Medical Screening

Systemic Pathology

Screening Questionnaires

- Ransford
- McGill
- Oswestry (LBP)
- Neck Disability Index
- Harris (hip)
- WOMAC (hip & knee)
- Lysholm (knee)

Performance Test & Scoring Scale for Evaluation of Ankle Injuries
- Foot Function Index
- SPADI (shoulder)
- Patient Rated Wrist Evaluation
- Severity of Symptoms & Functional Status in CTS

Patient Interview

- Screening Tools
- Diagnostic Tests = +/-
- Domestic Violence

Screening Questionnaires

- Domestic Violence Screening Questionnaires
  - Ransford
  - McGill
  - Oswestry (LBP)
  - Neck Disability Index
  - Harris (hip)
  - WOMAC (hip & knee)
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Western Ontario & McMaster Universities Osteoarthritis Index

Instructions: Please rate the activities in each category according to the following scale of difficulty: 0 = none; 1 = slight; 2 = moderate; 3 = very; 4 = extremely

<table>
<thead>
<tr>
<th>Pain</th>
<th>Walking</th>
<th>Stairs or pneumonia</th>
<th>Severe &amp; sitkant</th>
<th>Reaching</th>
<th>Morning stiffness</th>
<th>Stiffness recurring later in the day</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>1</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>2</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>3</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>4</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
</tbody>
</table>

Physical Function

- Descending stairs
- Ascending stairs
- Rising from sitting
- Standing
- Walking on flat floor
- Walking on stairs
- Lying in bed
- Getting out of bed
- Getting out of bathtub
- Getting into bathtub
- Getting on/off toilet
- Heavy domestic duties
- Light domestic duties

Score:

- Performance Test & Scoring Scale for Evaluation of Ankle Injuries
- Foot Function Index
- SPADI (shoulder)
- Patient Rated Wrist Evaluation
- Severity of Symptoms & Functional Status in CTS

Shoulder Pain & Disability Index (SPADI)

0 = no pain; 10 = worse pain imaginable

<table>
<thead>
<tr>
<th>Disability Scale Score</th>
<th>Total Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>4</td>
<td>40</td>
</tr>
</tbody>
</table>

Foot Function Index

0 = no pain; 10 = worse pain imaginable

Performance Test & Scoring Scale for Evaluation of Ankle Injuries
- Foot Function Index
- SPADI (shoulder)
- Patient Rated Wrist Evaluation
- Severity of Symptoms & Functional Status in CTS
Diagnostic Tests

- X-ray
- MRI
- CT-Scan
- US
- Bone Scan
- Dexa Scan
- EMG/NCV
- EKG
- EEG
- Urine Analysis
- Blood Work
- Stress Test

Clinical Tests

- Good diagnostic tests?
- Good screening tests?
- Clustering of tests?

Clinical Decision Making

Statistics:

- **Sensitivity** = \( \text{Se N OUT} \) = if the test is negative, it is effective at ruling the dysfunction out
- **Specificity** = \( \text{Sp P IN} \) = if the test is positive, it is effective at confirming the dysfunction

Cleland J, Orthopaedic Clinical Examination: An Evidence-Based Approach for Physical Therapists. Saunders Elsevier, Phila. 2007
Clinical Decision Making

**Statistics:**

- **(-) Likelihood Ratio** = how much the odds of the disease decrease when a test is negative
- **(+) Likelihood Ratio** = how much the odds of the disease increase when a test is positive

Statistics to Rule Out

- **High Sensitivity:** ≥ 90
- **(-) Likelihood Ratio:** < 0.10 - 0.20

Statistics to Confirm

- **High Specificity:** ≥ 90
- **(+) Likelihood Ratio:** > 5 - 10

Table 2. Referral Practice Act Language

<table>
<thead>
<tr>
<th>Practice Act Language</th>
<th>States</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DUTY TO REFER.</strong> A physical therapist shall refer a patient to an appropriate health care practitioner if the physical therapist has reasonable cause to believe that symptoms or conditions are present that require services beyond the scope of the practice of physical therapy.</td>
<td>AK, AZ, CO, CT, DC, FL, GA, ID, IN, KS, LA, ME, MA, MN, NH, NJ, ND, NC, OH, OK, OR, RI, SC, TN, TX, VA, WA, WI, WY</td>
</tr>
<tr>
<td><strong>Grounds for disciplinary action.</strong> Failure to refer a patient to the appropriate licensed health care practitioner when the services required by the patient are beyond the level of competence of the physical therapist or beyond the scope of physical therapy practice.</td>
<td></td>
</tr>
</tbody>
</table>

Domestic Violence Stats

- Estimated 2-4 million episodes per year
- More than 33% of murdered women & 4% of murdered men are killed by former partners (US Dept of Justice)
- 6% of pregnant women are abused annually
- 1 of every 3 women who attempt suicide do so to escape abuse
- In 60% to 75% of families in which a woman is battered, children are battered
Child Abuse Laws

- Include any type of cruelty inflicted on a child, such as mental abuse, physical abuse, sexual assault or exploitation, & neglect.
- Child abuse laws also include provisions requiring certain adults with access to children (such as teachers & medical providers) to report signs of abuse.

