When to Think About Fracture

- Major Trauma
- **Minor Trauma/No Trauma (Pathological fractures)**
  - **compromised bone density –**
    - **Bony tumor**
    - **Osteoporosis**
- Repetative/Unusual Activity
  - Repetative minor trauma on normal bone
  - Normal load on abnormal bone

Traumatic Fractures

- Minor Trauma (sneeze, misstep, lift gallon of milk, raise window etc.)
- Most common sites: vertebral bodies, femur and distal radius
  - Risk factors for decreased bone density
    - Age, race, body build
    - Family history
    - Medications
    - Disease states

Risk Factors

- Family history
- Caucasian/Asian Race
- Female sex
- Age 50 (70)years and older
- Low body weight
- Immobilization
- inactivity
- Long---term exposure to toxins such as alcohol, tobacco, and caffeine
- Medication use
- Co---morbidities
- Dietary deficiencies (Ca and Vitamin D)
- Northern European ancestry

Medications/Toxins

- Aluminum
- Anticonvulsants
- Corticosteroids
- Cytotoxic drugs
- Excessive thyroxine
- Caffeine
- Heparin
- Lithium
- Tamoxifen (pre---menopausal use)
- Tobacco
- Soft Drinks

Diseases

- Hyperthyroidism
- Cushing's Syndrome
- Chronic Renal Failure
- Rheumatoid Arthritis
- Ankylosing Spondylitis
- IDDM
- Endometriosis
- GI Malabsorption Syndrome
- Mul2ple Myeloma
- Hyperparathyroidism
- Hypogonadism
- Bony Metastasis
- Multiple Sclerosis
- Lymphoma
- Leukemia
- Acromegaly
- COPD
- Chronic Alcohol Dependency

Stress Fractures

- **Insufficiency fractures:** bone that is deficient in mineral content or elastic resistance.
- **Fatigue fractures**: normal bone placed under abnormal mechanical loads---repetetive overuse.
  - Athletes (runners)
  - Military servicemen/women
  - Dancers

Fatigue Stress Fractures

- Most common sites:
  - Tibia (20---75%)
  - Tarsals
  - Metatarsals
  - Femur
  - Pelvic ring

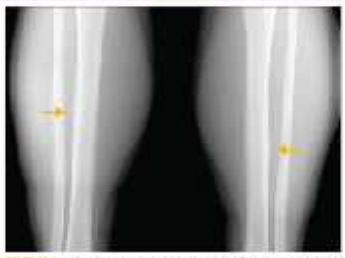
Fatigue Stress Fxs: Risk Factors

- Repetative overuse
- Sudden change in training regimen
- Alterations in training surface
- Improper foot wear
- Women
- Leg length discrepancy
- Diminished muscle strength

Fatigue Stress Fxs: Clinical Manifestations

- Pattern of decreased WB tolerance over time
- Localized pain
- Tenderness with palpation
- Antalgic gait
- Minimal joint ROM loss for extra---articular lesions
- Special tests: tuning fork, patellar pubic percussion test etc.

Identification of a High-Risk Anterior Tibial Stress Fracture



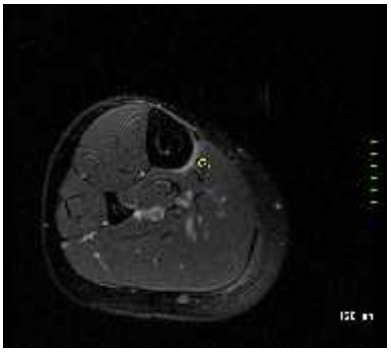
Femoral Neck Stress Fracture in a Military Trainee

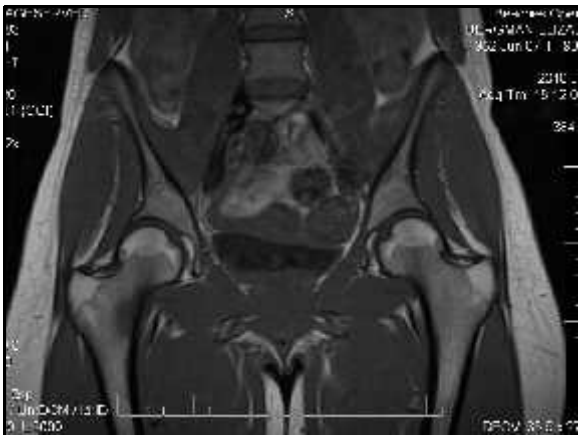
Diagnostic Gold Standards

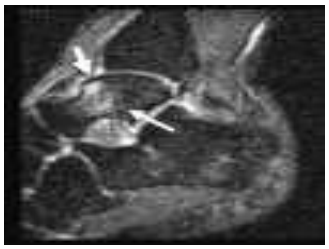
- Plain films---NO!!
  - Sensitivities as low as 15---29%
  - Specificities as high as 100%
  - Plain films can be (–) for 14---21 days or longer!!
- MRI and bone scan

