

# Evidence based physiotherapy and DIFFERENTIAL DIAGNOSIS

Assoc. prof. dr. Vilma Dudoniene, LSU



# LITHUANIAN SPORTS UNIVERSITY

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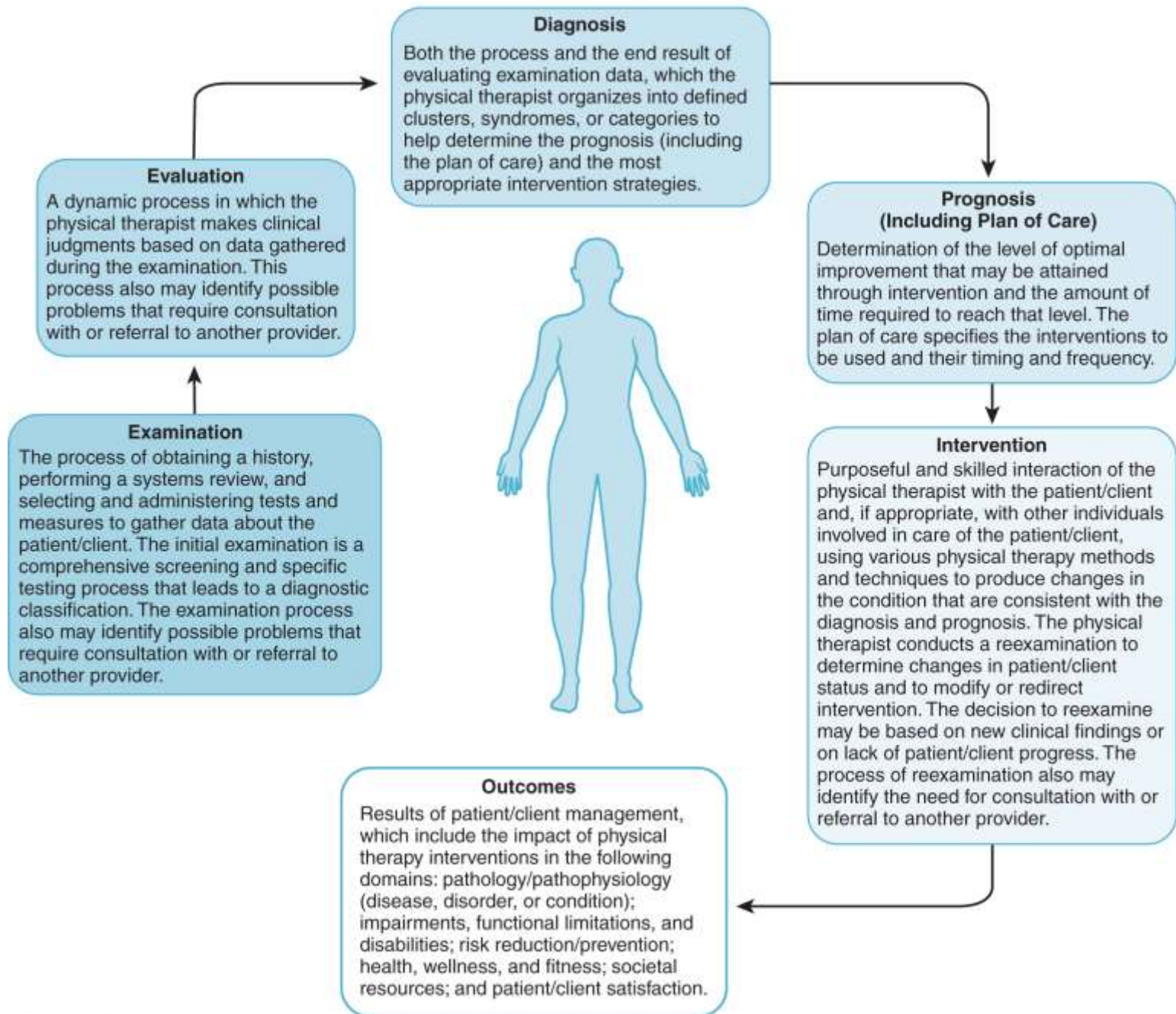
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# The Elements of Patient/Client Management Leading to Optimal Outcomes



# What do we need to be able to practice?

- Knowledge
- Skills
- Competences

**Identify impairments** → **plan of care** → **treatment**

# Clinical decisions

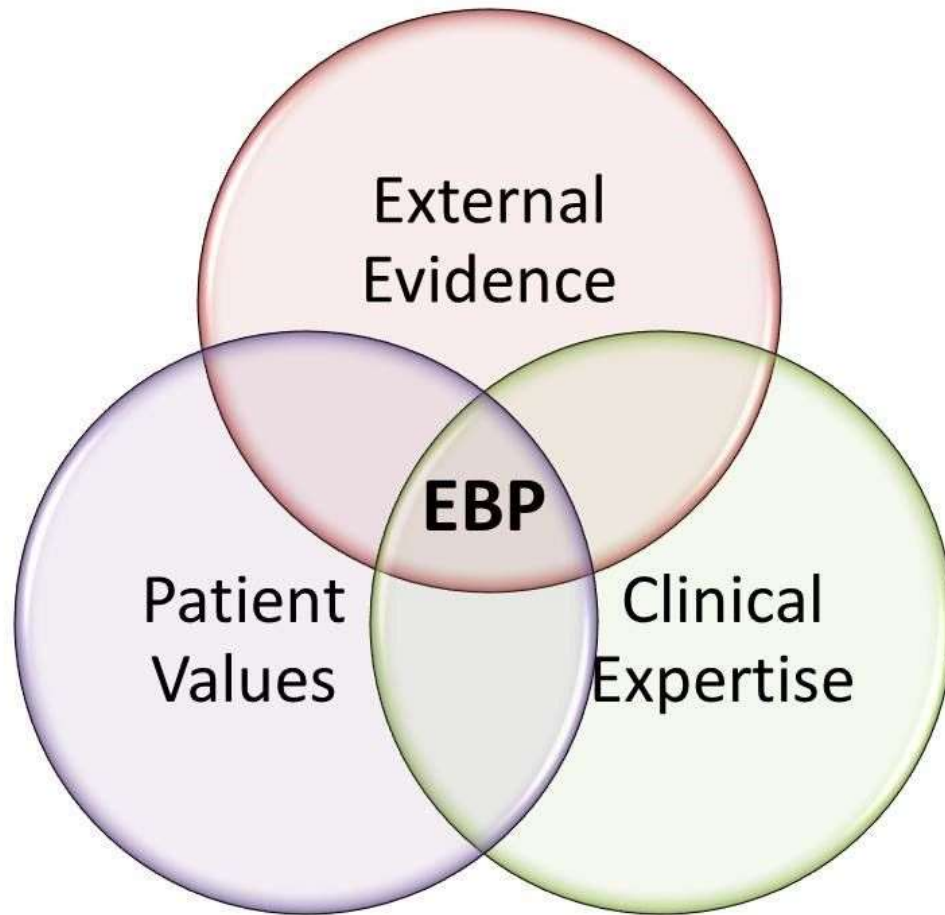
must be based on the best evidence available.

The clinical basis for diagnosis, prognosis, and intervention must come from a valid and reliable body of evidence referred to as evidence-based practice.

Each therapist must develop the skills necessary to assimilate, evaluate, and make the best use of evidence when screening patient/clients for medical disease.



