Musculoskeletal Examination of the Pain Patient

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Purpose of Examination

- Clearly define goals of examination
  - What information do you need in order to make appropriate patient care decisions
- Emphasis on discovering the Structural Underpinnings of Pain
- Determine the physical obstacles to restoration of normal function and structural integrity
Lumpers vs. Splitters

- Health Services Research
  - Diagnosis focuses on ruling out severe neurologic compromise, systemic illness, malignancy, psych issues
  - Treatment has become irrelevant
    - Outcome similar regardless of diagnosis
    - If Treatment proves ineffective, patients are labeled: “Psychological factors have prevented recovery”

Psychosocial factors, *ambiguous diagnoses*, and lack of a clearly superior treatment have complicated the management of patients with pain.

Causes of LBP: Lumpers World View

- NON-SPECIFIC: 95%
- HERNIATED DISC: 2-4%
- OTHER: 1%
- MALIGNANCY: <1%
Non-specific LBP: Splitters World View

- Soft tissue Injuries
  - Sprain/ Strain
  - Myofascial Pain
  - Piriformis Syndrome

- Structural
  - Sacral Joint Dysfunction
  - Facet Syndrome
  - Discogenic Pain
  - Scoliosis

- Degenerative
  - Lumbar Spondylosis
  - Degenerative Disc Disease
  - Spondylolisthesis
  - Spinal Stenosis
Dilemma

- Can Pain Specialist Refine Diagnostic Methods Sufficiently to
  - Improve Outcomes with Improved Treatment Plans
  - Limit Unnecessary Tests and Imaging
  - Reduce Overmedication
  - Prevent Perpetuation of Chronic Pain
The Fallacy of Relying on History

- Neck pain with numbness in hand = Cervical Radiculopathy in many Pain clinics
  - True Radiculopathy less than 5% of cases

- Differential
  - Myofascial
  - Thoracic Outlet
  - Entrapment Neuropathy
  - Repetitive Strain Injury
  - Shoulder Hand Syndrome
  - Other
Fallacy of Spine Imaging

- Lack of specificity, NEJM 1994 (Jensen)
  - Only 36% of asymptomatic individuals had normal LS Spine MRI
  - 52% with bulges, 27% with disc protrusion, 1% extrusion

- Reinforces disability
  - Patients assume lesions fixed
  - Unnecessary unless surgery planned or malignancy suspected
Fallacy of Orthopedic referral

- 200,000 disc surgeries per annum
- 1 in 5 patients seeing a surgeon will ultimately have surgery
- Surgical rate 2x that of Europe
- 55% rise in surgical interventions over last decade without evidence of improved outcomes
- Technology Driven – Done with little or no reliance on low-tech physical examination
Categories of Examination Components

Gait Assessment
Body Mechanics Assessment
Spine Assessment
  Range of Motion
  Joint Dysfunction
Muscle Imbalance
Nerve Impingement
Central Facilitation
Waddell Tests
Myofascial Assessment
"I suppose it's all for the best - his PT was going nowhere."
Pain Location: O,P,Q,R,S,T

- O – Onset
- P – Provocation
- Q – Quality: Sharp, dull, throbbing, aching
- R – Radiation pattern
- S – Sites other than main pain
- T – Timing of pain: AM, PM, while sleeping

GOAL IS TO REPRODUCE PAIN DURING EXAM AND FIND RELATED STRUCTURES THAT ARE PART OF THE COMPENSATION PATTERN
Gait

- Pain Behavior
- Gait Patterns
  - Antalgic
  - Trandelenberg & Compensated Trandelenberg
- Toe & Heel Walk
- Squat
Body Mechanics

- Single Leg Stance Preference
- Foot Pronation
- Knee Valgus/Varus Imbalance
- Hip Flexion/Rotation Imbalance
- Kyphosis/Lordosis
- Poor Diaphragmatic Excursion
- Internally Rotated Shoulders
- Head Extension and Forward Thrust
Spine Assessment: Standing

- Pelvic Obliquity – Assessment of SI Joint Function
  - Standing
  - Forward Flexion
  - Single Leg Weight Bearing

- Asymmetries – Compensation Pattern
  - Scapula
  - Fat Creases
  - Functional Scoliosis

- Flexion/Extension/Side Bend
  - 100 degrees/ 25 degrees/25 degrees – Muscle Imbalances
  - Adams Sign: Humping of ribs with Congenital Scoliosis
MMPI and Forward Flexion Test

Use an appropriate symbol. Mark areas of radiation. Include all affected areas.

NUMBNESS
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PINS & NEEDLES 0000
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BURNING
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STABBING
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Male
H.S.