Osseous Stress Reaction Injuries---MRI

- Grade 1: T2 image---mild---moderate periosteal edema
- Grade 2: T2 image---mod/severe periosteal edema with marrow edema
- Grade 3: T2 and T1 images---mod/severe periosteal edema with marrow edema
- Grade 4: T2 and T1 images--- images---mod/ severe periosteal edema with marrow edema; plus obvious Fx line







Fatigue Stress Fxs: Complications

- Risk for Fracture Progression
  - Head/neck of femur (2---9%)
    - Groin, greater trochantor, deep buttock pain with WBing
    - No palpable tenderness
    - ROM deficits---minimal

Patellar **P**ubic **P**ercussion **T**est

- Normal bone has clear, “crisp” sound
- Bony disruption results in a dull, muffled, diminished
- LEs positioned symmetrically
- “Grab” patella and hold

Patellar **P**ubic **P**ercussion **T**est

- The PPPT was only test that significantly altered post---test probability: Sensitivity 0.95 (95% CI 92---97%); specificity 0.86 (95% CI 78---92%).
  - Reiman et al. diagnos2c accuracy of clinical tests of the hip: a systema2c review with meta---analysis. Br J Sports med. Doi:10.1136/bjsports---2012---091035
- Interrater agreement of 90.2% ($p<0.0001$)
  - (Adams and Yarnold. Am J Emerg Med 1997)
- Positive test warrants consideration of bone scan or MRI

Other **P**ercussion **T**ests

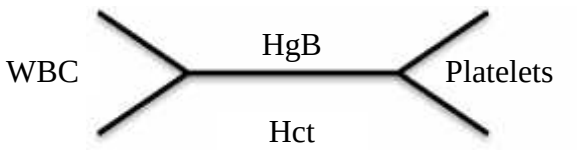
- Normal bone has clear, “crisp” sound
- Bony disruption results in a dull, muffled, diminished
- Humerus (manubrium---stethoscope and percuss olecranon)
- Tibia (medial tibial plateau---stethoscope and percuss medial malleolus
- Fibula??

Other Percussion Tests---With Tuning Fork

- Moore MB. The use of tuning fork and stethoscope to ID Fx. J Athl Training. 2009;44(3):272---274
  - Fibula, phalanges, radius, ulna, 2bia, MCPs
  - Sensitivity 0.83, specificity 0.80; +LR 4.2, ---LR of 0.21
  - When stethoscope was placed over edema and not tuning fork, sensitivity stayed same, but specificity increased to 0.92; +LR 10.4, ---LR 0.18

Vital Signs & Lab Values

VITAL SIGNS		
Blood Pressure (mmHg)	**Adult:** Optimal: slightly below 120/80 Normal: 120/80 to 129/84 High Normal: 130/85 to 139/89 **Hypertension Stages**: **Stage 1: above 140/90** **Stage 2: above 160/100** **Stage 3: above 180/110**	**Pregnant Women:** Pre-Eclampsia: **≥140/99** after week 20 Eclampsia: **≥140/99** plus grand mal seizures **Children**: **Ages 3-6:** 80/50 to 116/76 **Ages 6-9:** 84/55 to 122/78 **Ages 10-13:** 90/55 to 126/82 **Ages 14-19:** 90/60 to 142/86
Heart Rate (bpm)	**Adult: Men**: 60-100 **Women**: 55-95	**Children**: **Neonate**: 70-190 **1 year**: 80-160 **2 - 4 year**: 80-130 **6-10 year**: 70-115 **12 - 14 year**: 60-110 **16 year**: 55-100
Respiratory Rate (breath/min)	**Adult**: 10-20	**Children:** **Neonate**: 30-40 breaths/min **1 year**: 20-40 **2 year**: 25-32 **4 year**: 23-30 **6 year**: 21-26 **8-10 year**: 20-26 **12-14 year**: 18-22 **16 year**: 16-20
SpO_2 (%)	**Adult**: 95-100 **CV: below 75%** **below 88% results in significant drop*	**Newborns:** 40-90 **Elderly:** 95
BMI	**Under**: <18.5 **Normal**: 18.5-24.9 **Overweight**: 25-29.9 *Equation:* *[Weight (lbs)/ Height (in)^2] x 704.5*	**Obesity Class**es: (I) 30-34.9 (II) 35- 39.9 (III) >40
Blood Glucose (mg/dL)	**Adults/Child >2 yrs:** ≤ 200 **CV men: <50 or >400 CV** **women: <40 or >400** **Child <2 yrs:** 60-100 **Infants:** 40-90 **CV: <40**	**Hyperglycemia:** extreme thirst, hunger, frequent urination, dry skin, nausea, drowsiness, diplopia **gradual onset** **risk of diabetic coma** **Hypoglycemia:** headache, nervousness, shakiness, sleepiness, anxiousness, weakness, confusion, difficulty speaking perspiration, dizziness, lightheadedness, hunger, neuromuscular incoordination **sudden onset** **risk of insulin shock**