# Evidence based PT



RCT

# PEDro Top 5 Trials 2014-2019

- [Preoperative physiotherapy for the prevention of respiratory complications after upper abdominal surgery: pragmatic, double blinded, multicentre randomised controlled trial](#)  
Boden et al., *BMJ* 2018 Jan 24;360:j5916
- [Exercises to improve function of the rheumatoid hand \(SARAH\): a randomised controlled trial](#)  
Lamb SE, et al (SARAH) Trial Team, *Lancet* 2015 Jan 31;385(9966):421-429
- [Hip arthroscopy versus best conservative care for the treatment of femoroacetabular impingement syndrome \(UK FASHIoN\): a multicentre randomised controlled trial](#)  
Griffin DR, et al., FASHIoN Study Group, *Lancet* 2018 Jun 2;391(10136):2225-2235
- [Effect of inpatient rehabilitation versus a monitored home-based program on mobility in patients with total knee arthroplasty: the HIHO randomized clinical trial](#)  
Buhagiar MA, et al., *JAMA* 2017 Mar 14;317(10):1037-1046
- [Efficacy and safety of very early mobilisation within 24 h of stroke onset \(AVERT\): a randomised controlled trial](#)  
The AVERT Trial Collaboration group, *Lancet* 2015 Jul 4;386(9988):46-55

# Kegel exercise

<a href="#">Effect of segmental stabilizing exercises augmented by pelvic floor muscles training on women with postpartum pelvic girdle pain: a randomized controlled trial</a>	clinical trial	7/10	<a href="#">Select</a>
<a href="#">The effect of pelvic floor muscle training on incontinence problems after radical prostatectomy</a>	clinical trial	6/10	<a href="#">Select</a>
<a href="#">Effect of a physiotherapy program in women with primary dysmenorrhea</a>	clinical trial	6/10	<a href="#">Select</a>
<a href="#">Comparison effect of physiotherapy with surgery on sexual function in patients with pelvic floor disorder: a randomized clinical trial</a>	clinical trial	6/10	<a href="#">Select</a>
<a href="#">Evaluation of the effect of pelvic floor muscle training (PFMT or Kegel exercise) and assisted pelvic floor muscle training (APFMT) by a resistance device (Kegelmaster device) on the urinary incontinence in women "comparison between them: a randomized trial"</a>	clinical trial	6/10	<a href="#">Select</a>
<a href="#">Pelvic floor (Kegel) exercises: a pilot study in nulliparous women</a>	clinical trial	6/10	<a href="#">Select</a>
<a href="#">A comparison of effectiveness of biofeedback and pelvic muscle exercise treatment of stress incontinence in older community-dwelling women</a>	clinical trial	6/10	<a href="#">Select</a>
<a href="#">Treatment of stress incontinence with pelvic floor exercises and biofeedback</a>	clinical trial	6/10	<a href="#">Select</a>
<a href="#">Effects of sex education and Kegel exercises on the sexual function of postmenopausal women: a</a>	clinical	5/10	<a href="#">Select</a>

# Scope of practice


- Musculoskeletal conditions account for roughly 25% of patient complaints in the primary care setting.
- However, physicians have been shown to lack confidence in their evaluation and treatment skills of these patients.

Is every patient appropriate  
candidate for PT?

How often does it happen that a systemic or viscerogenic problem masquerades as a neuromuscular or musculoskeletal problem?


# What is Diagnosis?

**“The anatomic, biochemical, physiologic, or psychologic derangement”**

**DIAGNOSIS**  **Labeling  
Pathology**

# What is PT Diagnosis?

**“Diagnosis is the term which names the primary dysfunction toward which the physiotherapist directs treatment” (Sahrmann, 1989)**

**DIAGNOSIS**  **Planning  
Treatment**



# Medical vs PT diagnosis

- **Medical Diagnosis:**

- **Herniated Disc**
- **CVA**

- **Physical Therapy Diagnosis:**

- **Right-sided radiculopathy centralizing with repeated extension -Правосторонняя радикулопатия с центральным повторным расширением**
- **Left-sided hemiplegia Левосторонняя гемиплегия - all movements with marked spasticity.**

# Diagnosis

—in PHYSICAL THERAPY is the result of a process of **clinical reasoning** which results in the identification of:

- existing or potential impairments,
- limitations in activities,
- restrictions in participation,
- factors influencing functioning.

# If the medical diagnosis is delayed

1. The patient/client does not get better with physical therapy intervention,
2. The patient/client gets better then worse, and
3. Other associated signs and symptoms eventually develop.

# Three Strategies of Clinical Diagnosis

- Pattern recognition,
- Complete history and physical examination,
- Hypothetic-deductive strategy.

# Differential diagnosis

- not to teach therapists to be medical diagnosticians.
- to help therapists recognize areas that are beyond the scope of a physical therapist's practice or expertise.
- to identify clients who need a medical (or other) referral or consultation.
- **Screening** is an essential skill because any client can present with red flags requiring reevaluation by a medical specialist.

# A need for screening

- Side effects of medications,
- Comorbidities,
- Visceral pain mechanisms.

# Screening is checking for pathology when there are no symptoms of disease

Common screening activities include:

- (1) screening for lifestyle factors (amount of exercise, activity, stress level, body weight),
- (2) screening posture,
- (3) identifying high risk factors of older adults,
- (4) Identifying work-related risk factors.

## Physical Therapy Medical Screening Questionnaire

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Age: \_\_\_\_\_

Are you latex sensitive? Yes No

Do you smoke? Yes No

Do you have a pacemaker? Yes No

FOR WOMEN: Are you currently pregnant or think you might be pregnant? Yes No

ALLERGIES: List any medication(s) you are allergic to: \_\_\_\_\_

---

Have you RECENTLY noted any of the following (check all that apply)?

- |   |   |  |
|---|---|--|
| <input type="checkbox"/> fatigue                                      | <input type="checkbox"/> numbness or tingling                 | <input type="checkbox"/> constipation        |
| <input type="checkbox"/> fever/chills/sweats                          | <input type="checkbox"/> muscle weakness                      | <input type="checkbox"/> diarrhea            |
| <input type="checkbox"/> nausea/vomiting                              | <input type="checkbox"/> dizziness/lightheadedness            | <input type="checkbox"/> shortness of breath |
| <input type="checkbox"/> weight loss/gain                             | <input type="checkbox"/> heartburn/indigestion                | <input type="checkbox"/> fainting            |
| <input type="checkbox"/> difficulty maintaining balance while walking | <input type="checkbox"/> difficulty swallowing                | <input type="checkbox"/> cough               |
| <input type="checkbox"/> falls  | <input type="checkbox"/> changes in bowel or bladder function | <input type="checkbox"/> headaches           |

Have you EVER been diagnosed with any of the following conditions (check all that apply)?

- |   |   |  |
|---|---|--|
| <input type="checkbox"/> cancer                                 | <input type="checkbox"/> depression                       | <input type="checkbox"/> thyroid problems      |
| <input type="checkbox"/> heart problems                         | <input type="checkbox"/> lung problems                    | <input type="checkbox"/> diabetes              |
| <input type="checkbox"/> chest pain/angina                      | <input type="checkbox"/> tuberculosis                     | <input type="checkbox"/> osteoporosis          |
| <input type="checkbox"/> high blood pressure                    | <input type="checkbox"/> asthma                           | <input type="checkbox"/> multiple sclerosis    |
| <input type="checkbox"/> circulation problems                   | <input type="checkbox"/> rheumatoid arthritis             | <input type="checkbox"/> epilepsy              |
| <input type="checkbox"/> blood clots                            | <input type="checkbox"/> other arthritic condition        | <input type="checkbox"/> eye problem/infection |
| <input type="checkbox"/> stroke                                 | <input type="checkbox"/> bladder/urinary tract infection  | <input type="checkbox"/> ulcers                |
| <input type="checkbox"/> anemia                                 | <input type="checkbox"/> kidney problem/infection         | <input type="checkbox"/> liver problems        |
| <input type="checkbox"/> bone or joint infection                | <input type="checkbox"/> sexually transmitted disease/HIV | <input type="checkbox"/> hepatitis             |
| <input type="checkbox"/> chemical dependency (i.e., alcoholism) | <input type="checkbox"/> pelvic inflammatory disease      | <input type="checkbox"/> pneumonia             |

Has anyone in your immediate family (parents, brothers, sisters) EVER been diagnosed with any of the following conditions (check all that apply)?