Nc:72
78
50

Hy:66
Provocative Tests

- Facet Loading: Kemp’s Sign
  - Rotation and Extension of Lumbar Spine
- Spurling’s Test:
  - Cervical Facet/
  - Neuro Foramen Compression
- Hyperabduction Test
Stress Reactivity

- Begin Waddells Assessment
  - Axial Compression
  - Rotation
  - Pain Behavior
WADDELL SCORE

- Quantification of illness behavior not malingering
- Does not predict who will succeed in a functional restoration program
- May predict if FCE will be useful
### Pain Drawing

| Localized with appropriate neuro-anatomical features | Magnified, covering diffuse regions of body |

### Pain Adjectives

| Sensory | Affective, evaluative |

### Symptoms

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<th>Pain</th>
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<th>Whole leg pain</th>
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<td>Numbness</td>
<td>Dermatomal</td>
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<td>Weakness</td>
<td>Myotomal</td>
<td>Whole leg giving away</td>
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<td>Time Pattern</td>
<td>Varies with time</td>
<td>Never free of pain</td>
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<td>Response to Treatment</td>
<td>Variable benefit</td>
<td>Intolerance of treatments Frequent ER visits</td>
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### Signs

| Tenderness | Localized | Superficial, non-anatomical |
| Axial Loading | No lumbar pain | Lumbar pain |
| Straight leg raise | Limited on distraction | Improves with distraction |
| Sensory | Dermatomal | Regional |
| Motor | Myotomal | Jerky, give away weakness |
| Tenderness | Appropriate pain | Over-reaction |
Spine Assessment: Sitting

- Straight Leg Raise
- Slump Test
- FABER (Flexion, Abduction, Ext. Rotation)
- Continue Waddell’s
  - Distraction Test – Inconsistencies
  - Sensory Testing – Non-Dermatomal
  - Motor Testing – Break away weakness
Spine Assessment: Supine

- Assess Leg Lengths and Hip Rotation
- Repeat Straight Leg Raise
- Repeat FABER
- Abdominal Strength Testing
- SI Joint Compression
- Gaenslen Test
- Thomas Test
  - Tight Hip Flexors
- Hip Rotator Testing
  - Assess for Groin pain – Hip DJD
  - Piriformis Tightness
Spine Assessment: Prone

- Reverse Straight Leg Raise – Yoeman’s Test
  - Assess Hip Flexor Tightness
  - Neural Tension sign L2-4
- Spinal Extensor Strength
- Palpation of Joint Structures
  - Ischial Tuberosity, Greater Trochanter
  - SI joint
  - Facets
  - Spinal Ligaments
- Myofascial Exam
Facet Joint Mediated Pain

- Zygapophyseal joint
- Cervical, thoracic, lumbar
- Difficult clinical diagnosis
  - Pain on extension, lateral flexion, lateral rotation
  - Poor specificity
  - Improved with Palpation
  - Pain: axial +/- radiation, no sensory abnormalities
- Cervicogenic headache
Piriformis muscle syndrome

- Hip External Rotator
- Can be source of
  - Hip Bursitis
  - Sciatica
- Often part of structural dysfunction that includes SI joint and Lumbar facets
Discogenic pain (non-neuropathic)

- Annular tear
- Internal disc disruption
- Clinical features
  - Axial back pain with some lower extremity referral pattern
  - Pain increased with sitting
  - Normal neurological exam
  - MRI: annular tears, high intensity zones
  - Discography: reproduction of concordant pain
Provocative Discography

- Vibration Test on the Spinous Process shown to correlate with results of Discograms (Agreement in 71% of cases)

Myofascial Testing

- Don’t Poke, Palpate
- Search for Irritable Taught fibers
  - Loss of Range of Motion
  - Recognized pain with Deep Palpation
  - Local Twitch Response
  - Dermatographia, Match Stick Test
- Expand search to Myotactic Unit
  - Set of muscles that work together for common functional tasks
    - Shoulder stabilizers
    - SI joint Stabilizers
# Spinal Nerve and Muscle Chart

## Neck, Diaphragm and Upper Extremity

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### Sensory

- **C2**: Supraclavicular fossa
- **C3**: Axillary fossa
- **C4**: Intercostal spaces
- **C5**: Posterior cord
- **C6**: Medial antebrachial sulcus
- **C7**: Radial nerve
- **C8**: Median nerve
Conclusions

Use Exam to exclude or rule in Differential formulated during the History
Maintain local – distal view of the biomechanical mechanism
Recheck Provocative tests after Procedures or Rehab interventions to assess efficacy
Pain relief should open the window to Correct biomechanical maladaption