Clinical Reasoning
for the
Physical Therapy Student

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AAOMPT 2014 Annual Conference
San Antonio, TX
25 Oct 2014
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No relevant financial relationships exist.
Outline

• Clinical Reasoning Introduction
• Errors in Clinical Reasoning
• Importance of a Systematic Approach
• Advanced Physical Therapy Examination
• Examples of Clinical Reasoning in Physical Therapy Literature
• Practical Exercise-Lumbar/Hip Differential
Clinical Reasoning

- The thinking and decision-making processes associated with professional practice (Higgs and Jones, 2000)

- Clinical reasoning is a complex phenomenon because it is both cognitive and interactive, mostly unobservable, at times automatic and subconscious, multifactorial and context-dependent. (Ajjawi and Higgs, 2008)

- Clinical reasoning consists of data gathering, organization, and interpretation; hypothesis generation and testing; and critical evaluation of alternative diagnostic and treatment strategies. (Jones and Rivett, 2004)

- The process of making sense of a clinical encounter (“Making Features Fit”) (Maitland, 2005)

- It is a skill that is enhanced by practice
Failure to filter and group an array of signs and symptoms into meaningful, and manageable, chunks of information

Letting personal and professional biases cloud our reasoning

Ineffectively gathering pertinent information to guide clinical reasoning

Kempainen, 2003
Most errors occurred with:

- Patient-practitioner clinical encounter (78.9%)
  - History taking (56.3%)
  - Examination (47.4%)
  - Ordering diagnostic tests for further workup (57.4%)
Importance of a Systematic Approach

1. **Patient Profile**
   - Chief Complaint
   - Body Chart

2. **Formulate Initial Hypotheses:**
   - Pattern Recognition
   - Structures Under Symptoms

3. **Agg/Ease**
   - 24hr Past Hx
   - Present Hx

4. **Review of Systems**
   - Patient Goals
   - Outcome Measure

5. **Reprioritize and Refine Hypotheses**
   - SINSS
   - SE*
   - Plan OE

6. **Fx*n* OE* that match ROM + OP Special tests Manual exam R1/2 PAIVM/PPIVM PAM

7. **Intervention Matched to SE*/OE* Test/Retest Prognosis**

8. **Follow up:**
   - Better/Worse/Same Outcome Measures
   - Recheck SE* and OE*

9. **Refine Hypotheses with Continuous Assessment**

10. **Discharge Planning; Rehab Goal Achievement**
Patient focused interview

Use of body chart or symptom map

Funneling technique for questions
  • Start with Open-Ended
  • Progress to Closed-Ended
  • Clarify with Closed and Biased

Use evidence-based screening questions/
medical screening form

Use of evidence-based tests/measures
Listen to your patients. They will tell you what is wrong with them.”
-Dr. William Osler

“I know that you believe you understand what you think I said, but, I am not sure you realize that what you heard is not what I meant.”
-Robert McCloskey

Keep An Open Mind
Body Chart/Symptom Map

- Location
- Intensity
- Quality
- Depth
- Behavior
- Relationship
- Paresthesias

P1: (worst) Constant, variable, deep, dull pain 3-7/10

P2: Intermittent, variable, sharp pain 0-4/10

Relationship of Symptoms:
P1 increase leads to P2; Sometimes P2 comes on without P1

✓ = Symptom free areas
I keep six honest serving-men
(They taught me all I knew);
Their names are **What** and **Why** and **When**
And **How** and **Where** and **Who**.
-Rudyard Kipling
Types of Questions

- **Open-Ended**: Where is your pain?
  - Always start with this type of question

- **Closed-Ended**: Does your shoulder pain change when you move your neck?
  - Progress to these if needed
  - Yes or No answers

- **Closed and Biased**: Does your shoulder pain get worse with overhead reaching?
  - Clarify with these if needed
  - Yes or No answers with a bias
Medical Screening Form

Physical Therapy Clinic Medical History Screening Form

What can your physical therapist help you achieve?

List any medications/ dietary supplements you are taking. [ ] None

List any drug or latex allergies. [ ] None

Do you have difficulties with? (check all that apply)
☐ Communication ☐ Vision ☐ None
☐ Speech ☐ Hearing ☐ Other

How do you learn best? (check one)
☐ Seeing ☐ Doing ☐ Hearing

Are you? [ ] Circle Yes or No
Pregnant / Potentially Pregnant / Nursing? N/A Yes No

Often bothered by feeling down, depressed or hopeless? Yes No

Often bothered by little interest or pleasure in doing things? Yes No

Do you? [ ] Circle Yes or No
Feel safe at home and in the workplace? Yes No

Use tobacco? Yes No
If yes, _____ packs per day, for ______ years

Use alcohol? Yes No
If yes, ________ drinks per week

Rate your HIGHEST/WORST pain level in the past 72 hrs.
0 1 2 3 4 5 6 7 8 9 10
No pain Worst pain

Rate your LOWEST/BEST pain level in the past 72 hrs.
0 1 2 3 4 5 6 7 8 9 10
No pain Worst pain

Are your symptoms:
☐ Getting worse? ☐ Not Changing? ☐ Getting Better?