- |  |                                     |   |
|--|-------------------------------------|---|
| <input type="checkbox"/> cancer              | <input type="checkbox"/> diabetes   | <input type="checkbox"/> tuberculosis     |
| <input type="checkbox"/> heart problems      | <input type="checkbox"/> stroke     | <input type="checkbox"/> thyroid problems |
| <input type="checkbox"/> high blood pressure | <input type="checkbox"/> depression | <input type="checkbox"/> blood clots      |

During the past month have you been feeling down, depressed or hopeless? YES NO

During the past month have you been bothered by having little interest or pleasure in doing things? YES NO

If yes to either, is this something with which you would like help? YES YES, but NOT today NO

---

Please list any medications you are currently taking (INCLUDING pills, injections, and/or skin patches):



# McGILL PAIN QUESTIONNAIRE

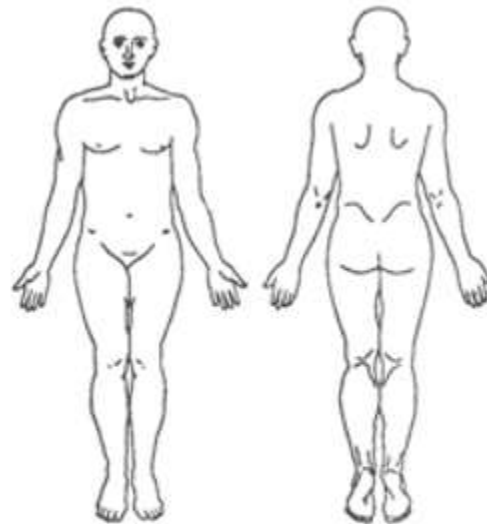
RONALD MELZACK

Patient's Name \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_ am/pm

PRI: S \_\_\_\_\_ A \_\_\_\_\_ E \_\_\_\_\_ M \_\_\_\_\_ PRI(T) \_\_\_\_\_ PPI \_\_\_\_\_  
 (1-10) (11-15) (16) (17-20) (1-20)

1 FLICKERING QUIVERING PULSING THROBBING BEATING POUNING	11 TIRING EXHAUSTING
2 JUMPING FLASHING SHOOTING	12 SICKENING SUFFOCATING
3 PRICKING BORING DRILLING STABBING LANCINATING	13 FEARFUL FRIGHTFUL TERRIFYING
4 SHARP CUTTING LACERATING	14 PUNISHING GRUELLING CRUEL VICIOUS KILLING
5 PINCHING PRESSING GNAWING CRAMPING CRUSHING	15 WRETCHED BLINDING
6 TUGGING PULLING WRENCHING	16 ANNOYING TROUBLESOME MISERABLE INTENSE UNBEARABLE
7 HOT BURNING SCALDING	17 SPREADING RADIATING PENETRATING PIERCING
	18 TIGHT NUMB DRAWING SQUEEZING

BRIEF _____	RHYTHMIC _____	CONTINUOUS _____
MOMENTARY _____	PERIODIC _____	STEADY _____
TRANSIENT _____	INTERMITTENT _____	CONSTANT _____

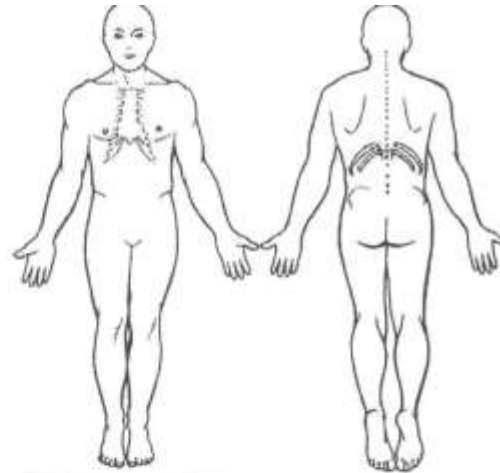


E = EXTERNAL  
I = INTERNAL

**Body Chart:**

Please mark the areas where you feel pain on the chart to the right

**For the therapist**  
+/- Cough/Sneeze  
+/- Saddle Anesth.  
+/- Bw/Bfddr Chnge  
+/- Numb/Ting.



**On the scales below, please circle the number which best represents the severity of your pain is.**

*Average* for the last 48 hours:

No Pain 0 1 2 3 4 5 6 7 8 9 10 Worst Pain Imaginable

*Best* for the last 48 hours:

No Pain 0 1 2 3 4 5 6 7 8 9 10 Worst Pain Imaginable

*Worst* for the last 48 hours:

No Pain 0 1 2 3 4 5 6 7 8 9 10 Worst Pain Imaginable

**Please circle the number below which best represents your overall average level of function.**

Cannot do anything 0 1 2 3 4 5 6 7 8 9 10 Able to do everything

What makes your symptoms better? \_\_\_\_\_  
\_\_\_\_\_

Please circle the activities which make your pain worse: sitting  
lying down standing  
walking stress

# Examination

in physical therapy practice includes taking:

- the client's history,
- reviewing the body systems for potential pathology,
- and performing specific tests and measures guided by the initial screening, patient/client history, professional judgment, and relevant clinical findings.

**Guidelines for Decision-Making  
in the Screening Process**

- **Past Medical History**
  - **Patient/Client Demographics**
    - Age
    - Gender
    - Race/Ethnicity
    - Occupation
  - **Personal and Family History**
    - Risk factors for disease
    - Medical/surgical history
    - Medications (current, recent past)
  - \* **Psychosocial**
    - Education
    - Family system
    - Culture/religion
- **Risk-Factor Assessment**
- **Clinical Presentation**
- **Associated Signs and Symptoms of Systemic Diseases**
- **Review of Systems**

# MUSCULOSKELETAL SCREENING EXAMINATION

- Muscle pain,
- weakness,
- poor coordination,
- joint pain

- hypokalemia,
- hypothyroidism,
- dehydration,
- alcohol or drug use,
- vascular disorders,
- GI disorders,
- liver impairment,
- malnutrition,
- Vitamin deficiencies,
- psychologic factors.

