Key Learning Points From:

Clinically Managing Chronic Low Back Pain

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Natural History of LBP

- **Acute LBP**
  - inflammatory or neuropathic injury
  - resolves spontaneously with minimal treatment
- **Intermittent, relapsing LBP**
  - more challenging diagnostic and treatment dilemma
  - precipitates symptomatic care and more aggressive interventions aimed at specific underlying pathology
- **Unremitting, recurring chronic LBP**
  - structural, neurophysiological, and biopsychosocial pathology
  - requires management at all these levels
  - major public health problem

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Nociceptive vs Neuropathic LBP

Nociceptive Pain

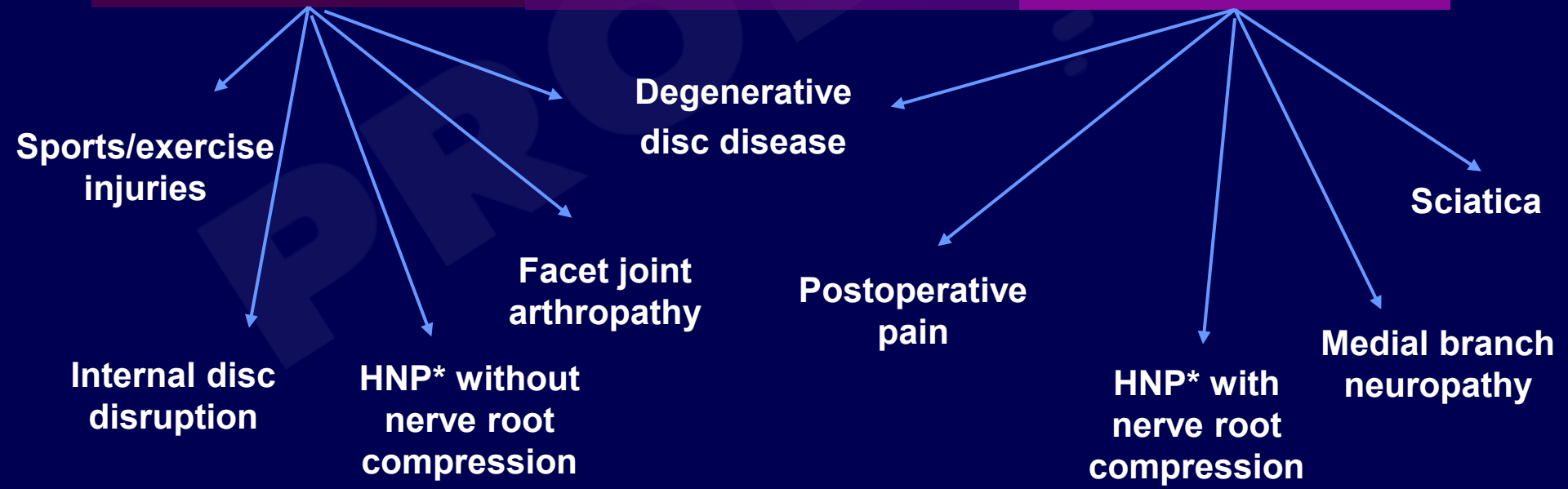
Caused by activity in neural pathways in response to potentially tissue-damaging stimuli

Mixed Type

Caused by a combination of both primary injury and secondary effects

Neuropathic Pain

Initiated or caused by primary lesion or dysfunction in the nervous system



*Herniated nucleus pulposus.

Referred LBP Is Remote From Source of Pain

- **LBP may radiate into**
  - groin
  - buttocks
  - upper thigh

  areas that share an interconnecting nerve supply
- Source of somatic referred pain is a skeletal or myofascial structure of the lumbar spine
- Source of visceral referred pain is within a body organ
  - ovarian cysts may refer pain to low back
  - cancer of head of pancreas can present as low back pain becoming excruciating at night

Radicular LBP Results From Irritation of Spinal Nerve or Its Roots

- Damage to specific nerve root
  - pain may radiate along the nerve down the lower extremity
- Lumbosacral radiculopathy often manifests as sciatica

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LBP Patient Treatment Prototypes