Fx	Pt Demographics	Risk Factors	Sx Investigation	Physical Exam	Radiographs	Advanced Imaging
Cauda Equina Syndrome		-Intervertebral disk herniation -Spondylolisthesis -DDD/stenosis	-Bowel/Bladder -Saddle anesthesias -Sexual dysfunction	-Saddle anesthesias -Gait ataxia -Heavy, weak legs		MRI
Spondylolisthesis -Bilateral pars interarticularis Fx -Traumatic: L5-S1 -Degenerative: L4-5	Grade 1: < 25% Grade 2: 25-50% Grade 3: 50-75% Grade 4: 75-100% Grade 5: Fallen off		-Numbness -Tingling -Bowel/Bladder Sx	-Sharp pain with trunk ext -Flexion is easier	Lateral (neutral, flex, ext)	CT Scan
Tethered Cord	Developing child	-Spina bifida -Spinal cord tumor -CSF shunt	Progressive neurological compromise	-Progressive neurologic symptoms -Weakness -Asymmetric postures -Altered gait -Decreased coordination -Change in bladder function -Progressive scoliosis		Ultrasound
Vertebral Compression -Anterior vertebral column -Traumatic	-Pathologic in older adults -Decreased bone density	- Major trauma (fall/land on tailbone) - Flexion/axial load injuries	Possible neuro Sx	- ^ kyphosis -Tender palpation		Traumatic: CT Scan
Labral Tear (SLAP tear)	-Men > women -Young (20s-40s)	-FOOSH -Compression injury -Traction injury -Overhead injury	-Pain, usually with overhead activities -Catching, locking, popping, or grinding -A sense of instability in the shoulder -Decreased range of motion -Loss of shoulder strength	-Anterior slide test -Biceps load test -Pain provocation test		MRI
Rotator Cuff Tear	-Men > women -Older age (>40)	-Repetitive overuse -Age -Overhead activities	-Anterolateral shoulder pain -Painful arc between 70 and 120° of abduction -Weakness in abduction and forward flexion	-(+) Drop arm test -Weak shoulder abduction and flexion		MRI

General Risk Factors for Fractures

Patient History	Medications/Toxins	Diseases	Potential Complications

- Family hx
- Caucasian/Asian
- Female – menopause
- 50yr+, >70*
- Low body wt
- Immobilization/ inactivity
- Long-term exposure to toxins, Meds, or Co-morbidities
- Dietary deficiencies (Ca, Vit D)
- Northern European ancestry
	- Alcohol
	- Aluminum
	- Anticonvulsants
	- Corticosteroids
	- Cytotoxic drugs
	- Excessive thyroxine
	- Caffeine
	- Heparin
	- Lithium
	- Tamoxifen (premenopausal use)
	- Tobacco
	- Soft drinks
		- Acromegaly
		- Ankylosing spondylitis
		- Bony metastasis
		- Chronic alcohol dependency
		- Chronic renal failure
		- COPD
		- Cushing's syndrome
		- Endometriosis
		- GI malabsorption syndrome
		- Hyperparathyroidism
		- Hyperthyroidism
		- Hypogonadism
		- IDDM
		- Leukemia
		- Lymphoma
		- Multiple myeloma
		- Multiple sclerosis
		- Rheumatoid arthritis
			- Bone Healing
			- Osteomyelitis
			- Pseudarthrosis
			- ROM Compromise
			- Hemmorage
			- Necrosis
			- Fat embolism
			- Infection
			- Complex Regional Pain Syndrome
			- Supracondylar Fx
			  - Brachial Artery
			- Proximal Humeral Fx
			  - Axillary Nerve

Clinical Prediction Rules

Plain Films: *General Guidelines for Use*

- Good diagnostic test for traumatic fractures:
  - Major trauma
  - Minor trauma (compromised bone density)
- NOT good for:
  - Stress Fractures
  - Navicular, Scaphoid Fractures
  - Bone Cancer
  - MSK Cancer
  - Early Tumors
  - Infection
  - Tendon avulsions
  - Ligament ruptures

Ottawa Ankle Rules (Modified)

- Following Ankle/Foot Injury:
  - Tenderness:
    - post malleolus
    - tip of malleolus
    - mid crest of malleolus
    - navicular
    - base of 5th MET
  - Inability to WB BOTH immediately after injury and during the exam
- Specificity: 0.40-0.46; Sensitivity: 1.0

Ottawa Knee Rules

- Post knee trauma, 1+ of the following:
- 55+ y/o
- **Isolated** tenderness of patella
- Tenderness of fibular head
- < 90deg of flexion
- Inability to WB 4 steps

Specificity: 0.48; Sensitivity: 1.0

Canadian C-Spine Rules

Following head/neck trauma, 1+ of the following:

- 65+ y/o
- "Dangerous" mechanism of injury:
  - fall from 3+ ft or 5+ stairs
  - axial load to head
  - MVA >55mph
  - MVA rollover or ejection
  - Collision with RV or Bike
- Paresthesia in >1 extremity
- <45deg of cervical rotation OR cannot safely assess cervical AROM

Specificity: 0.45; Sensitivity: 0.99

Pittsburgh Knee Rules

- Blunt Trauma or fall AND:
  - Age <12 or >50 AND/OR
  - Inability to walk 4 steps or more at time of clinic visit
- Specificity: 0.60; Sensitivity: 0.99