Mandatory Reporters

- Social workers
- School personnel
- Medical providers
- Child care providers
- Camp
- Medical examiners/coroners
- Law enforcement officers
- Animal control officers
- Members of the clergy
- Coaches & Athletic directors

Child Indicators: Signs of Sexual Abuse

<table>
<thead>
<tr>
<th>Physical Indicators</th>
<th>Behavioral Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sleep disturbances</td>
<td>Sexually promiscuous</td>
</tr>
<tr>
<td>Bedwetting</td>
<td>Developmental age-inappropriate sexual play &amp;/or drawings</td>
</tr>
<tr>
<td>Pain or irritation in genital/anal area</td>
<td>Cruelty to others</td>
</tr>
<tr>
<td>Difficulty walking or sitting</td>
<td>Cruelty to animals</td>
</tr>
<tr>
<td>Difficulty urinating</td>
<td>Fatigued</td>
</tr>
<tr>
<td>Pregnancy</td>
<td>Amorous</td>
</tr>
<tr>
<td>Positive testing for sexually transmitted disease or HIV</td>
<td>Withdrawn</td>
</tr>
</tbody>
</table>

Child Indicators: Signs of Physical Abuse

<table>
<thead>
<tr>
<th>Physical Indicators</th>
<th>Behavioral Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unexplained injuries</td>
<td>Fear of going home</td>
</tr>
<tr>
<td>Unbelievable or inconsistent explanations of injuries</td>
<td>Extreme apprehensiveness/suspiciousness</td>
</tr>
<tr>
<td>Multiple bruises in various stages of healing</td>
<td>Pronounced aggression or passivity</td>
</tr>
<tr>
<td>Bruises located on facies, ears, necks, buttocks, backs, chests, thighs, back of legs, &amp; genitalia</td>
<td>Finishes easily or avoids being touched</td>
</tr>
<tr>
<td>Bruises that resemble objects such as a hand, fist, belt buckle, or rope</td>
<td>Play includes abusive behavior or talk</td>
</tr>
<tr>
<td>Injuries that are inconsistent with a child's age/developmental level</td>
<td>Unable to recall how injuries occurred or account of injuries is inconsistent with the nature of the injuries</td>
</tr>
<tr>
<td>Burns</td>
<td>Fear of parent or caregiver</td>
</tr>
</tbody>
</table>

Child Indicators: Signs of Neglect

<table>
<thead>
<tr>
<th>Physical Indicators</th>
<th>Behavioral Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of adequate medical and dental care</td>
<td>Not registered in school</td>
</tr>
<tr>
<td>Often hungry</td>
<td>Inadequate or inappropriate supervision</td>
</tr>
<tr>
<td>Lack of shelter</td>
<td>Poor hygiene control</td>
</tr>
<tr>
<td>Child's weight is significantly lower than what is normal for his/her age and gender</td>
<td>Frequently left exposed</td>
</tr>
<tr>
<td>Developmental delays</td>
<td>Parentified behavior</td>
</tr>
<tr>
<td>Persistent untreated conditions (e.g. head lice, diaper rash)</td>
<td>Deficient behavior</td>
</tr>
<tr>
<td>Exposure to hazards (e.g. illegal drugs, rodent/insect infestation, mold)</td>
<td>Mistreatment</td>
</tr>
<tr>
<td>Clothing that is dirty, inappropriate for the weather, too small or too large</td>
<td></td>
</tr>
</tbody>
</table>

Child Indicators: Signs of Mental Abuse

<table>
<thead>
<tr>
<th>Physical Indicators</th>
<th>Behavioral Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequent psychosomatic complaints (nausea, stomachache, headache, etc.)</td>
<td>Expressing feelings of inadequacy</td>
</tr>
<tr>
<td>Bed-wetting</td>
<td>Fearful of trying new things</td>
</tr>
<tr>
<td>Self harm</td>
<td>Overly compliant</td>
</tr>
<tr>
<td>Speech disorders</td>
<td>Poor peer relationships</td>
</tr>
<tr>
<td>Excessive dependence on adults</td>
<td>Excessive dependence on adults</td>
</tr>
<tr>
<td>Habit disorders (sucking, rocking, etc.)</td>
<td>Habit disorders (sucking, rocking, etc.)</td>
</tr>
<tr>
<td>Eating disorders</td>
<td>Eating disorders</td>
</tr>
</tbody>
</table>
Why Screen?