- **Chronic axial LBP**
  - pain does not extend beyond mid-buttock
  - absence of radicular pain or sensory symptoms below the knee
- **Chronic axial LBP with radiation**
  - pain with radiation beyond mid-buttock
  - absence of radicular pain or sensory symptoms below the knee
- **Chronic axial LBP with radicular component**
  - radicular pain or sensory symptoms below the knee

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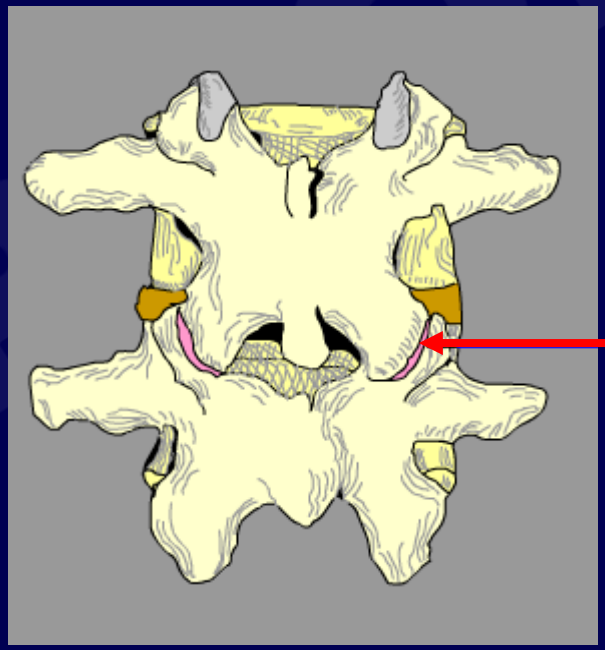
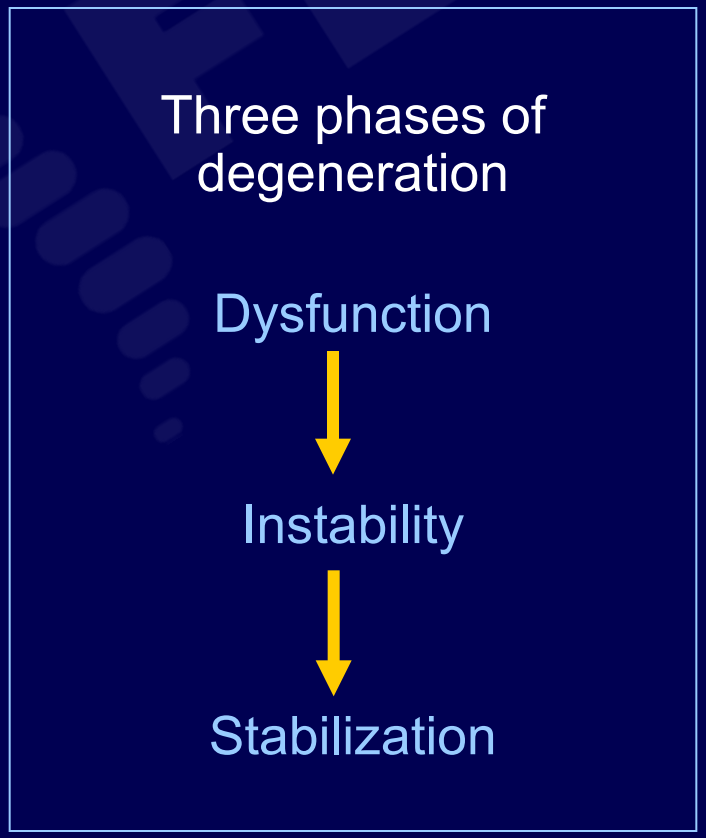
Structure of Lumbar Spine

Basic functional units of spine—motion segments—consist of two posterior zygapophyseal (facet) joints and an intervertebral disc, forming a tri-joint complex



Lumbar Structural Pathology and Degenerative Cascade

- In all individuals, there is natural, progressive degeneration of the motion segments over time
- This results in anatomic, biochemical, and clinical sequelae
- Although lumbar motion segment degeneration is not a normal process, it may not be painful



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Sources of LBP

- Damage to several structures in the low back can result in severe pain
  - vertebrae
  - thoracolumbar fascia
  - ligaments
  - joints
    - specifically sacroiliac joint
  - discs
  - muscle

Deyo RA, Weinstein JN. *N Engl J Med*. 2001;344:363-370.

