The Female Athlete w/ Dr. Mulcahey: Notes

Why is this important?

- Passage of Title IX in 1972- required institutions receiving federal money to offer equal opportunities to both males and females in all programs including athletes
- This led to inc # of women in sports, dedicated women sports clothing and sportswear, and also lead to inc injury

General Considerations w/ Conditioning

- Emphasize:
    - Core strengthening: Females have more anterior pelvic tilt which is assoc w/ PF pain syndrome
        - Medial quad exercises- strengthen VMO- improve patellar tracking
    - Scapular stabilizer strengthening- to minimize laxity issues of shoulder joint
    - Minimize loading PF joint in full knee flexion (ex: leg presses)
    - Perform UE strengthening at shoulder height and below- minimize RTC stress

Nutrition

- Vitamin D- Esp important in northern athletes who play indoor sports
    - Athletes age 19-49 may benefit from 200IU of vitamin D
    - Athletes w/ female athlete triad or OP risk factors- 400-800IU daily
    - Deficiency assoc w/ URI risk
- Calcium
    - Age 9-18 suggested 1300 mg/day
    - Age 19-50 suggested 1000 mg/day
    - Yogurt, mozzarella, sardines, yogurt, cheddar cheese
- Iron
    - Vegetarian athletes are high risk + females at higher risk due to menses
    - Lean red meats, seafood (oysters, tuna, salmon)
    - Recommendation are 15mg/day girls- 14-18 and 18 mg/day women age 19-50
    - Fortified grains

Female athlete triad

- Most common in ‘lean look’ sports- running, gymnasts, figure skating, ballet

- Low energy availability (BMI <17.5- low energy prob present)
- Menstrual dysfunction
    - primary amenorrhea
    - Secondary amenorrhea- previous menstrating then no menstruation for 3 consecutive cycles
    - Oligomenorrhea- cycle length >35 days or <9cycles per year)
- Low BMD
    - Dexa scan indications: hx of eating disroder, low BMI, menarche >16 y/o, hx stress fractures, hx of low Z scores, decreasing menses
- Sypmtoms: disordered eating, hair loss, dry skin, fatigue, weight loss, increased healing time for injuries, inc incidence of stress fractures, absent menses
    - Screening Q's
        -

> Have you ever had a menstrual period?
>
> How old were you when you had your first menstrual period?
>
> When was your most recent menstrual period?
>
> How many periods have you had in the past 12 months?
>
> Are you presently taking any female hormones (estrogen, progesterone, birth control pills)?
>
> Do you worry about your weight?

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Psychological Issues in the female athlete

- Female athletes may be at greater risk for concussions than male athletes
- Female soccer players have most concissions + more severe
- Athletes may take 6 days longer to begin RTP protocol compared to age matched male controls
- Various theories

Orthopaedic injuries in female athlete

- Patellofemoral pain syndrome
    - 2 - 10x higher than male counterparts
    - Diffuse pain in anterior aspect of knee- inc by squatting, kneeling, running, and ascending/descending stairs.
    - Patellar instability- note Q angle, VMO atrophy, abductor strength,
    - Tx:
        - PT: quads, hamstrings, IT band stretching, patellar mobilization. Strengthening program involving hip abductors and ER's