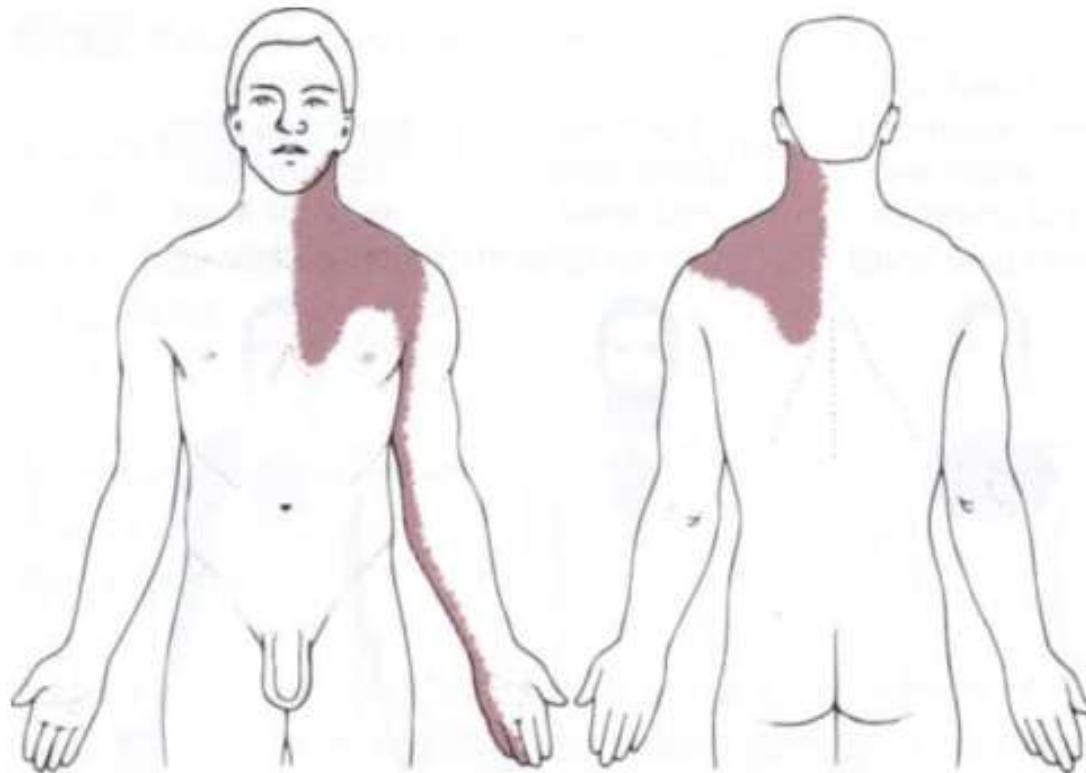
# NEUROLOGIC SCREENING EXAMINATION

areas to assess:

1. Mental and Emotional Status
2. Cranial Nerves
3. Motor Function (Gross motor and fine motor)
4. Sensory Function (Light touch, vibration, pain, and temperature)
5. Reflexes
6. Neural Tension

# CARDIAC CHEST PAIN PATTERNS

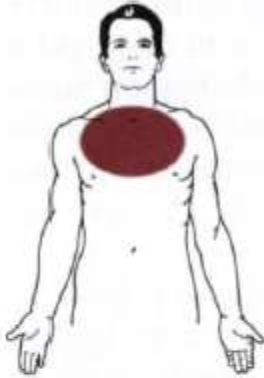
## ANGINA



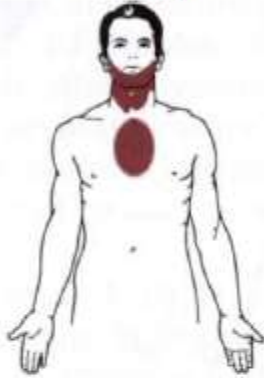
Pain patterns associated with angina. *Left*, Area of substernal discomfort projected to the left shoulder and arm over the distribution of the ulnar nerve. Referred pain may be present only in the left shoulder or in the shoulder and along the arm only to the elbow. *Right*, Occasionally, anginal pain may be referred to the back in the area of the left scapula or the interscapular region. Women can have the same patterns as shown for men in this figure or they may

# MYOCARDIAL INFARCTION

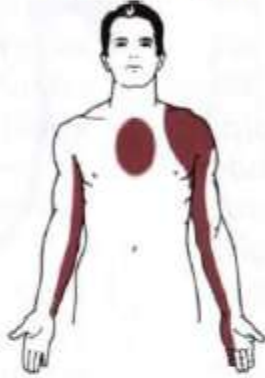
Localized just under breastbone; or in larger area of mid-chest; or entire upper chest



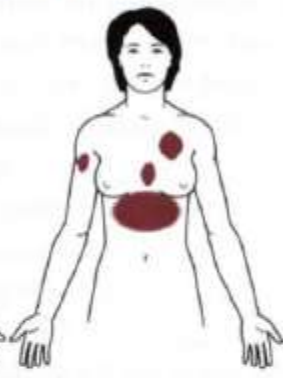
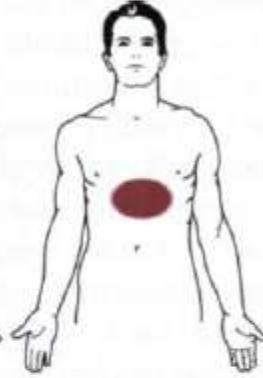
Common combination: mid-chest, neck and jaw



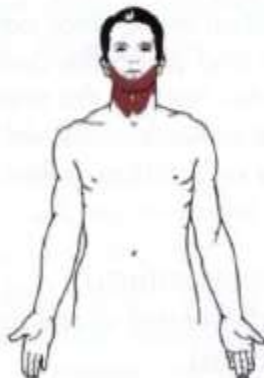
Mid-chest and inside arms. Left arm and shoulder more frequent than right



Upper abdomen—where most often mistaken for indigestion



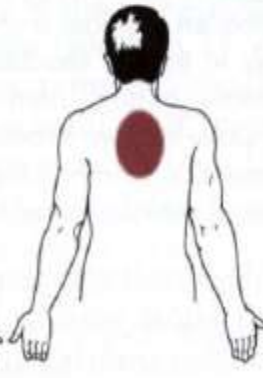
Larger area of chest, neck, jaw and inside arms



Lower center neck, to both sides of upper neck; and jaw from ear to ear



Inside right arm from armpit to below elbow; inside left arm to waist. Left arm and shoulder more frequent than right

