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Overview of Manual Therapy  
Assessment and Treatment of  
the Thoracolumbar Spine

Megan Casey Douglas, PT, DPT, MTC, OCS

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Megan Casey Douglas, PT, DPT, MTC,  
OCS

- Bellingham, WA
- Director of Physical Therapy at Northwest Physical Therapy- Skagit Valley, Private Practice
- Recently moved from Cincinnati, OH
- DPT, MTC thru University of St. Augustine
- OCS thru APTA
- MPT – Andrews University
- BS- Miami University
- Teaching Experience
  - Adjunct University of Dayton
  - College of Mt. St. Joseph
  - Continuing Education



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## WHAT IS MANUAL THERAPY?

- A clinical approach utilizing skilled, specific hands-on techniques, including but not limited to manipulation/mobilization, used by the physical therapist to diagnose and treat soft tissues and joint structures for the purpose of modulating pain; increasing range of motion (ROM); reducing or eliminating soft tissue inflammation; inducing relaxation; improving contractile and non-contractile tissue repair, extensibility, and/or stability; facilitating movement; and improving function.<sup>1,2</sup>  
*(Definition from American Academy of Orthopedic Manual Physical Therapy (AAOMPT) and American Physical Therapy Association (APTA)).*

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## Anatomy and Biomechanics of the Lumbar Spine

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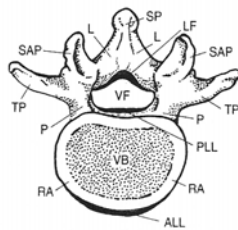
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## Lumbar Osseous Review

- L3/4 viewed from above
  - Spinous process
  - Lamina
  - Superior articular process
  - Transverse process
  - Pedicle
  - Vertebral body
  - Ligamentum flavum
  - Posterior Longitudinal ligament
  - Anterior Longitudinal ligament



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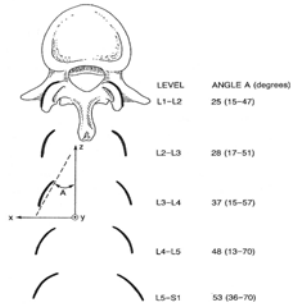
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## Lumbar Facet Planes




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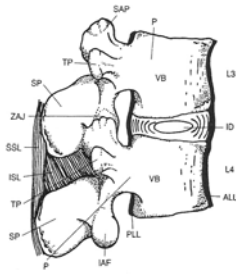
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## Lumbar Spinal Segment

- Pars Interarticularis
- Facet joint
- Interspinous ligament
- Supraspinous ligament
- Anterior longitudinal ligament
- Posterior




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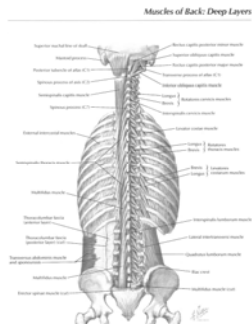


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## Muscular Support




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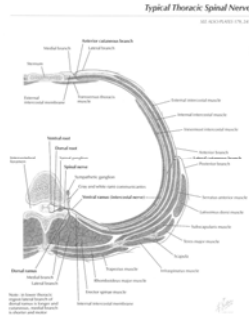


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## Muscular Support




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## Forward Bending

- Thoracic
  - Facets are almost vertical and the ribs also play a role
    - Facets slide up bilaterally
    - Ribs rotate on their long axis.
- Lumbar
  - Facets translate superiorly bilaterally
  - Annulus bulges anteriorly and flattens posteriorly




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## Backward Bending

- Thoracic Spine
  - Facets slide down bilaterally
  - Ribs rotate
- Lumbar Spine
  - Facets slide down bilaterally
  - Facets fulcrum on the lamina
  - Facet joints open up cephalically (tilt)
  - Annulus bulges posteriorly and flattens anteriorly




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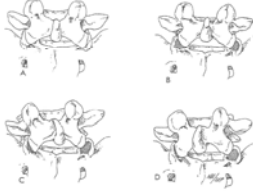
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## Lumbar Sidebending and Rotation