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LBP ⟷ Psychological Factors

- **Prolonged back pain may be associated with a psychological disturbance, manifesting as**
  - behavioral
  - cognitive
  - affective
  - somatoform (psychophysiological)
- **Psychological factors that may contribute to or be caused by chronic LBP include**
  - depression
  - anxiety
  - somatization
  - post-traumatic stress disorder
  - pre-existing bipolar or other disorders

Andersson GBJ. *Lancet*. 1999;354:581-585.

Social Issues May Contribute to Chronic LBP

- Job dissatisfaction/loss of ability to work
- Pursuit of disability compensation
- Substance abuse
- Family dynamics
- Financial issues
- Loss of social identity or context
- Loss of ability to participate in recreational activities

Wheeler AH, Stubbart JR. Pathophysiology of chronic back pain. Available at: www.emedicine.com/neuro/topic516.htm.

Considerations in the Clinical Assessment and Diagnosis of Chronic LBP

Goals of Clinical Assessment

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Medical History

General → Pain Scales/Questionnaires

Neurologic → Factors in the Elderly

Psychosocial

↓

Physical Examination → Diagnostic Studies

Neurologic → Evaluation of the Elderly

↓

Making the Diagnosis

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Medical History

- Symptom onset/cause of LBP
- Duration, location, and character of LBP (pain scales/questionnaires)
- Physical/functional impairment
- Factors that exacerbate or relieve LBP
- Associated features or secondary signs/symptoms
- Neurologic history
- Psychosocial history

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Red Flags

- **Diagnostic tests indicated early on for**
  - **current medical history:** significant trauma, recent intervention, pain unrelieved or worse with lying down, pain worse at night, progressive neurological deficit
  - **past medical history:** cancer, recent rapid weight loss, immunosuppression or systemic steroids, IV drug use, recent bacterial infection, chills or fever, first incident of back pain in older patient
- **Patient offered appointment within 24 hours for**
  - fever lasting >48 h, new below-the-knee pain or numbness, new leg weakness, loss of bladder or bowel control (retention or incontinence), progressive neurologic deficit
- **Psychosocial red flags**
  - suicidal ideation, social withdrawal, panic attacks, serious financial reversal, homelessness: refer for psychiatric consultation or send to psychiatric crisis center

Deyo RA, Weinstein JN. *N Engl J Med.* 2001;344:363-370.
Institute for Clinical Systems Improvement (ICSI). Adult low back pain. Bloomington, Minn: ICS; September 2003:63.

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Neurologic History

- **Symptoms**
- **Onset**
- **Common etiologic factors**
  - leg pain (HNP with nerve root compression L4, L5, S1)
  - leg weakness (HNP, extrusion, fragment)
  - groin pain (HNP with nerve root compression L2, L3)
  - back pain with allodynia of skin (inflammatory recruitment of non-nociceptors)
  - non-dermatomal leg pain with weakness, mottling of skin, temperature change, asymmetric hair growth, sweating, allodynia, hyperalgesia (CRPS 1 or 2)

HNP=herniated nucleus pulposus;
CRPS=complex regional pain syndrome

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Musculoskeletal Examination

- **Observation**
  - pain behaviors–groaning, position changes, grimacing, etc
  - atrophy, swelling, asymmetry, color changes
- **Palpation**
  - palpate area of pain for temperature, spasm, and pain provocation
  - point palpation for trigger points/tender points
- **Range of motion**
  - active and passive
  - flexion, extension, rotational, lateral bending
  - leg raising

Neurologic Exam Determines Presence/Absence and Level of Radiculopathy and Myelopathy

The exam should include

- **Motor elements**
  - muscle bulk/tone
    - atrophy/flaccidity
  - muscle strength
  - coordination
  - gait
- **Sensory elements**
  - sensory deficits, eg, touch, position sense, temperature, vibration
  - allodynia: light touch
  - hyperalgesia: single or multiple pinpricks
- **Autonomic elements**
  - limb temperature
  - sweating
  - hair/nail growth
  - skin color changes
- **Deep tendon reflexes**