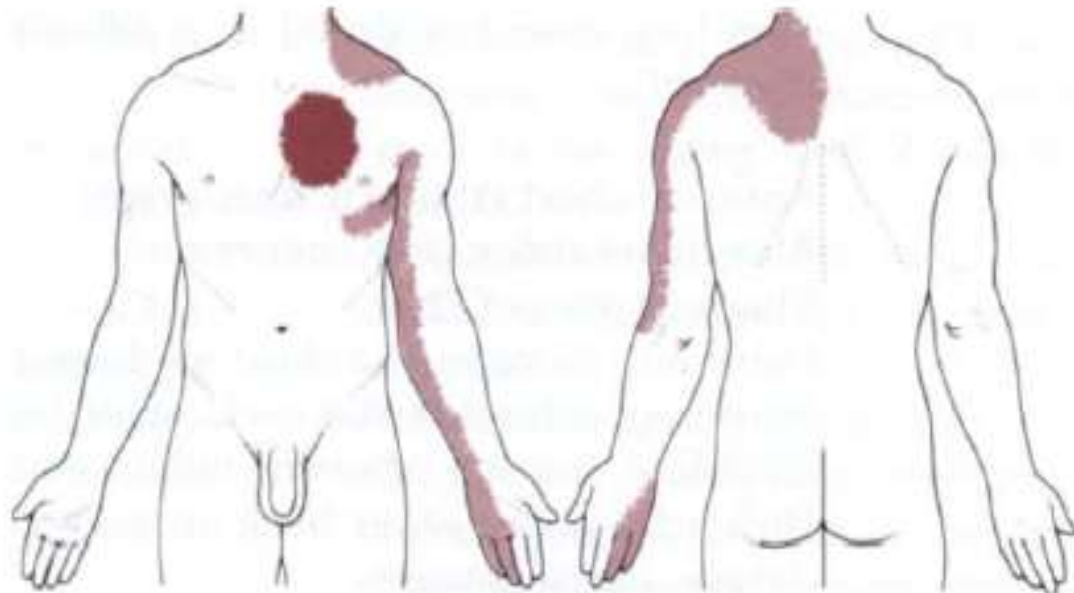


Between shoulder blades



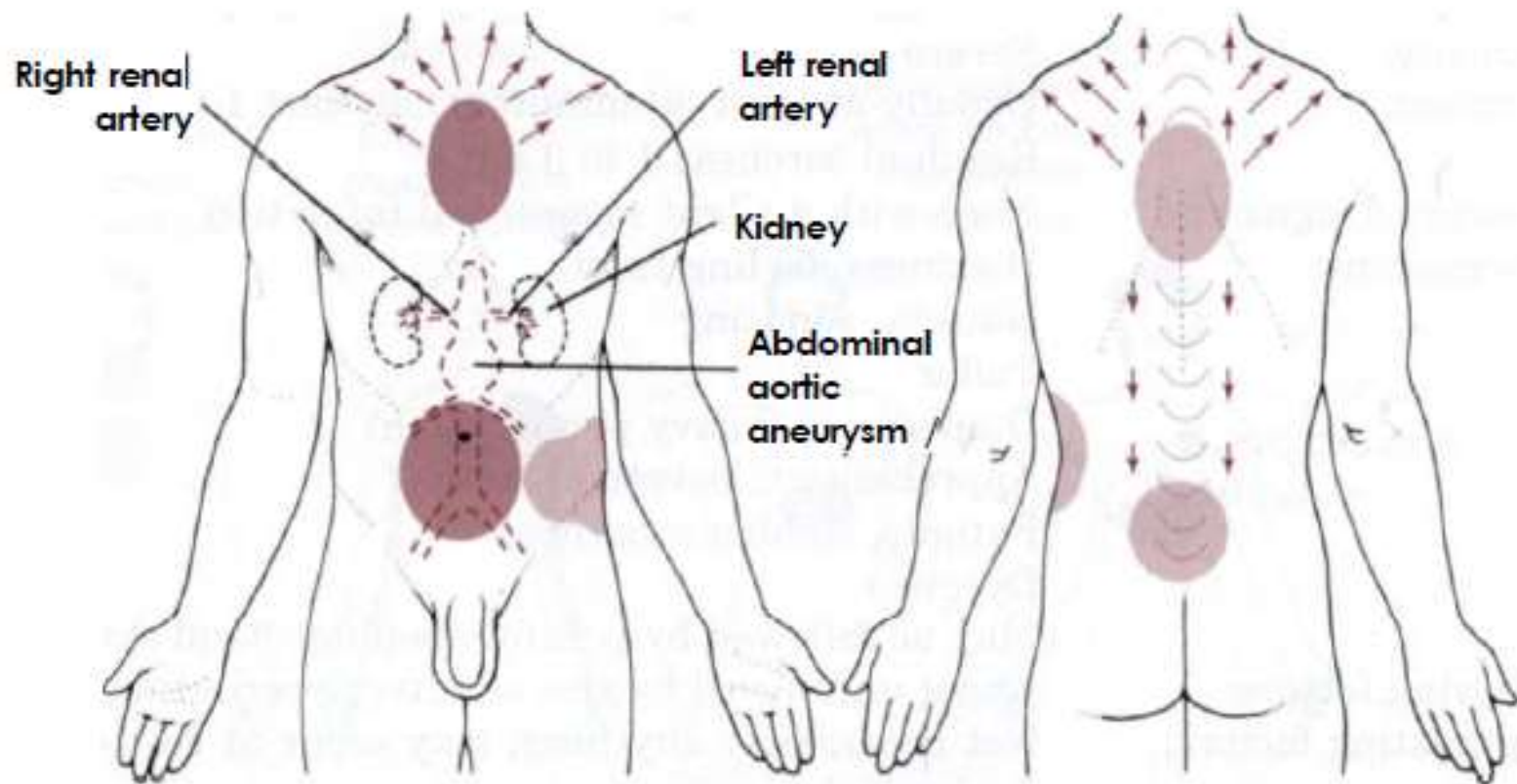


## PERICARDITIS



- Substernal pain associated with pericarditis (*dark red*) may radiate anteriorly (*light red*) to the costal margins, neck, upper back, upper trapezius muscle, and left supraclavicular area or down the left arm.

# DISSECTING AORTIC ANEURYSM

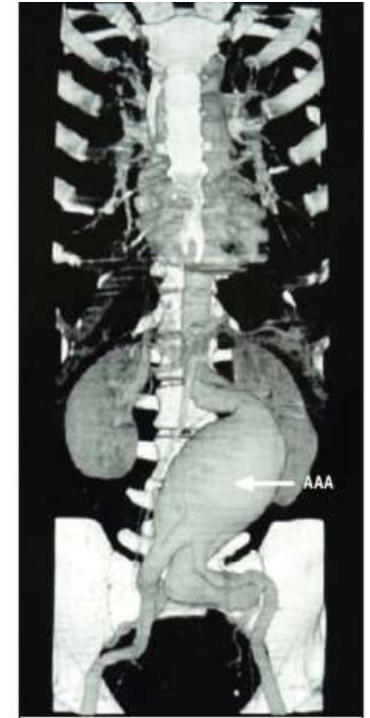


- Most aortic aneurysms (more than 95%) are located just below the renal arteries and extend to the umbilicus, causing low back pain. Chest pain (dark red) associated with thoracic aneurysms may radiate (see arrows) to the neck, interscapular area, shoulders, lower back, or abdomen. Early warning signs of an impending rupture may include an abdominal heartbeat when lying down (not shown) or a dull ache in the midabdominal left flank or lower back (light red).

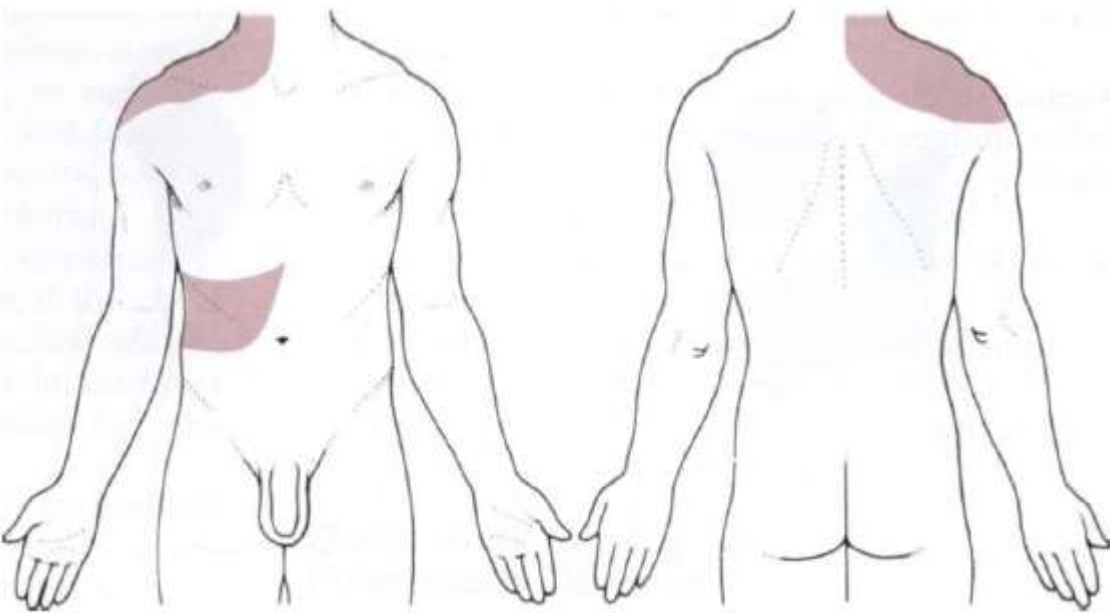
# [ RESIDENT'S CASE PROBLEM ]