- “Many PT’s have long-term professional relationships with patients & their families, an opportunity exists to intervene meaningfully with regard to domestic violence.”
- “PT’s should routinely screen for domestic violence...”
  - 1996 – 8% of PT curriculums teach screening
  - 2001 – 45% of PT curriculums teach screening
  - 2001 – only 1% routinely screen

Intervention = RADAR

- Routinely screen every client
- Ask directly, kindly, non-judgmentally
- Document your findings
- Assess the client’s safety
- Review options & provide referrals

Red Flags

- Insidious onset with no known mechanism of injury
- Symptoms out of proportion to injury
- No change in symptoms despite position, rest, or treatment
- No pattern to the symptoms; unable to reproduce symptoms
- Symptoms persist beyond expected healing time
- Recent or current fever, chills, night sweats, infection
- Unexplained weight loss, pallor, nausea, dizziness, vomiting, b&b changes (constitutional symptoms)

Generalized Systemic Red Flags

- Headache or visual changes
- Change in vital signs
- Bilateral symptoms
- Pigmentation changes, edema, rash, nail changes, weakness, numbness, tingling, burning
- Hx of cancer
- > 40 yo gender, ethnicity, race
- Night pain
- Progressive neurology symptoms
- Cyclic presentation
- Joint pain with skin lesions

Generalized Systemic Red Flags


Vital signs

- “Fun” facts
  - 52% report vitals are not important
  - 60% say should screen HR & BP
  - 43% never measure BP
  - 39% never measure HR

MUST establish a baseline

Malpractice

Standard of minimal acceptable care
Vital Signs

<table>
<thead>
<tr>
<th>HR</th>
<th>Infection, ↓ H&amp;H, CHF, COPD, ↓ blood sugar, fever, ↓ fluid volume, ↓ K+, anxiety, pain, exercise</th>
<th>Narcotics, acute MI, ↑ K+, Beta blockers</th>
</tr>
</thead>
<tbody>
<tr>
<td>RR</td>
<td>Infection, ↓ H&amp;H, anxiety, ↓ blood sugar, pain, acute MI, asthma, exercise</td>
<td>Narcotics</td>
</tr>
<tr>
<td>BP</td>
<td>CAD, anxiety, pain, renal disease, steroids, ↓ caffeine, exercise (SBP only)</td>
<td>↓ H&amp;H, ↓ K+, narcotics, acute MI, anemia</td>
</tr>
<tr>
<td>Temp</td>
<td>Infection, exercise, ↑ blood sugar</td>
<td>↓ H&amp;H, ↓ blood sugar, narcotics, aging</td>
</tr>
</tbody>
</table>

2010 Mortality in USA

1. Heart Disease = 597K
2. Cancer = 574K
3. Chronic respiratory diseases = 138K
4. Stroke = 129K
5. Accidents = 120K
6. Alzheimer’s = 83K
7. Diabetes = 69K
8. Kidney disease = 50K

National Center for Health Statistics, CDC, 2012

~2014 US New Cancer Cases

<table>
<thead>
<tr>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prostate</td>
<td>27%</td>
</tr>
<tr>
<td>Lung-Bronchus</td>
<td>14%</td>
</tr>
<tr>
<td>Colon-Rectal</td>
<td>8%</td>
</tr>
<tr>
<td>Urinary Bladder</td>
<td>7%</td>
</tr>
<tr>
<td>Skin Melanoma</td>
<td>5%</td>
</tr>
<tr>
<td>Kidney</td>
<td>5%</td>
</tr>
<tr>
<td>Lymphoma</td>
<td>4%</td>
</tr>
<tr>
<td>Oral-Pharynx</td>
<td>4%</td>
</tr>
<tr>
<td>Leukemia</td>
<td>4%</td>
</tr>
<tr>
<td>Liver-Bile Duct</td>
<td>3%</td>
</tr>
</tbody>
</table>

Breast 29%  Lung-Bronchus 13%  Colon-Rectal 8%  Uterine 6%  Thyroid 6%  Lymphoma 4%  Skin Melanoma 4%  Kidney 3%  Pancreas 3%  Leukemia 3%

~2014 US Cancer Deaths

<table>
<thead>
<tr>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lung-Bronchus</td>
<td>28%</td>
</tr>
<tr>
<td>Prostate</td>
<td>10%</td>
</tr>
<tr>
<td>Colon-Rectal</td>
<td>8%</td>
</tr>
<tr>
<td>Pancreas</td>
<td>7%</td>
</tr>
<tr>
<td>Liver-Bile Duct</td>
<td>5%</td>
</tr>
<tr>
<td>Leukemia</td>
<td>5%</td>
</tr>
<tr>
<td>Esophagus</td>
<td>4%</td>
</tr>
<tr>
<td>Bladder</td>
<td>4%</td>
</tr>
<tr>
<td>Lymphoma</td>
<td>3%</td>
</tr>
<tr>
<td>Kidney</td>
<td>3%</td>
</tr>
</tbody>
</table>

