

Red Flag Screening and Differential Diagnosis in Patients with Spinal Pain

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Objectives

At conclusion of today's session, the learner will be able to:

- Recognize red flag items and appropriately refer out in order to maximize efficiency with direct access
- Differentiate red flag screening items from musculoskeletal conditions in patients with spinal pain and treat as appropriate
- Design an initial examination for patients with spinal pain that will clear out all red flag conditions, while differentiating various musculoskeletal hypotheses
- Categorize patients with spinal pain by treatment based classification system
- Plan best initial treatment for patients with spinal pain based on classification

APTA Vision Beyond Vision 2020

Quality: "As independent practitioners, physical therapists in clinical practice will embrace best practice standards in **diagnosis/classification**, measurement, and intervention."

".....Striving to **prevent adverse events related to patient care**, and demonstrating continuing competence."



APTA Vision Beyond Vision 2020

Advocacy:

"The physical therapy profession will advocate for patients/clients/consumers both as individuals and as a population, in practice, education, and research settings to manage and promote change, **adopt best practice standards and approaches, and ensure that systems are built to be consumer-centered.**"

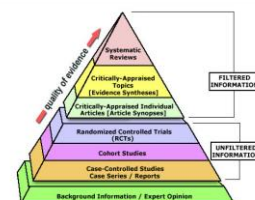
Direct Access

As many states, Missouri included, push for greater direct access in the profession, a thorough examination is absolutely essential.

Vital to assess and refer out for red flag items

Ensure the safety and appropriate treatment for all patients

Evidence-Based Practice



EBP

- Clinical Experience
- Evidence/Research
- Patient Values

Current Practice

A survey of current physical therapists was created to assess the perception of both current practice and the future of clinical practice, as it relates to direct access and medical screening



Physical Therapists are CURRENTLY

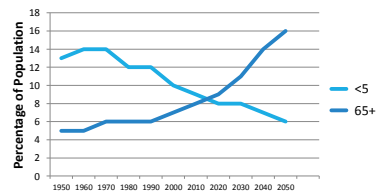
	Strongly Disagree	Disagree	Agree	Strongly Agree
Capable of seeing patients in a primary care role	.86%	5.17%	46.55 %	47.41%
Capable of screening for medical conditions masked as a musculoskeletal condition	.87%	3.03%	47.62 %	48.48%
Perceived by the medical community as being a primary care provider that can effectively screen for medical conditions	17.83%	63.48%	16.52%	2.17%
Perceived by the public as being seen as a primary care provider that can effectively screen for medical conditions	17.75%	62.77%	16.88%	2.06%

Physical Therapists of the future SHOULD BE

	Strongly Disagree	Disagree	Agree	Strongly Agree
Capable of seeing patients in a primary care role	0.00%	3.45%	25.43%	71.12%
Capable of screening for medical conditions masked as a musculoskeletal condition	0.00%	0.00%	24.24%	74.76%
Perceived by the medical community as being a primary care provider that can effectively screen for medical conditions	.43%	3.03%	29.44%	67.10%
Perceived by the public as being seen as a primary care provider that can effectively screen for medical conditions	0.00%	3.46%	30.30%	66.23%

Patients of Tomorrow

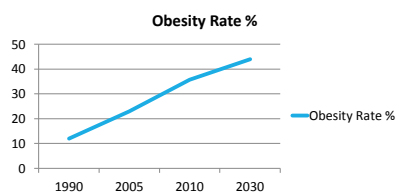
Life expectancy continues to grow, meaning patients are living longer



Patients of Tomorrow

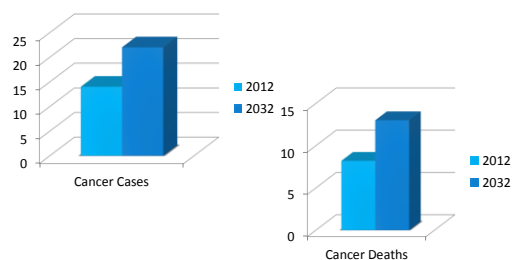
Reports indicate a doubling in number of new cases of obesity-related ailments

- Diabetes, heart disease and hypertension by 2030



Am J Prev Med. 2012 Jun;42(6):563-70. doi: 10.1016/j.amepre.2011.10.028.
Obesity and severe obesity forecasts through 2030.
 Finkelstein EA¹, Khavjou OA, Thompson H, Trogdon JG, Pan L, Sherry B, Dietz W.