FILIPPO MEHELLI, PT<sup>1</sup> • ZACHARY PREBOSKI, PT, CSCS<sup>2</sup> • WILLIAM BOISSONNAULT, PT, DHSC, FAAOMPT<sup>3</sup>

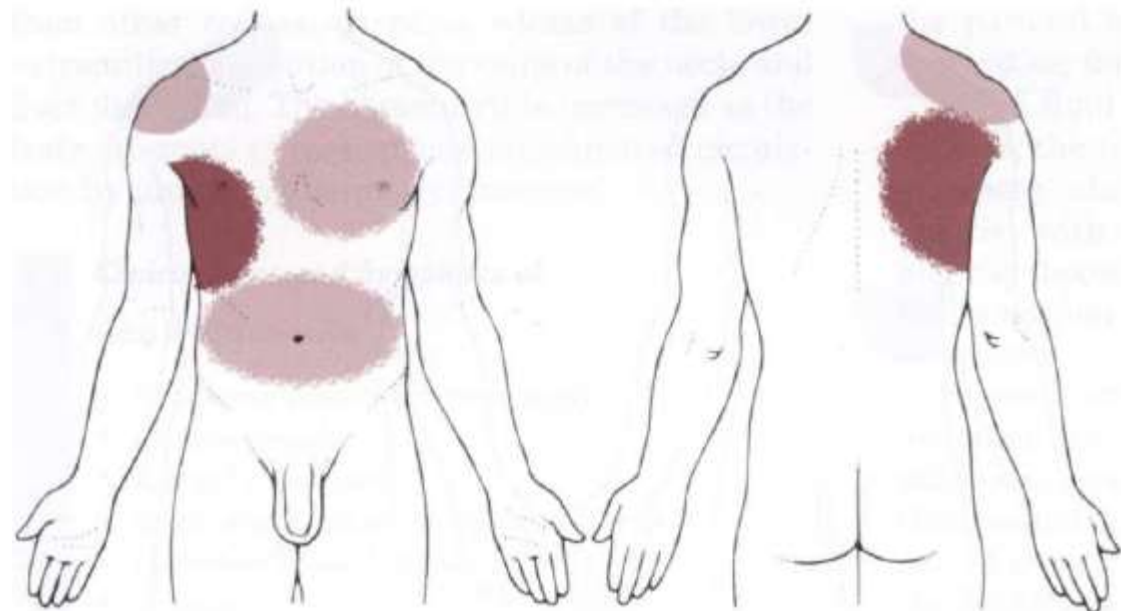
## Differential Diagnosis of a Patient Referred to Physical Therapy With Low Back Pain: Abdominal Aortic Aneurysm



Mechelli, F., Preboski, Z., & Boissonnault, W. (2008). Differential diagnosis of a patient referred to physical therapy with low back pain: abdominal aortic aneurysm. *Journal of orthopaedic & sports physical therapy*, 38(9), 551-557.

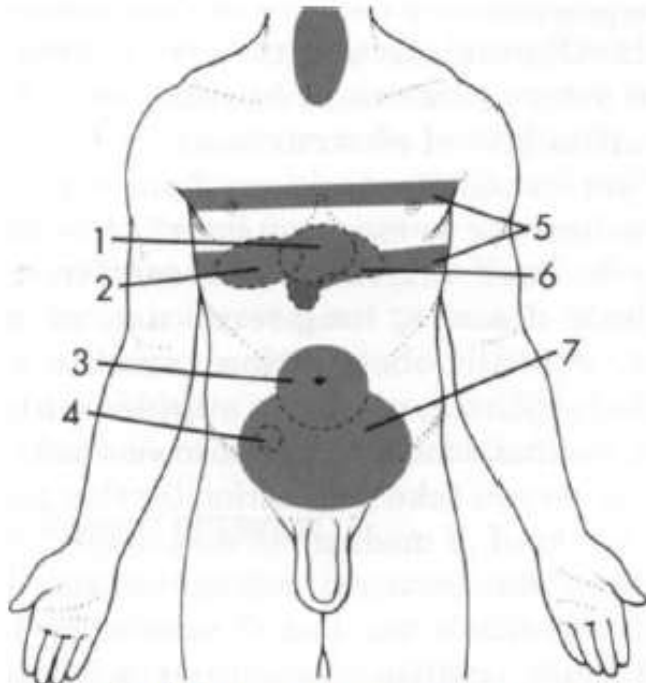


pleuritis

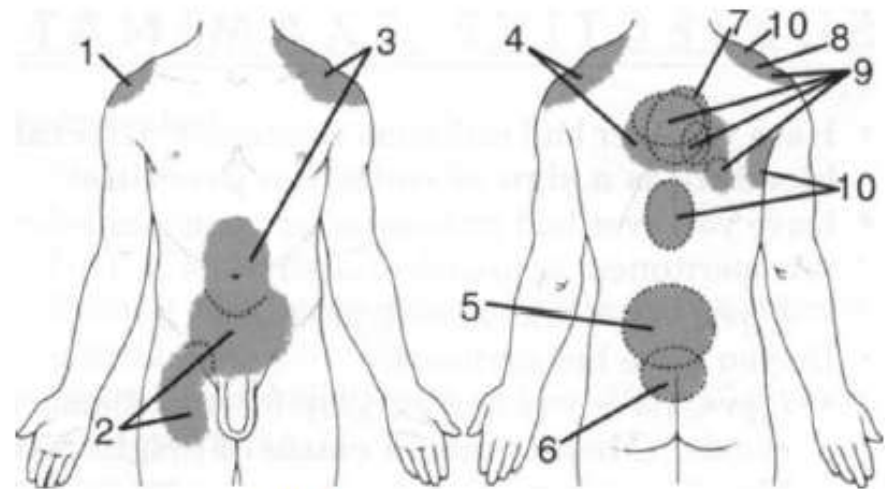


pneumothorax

a summary of all the GI pain patterns described that can mimic the pain and dysfunction usually associated with musculoskeletal lesions.