Lung-Bronchus 26%  Breast 15%  Colon-Rectal 9%  Pancreas 7%  Ovary 5%  Leukemia 4%  Uterine 3%  Lymphoma 3%  Liver 3%  Brain 2%

Screen Detection & Tumor Growth Rate

American Cancer Society, 2014

Overdiagnosis Bias

Gates, 2014

Patz, Goodman & Bepler, 2000
Cancer Risk Factors

- Internal
  - Hormones
  - Immune conditions
  - Inherited mutations (BRCA)
- External
  - Chemicals & Radiation
  - Viruses, Smoking, Alcohol
  - Sexual Behaviors
  - Diet

Early Warning Signs of Cancer

- C = Change in bowel & bladder
- A = A sore that fails to heal in 6 weeks
- U = Unusual bleeding or discharge
- T = Thickening/lump (breast or elsewhere)
- I = Indigestion or difficulty swallowing
- O = Obvious change in wart or mole
  - A = Asymmetrical shape
  - B = Border irregularities
  - C = Color – pigmentation is not uniform
  - D = Diameter > 6 mm
  - E = Evolution (change in status)
- N = Nagging cough, hoarseness, rust colored sputum

Monohemispheric Brain Tumor

- The purpose of the study was to determine the sensitivity & specificity of 13 clinical tests for detection of subtle motor deficits in patients with unilateral brain tumors
- Summary:
  - Sensitivity = 1 – 51%
  - Specificity = 70 – 100%

Clinical Tests

- Pronator drifting test
- Mayer sign
- Finger tapping sign
- Digit quinti rolling sign
- Babinski sign
- Chaddock sign

<table>
<thead>
<tr>
<th>Clinical Test</th>
<th>Maneuver</th>
<th>Positive Sign</th>
<th>Sens</th>
<th>Spec</th>
<th>PPV</th>
<th>NPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forearm rolling</td>
<td>Make fists, hold forearms horizontal &amp; roll arms</td>
<td>1 arm orbits around other</td>
<td>16%</td>
<td>100%</td>
<td>100%</td>
<td>37%</td>
</tr>
<tr>
<td>Finger rolling</td>
<td>Use index fingers pointing towards each other ~ 1 finger length apart; roll fingers</td>
<td>1 finger orbits around other</td>
<td>41%</td>
<td>93%</td>
<td>92%</td>
<td>44%</td>
</tr>
<tr>
<td>Souques interosseous sign</td>
<td>Pt raises both UE to 180° of shoulder flexion</td>
<td>Involved fingers ext &amp; abd</td>
<td>23%</td>
<td>80%</td>
<td>70%</td>
<td>34%</td>
</tr>
<tr>
<td>Finger tapping</td>
<td>Index finger to thumb IP quickly x 10 sec</td>
<td>&gt; 5 rep difference</td>
<td>18%</td>
<td>90%</td>
<td>78%</td>
<td>35%</td>
</tr>
<tr>
<td>Foot tapping</td>
<td>Sit, knee &amp; ankle @ 90°, keep heel on floor &amp; tap foot x 10 sec</td>
<td>&gt; 5 rep difference</td>
<td>23%</td>
<td>93%</td>
<td>87%</td>
<td>37%</td>
</tr>
<tr>
<td>Babinski sign</td>
<td>Stimulate lateral plantar surface with blunt object</td>
<td>Extension of great toe</td>
<td>8%</td>
<td>100%</td>
<td>100%</td>
<td>35%</td>
</tr>
</tbody>
</table>


Maranhao, Maranhao-Filho, Lima, & Vincent, 2010
Cerebral Lesions

- Sensitivity = 68.9%
- Specificity = 87.5%
- (+) LR = 5.5
- (-) LR = 0.36
- (+) PV = 86.1
- (-) PV = 71.4%

Pain Patterns

- Dermatomes
- Myofascial Trigger Points (Travell & Simon)
- Viscera

Visceral referral patterns

Gulick, DT Screening Notes, FA Davis, Phila, 2006

Gulick, DT Screening Notes, FA Davis, Phila, 2006

Gulick, DT Screening Notes, FA Davis, Phila, 2006
Purpose of Visceral Palpation

Identify:
- Masses
- Tenderness
- Irregularities

Systemic Pathology

- Cardiovascular
- Pulmonary
- Hepatic
- Gastrointestinal
- Urogenital
- Endocrine

Risk Factors for Coronary Artery Disease

<table>
<thead>
<tr>
<th>Modifiable</th>
<th>Not Modifiable</th>
<th>Contributing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical activity</td>
<td>Age</td>
<td>Obesity</td>
</tr>
<tr>
<td>Smoking</td>
<td>Gender</td>
<td>Waist &gt;88cm in women</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>Family Hx</td>
<td>Waist &gt;102cm in men</td>
</tr>
<tr>
<td>LDL &gt;130</td>
<td>Race</td>
<td>Stress</td>
</tr>
<tr>
<td>HDL &lt;40</td>
<td>Post-menopausal</td>
<td>Personality</td>
</tr>
<tr>
<td>Total &gt;200</td>
<td></td>
<td>PVD</td>
</tr>
<tr>
<td>BP</td>
<td></td>
<td>Hormones</td>
</tr>
<tr>
<td>SBP &gt;140</td>
<td>Alcohol</td>
<td>Fasting blood glucose &gt;100</td>
</tr>
<tr>
<td>DBP &gt;90</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Cardiac