Patients of Tomorrow



Optimal Screening for Prediction of Referral and Outcome (OSPRO)

Purpose: Develop a concise review-of-systems screening tool

Why: "A standard assessment tool would mitigate the variability in red flag symptom identification"

Start with red flag raised and lower throughout exam

Found to have a long and short form

- 23-item: 100% of red flag items
- 10-item: 94.7% of red flag items

What is on the OSPRO?

- | | |
|--|---|
| 1. abnormal sensations (eg, numbness, pins and needles)? | 13. chest pain with rest? |
| 2. headaches? | 14. shortness of breath? |
| 3. night pain? | 15. muscle weakness? |
| 4. sustained morning stiffness? | 16. a failure of conservative intervention (failure to improve within 30 days)? |
| 5. light-headedness? | 17. excessive sweating? |
| 6. trauma (eg, a motor vehicle accident, a fall)? | 18. edema or weight gain? |
| 7. night sweats? | 19. a heartbeat in your abdomen when you lie down? |
| 8. constipation? | 20. cramps in your legs when you walk for several blocks? |
| 9. easy bruising? | 21. abdominal pain? |
| 10. changes in vision? | 22. changes in the integrity of your nails? |
| 11. changes in menstruation patterns? | 23. prolonged use of corticosteroids? |
| 12. gait or balance disturbances? | |

General Screening from Patient History

Age

- Cancer rate generally increases with age, unlikely < 50
- Osteoporosis more likely with increased age

Gender

- Higher cancer risk in females
- Mortality is higher in men than women for cancer

Past Medical History

- History of Cancer - highest likelihood ratio (+LR) of current cancer

Family History

- Abdominal Aortic Aneurysm (AAA) - 15% of male first relatives
- Ankylosing spondylitis- 8.2% of first relatives

Infection

General signs/symptoms:

- Redness, fever, warmth
- Lethargy, recent bite or infection

Cellulitis – skin

- Blisters, skin dimpling

Osteomyelitis – bone

Joint Sepsis

UTI



Cancer

Biggest risk factor for cancer is previous history of cancer

Prevalence

- Breast 123.7/100,000
- Lung 69.8/100,000 (male>female)
- Pancoast Tumor can present similarly to cervical radiculopathy

Consider unexplained weight loss, night pain, pain not correlated to functional movements, no improvement with conservative care for 4 weeks, age greater than 50

Osteoporosis

Increased age correlates with increased risk of osteoporosis

Assess for previous falls with fractures or injury, decreased bone mineral density via DEXA scans, prolonged use of corticosteroids



Myocardial Infarction

Men > 40 y/o, Women > 50 y/o, Increases with age

Signs and symptoms:

- Angina > 30 min not relieved by rest, antacids, or nitroglycerin
- Vague chest, shoulder, mid back, or arm(s) pain
- Shortness of breath
- Cold sweat
- Nausea
- Rapid or irregular pulse

Aortic Syndromes

Acute aortic syndromes, thoracic aortic aneurysms

- More prevalent in men, but common during pregnancy
- Signs and symptoms:
 - Chest pain
 - Anterior pain or radiation to neck, back, abdomen
 - Syncope or CVA
 - Pressure differential in UEs
 - Pulse deficits
 - Risk factor - hypertension

Pulmonary Embolism (PE)

Age < 55, the incidence of pulmonary embolism is higher in females

Well's Criteria to raise red flag

Clinical Features	Points
Clinical signs and symptoms of DVT (minimum of leg swelling and pain with palpation of the deep veins)	3
An alternative diagnosis is less likely than PE	3
Heart rate >100bpm	1.5
Immobilisation for more than 3 days or surgery in the previous 4 weeks	1.5
Previous DVT/PE	1.5
Haemoptysis	1
Malignancy (on treatment, treated in the last 6 months, or palliative)	1
Clinical Probability Simplified Score	
PE Likely	>4
PE Unlikely	4 or less