Spinal Facets and Spinal Motion

The following illustration shows four different motions

- A: backward bending
- B: forward bending
- C: physiological side bending left
- D: rotation right




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## Lumbar Sidebending

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>• Lumbar Flexion or Extension</li> <li>• Non-neutral Functional</li> <li>– Sidebending and rotation are coupled in the same direction</li> </ul> | <ul style="list-style-type: none"> <li>• Neutral Lumbar Spine</li> <li>• Neutral Non-Functional</li> <li>– Sidebending and rotation are coupled in opposite directions</li> </ul> |
|---|---|

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## Fryette's Laws

1. When the spine is in neutral, sidebending to one side will be accompanied by horizontal rotation to the opposite side. In type I somatic dysfunction this law can be seen when more than one vertebrae are out of alignment and cannot be returned to neutral by flexion or extension.
2. When the spine is flexed or extended (non-neutral), sidebending to one side will be accompanied by rotation to the same side. In type II somatic dysfunction of the spine, this law can be seen when only one vertebrae is out of place and becomes much worse on flexion or extension.
3. When motion is introduced in one plane it will modify (reduce) motion in the other two planes. Type III sums up the other two laws by stating dysfunction in one

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### Manual Therapy Evaluation of the Thoracic and Lumbar Spine

- Subjective History
  - Mechanism of injury
  - Chief complaints
  - Diagnostic tests/results
  - Pain scale
  - Characteristics/Progression of symptoms
  - Past Medical History
  - Medications
  - Occupation/Activities
- Red flags
  - Night pain
  - Bowel and Bladder dysfunction
  - Saddle paresthesias
  - Marked myotome weakness/paresis

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### Manual Therapy Evaluation of the Thoracic and Lumbar Spine

- Structure/Posture
  - Body type
  - Iliac crest height
  - PSIS, ASIS
  - Greater Trochanters
  - Angle of Inclination
  - Sagittal Contours
  - Hypertonicity
- Active Movements of the Lumbar Spine
  - Forward Bending
  - Backward Bending
  - Sidebending
  - Rotation

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### Manual Therapy Evaluation of the Thoracic and Lumbar Spine

- Neurovascular Assessment
  - Myotomes
  - Reflexes
  - Sensation
- Strength/Flexibility testing
- Special Tests
- SIJ, hip...
- Passive Intervertebral motion (Paris)
- Palpation
  - flexion, neutral, extension (DO)

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Manual Therapy Evaluation of the Thoracic and Lumbar Spine- Video Demonstration

- Passive Intervertebral Motion
  - Lumbar flexion
  - Lumbar sidebending
  - Lumbar rotation
- Joint mobility testing/Spring testing
  - Thoracic posteroanterior spring
  - Lumbar rotation spring testing

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Lumbar and Thoracic Manipulations

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Lumbar and Thoracic Manipulations

- Indications for Manipulation
  - Restricted accessory joint motion
  - Neurophysiological benefit and pain control

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## Lumbar and Thoracic Manipulations

- Contraindications/Precautions for Manipulation
  - Disease states
  - Hemarthrosis
  - Muscle holding
  - Fracture
  - Acute Inflammation
  - Fusion/ Joint replacement
  - Anticoagulant therapy
  - Osteoporosis
  - Instability/Hypermobility
    - Spondylolisthesis

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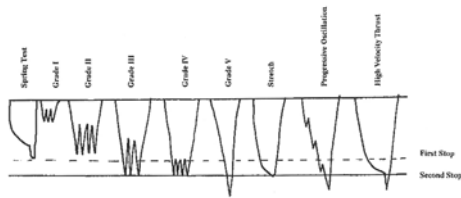
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## Grades of Manipulation




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## Grades of Manipulation

- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>➤ Non-Thrust           <ul style="list-style-type: none"> <li>Maitland- Grade I</li> <li>Grade II</li> <li>Grade III</li> <li>Grade IV</li> <li>Traditional- stretch</li> <li>Paris- progressive</li> <li>oscillation</li> <li>Mulligan- mobilizes with active movement</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>➤ Thrust           <ul style="list-style-type: none"> <li>Traditional- High Velocity Low Amplitude (HVLAT)</li> </ul> </li> <li>➤ Distraction           <ul style="list-style-type: none"> <li>Traditional- Manual Mechanical</li> <li>Paris- Positional</li> </ul> </li> </ul> |
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## Lumbar and Thoracic Manipulations

