Back Pain in Children

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Back Pain

- **In the past, believed to be uncommon**
- **Rate continually increases throughout childhood**
- **When medical care is sought, many will have an identifiable cause but some will not**

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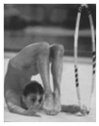
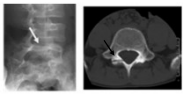
Differential Dx

- **1. Mechanical**
  - **–Trauma**
    - **•Fracture**
    - **•Spondylolysis/-listhesis**
    - **•Disc herniation**
  - **–Postural/overuse**
  - **–Syrinx/Tethered Cord**
  - **–High BMI**





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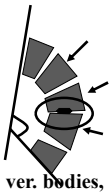
Differential Dx

- 2. Developmental
  - –Scheuermann's Disease



Wedged ver. bodies,
Rigid Kyphosis >45^0

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Differential Dx

- 2. Developmental
  - –Scoliosis
    (~47%)

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Differential Dx

- 3. Inflammatory
  - –Infection
    - Osteomyelitis
    - Discitis
  - –Rheumatologic
    - eg. ankylosing Spondylitis

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Differential Dx

- 4. Neoplastic
  - –Bone
  - –Spinal cord/canal
  - –Muscle
  - –Metastatic
- Referred
  - –Eg., pyelonephritis, cholecsystitis

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Diagnosis

Frequently made from the history and then confirmed by the physical and subsequent studies

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Evaluation

- Careful H&P
  - –Onset
    - •Acute or insidious
  - –Location/radiation
  - –Frequency
  - –Duration
  - –Intensity

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History

- Night pain?
- Response to NSAIDs
- Does it interfere with play?
- Motions that cause pain
- Weight loss, fever, other generalized Sx's
- Neurologic symptoms
- Age < 5 years
- Pain > 4 weeks

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History

- Neurologic Complaints
  - –Numbness
  - –Weakness
  - –Jumpy legs
  - –Bowel or Bladder changes
  - –Gait changes

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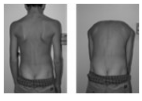
Physical Exam

- Back alignment (coronal and sagittal)
- Rashes or other marks
- Midline defects
- LLD
- Flexion and extention
- Pain to palpation/percussion



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Physical Exam

- Watch their gait
  - –Assymetric Movement
- Neurologic exam
  - –DTRs and abdominal reflexes
  - –Motor exam
  - –Sensory Exam
  - –Straight leg raise
  - –FABER test

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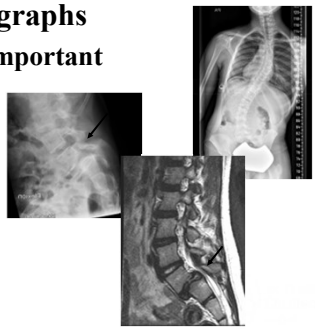
Radiographic Exam

- AP, lateral radiographs
  - –Good quality is important
- Bone Scan?
- MRI
- CT



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Labs

- CBC
- ESR and CRP
- ANA, RF, HLA B27?
- Others?

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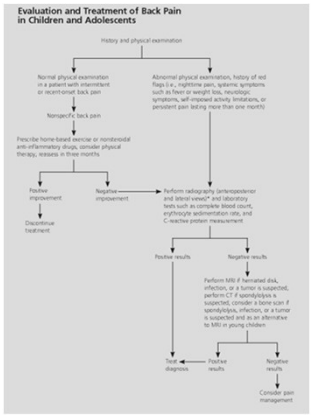

Evaluation of Back Pain in Children and Adolescents. Am Fam Physician. 2007; 76(11):1669-1676.

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Treatment

- **Targeted treatment if underlying cause**
- **If none identified:**
  - **–Activity modification**
  - **–Core strengthening and PT**
  - **–Judicious use of NSAIDs**
    - **Consider Omega 3 fatty acids and other anti-inflammatories**
  - **–Weight loss**

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Summary

- **Relatively high yield**
- **History usually helps determine seriousness ± Dx**
- **PE and radiographs often confirm the Dx**

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When should you be worried (red flags)?

- Systemic symptoms
- Self-imposed limitations
- Night pain
- Neurologic symptoms
- Age < 5 years
- Pain lasting > 4 weeks

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Adolescent Idiopathic Scoliosis

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Normal Spinal Alignment

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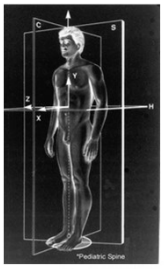
Normal Spine

- Normal lateral curves
  - –Thoracic kyphosis
  - –Lumbar lordosis
- Frontal plane
  - –Straight



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What is it?

- 'Scolio' – (*gk*) curved or bent
- Lateral curvature
- > 10 degrees

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Scoliosis Etiology

- Vertebral anomolies (congental)
- Neurologic conditions
- Muscular diseases
- Idiopathic
- Others

Scoliosis is a phenotype!

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History

- Pregnancy and birth history
- PMHx
- Family history
- When 1st noticed?
- Back pain?
- Weakness/numbness?
- Bowel/bladder problems?

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Examination

- General exam
- Adam's Forward Bend
- LLD?