LBP Rules

- Suspicious of Cancer
  - personal hx of cancer
  - 50+ y/o
  - unexplained weight loss
  - no improvement w/ 4-6wks of conservative therapy
- Suspicious of compression fx
  - 50+ y/o (women); 70+ y/o (women and men)
  - Hx of osteoporosis (primary or secondary)
  - Hx of corticosteroid use

Specificity: 0.99; Sensitivity: 0.67

Clinical Screening Tools			
Percussion Auscultation - Sensitivity: 0.95 - (CI 92-97%) - Specificity 0.86 - (CI 78-92%) - Interrater agreement 90.2% (p< 0.0001) +/- LR: 6.8/0.15	**Tuning Fork** - PPV and NPV to predict stress fx (51.4-58.6) - **128Hz**: Sensitivity (0.70) Specificity (0.60) +/- LR: 1.75/0.57 - **256Hz**: Sensitivity (0.77) Specificity (0.25) +/- LR: 1.03/0.97 - **512Hz**: Sensitivity (0.35) Specificity (0.83) +/- LR: 2.69/0.37	**Fulcrum Test** + Patient apprehension - Sensitivity: 0.88-0.93 - Specificity: 0.13-0.75 +/- LR: 1-3.72/1-0.27	**Ultrasound** - Mixed results - Sensitivity: 0.43-0.75 - Accuracy up to 92-96%

Stress		
Risk Factors: - *Repetitive overuse on normal bone - *Sudden change in training regimen - *Slterations in training surface - Improper foot wear - Women - Leg length discrepancy - Diminished muscle strength	**Most common:** - Military, dancers, runners/athletes - Tibia - Tarsals - Metatarsals - Femur – proximal, most likely to progress to complete fx - Pelvic ring - Clinical manifestations: - Pattern of decreased WB tolerance over time	**Clinical manifestations:** - Pattern of decreased WB tolerance over time - Localized pain - Pain w/ WB - **Tenderness with palpation - Antalgic gait - Minimal jt ROM loss for extra-articular lesions

Fx	Pt Demographics	Risk Factors	Sx Investigation	Physical Exam	Radiographs	Advanced Imaging
Carpals **1. Scaphoid** (most common) -Traumatic -20% distal -70% mid waist -10% proximal	Males 20-30 yrs	FOOSH	-Pain w/ club sports -Blood supply distal to proximal -Potential ^ risk of osteonecrosis	-Pain w/ active ROM -Pain end range passive motion + pain resist pronation + pain axial load 1st met + snuff box tenderness + radial dev/wrist ext	-Semi-pronated oblique PA -Semi-supinated oblique AP -Lateral -Ulnar dev. PA	MRI
2. Hamate -Type 1: body, FOOSH (Traumatic) -Type 2: hook	-Racket & club sports	-Crush injury -Force through 5th metacarpal	-Pain to type -Unable to hold objects out -Severe pain with swinging golf club	-Tenderness medial wrist -Lack of wrist flexion -Lack of grip strength -Concern w/ ulnar n. damage	1. Lateral wrist 2. Carpal tunnel	CT Scan
Colles -Distal radius -Traumatic (FOOSH)	-Post menopausal women (OP) -young adults	Osteoporosis	Pain w/ mvt	-Swelling, tenderness -Painful radial deviation	-Lateral -PA -Oblique	CT Scan
Avascular Necrosis (Femoral Head)		-Hx of long-term corticosteroid use (especially in patients with RA, SLE, asthma) -Hx of osteonecrosis of contralateral hip; -Hx of sickle cell disease; trauma	-Gradual onset of pain with a possible referral to groin, thigh, and/or medial knee -Worse with WB	Restricted hip IR and flexion (stiff hip joint)	Non-diagnostic	Coronal MRI (most sensitive)
Developmental Dysplasia of Hip (DDH)	Infants in utero or within first year of life	-Breech birth -Family hx	Trendelenburg gait (if untreated)	-Limited hip abduction -Asymmetric proximal thigh skin folds & shortening of thigh on dislocated limb		Coronal US (Graf method)
Femoral Neck -Prox femoral neck -Stress + Pathologic (dec BD)	-Females > males -Runners, military, dancers	Repetitive WB -stress in young adults	-Tenderness -Limp	-Capsular pattern: pain with flex & IR -Compressive: stable -Tensile: unstable (blood supply concern)	-AP -Lateral -Frog Leg	
SCFE -Type I -Stress (more common) + Traumatic	-Male (2-3x ^) -Left leg 2x ^ males -No leg dominance in females	-Recent growth, obesity -Trauma (Abd w/ rotation)	-Knee pain, intermittent hip pain, groin pain -Limp, ^ pain in WB	-Keep leg in ER -Loss of ROM in flex & IR	-AP Pelvis -Frog Leg -Lateral	

