - Iliac crests

Objective/Exam

- Neurological
  - Sensory
  - Strength (weakness)
  - Reflexes
    - Patellar
    - Achilles

Solitary nerve root lesions of the lumbosacral spine

Root	Pain	Sensory loss	Weakness	Stretch reflex loss
L1	Inguinal region	Inguinal region	Rarely hip flexion	None
L2-L3-L4	Back, radiating into anterior thigh, and at times medial lower leg	Anterior thigh, occasionally medial lower leg	Hip flexion, hip adduction, knee extension	Patellar tendon
L5	Back, radiating into buttock, lateral thigh, lateral calf and dorsum foot, great toe	Lateral calf, dorsum foot, web space between first and second toe	Hip abduction, knee flexion, foot dorsiflexion, toe extension and flexion, foot inversion and eversion	Semitendinosus/semimembranosus (internal hamstrings) tendon
S1	Back, radiating into buttock, lateral or posterior thigh, posterior calf, lateral or plantar foot	Posterior calf, lateral or plantar aspect of foot	Hip extension, knee flexion, plantar flexion of the foot	Achilles tendon
S2-S3-S4	Sacral or buttock pain radiating into the posterior aspect of the leg or the perineum	Medial buttock, perineal, and perianal regions	Weakness may be minimal, with urinary and fecal incontinence as well as sexual dysfunction	Bulbocavernosus, anal wink

UpToDate

Objective/Exam

- Maneuvers
  - Supine
    - Straight leg raising
  - Seated
    - Slump test
  - Standing
    - ROM

Objective/Exam

- Waddell's signs
  - Over-reaction during exam
  - Superficial or widespread tenderness
  - Inconsistent supine and seated SLR
  - Unexplainable neuro deficits
  - Pain on simulated axial load test

Objective/Studies

- Radiographs
- CT scan
- MRI
- Nuclear bone scans
- Lab – ESR, CRP

Objective/Studies

- Lancet 2009 (Chou, Fu, Carrino)
  - systematic review and meta-analysis of 6 trials
  - Compared immediate imaging (XR, CT, MRI) w/o red flags
  - Found NO sig difference in short-term (<= 3m) or long-term (6-12m) outcomes in pain or function

Objective/Studies

- MRI – disc herniations seen in 22-67% of asymptomatic adults

Joint Guidelines

ACP & APS

- Clinicians should **NOT** routinely obtain imaging or other diagnostic tests in patients with nonspecific low back pain

Objective/Studies

- ABIM "Choosing Wisely" campaign
  - Avoid imaging in acute low back pain

Red Flags

- Prevalence
  - <1% of those with LBP will have a serious systemic etiology
    - cauda equina syndrome
    - metastatic cancer
    - spinal infection

Red Flags

- Symptoms
  - New urinary retention or fecal incontinence
  - Saddle anesthesia
  - Significant neurological deficits (not localized to single nerve root)

Nonspecific back pain

- >85% patients seen in primary care with back pain
- Most will be MSK in nature
- ~ 1/3 will seek medical care
  - 70-90% improve within 7 weeks
- Recurrences common
  - 50% within 6 months
  - 70% within 1 year

Nonspecific back pain

- Subjective
  - Pain
- Objective
  - POP +/-
  - Muscle spasm +/-

Nonspecific back pain

- Studies
- Treatment
  - NSAIDs - decrease as tolerated
    - IB 400-600 mg QID
    - Naproxen 250-500 mg BID
  - Acetaminophen ??

Nonspecific back pain

- Studies
- Treatment
  - NSAIDs - decrease as tolerated
    - IB 400-600 mg QID
    - Naproxen 250-500 mg BID
  - Acetaminophen ??
    - 2016 Cochrane review - = to placebo

Serious Systemic Causes

- Spinal cord / cauda equina compression
- Metastatic cancer
- Spinal epidural abscess
- Vertebral osteomyelitis

Spinal Cord / Cauda Equina Compression

- Most common causes
  - Disc herniation (22.7)
  - Ankylosing spondylitis (15.9)
  - Lumbar puncture (15.9)
  - Trauma (7.6)
  - Malignant tumor (7.2)
  - Benign tumor (5.7)
  - Infection (5.3)