- Chest pain
- Irregular heartbeat (palpitations)
- Dyspnea, orthopnea
- Fainting, dizziness
- Rapid onset of fatigue
- Peripheral edema
- Cold hands/feet
- ↓ peripheral pulse
- LE claudication
- Cyanotic nail beds

Where to place your stethoscope

Gulick, DT Screening Notes, PA Daye, Phila, 2006
**Palpation of Aorta**

- Supine with hips/knees flexed
- At the upper abdomen, half way between xiphoid & umbilicus, just (L) of midline, press firm & deep to palpate the pulsation of the aorta
- Place your thumb on 1-side & your index/middle finger on the other side
- Palpate for a prominent lateral expansion of the aorta (aortic aneurysm)
- **Red flag:** Aortic pulse width > 2 cm; Back pain with palpation; Bruit on auscultation


**Pulmonary**

- Sharp, localized pain
- Fever, chills
- Symptoms aggravated by cold air or exertion
- ↑ Pain in recumbent; ↓ Pain when lying on involved side
- Cough with/without blood
- Sputum
- SOB or DOE


**Auscultation**

- Crackles, wheezes, pleural friction rub on auscultation
- Clubbing of nails
- Pain with deep inspiration
- ↓ O₂ saturation
- Weak/rapid pulse with ↓ BP = pneumothorax

**Sputum**

<table>
<thead>
<tr>
<th>Presentation</th>
<th>Possible Pathology</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>Bronchitis, CF</td>
</tr>
<tr>
<td>Rusty</td>
<td>Pneumonia</td>
</tr>
<tr>
<td>Hemoptysis</td>
<td>Pneumonia, acute bronchitis, lung CA, TB</td>
</tr>
<tr>
<td>Stringy mucous</td>
<td>After an asthma attack</td>
</tr>
</tbody>
</table>
**Blumberg sign**
(Rebound tenderness)

- In supine, select a site away from the painful area & place your hand on the abdomen
- Push down slow & deep, hold for a moment then lift up quickly
- **Red flag**: (+) = pain on release; (-) = no pain

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**Hepatic**

- @ UQ pain
- Weight loss
- Ascites / LE edema
- CTS symptoms
- Intermittent pruritus
- Weakness & fatigue
- Dark urine / clay-colored stools

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**Asterixis**

- **VIDEO:**
  - [Search for video of asterixis](http://search.mywebsearch.com/mywebservice/video.jhtml?searchfor=video+of+asterixis&ts=1367199372117&p2=^ZU^xddd918^S05006^us&n=77fc723d&ss=sub&st=hp&ptb=38927557-9786-402E-B964-B08D0BA2A7C6&tpr=hpsb&si=eclwf100130)

Asterixis/flapping tremor by Dr. Siva Kumar Jogu (in a pt. of CO2)

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**Liver Palpation**

- Bates B (1995); Boissonnault WG (2005); Munro J & Campbell I (2000); Gulick (2006)

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**Hepatic**

- Jaundice / bruising; yellow sclera
- Pain referral to t-spine (scapula, @ shoulder, @ upper trap, @ subscapular region)
- Palmar erythema (liver palms)
- White, not pink, finger nails
- Asterixis (liver flap)

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**Gulick, DT Screening Notes, FA Davis, Phila, 2006**
**Gall Bladder**

- Place fingers to ® of rectus just below rib cage
- Ask patient to take a deep breath
- **Red flag:** Sudden pain & abdominal muscle tensing that ceases inspiration is suggestive of gall bladder pathology; Pain also ↑ with FB

---

**Murphy’s Sign**

- Hook fingers under costal margin
- Inhale
- (+) = Sharp pain or unable to complete inspiration
- Sensitivity = 97%
- Specificity = 48%

---

**Gall Bladder Pathology**

- **Risk Factors = 8 F’s**
  - Female
  - Fat
  - Forty
  - Fertile
  - Flatulent
  - Family History
  - Fatty Foods

---

**Spleen**

**Kehr’s Sign for the Spleen**

- With patient in supine, raise the foot of the bed (Trendelenburg position)
- Kehr’s sign often occurs 30-minutes after a spleen injury & can take days to subside
- **Red flag:** the presence of blood or other irritant in the peritoneal cavity will result in severe (L) shoulder pain a few minutes after the LE are elevated
### Gastrointestinal
- Symptoms influenced by eating, swallowing
- Epigastric pain with radiation to the back
- Blood or dark, tarry stool
- Fecal incontinence/urgency, diarrhea/constipation
- Nausea, vomiting, bloating
- Weight loss, loss of appetite
- (+) Blumberg sign