Fx	Pt Demographics	Risk Factors	Sx Investigation	Physical Exam	Radiographs	Advanced Imaging
Tibial avulsion (Segond Fx by LCL)		Transverse plane deceleration injury	Varus + rotation	-Swelling, Pain w/ WB -Unable to ext knee		
Tibial Stress -Proximal 1/3 of tibia -Junction of middle & distal ⅓	-Adolescents -Runners (shin pain)	Athletes, military		. Posteromedial- compression (good prognosis) . Anterolateral- tension, prolonged non union		
Tarsal Coalition -Abn CT connecting 2+ normally separated tarsals - developmental	-Male (4x ^) -50% bilat. -Congential but dx in adolescents	Congential → family hx? more research needed	-Foot/ ankle pain, stiffness -Tarsal tunnel syndrome -peroneal tendon spasms -tired legs	-pes planus -antalgic gait	45%- calcaneonavicular fusion 45%- talocalcaneal fusion	CT, MRI
<u>Tarsals</u> **1. Navicular** -Stress	-Track & field athletes	-Jumping & sprinting events -repetitive mvt	-Insidious mid foot pain post activity -Mid dorsal midfoot swelling	-Pain w/ active INV & passive EV -Tender N spot (prox dorsal part of navicular) -Tender midmedial arch	-AP -Lateral -Oblique	
2. Talus OCD -Traumatic 1. Posteromedial: most common, deep cup shaped lesion, less Sx, better healing	2. Anterolateral: less common, shallow wafer shaped lesions, more Sx, more frequently displaced	-Possible vascular component -High prevalence w/ chronic ankle instability	-No pain w/ WB -Mechanical Sx -Pain & swelling after sprain	-Moderate effusion, + drawer, + clunk with PF & INV	-AP -Lateral -Mortise	
3. Lateral Process Talus	-15% of snowboard related ankle injuries	MOI: axial load w/ DF & EV		-Swelling lateral ankle -Decreased mobility -Tender w/ palpation over fibula & CF lig	-AP -Lateral -Mortise	Possible CT
Bony Tumors -Pathologic	**Primary** -Long bones of extremities **Secondary** - Metastatic: most common -Axial skeleton: proximal 1/3 of humerus & femur	Young age (teens, 20s) -Age >50 + Personal Hx of CA &/or fam Hx -Sources: breast, prostate, lung, renal, thyroid (not non-melanoma)	-Mechanical pain pattern -Fever, wt loss, malaise (metastatic), night pain -No improvement w/ 4-6 wks of conservative therapy	-Localized pain (dull, diffuse ache), insidious onset, progressive over time, palpable tenderness, edema, palpable mass -AGG w/ WB; ALLEV w/ rest (mechanical)	**Benign** -Smooth borders, doesn't involve cortical shell **Malignant** - Cloudy, undefined borders, involves cortical shell	-MRI -Bone Scan -ESR

COMPLETE BLOOD COUNT (CBC)			
Hemoglobin (Hb) (g/dL)	**Adults:** **Males:** 14-18 **Females:** 12-16 **Pregnant Women:** >11 **Children:** **Newborn-** 14-24 **0-2 wk:** 12-20 **2-6 mo:** 10-17 **6mo-6yr:** 9.5-14 **6-18 yr:** 10-15.5 **CV: <5.0 or >20**	**Therapy Guidelines**: >10 -Resistive exercise permitted 8-10 - Resistive exercise as tolerated (possibly contraind.) <8 -Exercise tolerance poor, light exercise as tolerated <7 - Pt. may need transfusion (exercise contraind.)	**S/S of Low Levels**: Pale, weak, diaphoretic, delayed verbal response, vacant stare, dizziness, lightheadedness, syncope, seizure, Sx of CVA/angina/MI, low urine output, fluid retention, increased HR or RR
Hematocrit (Hct) (%)	**Adults**: **Males**: 42-52 **Females**: 37-47 **Pregnant Women**: >33 **Children:** **Newborn**: 44-64 **2-8 wk**: 39-59 **2-6mo**: 35-50 **6mo-1yr**: 29-43 **1-6 yr**: 30-40 **6-18 yr**: 32-44	**Therapy Guidelines**: <25% -No exercise >25% -Light exercise permitted 30-32% -Add resistive exercise as tolerated	**S/S of Low Levels**: Pale, weak, diaphoretic, delayed verbal response, vacant stare, dizziness, lightheadedness, syncope, seizure, Sx of CVA/angina/MI, low urine output, fluid retention, increased HR or RR
White Blood Cell Count ($1000/mm^3$)	**Adult/ child >2 yrs**: 5-10 K **Children** **Newborn**: 90-30 **< 2 yrs**: 62-17	**Therapy Guidelines**: <5 with fever- No exercise >5- Resistive exercise as tolerated <2.5 - Light exercise as tolerated <1- possible isolation for neutropenic precautions	**S/S of High or Low Levels**: High: may be fighting illness Low: susceptible to infection **ROS**: fatigue, fever, nausea, malaise, pallor, etc.
Platelets ($1000/mm^3$)	**Adult/child/elderly**: 150-400 **Infant**: 200-475 **Newborn**:150- 300 **Premature infants**: 100-300	**Therapy Guidelines**: 150-450= No restrictions 50-150= PRE, swimming, low bench stepping, bicycling 30-50= AROM, moderate exercise, stationary bike, walking as tolerated, aquatic therapy 20-30= light exercise, AROM only, waling as tolerated, aquatic therapy with MD approval	**S/S of Low Levels**: Signs of bruising or internal bleeding- weakness, pallor, fatigue
INR	**Normal:** 0.9 – 1.1 **>5 risk of spontaneous bleed** **<0.9 at risk for DVT** **Desired range for…** **- Acute post-thrombotic CVA DVT = 2-3** **- Mechanical heart valve = 2.5-3.5**	**Therapy Guidelines:** Pts not on anticoagulants: >2 check with MD, watch for bleeding >3 at risk for hemorrhage, exercise with caution Pts receiving oral anticoagulants: 2-3 therapeutic range	**S/S of Low Levels:** Signs of bleeding: pallor, fatigue, bruising, hematochezia, melena