        - McConnel patellar taping, kinesio taping, or patellar bracing to centralize patella nay be useful in sports participation
- ACL injuries
    - Injury rate of 1-3 per 10,000 athletic exposures in females- 2-6x rate in males
    - Risk factors:
        - Anatomic, hormonal, environmental, neuromuscular
        - Anatomic
            - Quadriceps angle, knee valgus, inc foot pronation
            - Higher BMI
            - Smaller femoral notch
        - Hormonal
            - No evidence to recommend activity modification or restriction w/ respect to phase of menstrual cycle
        - Enviromental
            - Harder ground- may increase shoe traction interface- which may inc risk of injury
        - Biomechanical/Neuromuscular
            - Awkward landing, inability to recover from perturbed gait + difficulty changing directions- assoc w/ inc risk ACL injury
                - Women exhibit inc knee valgus, inc IR of hip, and inc ER of tibia when landing from jump/changing directions
        - Neuromuscular
            - Reduced in fatigued states w. Less time to prepare for a cutting or landing movement
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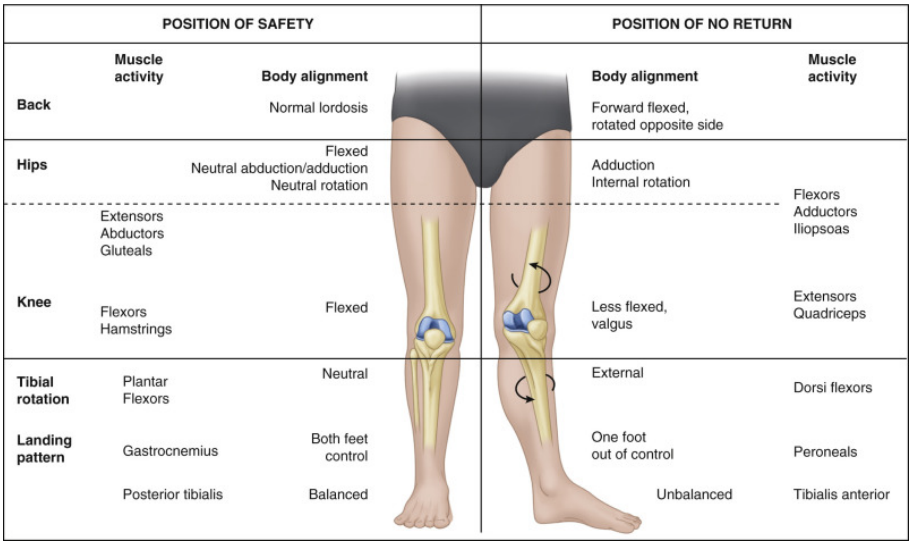
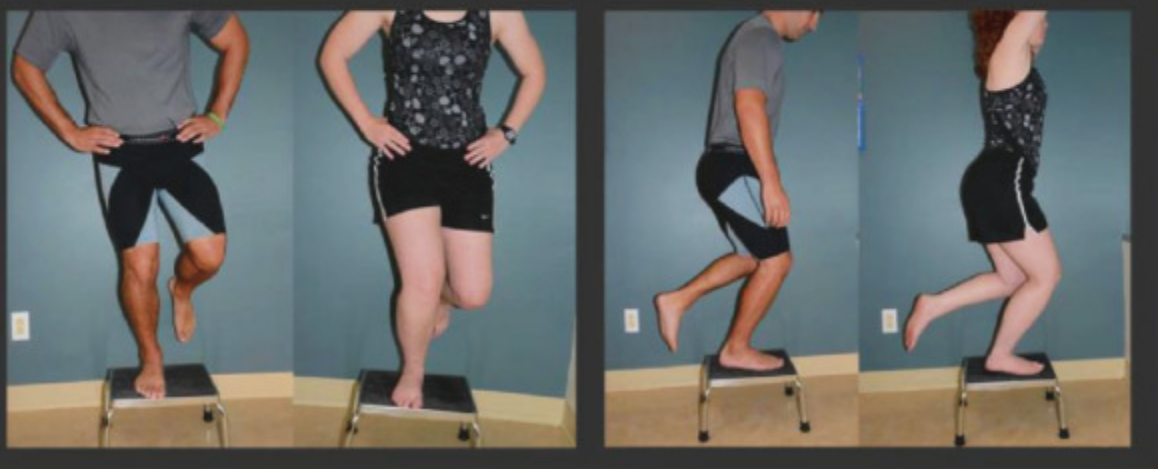


- ACL prevention
    - NM training. Core, hamstring, and quad strengthening exercises. Education of appropriate landing and cutting techniques
- ACL Recon
    - Women report improved knee function and less instability after reconstruction

- Doesnt prevent arthritis, but ACL recon provides stability and function and decreases further intra-articular injury

	Male	Female
Pelvis	Level	Contralateral Drop
Hip	No Rotation	Internal Rotation and Adduction
Knee	0° Varus/Valgus	Valgus
Tibia	Neutral	External Rotation
Foot	Flat	Pronation
Back	Flat	Lordotic
Pelvis	Neutral	Anterior Tilt



Shoulder instability
- Shoulder laxity- an increased normal physiologic motion of GH joint, but not pathologic
- Shoulder instability- abnormal or painful subluxation or dislocation of the GH joint.
- MDI- symptomatic laxity of the shoulder in 2+ directions, one which is inferior
    - MDI more common in the female athlete and has been described in overhead athletes such as baseball, tennis players, swimmers and gymnasts
    - On PE: anterior/posterior load shift should be performed. Sulcus tet.
    - Identify bony lesions on xrays. MRI
    - PT for NM control, periscapular stabilization w/ strengthening

Acetabular labral injuries and FAI
- Pincer impingment- excessive prominence of anterolateral acetabulum rim
    - This impinges on labrum of hip against neck of femur.
- CAM impingement- non spherical femoral head rotates within anterosuperior acetabulum- results in injury to articular cartilage w/ secondary failure of labrum.
- Insidious groin pain.
- Tx: avoid aggravating activity i.e. squats

Scoliosis

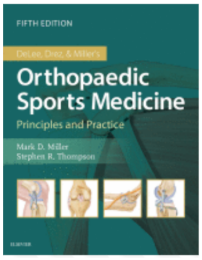
- Inc in adolescent females

Stress fx

- Inc in women
- Female triad
- Tx: find predisposing factors: training errors, lack of sleep, biomechanical considerations, vitamin D deficiency

Sources:

DeLee and Drez & Miller's Orthopaedic Sports Medicine



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