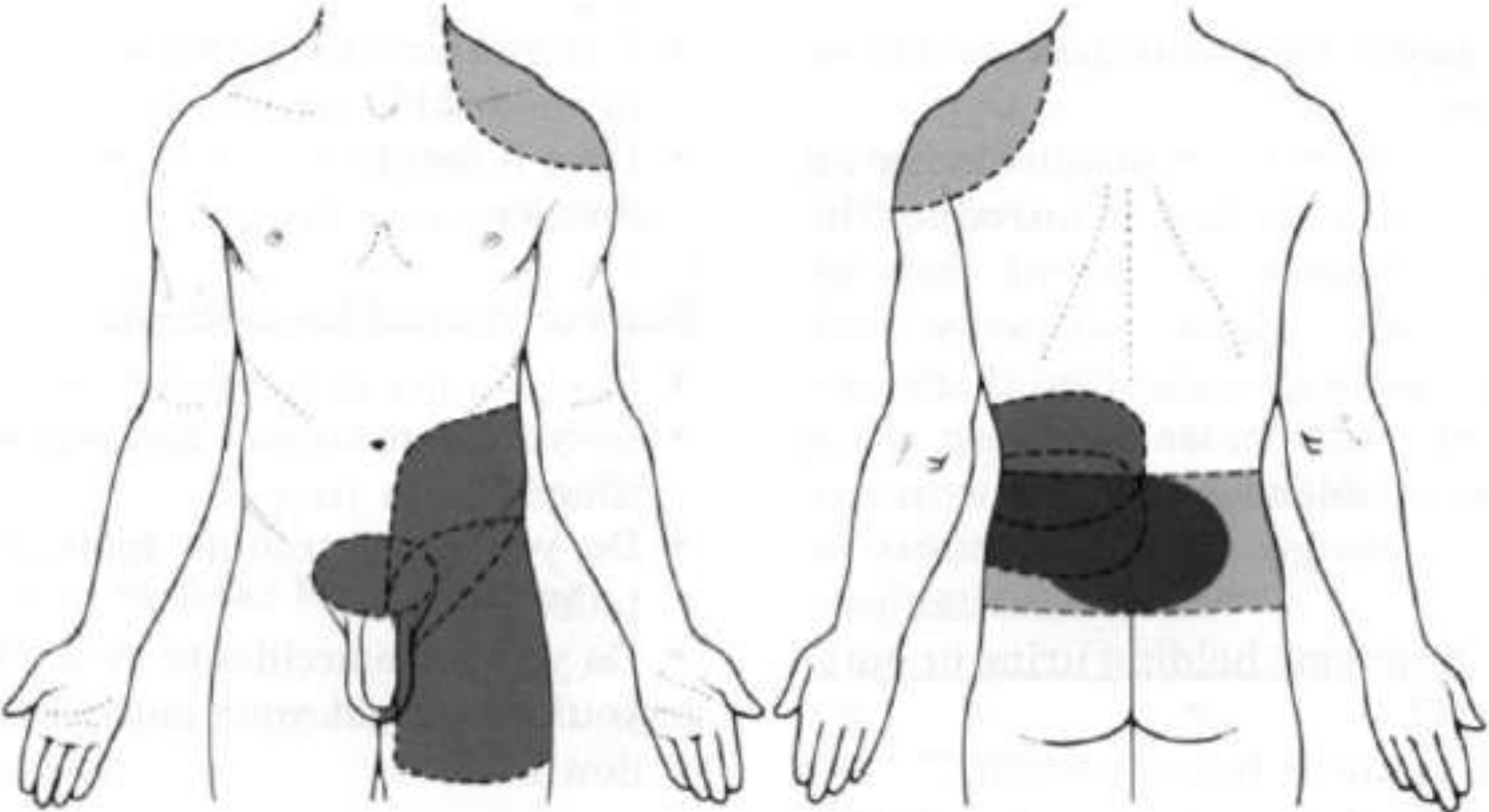


• Full-figure primary pain pattern: (1) stomach/ duodenum; (2) liver/gallbladder/common bile duct; (3) small intestine; (4) appendix; (5) esophagus; (6) pancreas; and (7) large intestine/colon.



• Full-figure referred pain patterns: (1) liver/gallbladder/common bile duct; (2) appendix; (3) pancreas; (4) pancreas; (5) small intestine; (6) colon; (7) esophagus; (8) stomach/duodenum; (9) liver/gallbladder/common bile duct; and (10) stomach/duodenum.

# UROGENITAL DISEASE



# Early Warning Signs of Cancer

- Changes in bowel or bladder habits
- A sore that does not heal in 6 weeks
- Unusual bleeding or discharge
- Thickening or lump in breast or elsewhere
- Indigestion or difficulty in swallowing
- Obvious change in a wart or mole
- Nagging cough or hoarseness

## **For the physical therapist:**

- **Proximal muscle weakness**
- **Change in deep tendon reflexes**

A **72 year old man** reports a chief complaint of **constant central mid lumbar ache**.

- The symptoms began insidiously 5-6 months ago, and have become more intense the past 4-6 weeks-**“that cold I had was a doozy-the coughing and sneezing killed my arthritic back”**.
- Plus for the past 2 weeks-a couple nights he has been waking up due to the back pain. This usually happens when he ends up on his stomach. If he can stay off his stomach he sleeps thru the night.
- Aggravating factors now include prolonged forward flexed postures and repetitive bending, and sitting greater than 20 minutes; **Alleviating factors include changing positions and lying supine**. He has a history of high blood pressure, and is taking medications for this and for high cholesterol.
- He complained that he has lost weight- **“my pants feel loose- the past 3 months-not sure why-“I am not trying to lose weight”**

How confident you are which of the following the patient may/may not have:

Spondylolisthesis (traumatic)

Vertebral Compression Fracture

Metastatic Spinal Cancer

Abdominal Aortic Aneurysm

Kidney Stones

Gout



# Systemic Origins of Neuromuscular or Musculoskeletal Pain and Dysfunction

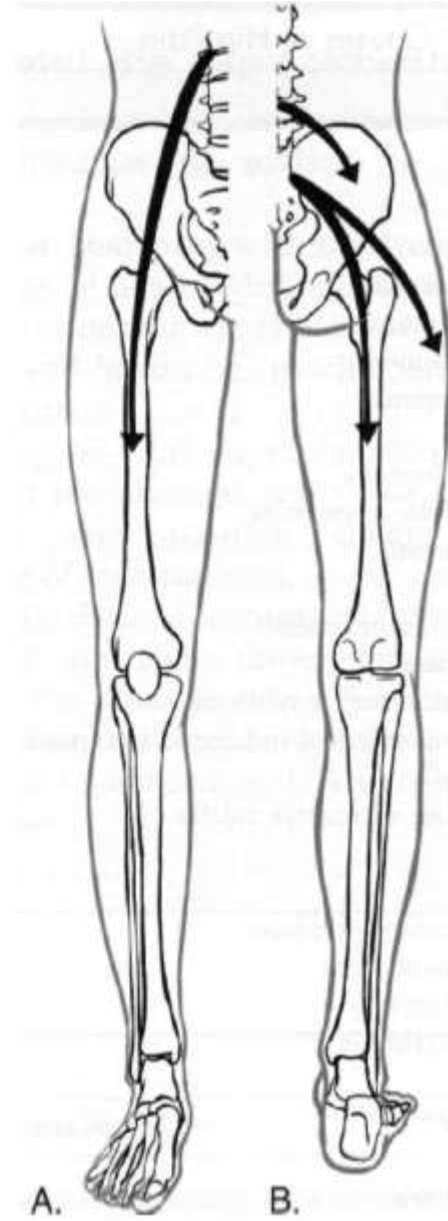
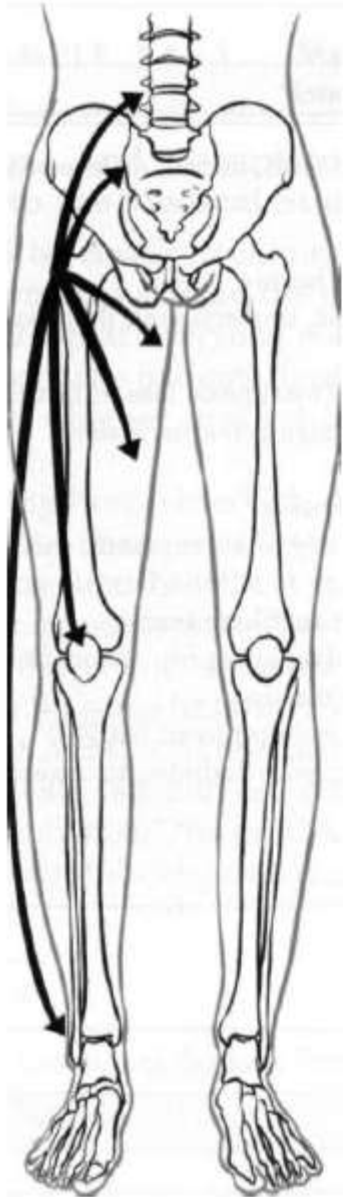
# Neck and Back Pain: Symptoms and Possible Causes