SKIN CANCER

DESCRIPTION:

- American Cancer Society estimates skin cancers are the most prevalent cancers.
- Estimates for 2017: 1- 2 million new cases of basal and squamous cell carcinoma. Also estimate of 75-80,000 new cases of melanomas.
- Melanoma is the most common cancer in women between ages of 25-29 and second only to breast cancer in women aged 30-34.
- Most common type of melanoma (75% of cutaneous melanomas) often arise in preexisting moles. Called superficial spreading melanoma.
- Etiology: most common cause – prolonged sun exposure.

RISK FACTORS:

NON-MELANOMAS (Basal Cell; Squamous Cell):

- Older age
- Fair complexion
- Males
- Inability to tan
- Prolonged redness after exposure to the sun
- White race
- Residence near the equator
- Prolonged sun exposure, family history, immunosuppression.
  Presence of pre-malignant conditions including chronic skin irritation, Radiation therapy,

  Exposure to local carcinogens such as tar and oil.

  Previous basal cell carcinoma carries almost 50% risk of a recurrence of non-melanoma

MELANOMAS

- 15 yrs of age and older
- Fair complexion (blond/red hair, fair skin, blue eyes)
- White race
- Sun sensitivity
- Excessive sun exposure
- + Family history,
- Presence of many moles
- Presence of atypical moles
- Previous history of melanoma.
- Medical history: chronic osteomyelitis, burn scars, chronic skin ulcers,
- Residence near the equator
- Previous Hx of basal cell carcinoma carries 3 Xs risk of developing melanoma

CLINICAL MANIFESTATIONS:

- More than 80% of squamous cell carcinomas occur in the head and neck region.
- More than 65% of basal cell carcinomas occur in head and neck region.
- Symptoms of metastasis include; malaise, weakness, fatigue, anorexia, pain.

DIAGNOSIS:

- Contingent upon biopsy and histologic study

TREATMENT:

- Melanomas: surgical resection and possible regional lymphadenectomy, chemotherapy, radiation therapy
- Prognosis for melanoma: 5 year survival rate if depth of lesion is less than .76 mm.

IMPLICATIONS FOR THE PHYSICAL THERAPIST:

- Melanomas can recur more than 5 years after primary surgery.
- Differentiate characteristics of benign versus malignant lesions (lab).
- ABCDs and detection of skin cancer: 100% sensitivity and 98.4% specificity.

Reference:

Wills M. Skin Cancer Screening. Phys Ther. 2002;82(12):1232-1237.
Skin Cancer Foundation: www.skincancer.org
Siegel R et al. Cancer Statistics, 2017. CA Cancer J Clin.
Mcgovern TW, Litaker MS. Clinical predictors of malignant pigmented lesions: a comparison of the Glasgow 7-point checklist and the American Skin Cancer Society's ABCDs of pigmented lesions. J Dermatol Surg Oncol.1992:18:22-26.

Skin Cancer

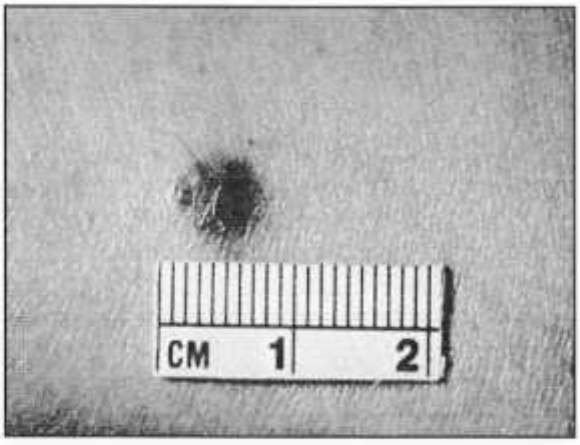
- **Melanoma Screening-Relative Risk**
  - **Family Hx**-1st degree relative: 8-12 increased risk
  - Large number of moles
    - 5.2 increased risk for women (≥ 12)
    - 4.6 increased risk for men (≥ 17)
    - Fears et al. J Clin Oncol. 2006;24:3590-6
  - Personal Hx of non-melanoma malignancy