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Scoliometer

Refer if $\geq 7^0$

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Examination

- Skin markings
  - Café' au lait
  - Dimples
  - Hairy patches

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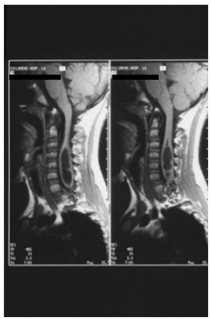
Examination

- Motor exam
  - LE and UE
- Reflexes
  - DTRs
  - Babinski/clonus
  - Abdominal



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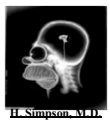
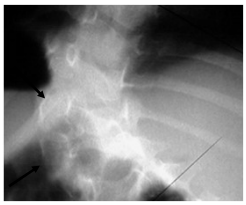
Studies

- Start simple!
  - Plain radiograph



H. Simpson, M.D.



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MRI

- **If:**
  - **–Neurologic abnormality**
  - **–Rapidly progressive**
  - **–Atypical**
- **Always prior to surgery in:**
  - **–Neurofibromatosis**
  - **–Congenital**
- ***Entire spine (occiput to sacrum)**

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Adolescent Idiopathic Scoliosis

- **~85%**
- **Otherwise healthy**
- **Cause is unknown (***idio- (gk): proper to one, 'peculiar'***)**
  - **–Lots of possibilities**
    - **•Neurologic**
    - **•Hereditary**
    - **•Hormonal, Collagen, etc.,**

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Idiopathic Scoliosis

- **Subclassified by Age**
  - **–Infantile**
    - **•(0-3 yrs) M>F**
  - **–Juvenile**
    - **•(3-10 yrs)**
  - **–Adolescent**
    - **•(10 yrs-maturity) F>M**

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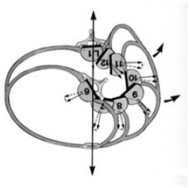
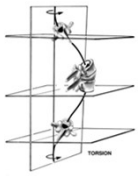
Scoliosis-3D



Lateral flexion
Rotation
Extension



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Idiopathic Scoliosis

- **Progression related to:**
  - **–Maturity**
  - **–Size of curve**
  - **–Location**

Curve magnitude at detection (degrees)	Age at detection (years)		
	10–12	13–15	16
<19	25%	10%	0%
20–29	60	40	10
30–59	90	70	30
>60	100	90	70

Prob. of progression

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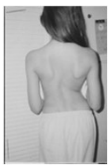
Natural History

- **70% don't progress**
- **Cosmetic problem**
- **Progression causes:**
  - **–Imbalance**
  - **–Pulmonary and cardiac compromise – RARE!!**
    - **(curves > 100^0)**



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Natural History

- **Progression**
  - **–Before skeletal maturity**
    - **•Up to 2^0/month**
  - **–After skeletal maturity**
    - **•1^0/yr (thoracic > 50^0)**

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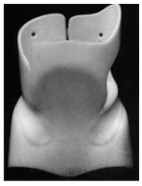
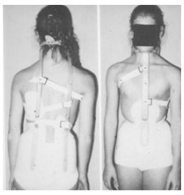
Treatment

- **Observation**
- **Brace**
- **Tethering**
- **Fusion**





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Brace if:

- **Skeletally immature *and***
- **Curves 20-45^0**
- **Brace until skel maturity**
- **BrAIST Study 2013**

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Tethering

- Idiopathic
- Sig growth remaining
- ≥ 8 years old
- Would otherwise need fusion

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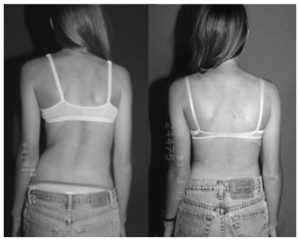
Fusion if:

- Thoracic curve > 50^0
- Rapidly progressive curve
- Out of balance (cosmetic)



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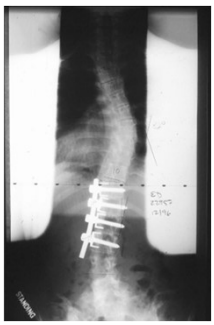
Anterior Fusion



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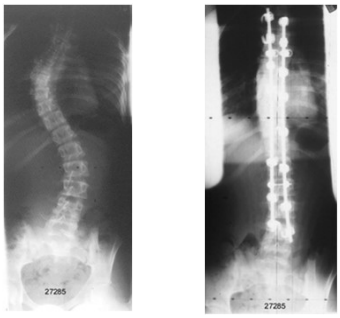
Posterior Fusion



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Summary

- Back pain is uncommon < 5 years of age, but frequency increases with age
- Look for an identifiable cause
- Careful history and physical exam

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Summary

- If identifiable cause, treat
- If no identifiable cause:
  - Activity modification
  - PT/Core strengthening
  - NSAIDs/anti-inflammatories
  - Weight loss

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Summary

- **Adolescent Idiopathic Scoliosis**
  - **–Represents 85% of cases**
  - **–Hereditary component**
  - **–Look for other causes (scoliosis is a phenotype)**
  - **–Treatments include observation, bracing, tethering, and fusion**

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Thank You!

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