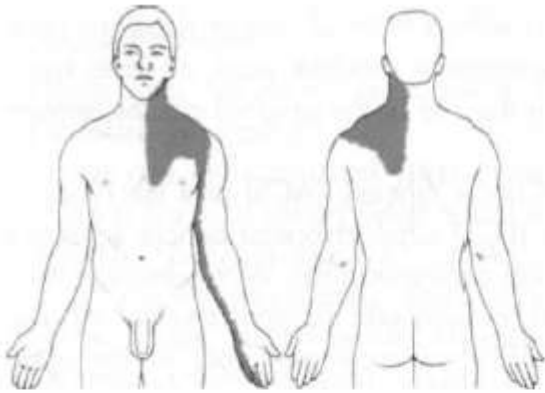
Symptom	Possible cause
Night pain unrelieved by rest or change in position; made worse by recumbency	Tumor
Fever, chills, sweats	Infection
Unremitting, throbbing pain	Aortic aneurysm
Abdominal pain radiating to midback; symptoms associated with food; symptoms worse after taking NSAIDs	Pancreatitis, gastrointestinal disease, peptic ulcer
Morning stiffness that improves as day goes on	Inflammatory arthritis
Leg pain increased by walking and relieved by standing	Vascular claudication
Leg pain increased by walking, unaffected by standing, but sometimes relieved by sitting or prolonged rest	Neurogenic claudication
"Stocking glove" numbness	Referred pain, nonorganic pain
Global pain	Nonorganic pain
Long-standing back pain aggravated by activity	Deconditioning
Pain increased by sitting	Discogenic disease
Sharp, narrow band of pain radiating below the knee	Herniated disc
Chronic spinal pain	Stress/psychosocial factors (unsatisfying job, fear-avoidance behavior)
Back pain dating to specific injury	Strain or sprain, fracture
Back pain in athletic teenager	Epiphysitis, juvenile discogenic disease, spondylolysis, or spondylolisthesis
Exquisite tenderness over spinous process	Tumor, fracture, infection
Back pain preceded or accompanied by skin rash	Inflammatory bowel disease

# Back pain: **vascular** or **neurogenic**

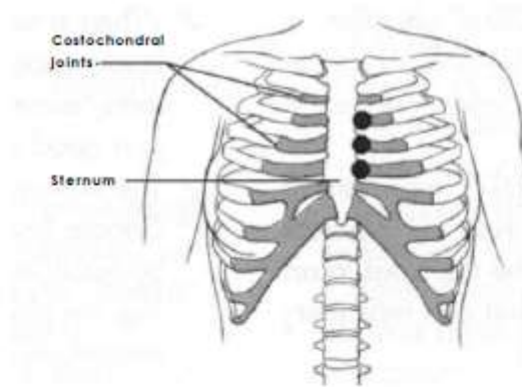
- Throbbing
  - Diminished, absent pulses
  - Trophic changes (skin color, texture, temperature)
  - Pain present in all spinal positions
  - Symptoms with standing: no
  - Pain increases with activity; promptly relieved by rest or cessation of activity
- Burning
  - No change in pulses
  - No trophic changes; look for subtle strength deficits (e.g., partial foot drop, hip flexor or quadriceps weakness; calf muscle atrophy)
  - Pain increases with spinal extension, decreases with spinal flexion
  - Symptoms with standing: yes
  - Pain may respond to prolonged rest

# Referred pain





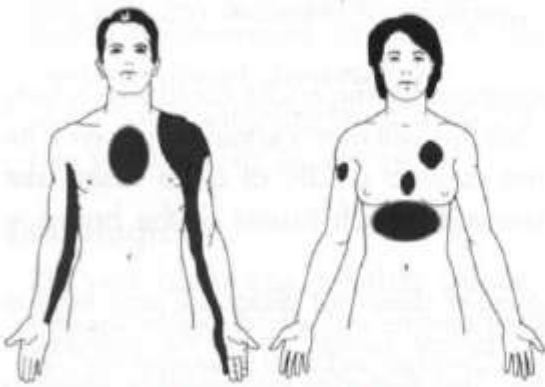
Angina



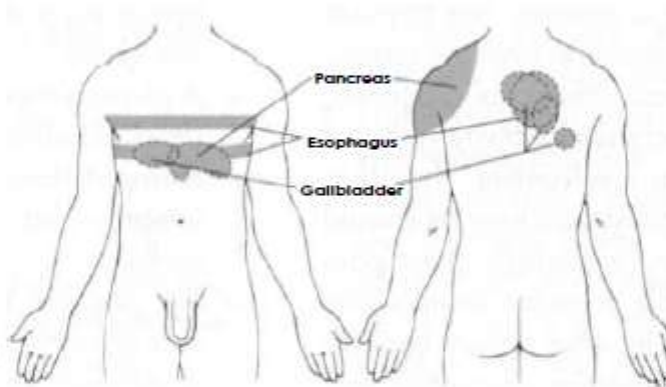
Costochondritis



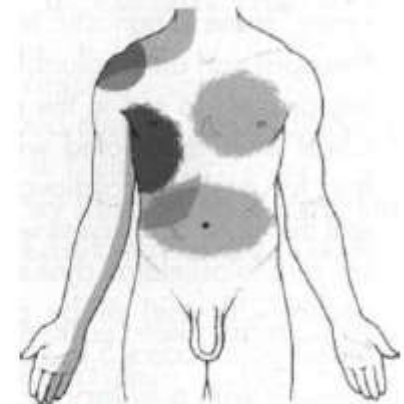
Breast



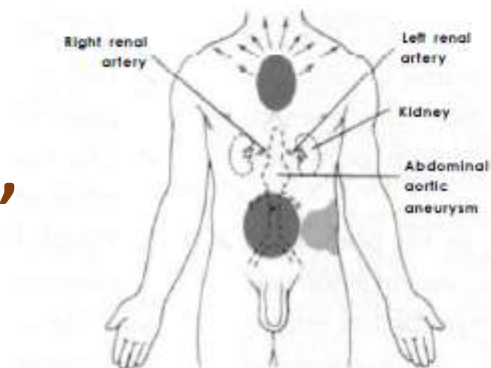
Myocardial Infarction



Esophagus



Pleuropulmonary



Aortic Aneurysm

# Referred chest, breast, and rib pain patterns

A 18 year old man working as a grocery clerk complains of **low lumbar and bilateral sacro-iliac** joint pain.

- The symptoms started insidiously 5-6 months ago.
- Morning is the worst time of the day - waking up extremely stiff. After a 20 minute hot shower and close to an hour of stretching he starts to loosen up.
- Generally the symptoms get better as the work day goes on. He describes feeling a bit run down, hasn't gotten sick, but feels like he could. He has not had trouble falling asleep at night, but often wakes up three quarters thru the night.

Osteoarthritis

Rheumatoid Arthritis

Ankylosing Spondylitis

Septic Arthritis

Slipped Capital Epiphysis

Gout

# References

- World Confederation for Physical Therapy. Policy statement: Description of physical therapy. London, UK: WCPT; 2017. [www.wcpt.org/policy/ps-descriptionPT](http://www.wcpt.org/policy/ps-descriptionPT)
- American Physical Therapy Association. Guide to Physical Therapist Practice 3.0. Alexandria VA, USA: APTA, 2014. <http://guidetoptpractice.apta.org>

# THANK YOU

AČIŪ UŽ DĒMESJ!