Skin Cancer

- **Melanoma Screening-ABCDE**
  - **A**symmetry
  - **B**orders (irregular and/or indistinct)
  - **C**olour (multiple shades, black/blueish hue)
  - **D**iameter (> 6mm)
  - **E**levation/Evolving
  - Sensitivity approaches 100%

Skin Cancer

- **Additional Screening-Melanoma and Non-melanoma**
  - Ulceration
  - Friability
  - Mobility
  - Consistency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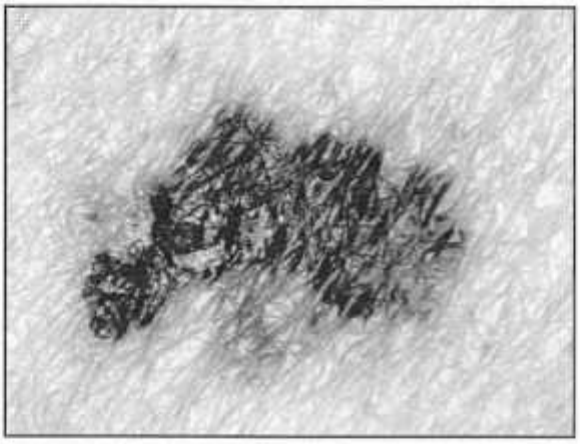

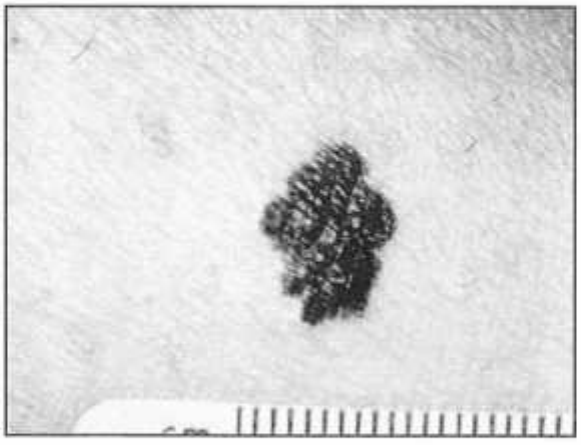

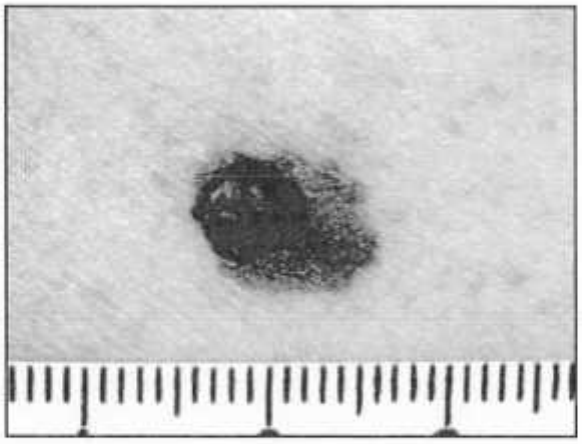

Cancer

- **Skin Cancer-African Americans**
  - Estimate 175,000-180,000 new cancer cases
  - Skin Cancer??
  - Melanoma rate: 1/10th of white race, prognosis?
  - Unique presentation?
  - DeSantis C, et al. Cancer Statistics for African Americans, 2013. CA Cancer J CLIN. 2013;63:151-166.

Are you trained to recognize the bone tumor in this lower back?

Neither is a physical therapist.

We're the New York State Society of Orthopaedic Surgeons. We have a point of view on Senate Bill S.3169 and Assembly Bill A.5622 — the Physical Therapists' Access Bills. If passed, these bills would allow physical therapists to see patients directly, without a referral from a medical doctor.

We're against these bills.

One argument dominates our thinking, defines our position, and trumps the opposing view.

Patient Safety.

When a patient goes to a physical therapist, the goal is to receive treatment, not a diagnosis.

When a patient sees a medical doctor, the goal is to get a diagnosis, followed by a decision about the best treatment — drawing from the full spectrum of medical knowledge. This treatment could include physical therapy.

Physical therapists aren't trained to make a medical diagnosis or recognize many potentially life-threatening conditions beyond their limited expertise. MDs are.

MDs and physical therapists are part of the world's best health care system. MDs study for at least eight years to fully understand health problems, their causes, and their symptoms.

Doctors will continue to prescribe physical therapy to patients who can benefit from this kind of treatment. But a patient with a health problem needs to be seen by a doctor first, *before* any treatment, including physical therapy, is prescribed.

Back pain — or any kind of pain — can mean many things. When it's your pain, you want to know what's causing it and how you can fix it. As soon, as safely, and as effectively as possible.

The New York State Society of Orthopaedic Surgeons recommends voting against S.3169 and A.5622, and continuing with the more medically responsible physician referral system currently in place. It's our position that S.3169 and A.5622 threaten the quality and integrity of our health care system, and the patient safety measures that guide it.

If you agree with us, call Senate Majority Leader Bruno at 518-455-3191, and Assembly Speaker Silver at 518-455-3791. Ask them to protect New York patients by opposing S.3169 and A.5622.