Have you or any immediate family member ever been told you have: [Circle Yes or No]
Cancer? Yes No Yes No
Diabetes? Yes No Yes No
High Blood Pressure? Yes No Yes No
Heart Disease? Yes No Yes No
Stroke? Yes No Yes No
Rheumatoid Arthritis? Yes No Yes No

Do you have a history of: [Circle Yes or No]
Asthma/Bronchitis? Yes No
Chest Pain/Angina? Yes No
Headache? Yes No
Kidney Disease? Yes No
Liver Disease? Yes No
Neurologic Disease? Yes No
Osteoarthritis? Yes No
Osteoporosis? Yes No

Pain with sexual intercourse? Yes No
Pain in the pelvic region? Yes No
Sexually Transmitted Disease? Yes No
Seizures? Yes No
Prior Surgeries? Yes No

In the past 3 months have you experienced: [Circle Yes or No]
A change in your general health? Yes No
Nausea/Vomiting? Yes No
Fever / Chills / Sweats? Yes No
Unexplained weight change (10 lbs)? Yes No
Number of colds? Yes No
Infections of any sort? Yes No
Changes in your appetite? Yes No
Difficulty swallowing? Yes No
Changes in weight/height/spine? Yes No
Shortness of breath? Yes No
Bowel / Bladder loss of control? Yes No

Dizziness / Vertigo? Yes No

List 3 activities you have difficulty doing because of your pain.
Then on the scale below each activity, mark how difficult the activity is to perform.
(Example: running 1 mile—8)

Activity #1:

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<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>No restrictions</td>
<td>Moderate difficulty</td>
<td>Unable to perform</td>
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Activity #2:

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Activity #3:

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<th>7</th>
<th>8</th>
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<th>10</th>
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<td>No restrictions</td>
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Form continued on back side
Use highly **reliable** and **valid** tests/measures

Use highly **sensitive** tests to rule out (SnNout)

Use highly **specific** test to rule in (SpPin)

**Likelihood Ratios** combine Sn and Sp to indicate a shift in probability from pre-test to post-test

<table>
<thead>
<tr>
<th>Positive LR</th>
<th>Negative LR</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 10</td>
<td>&lt; 0.1</td>
<td>Large and often conclusive shift</td>
</tr>
<tr>
<td>5-10</td>
<td>0.1-0.2</td>
<td>Moderate shift</td>
</tr>
<tr>
<td>2-5</td>
<td>0.2-0.5</td>
<td>Small; sometimes important</td>
</tr>
<tr>
<td>1-2</td>
<td>0.5-1</td>
<td>Small; rarely important</td>
</tr>
</tbody>
</table>
Examples of Clinical Reasoning in PT

Clinical Reasoning and Advanced Practice Privileges Enable Physical Therapist Point-of-Care Decisions in the Military Health Care System: 3 Clinical Cases
Daniel I. Rhon, Gail D. Deyle and Norman W. Gill

September 2013 Volume 93 Number 9 Physical Therapy

Integration of Critically Appraised Topics Into Evidence-Based Physical Therapist Practice

Michael S. Crowell, PT, DPT1 + Bradley S. Tragard, PT, DPT1 + Alden L. Taylor, PT, DPT1 + Gail D. Deyle, PT, DSc2

October 2012 Volume 42 Number 10 Journal of Orthopaedic & Sports Physical Therapy

Clinical Reasoning for Manual Therapists

Clinical Reasoning in the Health Professions

Clinical Cases in Physical Therapy
Systematic Clinical Reasoning in Physical Therapy (SCRIPT): A tool for the purposeful practice of clinical reasoning in orthopaedic manual physical therapy

Publication pending

Break up in groups for practical exercise

Baker S, Painter E, Morgan B, Kaus A, Petersen E, Deyle G
Patient Profile:
- 45 y/o male office worker. Sits at desk 90% of day. Some walking around hallways to and from offices. Stairs in/out of building 1 flight.
- Hobbies: HAM radio operator, limited yard work (difficult secondary to current problems), plays with children ages 6 and 10. Walks for exercise 1/2 mile (had been 1-2 miles prior to current problem) few times per week. Some light work outs in gym 2 x week.