### Bowel Changes

<table>
<thead>
<tr>
<th>Presentation</th>
<th>Possible Pathology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Melena (black, tarry)</td>
<td>Upper GI bleed (loss of &gt; 150–200 ml of blood)</td>
</tr>
<tr>
<td>Blood-red</td>
<td>Colon-rectal tumor, colon diverticulitis, hemorrhoids</td>
</tr>
<tr>
<td>Silvery</td>
<td>Pancreatic cancer</td>
</tr>
<tr>
<td>Pencil-thin, ribbon stools</td>
<td>Distal colon/anal cancer</td>
</tr>
</tbody>
</table>

### McBurney’s Point for Appendix
- In supine, identify the point that is 1/3 the distance between the ASIS & umbilicus
- Apply vertical pressure to this point
- **Red flag:** (+) test is ↑ abdominal pain

### Psoas Sign for Appendicitis
- In (L) sidelying, hyperextend LE
- **Red flag:** (+) test is ↑ abdominal pain

### Anatomic Basis for the Psoas Sign

### Obturator Sign for Appendicitis
- In supine, raise the pt’s LE with the knee in flexion
- Rotate the LE into IR @ the hip
- **Red flag:** (+) test is ↑ abdominal pain
Anatomic Basis for Obturator Sign

Renal

- (+) Percussion over kidney
- Fever, chills
- Dull aching pain aggravated by prolonged sitting
- Blood in urine (hematuria)
- Cloudy/foul smelling urine
- Painful/frequent urination
- Pain is constant (stones)
- Back pain at the level of the kidneys (costovertebral angle tenderness)
- Skin hypersensitivity
- HTN
- Bleeding tendencies; ecchymosis
- Headache
- Pruritus

Kidney Palpation

- With patient in supine, place (L) hand under the patient between the ribs & iliac crest
- Place your ® hand on the ® abdomen just below the ribs with your fingers pointing left
- Ask patient to take an "abdominal" breath & try to "capture" the right kidney between your fingers
- **Red flag:** reproduction of symptom(s)

Kidney Palpation

Urinary Changes

<table>
<thead>
<tr>
<th>Presentation</th>
<th>Possible Pathology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>Glomerulonephritis, TB, trauma, lupus, renal cystic disease</td>
</tr>
<tr>
<td>Orange/Brown</td>
<td>Dehydration, ↑ bilirubin</td>
</tr>
<tr>
<td>Milky/Casts</td>
<td>Infection</td>
</tr>
<tr>
<td>↓ flow</td>
<td>Obstruction, UTI, prostate hyperplasia</td>
</tr>
<tr>
<td>Fruity odor</td>
<td>Ketosis</td>
</tr>
</tbody>
</table>

Incontinence

- **Quality of Life Issue**
  - Embarrassment; decreased socialization
  - Burden of care
  - Risk of falls
  - Cost

Resch & Diedrich, 2009

Gulick, DT Screening Notes, PA Davis, Phila, 2006

**Incontinence**

- **Characteristics**
  - 40% from 60-80 years old
  - 36% after 3+ children
  - 26% with BMI over 25
  - 26% diuretics
  - 18% after hysterectomy (prostate)

- **Medications:**
  - Diuretics can increase frequency & urge
  - Ca++ channel blockers increase retention
  - Antidepressants cause incomplete emptying

  Roher et al, 2005

**Prostate**

- Men > 50 yo with LBP or suprapubic pain
- Difficulty starting or stopping urine flow
- Change in frequency; ↓ urine flow
- Nocturia, hematuria
- Incontinence / dribbling
- Sexual dysfunction
- PSA (Prostate-specific antigen) level > 4 ng/ml ??? (benign prostatic hyperplasia)

**Gynecological**

- Cyclic pain
- Abnormal bleeding
- Nausea, vomiting
- Vaginal discharge
- Chronic constipation
- Low BP (blood loss)
- Missed or irregular periods
- Pain with cough/intercourse

**Evans’ Sign**

- Also known as “hot foot syndrome”
- Symptoms = warm, dry foot
- Etiology = sympathetic interruption from lumbosacral plexus via tumors or other lesions (vasodilatation with loss of perspiration)
- Most common in cervical cancer

  Evans & Watson, 2012

**Location of 9 endocrine glands**

**Endocrine**

- Joint pain
- Muscle pain
- Paresthesia
- Dry, scaly skin
- Constipation
- Fatigue
- Dyspnea
- Brittle nails/hair
- Heat / Cold intolerance
- Weight change
- Periorbital edema
- Hoarseness
- Polydipsia/polyuria
### Nails

