

## The Athlete's Lumbar Spine: Current Concepts



Ajeya P. Joshi, M.D.

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## Financial Disclosure

Dr. Ajeya Joshi has disclosed that he has ownership interest from Phygen and SpineSmith; he also receives non-CME service fees from Eli Lilly, Inc.

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## Speaker Background

- Spine Surgeon, South Texas Spinal Clinic
- Clinical Associate Professor, UTHSC-SA
- Spine training: Baylor (Houston)
- In practice in San Antonio 8+ years

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## Content / Objectives

- On-field screening 'red flags' and management
- Low back pain
  - Epidemiology
  - Trends
  - Treatments
  - **Prevention**
- Spinous process / transverse process fractures

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## Content / Objectives

- Spondylolysis (pars fractures) updates
- Hot topics / On the horizon...

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## Acute / Traumatic (Fall, Collision)

- Look for on-the-field 'Red Flags':
  - Weakness, incontinence, cannot stand or jog, impaired flexibility, loss of consciousness
  - (Concussion, upper extremity weakness, all part of head/neck/spine broader trauma considerations)

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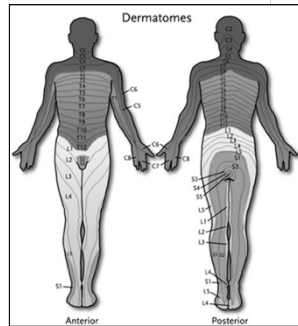
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## Neurologic Testing

- L2 Hip flexors (iliopsoas)
- L3 Knee extensors (quadriceps)
- L4 Ankle dorsiflexors (tibialis anterior)
- L5 Long toe extensor (extensor hallucis longus)
- S1 Ankle plantiflexors (gastrocnemius)
- Grading Strength 0-5



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## Acute Injury Algorithm

- Red Flag finding = Assume structural problem (fracture / instability of the C-T-LS spine)
- Expedite ER / spinal evaluation, with:
  - Spinal precautions (head-neck immobilization and spine board)
  - Advanced Trauma Life Support, ABCs



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## Athletes and Low Back Pain

- Trend / suggestion of higher incidence of LBP<sup>1-5</sup>
  - Age, prior injury/LBP, females, Volleyball, time spent watching TV
- My observations: MATCH/CONCUR
- Significant lost time from athletic participation<sup>6-8</sup>

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## LBP Contributing factors

### Acute LBP:

Growth spurt  
**Abrupt increases in training intensity or frequency**  
**Improper technique**  
Unsuitable sports equipment  
Leg-length inequality

### Chronic LBP:

Poor core strength  
Structural issues (pars, disk)  
Tight hamstrings

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## Subacute or Chronic LBP

Muscle strain/ligament sprain  
Degenerative disc disease  
Isthmic spondylolysis (no slip)  
Isthmic spondylolisthesis  
Facet syndrome  
Ring apophyseal injury (adolescents)  
Sacral stress fracture  
Central disc herniation (without radiculopathy)  
Sacralization of L5/transverse process impingement  
Facet stress fracture  
Lumbar vertebral body fracture  
Discitis/osteomyelitis  
Neoplasm (CANCER)

Intrapelvic, gynecologic conditions (e.g., ovarian cysts)  
Renal disease  
Sacroiliac joint dysfunction

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## Low Back Pain

- Treatment (strain, no fracture)
  - Core strengthening (PT)
  - Stretch Hamstrings
  - Short-term medications: anti-inflammatory (NSAIDs), muscle relaxant
  - Weight optimization
  - Lessen impact activities during active symptoms
- Prevention
  - Sports-specific training
  - Rest
  - Manageable reps/goals



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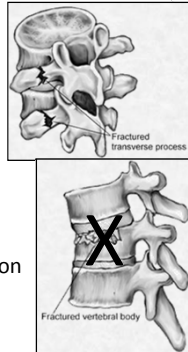
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### Spinous / transverse process injuries

- Typically not unstable
- Due to muscle pulling or direct impact
- Treat symptomatically
  - Brace, meds, PT
- Specialist to clear athlete as symptoms subside
- Flexion-extension x-rays on occasion



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### Spondylolysis

- aka pars fracture, stress reaction/fracture
- 3-6% prevalence<sup>9-10</sup>
- Non-athletic population:
  - Often asymptomatic
  - Often incidental
  - Risk of slip: 25-50%
- May develop as stress fracture in athletics
- Adolescent athletes:
  - 38% with slip progression (avg. 10%)
  - 8% with slip decrease<sup>11</sup>



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### Spondylolysis – Risks

- Twisting, hyperextension
- Repetitive axial loading
- Offensively linemen, gymnasts, soccer, baseball, volleyball, weightlifting, rowing, wrestlers...



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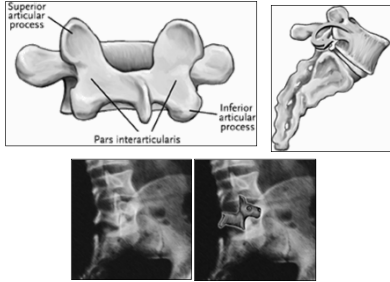
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# Spondylolysis



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## Exam

- Tight hamstrings
- Pain with lumbar hyperextension
- Restricted range of motion
- 'Stork' Test

## Diagnosis - Imaging

- Oblique films not useful; extra radiation
- Rely on SPECT bone scan + CT (radiation)
- MRI useful for excluding other processes (disk degeneration, herniation)

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## Spondylolysis Scenarios and Treatment

- Spondylolysis ('crack', 'stress fracture')
- Developing spondylolysis = 'stress reaction' (no crack...yet)
- Treatment of these two situations
  - Bracing (+/- 3 months), wean, rehab (CORE), ramp-up to sports
  - Stable fibrous union with resolved symptoms is OK
  - Check vitamin D ????. Doesn't hurt....you'll find low levels to Rx
- Future treatments...
  - External electrical stimulation
  - Bone growth stimulators (external)(magnetic field)
  - Oxygen-Ozone CT guided therapy
  - Hyperbaric oxygen?

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## On the horizon...

- Stem cells (mesenchymal stem cells)
  - Adipose-based
  - Bone marrow-based
- Needs rigorous study...no great EBM to share with you at present
- Europe >>> U.S.



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Dr. Jesse DeLee  
Dr. Pablo Vazquez



## Thank you!!

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