Chief Complaint: Left leg pain
Body Chart

- **P2**: Intermittent, variable, deep ache, 0-4/10
- **P1**: Intermittent, variable, cramping ache 0-8/10
- **P3**: (Worst) Intermittent, variable, hot burning 0-8/10
- **P4**: Intermittent, variable, N/T 0-3/10 (bothersome)

✓ = Symptom free areas
## Determine Sources of Symptoms

### I. WHAT AREAS/STRUCTURES MUST BE EXAMINED AS A POSSIBLE SOURCE(S) OF THE PATIENT’S SYMPTOMS? Consider the following:

<table>
<thead>
<tr>
<th>Joints &amp; bony structures UNDER the area of symptoms</th>
<th>Muscles, tendons &amp; other soft tissue UNDER &amp; IN the area of symptoms</th>
<th>Pain producing structures which may REFER into the area of symptoms</th>
<th>OTHER structures or conditions which must be examined or ruled out</th>
</tr>
</thead>
<tbody>
<tr>
<td>L L5-S1 L Hip/Pelvis L SIJ L Femur L Knee L Tibia/Fibula L Ankle L Metatarsals L Phalanges</td>
<td>L Lx paraspinals L glutes L Hip Ext Rot. L Hamstrings L Gastroc/Soleus L Peroneals L Foot Intrinsic Sciatic Nerve</td>
<td>L Upper Lx/Lower thoracic into L Lower Lx L Lower Lx into buttocks, posterior leg, and foot L SIJ into posterior leg and foot L Hip into posterior leg L Thigh/Knee into ankle and foot</td>
<td>Adherent nerve root (L5-S1) or adherent peripheral nerve (Sciatica) Lower GI Genitourinary Cancer Infection</td>
</tr>
</tbody>
</table>

![Diagram showing symptom areas]

- **P1:** Intermittent, variable, cramping ache 0-8/10
- **P2:** Intermittent, variable, deep ache, 0-4/10
- **P3:** (Worst) Intermittent, variable, hot burning 0-8/10
- **P4:** Intermittent, variable, N/IT 0-3/10 (bothersome)

☑️ = Symptom free areas
### Make Initial Hypotheses

<table>
<thead>
<tr>
<th>Most Likely Hypotheses:</th>
</tr>
</thead>
<tbody>
<tr>
<td>L L5-S1 Radiculopathy/HNP</td>
</tr>
<tr>
<td>L L5-S1 DDD/DJD</td>
</tr>
<tr>
<td>L L5-S1 Facet Dysfunction with somatic referral into leg and foot</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Less Likely Hypotheses:</th>
</tr>
</thead>
<tbody>
<tr>
<td>L SIJ pathology with referral into leg</td>
</tr>
<tr>
<td>L adherent nerve root</td>
</tr>
<tr>
<td>L Sciatica/Piriformis Syndrome</td>
</tr>
<tr>
<td>L Hip pathology with somatic referral into leg and back</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Remote Hypotheses:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-MSK Conditions:</td>
</tr>
<tr>
<td>- Lower Gastrointestinal</td>
</tr>
<tr>
<td>- Genitourinary</td>
</tr>
<tr>
<td>- Cancer</td>
</tr>
<tr>
<td>- Infection</td>
</tr>
</tbody>
</table>
Aggravating Factors:
- **Sitting**: longer than 15 minutes brings on P1/P2; longer than 30 minutes brings on P3/P4; standing few minutes clears P1, P2. P3, P4 persist and subside only partially after 10 minutes of walking around.
- **Standing**: longer than 20 minutes P1; sitting or lying down few minutes
- **Walking**: over ½ mile P3/P4 must stop; sitting few minutes partially eases but P3 and P4 will persist an hour or two strongly, and be present the rest of the day
- **Bending**: 1/2 bend forward P1; OOP (sometimes increases P3 strongly)
- **Lifting 6-year old from floor**: All areas of pain aggravated; lie down for a few hours

Easing Factors:
- **Lying down** either flat on back with knees flexed or on R side,
- **NSAIDs** (partial), Has some Tylenol (T3) from a dental procedure that he takes as needed.
- **Ice** (partial)
24 Hour Behavior:
- AM: Stiff lower back P1, P3 upon standing; eases somewhat in 40 minutes
- End of Day: Bad by 1600 hrs because of sitting required; all Sx increased.
- Night: 1-2X per night most nights must get up and move around due to P3 awakening him; RTS 10 minutes especially with Tylenol 3.