- Video Demonstration
  - Thoracic Posteroanterior Manipulation
  - Lumbar rotation via transverse process
  - Lumbar sidebending
    - Prone
    - Sidelying
  - Positional Distraction- SV Paris

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## Common Diagnoses that may benefit from Manual Therapy

- Facet Joint Arthropathy
- Osetoarthritis
- Lumbar Disc Protrusion/Herniation
  - Subacute, Chronic
  - “Sciatica”
- DDD
- Lumbar Sprain/Strain
- Lumbar Stenosis
  - Central
  - Foramenal

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## Poor Posture and Body Mechanics can contribute to...

- Muscle Imbalance/ Adaptive shortening
- Joint restrictions
  - Areas of relative hypo/hypermobility
  - Facet arthropathy
  - DDD
  - Compromise of neural foramen
- Lumbar disc protrusion/herniation

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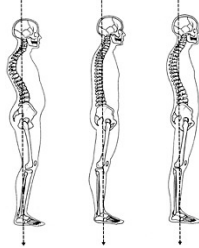
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### Key Tips to Remember...

- Education!
  - Posture
  - Proper Body Mechanics
  - Ergonomics
- Treatment to improve posture and optimize intended spine biomechanics



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### Key Tips to Remember...

- Treat joint restrictions with manipulation
- Stabilize areas of hypermobility
- Avoid manipulative forces thru hypermobile segments (i.e. spondylolisthesis)
- Joint restrictions may not be where the patient complains of pain/tenderness
- Pain is deceiving/ referral patterns

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### Key Tips to Remember...

- Lumbar Disc Protrusion
  - Acute- annular wall tear, posterior-posterolateral, avoid flexion, rotation, and especially a combination of both
  - Too much extension may cause a dessication
  - **NO ROTATION MANIPULATION** (acute-subacute)
- Warm up prior to manipulation is beneficial
- If cavitation occurs (pop), reflex inhibition
- After acute phase/palliative treatments, go to the source of the problem
  - Disc Protrusion- symptom
  - Muscle "sprain/strain" may be guarding due to underlying problem.

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## Case Study #1

### Lumbar Strain

- Pt. is a 42 y/o male c/o pain in the R side of his low back that began while playing catch with his son
- Denies radicular Sx
- c/o pain during AROM with flex. (veers R), SB L, and ROT R
- Guarding, increased tone R lumbar paraspinals
- Joint mobility testing
  - Decreased SB L at L3/L4, L4/5
  - Decreased ROT R at L3/L4, L4/5
  - Decreased PA mobility T4/5

### Manual Therapy Treatment

- R L3/4, L4/5 facet dysfunction?
- Manipulation to gap/open R lumbar facets L3/4, L4/5
  - Lumbar Rot R via t.p. on Left on L3 and L4
  - Lumbar SB L (prone, sidelying)
- STM may be beneficial prior to manipulation to decrease muscle guarding
- Manipulation to increase

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## Case Study #2

### Lumbar Disc Protrusion

- Pt. is a 32 y/o male c/o severe pain in his Left low back which radiates down to his calf after bending over to pick up the newspaper
- Guarded movements, sits shifted to R
- Pt. has decreased AROM flex, SB L, and mild decrease in ext.
- Decrease great toe ext. strength on L

### Manual Therapy Treatment

- Pt. Education/Posture!
- Positional distraction- R sidelying over bolster to open neural foramen of L4/5, L5/S1 on L
- Lumbar SB R manipulation?
- As acute phase subsides, reassess joint mobility and manipulate restrictions,
  - may begin with Lumbar SB over Rot initially
  - Also assess thoracic mobility

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## Case Study #3

### Chronic Low Back Pain

- Pt. is a 57 y/o female c/o chronic low back pain, she has a h/o L4/L5/S1 fusion 10 years ago.
- Osteopenia, increase thoracic kyphosis
- Denies radicular Sx
- Imaging: DDD L4/5, L5/S1
- Residual Myotome weakness from HNP, R gastroc
- Increase joint mobility L4/5, L5/S1 with tenderness, decreased