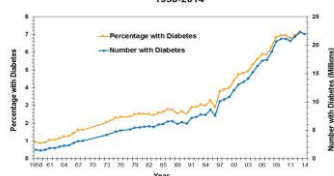
Pneumothorax

- Age 60-65, more prevalent in males
- COPD is a common cause of spontaneous pneumothorax
- Signs and symptoms:
 - Ipsilateral chest pain that increases w/ deep breath or cough
 - Dyspnea
 - Cyanosis
 - Significant fatigue
 - Decreased ipsilateral chest expansion
 - Hyperresonance on percussion
 - Reduced breath sounds

Diabetes Mellitus

Signs and symptoms: hunger, fatigue, thirst, increased urination frequency, dry mouth, itchy skin, blurred vision, yeast infections, slow healing, pain/numbness in feet and legs

Number and Percentage of U.S. Population with Diagnosed Diabetes, 1958-2014



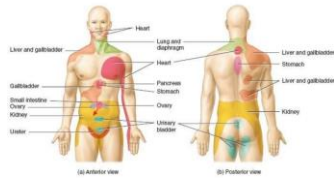
Diabetes Mellitus

Screening/Risk Factors for Type 2 Diabetes

- Age > 45 years
- Family history of diabetes
- Obesity
- High risk ethnic or racial group
- Hypertension or Dyslipidemia
- Gestational diabetes
- Sedentary lifestyle
- History of vascular disease
- History of impaired glucose tolerance

Referral Pain

Visceral dysfunction can mimic musculoskeletal pains and complaints



Cervical Conditions

Upper Cervical Instability

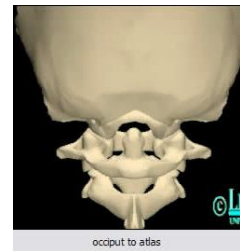
- The prevalence of UCI varies among different types of patients.
- **Signs and symptoms:**
 - Cervical trauma
 - Neck pain with sustained postures
 - Weakness of the neck
 - Altered ROM
 - Hypermobility and soft end-feeling in passive testing
 - Referred pain in the shoulder and periscapular area
 - Cervical radiculopathy or myelopathy
 - Occipital and frontal or retro-orbital headaches
 - Down Syndrome, Rheumatoid Arthritis

Upper Cervical Instability

Often missed on initial imaging post-trauma

Multiple examination options to utilize but best in combination

- Transverse Ligament Testing
 - Anterior Shear Testing – SYMPTOM PROVOKING
 - Sharp-Purser - SYMPTOM RELIEVING
- Alar Ligament Testing



Cervical Arterial Dysfunction

Risk Factors

- Past hx of cervical trauma
- Hx of migraine-type HA
- Hyperlipidemia
- Cardiac or vascular disease
- Previous CVA or TIA
- Diabetes
- Clotting disorders or other blood disorders
- Anticoagulant therapy
- Long-term steroid use
- Hx of smoking
- Recent infection
- Immediately postpartum
- *Absence of a plausible mechanical explanation for the patient's symptoms*

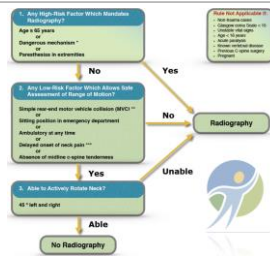
Cervical Fracture

Multiple tools have been developed to assess for cervical fractures

Important to utilize most sensitive and specific tool, especially in post-traumatic patients

Most sensitive and specific is the Canadian C-Spine Rules

Canadian C-Spine Rules



Thoracic Compression Fractures

CPR by Henschke et al:

1. Age > 70 year old
2. Female
3. Significant trauma – major in young patients, minor in elderly
4. Prolonged use of corticosteroids

Cervical Treatment Based Classification (TBC)

Fritz developed a TBC for patients with cervical pain

Initial question: Is this patient appropriate for therapy?