- Spine (2014 Apr), study in China

Spinal Cord / Cauda Equina Compression

- Objective
  - Pain
  - Motor and sensory deficits
  - Bowel/bladder dysfunction – late
- Studies
  - Immediate MRI

Spinal Cord / Cauda Equina Compression

- Treatment
  - Urgent specialist referral

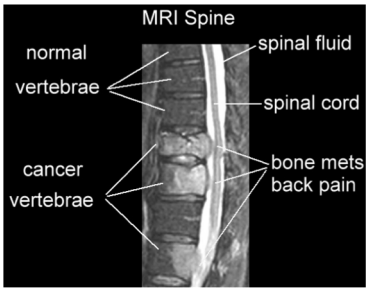
Metastatic Cancer

- Bone one of the most common sites of metastasis
  - 80% from breast, prostate, lung, thyroid, kidney
  - ~60% pts with MM have skeletal lesions at Dx

Metastatic Cancer

- Subjective
  - Pain most common symptom
  - Sudden, severe pain – in those with CA, look for pathological Fx
  - +/- neurological symptoms
- Studies – spinal MRI w/o contrast

Metastatic Cancer



Metastatic Cancer

- Treatment
  - Specialist referral

Spinal Epidural Abscess

- Risk factors
  - Recent spinal injection / epidural cath
  - IV drug abuse
  - Recent infection (contiguous bony/soft tissue, bacteremia)
  - Immunocompromised pt

Spinal Epidural Abscess

- Subjective
  - Fever, malaise
- Objective
  - Localized back pain >> radicular pain >>neurological deficits
- Studies – MRI w & w/o contrast
  (CT alternative)

Spinal Epidural Abscess

- Treatment
  - Urgent specialist referral / ED

Vertebral Osteomyelitis

- Incidence
  - Increases with age
  - Men > women
- Risk factors
  - HC-related or postprocedural from bacteremia
  - Immunocompromised
  - IVDA

Vertebral Osteomyelitis

- Subjective
  - Back pain -- increases over weeks to months
  - Fever +/-
- Objective
  - Positional discomfort
  - POP
  - Neurological findings +/-

Vertebral Osteomyelitis

- Studies
  - MRI with and without contrast
  - Nuclear scan alternative
- Treatment
  - Specialist referral

Less Serious Causes

- Vertebral compression fracture
- Radiculopathy
- Spinal stenosis

<10% will have above

Vertebral Compression Fx

- Incidence - ~ 4% with back pain (PCP)
- Risk factors
  - Advanced age
  - Chronic glucocorticoid use
  - Hx of previous osteoporotic Fx

Vertebral Compression Fx

- Subjective
  - +/- pain, some may be incapacitating
  - +/- trauma
- Studies – XR

Vertebral Compression Fx

Vertebral Compression Fx

- Treatment
  - Conservative
  - Surgical

Radiculopathy

- Prevalence
  - 3-4% with LBP will have symptomatic disc herniation or spinal stenosis
  - > 90% L5/S1

Radiculopathy

- Subjective
  - Pain
  - Sensory loss
  - Weakness
- Objective
  - Sensory loss
  - Weakness
  - Reflex changes

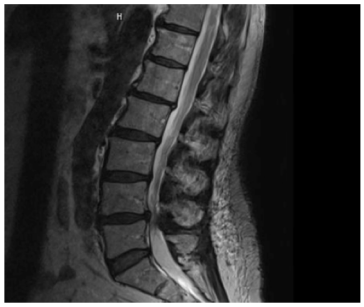
Radiculopathy

- Studies – if not better at 4-6 weeks (and none previous), MRI
- Treatment
  - NSAIDs or acetaminophen
  - Temporary activity modification
  - PT not indicated in the 1st two weeks
  - Referral (get the MRI)

Spinal Stenosis

- Subjective
  - Pain worsens with walking, standing, or certain positions
  - Pain relieved with sitting or lying

Spinal Stenosis



Other causes

- Ankylosing Spondylosis
- OA
- Scoliosis
- Psych issues

Outside the box

- Pyelonephritis
- Renal/ureteral stone
- AAA
- Pancreatitis

Close but no

- Piriformis syndrome
- SI joint dysfunction