<table>
<thead>
<tr>
<th>Presentation</th>
<th>Possible Pathology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beau’s nails (transverse ridging)</td>
<td>Temporary arrest of nail growth due to a systemic insult, fever, infection, renal/hepatic px</td>
</tr>
<tr>
<td>Clubbing</td>
<td>Respiratory/CV pathology, thyroid, ulcerative colitis, cirrhosis, CA</td>
</tr>
<tr>
<td>Yellow</td>
<td>Bronchiectasis, thyroid disease, COPD, RA, malignancies, AIDS</td>
</tr>
<tr>
<td>Black stripe</td>
<td>Malignant melanoma</td>
</tr>
</tbody>
</table>

**Beau’s Lines**

Appears 1-2 months after a systemic problem

---

### Clubbing – chronic hypoxemia

- Yellow jaundice – scleras (bilirubin 2° liver disease)
- Brown nipples, areolae, linea nigra, vulva (Pregnancy, Addison’s disease, pituitary tumor)
- Orange (Consumption of large quantities of carrots)
- Violet colored palms (Liver disease, pregnancy)

---

### Skin

<table>
<thead>
<tr>
<th>Presentation</th>
<th>Possible Pathology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow jaundice – scleras</td>
<td>↑ bilirubin 2° liver disease</td>
</tr>
<tr>
<td>Brown nipples, areolae, linea nigra, vulva</td>
<td>Pregnancy, Addison’s disease, pituitary tumor</td>
</tr>
<tr>
<td>Orange</td>
<td>Consumption of large quantities of carrots</td>
</tr>
<tr>
<td>Violet colored palms</td>
<td>Liver disease, pregnancy</td>
</tr>
</tbody>
</table>

---

### Electrolyte Imbalances

<table>
<thead>
<tr>
<th>Causes of ↓ Ca++</th>
<th>Symptoms of ↓ Ca++</th>
<th>Causes of ↑ Ca++</th>
<th>Symptoms of ↑ Ca++</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitamin D deficiency</td>
<td>Parathesia</td>
<td>Hyperparathyroidism</td>
<td>Muscle weakness, ataxia</td>
</tr>
<tr>
<td>Kidney disease</td>
<td>Muscle cramps</td>
<td>Metastatic CA</td>
<td>Deep bone pain</td>
</tr>
<tr>
<td>Hypoparathyroidism</td>
<td>Slow mental processing</td>
<td>Multiple myeloma</td>
<td>HTN</td>
</tr>
<tr>
<td></td>
<td>(+) Chvostek test = tap just below zygomatic arch</td>
<td></td>
<td>Renal dysfunction</td>
</tr>
<tr>
<td></td>
<td>(+) Trousseau test = BP cuff &gt; SBP results in wrist &amp; MCP flex &amp; finger hyperext</td>
<td></td>
<td>AV block on EKG</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Nausea, vomiting, constipation</td>
</tr>
</tbody>
</table>

**Vitamin Deficiencies**

- **Sunshine Vitamin** = Vitamin D
- **Recommended exposure** is 10-15 minutes a few times a week
- **Food equivalents**
  - 6.5 lbs of mushrooms
  - 150 egg yolks
  - 3.75 lbs of salmon
  - 30 servings of fortified cereal
  - >2 lbs of sardines
  - 30 cups of fortified OJ

**Recommended exposure** is 10-15 minutes a few times a week?

- How much skin exposed depends on skin type (I-VI) & UV index
  - UV index ≥ 3 between 10:30 -12 noon requires 50-75% of skin exposed
  - Darker skin requires increased exposure
  - UV index < 3 means increase risk of UVA rays without the benefit of UVB
- Early morning & evening sunlight provides only UVA rays while mid-day has UVB

**Low serum levels of vitamin D are associated with clinically significant symptoms of depression**
- Healthy women followed x 1-month
- > 1/3 had depressive symptoms
- ~ ½ had vitamin D insufficiency
- Depressive symptoms were predicted by vitamin D levels

David Kerr, PhD, School of Psychological Science, College of Liberal Arts, Oregon State University, Corvallis, 2015

**A randomized double-blind placebo-controlled study adding high dose vitamin D to analgesic regimens in pts with musculoskeletal pain**

Adding 4000 IU of vitamin D for patients with musculoskeletal pain may lead to a faster decline of consecutive VAS scores & to a decrease in the levels of inflammatory & pain-related cytokines.