New York State Society *of* Orthopaedic Surgeons

1. *A 65-year-old man with a history of COPD and significant cigarette smoking ·complains of bilateral buttocks cramping associated with stair climbing beginning about 6 months ago. Over the past 2 months, the cramping has become associated with walking as well. When he stops walking and stands still, the cramping decreases and then disappears. No reflex or sensory changes are detected, and the pain is not affected by trunk flexion or extension.*

2. *A 35-year-old woman who is healthy and an occasional jogger complains of pain in the anterolateral aspect of the forefoot starting about 3 days ago. The pain started when she was running and is exacerbated by any weight bearing. There is moderate tenderness to palpation; no swelling or redness is noted. Foot and ankle ROM are grossly WNL.*

3. *A 40-year-old woman who is healthy, but inactive, complains of sudden onset of low back pain after slipping off a curb and nearly falling. The pain increases with movement and is relieved with lying down. There is no motor or sensory loss. The patient reports some moderate muscular tenderness to palpation in the thoracic area on the right side.*

4. *A .39-year-old woman complains of 6-9 months of intermittent dull aching in the posterior cervical, occipital, and interscapular areas. There is local muscular tenderness and pain with movement. ROM of the neck is slightly decreased. There is no dizziness, radiation of pain to the upper limbs, or motor or sensory loss.*

5. *A 60-year-old man who apparently is healthy, but inactive, complains of sudden onset of pain in the right knee with no known precipitating incident. The joint is very tender, warm, and red. ROM is painful and decreased. No other previous or current joint complaints are reported.*

6. *A 65-year-old man, former football player and current tennis player, complains of bilateral knee pain, worsening over the last 6 months. The pain is affecting his leisure activities as it increases with activity and movement. He reports a feeling of grinding in his knee. No swelling is noted, and the ROM is WNL.*

7. *An 80-year-old, active but frail woman fell on a rug in her apartment and landed on her outstretched hands. She complains of tenderness over the lateral aspect of the right wrist and distal forearm, and a bony deformity is palpable. Her wrist is swollen and painful, with decreased ROM*

8. *A 17-year-old girl complains of knee pain following an injury that occurred when she was running in from the outfield during a softball game and stepped in a hole. She was unable to compete in the remainder of the game. The medial aspect of the knee is generally tender to palpation and slightly swollen. Pain is increased at the ends of the ROM and with valgus stress. No complaints of knee locking.*

9. *A 70-year-old man complains of a dull aching, constant thoracolumbar pain that has been increasing over the past 2 days. The pain is aggravated by general activity, but no particular posture or movement of the trunk increases or decreases the pain more than another. Pain is not radiating, and no sensory or motor changes are noted.*

10. *A 53-year-old woman with a fairly sedentary lifestyle complains of a sudden onset of deep, dull, aching pain in the center of the chest, aggravated by movement of the left arm. She cannot identify a precipitating incident or injury. The pain is not radiating, and there is extreme tenderness to palpation lateral to the sternum. Coughing and sneezing increase the pain.*

11. *A 55-year-old woman complains of constant, intense aching back pain subcostally on the right side over the past 2-3 days. The pain radiates along the iliac crest on the right side. She cannot identify a precipitating incident or injury. The pain is not affected by positional changes or the use of a heating pad.*

12. *A 45-year-old man complains of mild-to-moderate, deep thoracic back pain that is preventing his sleeping at night. The pain is intermittent but has increased over the past 2 weeks and is not relieved by positional changes. It seems to be worse at night than during the day. The patient complains of fatigue that he attributes to not sleeping well.*

Medical Screening: Bottom Lines

Over---Riding Principles:

- Makes no difference how patients access our services
- The patient starts their story – "What's the worst *thing* this can be"? Then rule *it* out as quickly as you can.
- There's overlap between PTs and MDs/DOs regarding how we would screen a patient. (Chou article)
- For most of the disorders covered---NO ONE can diagnose the condition simply based on patient history and physical exam.
- Important to know diagnostic gold standard tests

Take Home Messages:

1. Disease has its own timetable/schedule
2. There's a lot of overlap between how disease would "present" to us and conditions that we can manage and manage well.
3. Referral rarely hinges on one red flag examination finding (Henschke article)
4. A mechanical pain pattern does not rule out disease
    a. Helps to differentiate visceral/systemic origins of pain, but…
    b. Early stages of MSK disease/conditions can present in a mechanical pain pattern (e.g. skeletal cancer, stress fractures)
5. Chief Complaint patient information often DOES NOT provide enough information to decide if referral is necessary.
    a. Patient demographics
    b. Health History
    c. Review of systems
    d. Physical examination
    e. Response to Treatment!!
6. Not all visceral pain is constant---intermittent is more the norm
7. Mechanical pain pattern, but atypical pattern of AGGR/ALLEV factors
8. Cannot make the patient do anything------ go to ED, urgent care or call physician's office to make an appointment
    a. Concern them enough they see this recommendation is in their best interest, but don't overly alarm if don't need to
9. Patient cannot be the sole messenger regarding red flag concerns.

Boissonnault