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Medical Red Flags = Early Warning

Surgical emergency procedures scheduled

- Cauda equina syndrome
  - LBP; sciatica
  - saddle anesthesia
  - urinary incontinence/hesitancy
  - fecal incontinence
  - unilateral or bilateral lower extremity motor and sensory loss
- Spinal epidural hematoma/abscess
  - severe pain
  - urinary/fecal incontinence
  - focal neurologic findings

Boukobza M, et al. *Neuroradiology*. 1994;36:456-459.
Gleave JR, Macfarlane R. *Br J Neurosurg*. 2002;16:325-328.
Thongtrangan I, et al. *Neurosurg Focus*. 2004;16(6):e6.

When to Refer for Surgical Consultation

- Motor weakness of one or both legs
- New bowel and urinary incontinence
- MRI HNP compressing nerve root
- MRI of grade 3 spondylolisthesis
- MRI/CT evidence of severe spinal stenosis with correlative leg weakness and pain
- Standing flexion/extension films showing significant movement

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Surgery Options

- Primarily involve correction or stabilization of the underlying pathological condition
- Principal reasons are to relieve pressure and nerve irritation caused by a prolapsed lumbar disc or to stabilize spinal structures
- Techniques include:
  - spinal fusion
    - one or more vertebrae are fused to prevent motion
  - decompression
    - removal of bone or disc material to prevent pinching of the nerve (neural impingement)
- Surgery may improve pain and lead to more effective nonsurgical pain interventions

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Pharmacotherapy Options*

- Antidepressants
- Anticonvulsants
- Muscle relaxants
- Opioid analgesics
- Corticosteroids
- NSAIDs
- Topical analgesics

* Except for certain opioids, none of these agents are indicated for chronic LBP.

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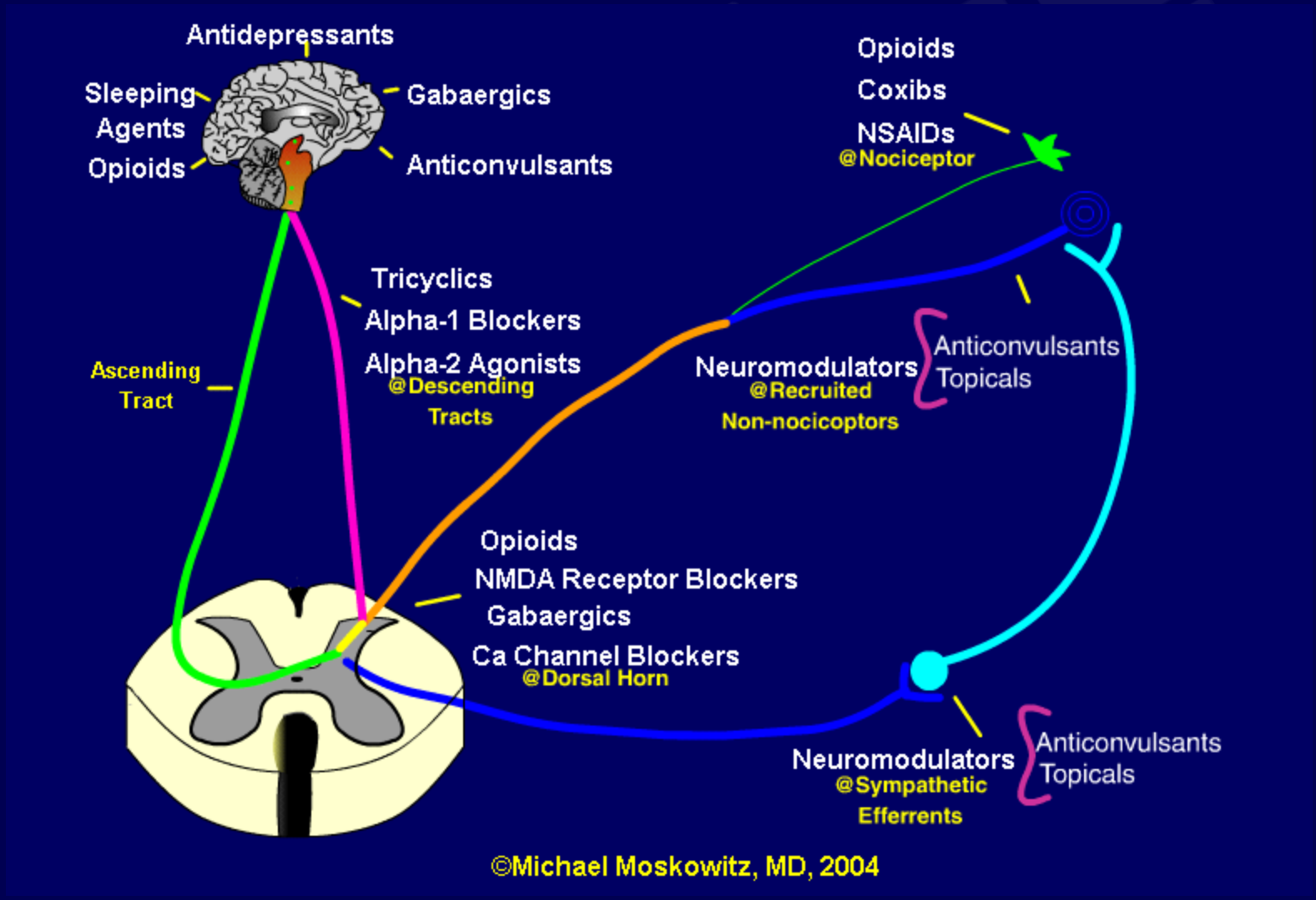
Where Can We Intervene?