Gendelman, Itzhaki, Makarov, Bennun, & Amital, 2015

**Headaches**

<table>
<thead>
<tr>
<th>Type of Pain</th>
<th>Possible Etiology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe &amp; intense</td>
<td>Meningitis, aneurysm, brain tumor</td>
</tr>
<tr>
<td>Throbbing &amp; pulsating</td>
<td>Migraine, fever, hypertension, aortic insufficiency</td>
</tr>
<tr>
<td>Temporal</td>
<td>Eye or ear px, migraine, with visual changes = temporal arteritis</td>
</tr>
<tr>
<td>Occipital</td>
<td>Herniated disk, eye strain, hypertension</td>
</tr>
<tr>
<td>Parietal</td>
<td>Meningitis, constipation, tumor</td>
</tr>
</tbody>
</table>


**Structured Migraine Interview**

- Based on the International Classification of Headache Disorders
- Sensitivity = 87%
- Specificity = 58%
- 60% of migraine sufferers were not aware that they had a migraine
1. Have you ever had recurrent headaches? □ No □ Yes
   If yes, how old were you when these headaches started? ___ years
2. Have you ever had moderate to severe headache accompanied by nausea and/or vomiting? □ No never □ Yes 1-4 times □ Yes 5-9 times □ Yes 10+ times
3. Have you ever had moderate to severe headache accompanied by hypersensitivity to sound or light? □ No never □ Yes 1-4 times □ Yes 5-9 times □ Yes 10+ times
4. Have you ever had visual disturbances e.g. (Flashing lights, zigzag lines, blurred vision) Lasting 5-60 minutes followed by headache? □ No never □ Yes once □ Yes 2+ times

• If answers to all Q1-4 are “No” then finish here

Visual Changes

<table>
<thead>
<tr>
<th>Presentation</th>
<th>Possible Pathology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spots</td>
<td>Impending retinal detachment, fertility drugs</td>
</tr>
<tr>
<td>Floating spots</td>
<td>Diabetic retinopathy</td>
</tr>
<tr>
<td>Flashes</td>
<td>Migraine, retinal detachment</td>
</tr>
<tr>
<td>Loss of peripheral vision, haloes around lights</td>
<td>Glaucoma (ocular hypertension)</td>
</tr>
<tr>
<td>Cloudy or fuzzy vision</td>
<td>Cataracts</td>
</tr>
</tbody>
</table>

Amsler Grid

Hold 14” away
Cover 1 eye

Substance Abuse

• Tobacco
• Caffeine
• Alcohol
• Food

Risks of Pathology Associated with Tobacco

• Cerebrovascular disease
• Tobacco amblyopia
• COPD
• PVD
• Ischemic heart disease
• Peptic ulcer
• Small babies; obstetric or fertility problems
• Impaired insulin absorption

• ↑ Risk of cancer
• Mouth
• Lung
• Bladder
• Kidney
• Breast
• Cervix
• Poor recovery from LBP, Sx
• Premature aging

Risks of Pathology Associated with Caffeine

- ↑ Blood sugar
- ↑ Blood fats
- ↑ BP
- Stimulates CNS – tremors, irritability, nervousness
- Irregular heart beat
- ↑ Urinary Ca++ & Mg++ losses (↓ bone mineralization)
- ↑ Stomach acid secretion
- Disrupted sleep patterns – anxiety & depression
- ↑ Symptoms of PMS

Andrews University Nutrition Department

Coffee Perks ??

- NIH studied 400K adults & found regular coffee drinkers lived longer than non-coffee drinkers
- Florida study found 3 cups of caffeinated coffee reduced the risk of Alzheimer’s & dementia
- Australian study found several cups of coffee with your post-exercise meal resulted in faster muscles recover

Caffeine use in sport

- ≥ 3 mg per kg of body weight will achieve an ergogenic effect

Caffeine

- How much is too much?
- Excess caffeine is > 350 mg / day

Caffeine Content

- Coffee = 110-150
- Decaf coffee = 2-5
- Tea = 9-50
- Cocoa = 6-35
- Regular & Diet - Mountain Dew, Mello Yellow, TAB, Coke, Pepsi, Mr. Pibb, Dr. Pepper = 36-54
- Red Bull = 80
- Anacin = 32
- Excedrin = 65
- Midol = 32
- Dextram = 200
- Darvon = 32
- Vivarin = 200
- NoDoz = 100

Gatorade Sports Science Institute

Risks of Pathology Associated with Alcohol

- Alcoholic dementia
- Subdural hematoma from falls
- Convulsions from withdrawal
- Delirium tremens
- Cardiomyopathy
- Hypertension
- Hepatic cirrhosis
- Pancreatitis
- Dupuytren’s contracture
- Myopathy
- Peripheral neuropathy

The Alcohol Use Disorders Identification Test: Interview Version

Clinical Institute Withdrawal Assessment of Alcohol Scale

Obesity

WEIGHTY PROBLEM
Prevalence of obesity among U.S. adults ages 20-74:

1960-62
13.4%
1971-74
14.5%
1976-80
15%
1988-94
23.2%
1999-2000
30.9%
2007-08
34.3%

Source National Center for Health Statistics
Karl Geihs, USA Today

Risks of Pathology Associated with Obesity

- Arteriosclerosis & hypertension
- CVA & MI
- Sleep apnea
- Hypoventilation & exertional breathlessness
- Gallstones
- Diabetes
- Reflux
- OA
- Abdominal striae & varicose veins
- Impaired fertility
- Dependent edema

Questions?