Special Questions:
- (-) Changes in General Health
- (-) Fever, Chills, Sweats
- (-) Bowel/Bladder loss of control
- (-) Unexplained weight change
- (-) Saddle anesthesia

X-rays:
- Unremarkable except for minimal degenerative changes in lumbar spine with most prominent at L5-S1. No MRI or CT Scan performed.
Present History:

- This episode started four weeks ago with P1 and P2 after a day-long HAM radio convention (prolonged standing/walking/some bending) He noticed P3 and P4 one week later. He denies any intervention other than NSAIDs, T3 in past week or two, and ice and bed rest for two days over the weekend. Overall, all symptoms are moderately worse than at onset.

Past History:

- Several episodes of LBP lasting 1-2 weeks over the past 15 years. First episode after planting trees in yard fifteen years ago. Usually feels better with local ice. Earlier this year had episode with P1 and P2 after doing yard work for 6 hours (bent over gardening) Resolved in three weeks.
### Determining the Vigor of Your Exam/Treatment

#### II. INFLUENCE OF THE SYMPTOMS ON THE EXAM. Detailed by Area of Symptoms as Mapped on Body Chart

<table>
<thead>
<tr>
<th>P</th>
<th>Severity</th>
<th>Irritability</th>
<th>Nature</th>
<th>Stage</th>
<th>Stability</th>
<th>Limit Exam</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mod</td>
<td>Mild</td>
<td>MSK</td>
<td>Subacute on Chronic</td>
<td>Worsening</td>
<td>No</td>
</tr>
<tr>
<td>2</td>
<td>Mod</td>
<td>Mild</td>
<td>MSK</td>
<td>Subacute on Chronic</td>
<td>Worsening</td>
<td>No</td>
</tr>
<tr>
<td>3</td>
<td>Severe</td>
<td>Severe</td>
<td>Neural, Inflammatory</td>
<td>Acute</td>
<td>Worsening</td>
<td>Yes</td>
</tr>
<tr>
<td>4</td>
<td>Mild</td>
<td>Mod</td>
<td>Neural, Inflammatory</td>
<td>Acute</td>
<td>Worsening</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Mild</td>
<td>Mild</td>
<td>(Healing, Fragile tissues, Inflammatory, Psychosocial)</td>
<td>Acute, Subacute, Chronic</td>
<td>Improving</td>
<td>Yes - Y</td>
</tr>
<tr>
<td></td>
<td>Mod</td>
<td>Mod</td>
<td>Non MSK / MSK / Both</td>
<td>Acute on Chronic</td>
<td>Worsening</td>
<td>No - N</td>
</tr>
<tr>
<td></td>
<td>Severe</td>
<td>Severe</td>
<td></td>
<td>Subacute on Chronic</td>
<td>Not Changing</td>
<td></td>
</tr>
</tbody>
</table>

#### What will be the vigor of your exam? Rationale

- **Examine to first onset or change in pain (P1)**
  - X
  - Yes, respecting P3

- **Examine to the end of active range or ACTIVE Limit**
  - X
  - Yes, respecting P3

- **Examine to the end of passive range or PASSIVE limit**
  - □
  - Probably not, unless very gentle with movement

- **Examine with OVER PRESSURE sufficient to determine end feel**
  - □
  - No, likely to get good OE* with less provocation

- **Use Sustained, Repeated or Combined Movements**
  - □
  - No, likely to get good OE* with less provocation

#### Does the nature, diagnosis, or co-morbidities warrant special caution for exam or treatment? Y / N What?
- Y / N
  - What?
    - e.g. Trauma / Red Flags / Instability/ Pathological Process

#### III. INFLUENCING FACTORS: Are there contributing factors that need to be addressed with this patient? (check all that apply)

<table>
<thead>
<tr>
<th>X</th>
<th>Posture</th>
<th>X</th>
<th>Ergonomics</th>
<th>X</th>
<th>Conditioning</th>
<th>Psychosocial Factors</th>
<th>Other:</th>
</tr>
</thead>
</table>

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*OE* = Overload Effect
### Planning the Objective Exam

#### Initial Exam:
- Lx Spine AROM to P1 and active limit respecting P3
- Neuro Exam
- SLR, Crossed SLR, Prone Knee Bend
- Palpation of symptom areas

#### Visit 2 Exam:
- Re-examine all SE/OE Asterisks
- Examine and eventually clear Hip/SIJ
- Progress/Layer treatment as able

#### Visit 3 Exam:
- Re-examine all SE/OE Asterisks
- Examine and eventually clear Hip/SIJ
- Recheck neuro
- Progress/Layer treatment as able
- Redo functional outcome measure
Clinical reasoning is an essential skill in physical therapy practice.

Errors in clinical reasoning can be eliminated by implementing a systematic approach and advanced examination techniques. (patient-focused interview, funnelling technique for questions, medical screening form, body chart, evidence-based tests and measures)

It takes Practice!
References