### Manual Therapy Treatment

- STM/MFR prior to joint manipulation
  - Muscle imbalance
  - Adaptive shortening
  - Decrease pain
- Joint manipulation to restricted thoracic segments
  - Grade of manipulation?
  - Block unstable segment
  - SIJ/hips?
- Strengthening for stability, L4/5, L5/S1

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## Evidence Supporting Manual Therapy of the Lumbar/Thoracic Spine

- Assendelft W, Morton S, Yu E, et. al. Spinal Manipulative Therapy for Low Back Pain: A meta-analysis of effectiveness relative to other therapies. *Annals of Intern. Med.* 2003;138:871-881.
- Aure O, Nilsen J, Vasseljen O. Manual Therapy and Exercise Therapy in Patients with Chronic Low Back Pain. *Spine.* 2003;28(6):525-532.
- Childs JD, FlynnTW, Fritz JM. A Perspective for Considering the Risks and Benefit of Spinal Manipulation in Patients with Low Back Pain. *Man. Ther.* 2006;11(4):316-20.
- Childs J, Fritz J, Flynn T, et. al. A Clinical Prediction Rule to Identify Patients with Low Back Pain Most Likely to Benefit from Spinal Manipulation: a Validation Study. *Annals of Intern. Med.* 2004;141(12):920-928.
- Cleland JA, Fritz JM, Whitman JM, Childs JD, Palmer JA. The Use of a Lumbar Spine Manipulation Technique by Physical Therapists in Patients Who Satisfy a Clinical Prediction Rule: A Case Series. *JOSPT.* 2006;36(4):209-14.

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## Evidence Supporting Manual Therapy of the Lumbar/Thoracic Spine

- Ferreira ML, Ferreira PH, Hodges PW. Changes in Postural Activity of the Trunk Muscles following Spinal Manipulative Therapy. *Man. Ther.* 2007;12(3):240-8.
- Fritz JM, Brennan GP, Leaman H. Does the Evidence for Spinal Manipulation Translate into Better Outcomes in Routine Clinical Care for Patients with Occupational Low Back Pain? A Case-Control Study. *Spine J.* 2006;6(3):289-95.
- Giles LGF, Muller R. Chronic Spinal Pain: a Randomised Clinical Trial Comparing Medication, Acupuncture, and Spinal Manipulation. *Spine.* 2003;28(14):1490-1503.
- Gill NW, Teyhen DS, Lee IE. Improved Contraction of the Transversus Abdominis Immediately Following Spinal Manipulation: A Case Study Using Real-Time Ultrasound Imaging. *Man. Ther.* 2007;12(3):280-5.

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## References

- Anatomy pictures  
– Netter, F.H. *Atlas of Human Anatomy.* 2<sup>nd</sup> ed. 1997
- Paris SV. *Manipulation and Management of the Spine.* S1 thru S4. University of St. Augustine, St. Augustine, FL 32086
- Greenman PE. *Principles of Manual Medicine.* Lippincott, Williams, & Wilkins. Philadelphia, PA. 2003

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# Thank You!

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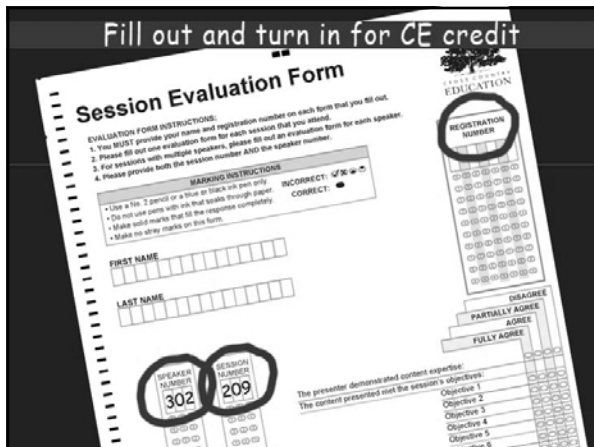
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