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Treatment Strategies for LBP

Clinical Presentation	Possible Cause of LBP	Treatment Strategies
Intermittent unilateral leg pain, numbness, weakness radiating to foot	Intermittent nerve entrapment with nerve root inflammation	• Short-acting opioids • NSAIDs • Topical analgesics
Constant burning, stabbing, or deep aching groin or leg pain	Permanent nerve damage	• Opioids • Tricyclic antidepressants • Anticonvulsants • Topical analgesics

Moskowitz MH. *Curr Pain Headache Rep.* 2003;7:178-187.

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Treatment Strategies for LBP (cont'd)

Clinical Presentation	Possible Cause of LBP	Treatment Strategies
Axial, aching, throbbing and/or stabbing LBP with trigger points radiating to buttocks and anterior thigh	Inflammation of surrounding tissue or joint, myofascial	• NSAIDs • Opioids • Topical analgesics
Pain > expected from injury, burning, electrical, to one or both limbs, edema, mottling, nail, skin, and hair changes, temperature change, allodynia, hyperalgesia	Sympathetically maintained pain	• Opioids • Tricyclic antidepressants • Anticonvulsants • Topical analgesics

Moskowitz MH. *Curr Pain Headache Rep.* 2003;7:178-187.

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Interventional Treatment Options

- **Neural blockade**
  - selective nerve root blocks
  - facet joint blocks, medial branch blocks
- **Neurolytic techniques**
  - radiofrequency neurotomies
  - pulse radio frequency
- **Stimulatory techniques**
  - spinal cord stimulation
  - peripheral nerve stimulation
- **Intrathecal medication pumps**
  - delivery into spinal cord and brain via CSF

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Physical Treatment Options

- Exercise (stabilization training)
- Neutral position
- Soft tissue mobilization
- Transcutaneous electrical nerve stimulation (TENS)
- Electrothermal therapy
- Complementary measures (acupuncture; relaxation/hypnotic/biofeedback therapy)
- Spinal manipulative therapy
- Multidisciplinary treatment programs (back schools/education/counseling/pain clinic)

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Summary

- Chronic LBP is a disease, not a symptom
- Progress is focused on targeting treatment at the mechanisms that produce pain rather than ameliorating the symptoms
- Biopsychosocial approach is critical for the successful management of chronic LBP
- Promising treatments for chronic LBP include
  - new agents
  - new uses of agents
  - new combinations of agents