Greater results with matched interventions compared to standard

Update in Clinical Practice Guidelines (CPG) of 2017

Pain Control

Signs/symptoms:

- High pain and disability scores
- Acute symptoms
- Often traumatic MOI
- Poor tolerance for examination and assessment

Primary Treatment:

- Gentle AROM within pain tolerance
- Education to remain as active as possible

Centralization

Signs/symptoms:

- Radicular or referred symptoms
- Peripheralization or centralization with neck ROM
- Signs of nerve root compression present
- + Spurling's A, + Distraction, + ULTT-A, ipsilateral rotation < 60 degrees

Primary Treatment:

- Mechanical or manual traction
- Repeated movements

Headaches

Signs/symptoms:

- Unilateral headaches
- Headache triggered by neck movements and positions
- Can be associated shoulder or arm pain
- Ruled out other causes – migraines, CAD, etc.

Primary Treatment:

- Cervical spine mobilization/manipulation
- Strength and endurance exercise program
- Postural education

Cervical Myelopathy

Cervical Myelopathy

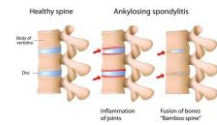
1. Gait deviation
2. + Hoffman's
3. + Babinski
4. + Inverted Supinator Sign
5. Age >45

Ankylosing Spondylitis

Ankylosing Spondylitis

- Male 3x > Female, <40 yo
- CPR (3 or more) = +LR 12.4

 1. LBP improved with exercise but not rest
 2. AM stiffness >30 min
 3. Awakening with LBP, 2nd half of the night
 4. Alternating buttock pain



Abdominal Aortic Aneurysm (AAA)

Patient population

- Age 50: 25/100,000
- Age 70: 78/100,000

Risk factors:

- Smoking
- Male
- HTN,
- Increased age

Palpation (normal size 2 cm)

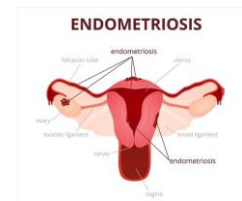
- 61% of AAA > 3 cm
- 82% of AAA > 5 cm

Throbbing, pulsing with palpation along aorta

OB-GYN Complications

Endometriosis:

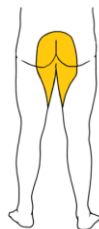
- Prevalence in women ranges from 40-70%
- Signs and symptoms:
 - Pain, fatigue, and mood change 1-2 days before menstruation, dysmenorrhea, pain with sexual intercourse, fever, diarrhea, constipation, rectal bleeding, referred pain, infertility



Cauda Equina

Cauda equina

- 1 case per 33,000 to 100,000
- Signs/symptoms:
 - Saddle anesthesia
 - Loss of bowel/bladder control
 - Radiating symptoms down leg
 - Pain not related to movement



Peripheral Arterial Dysfunction (PAD)

Can be difficult to differentiate from spinal stenosis

Signs/symptoms:

- Pain worsening with activity
- Loss of color, temperature and pulse

Differentiate with positional testing

- Seated bicycle testing with symptoms – likely PAD
- Worse with treadmill – likely spinal

Other Lumbar Considerations

Cancer

- Previous history of cancer +LR 23.7
- Bladder, prostate, colorectal cancers

Prolonged steroid use

- Incidence of low back pain and hip pain

Osteoporosis

- Pelvic fractures with falls

SIJ Pain

Laslett CPR for SIJ pain

- Gaenslen's
- Sacral Thrust
- Thigh Thrust
- Compression
- Distraction

Lumbar TBC

Delitto et al developed initial lumbar TBC similar to cervical TBC

Brennan et al progressed this into 3 main categories

Alrwaily et al took this TBC and built on

Initial screening for appropriateness of therapy

Grouped into medical management, rehab management and self-care

Manipulation

Signs/symptoms:

- Recent onset of symptoms (<16 days)
- No symptoms distal to the knee
- Segmental hypomobility
- Low FABQ (FABQ-W <19)
- Hip IR > 35 degrees in at least one hip

Primary Treatment:

- Lumbar manipulation



Directional Preference

Signs/symptoms:

- Preference for sitting or walking/specific positions
- Centralization with motion testing and peripheralization with opposite movement
- No evidence of nerve root compression

Primary Treatment:

- Repeated movement exercises



Stabilization

Signs/ Symptoms:

- Age < 40 yo
- SLR > 91 degrees on one side
- Aberrant motion
- + Prone instability test

Primary Treatment:

- Core stabilization and functional movements



References

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