

MAINTAINING HEALTHY JOINTS THROUGH GROWTH SPURTS

For Athletes of All Programs

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Agenda

- Immature vs mature skeletons
- Salter fractures
- Apophysitis
- Spine fractures
- OCD lesions

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- Salter fractures (fractures through a growth plate)
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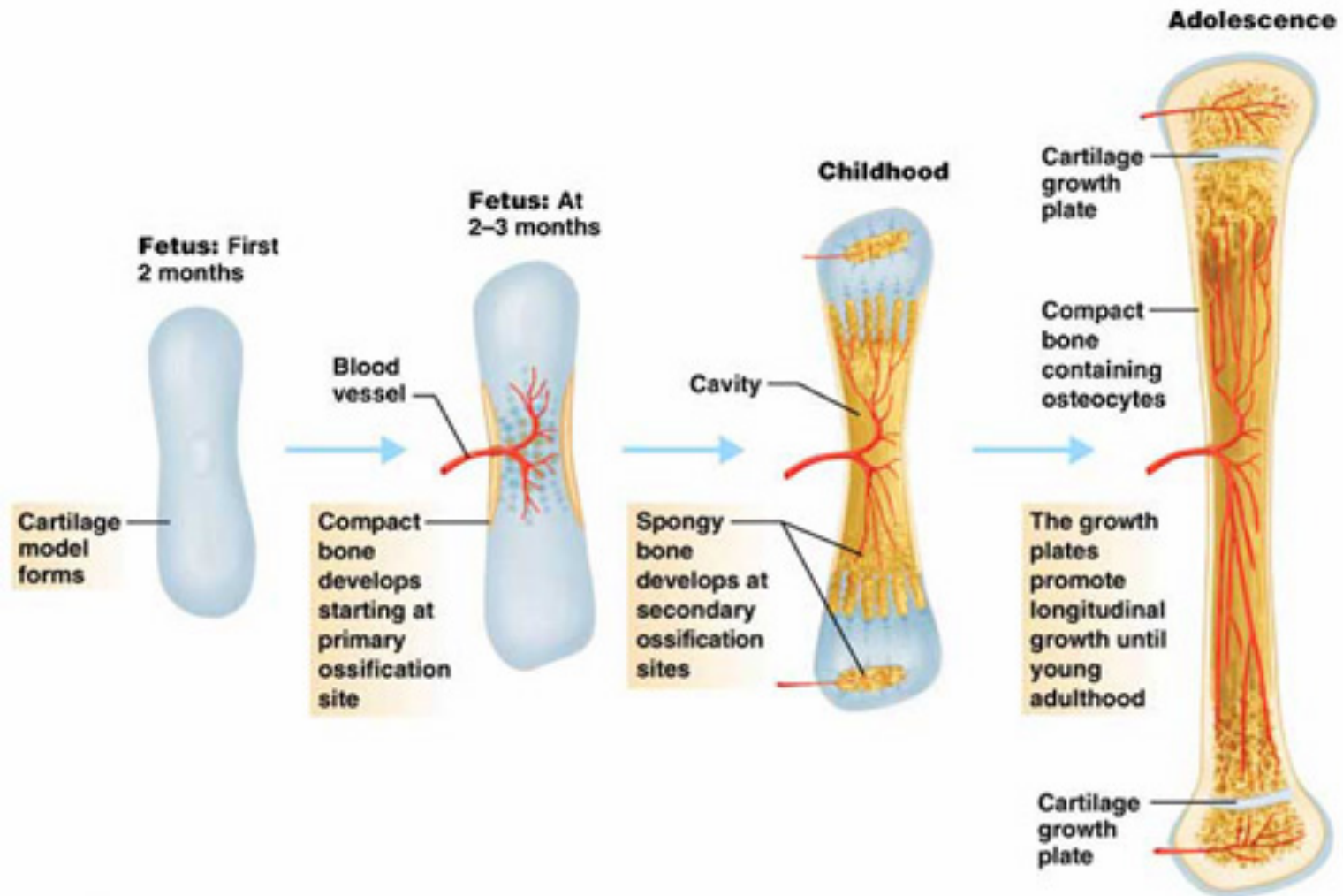
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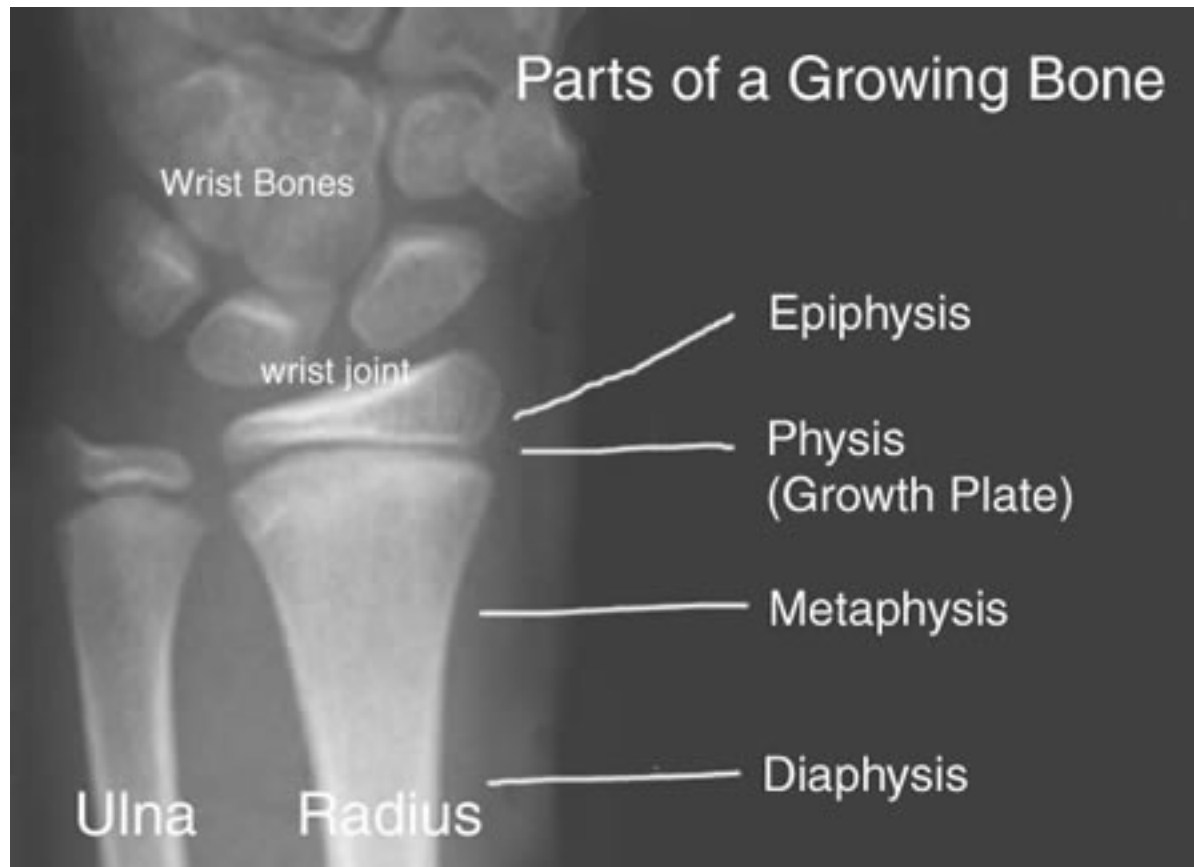
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- Salter fractures (fractures through a growth plate)
- Apophysitis (inflammation of a growing part of bone where soft tissue attaches)
- Spine fractures
- OCD lesions (injuries to cartilage)

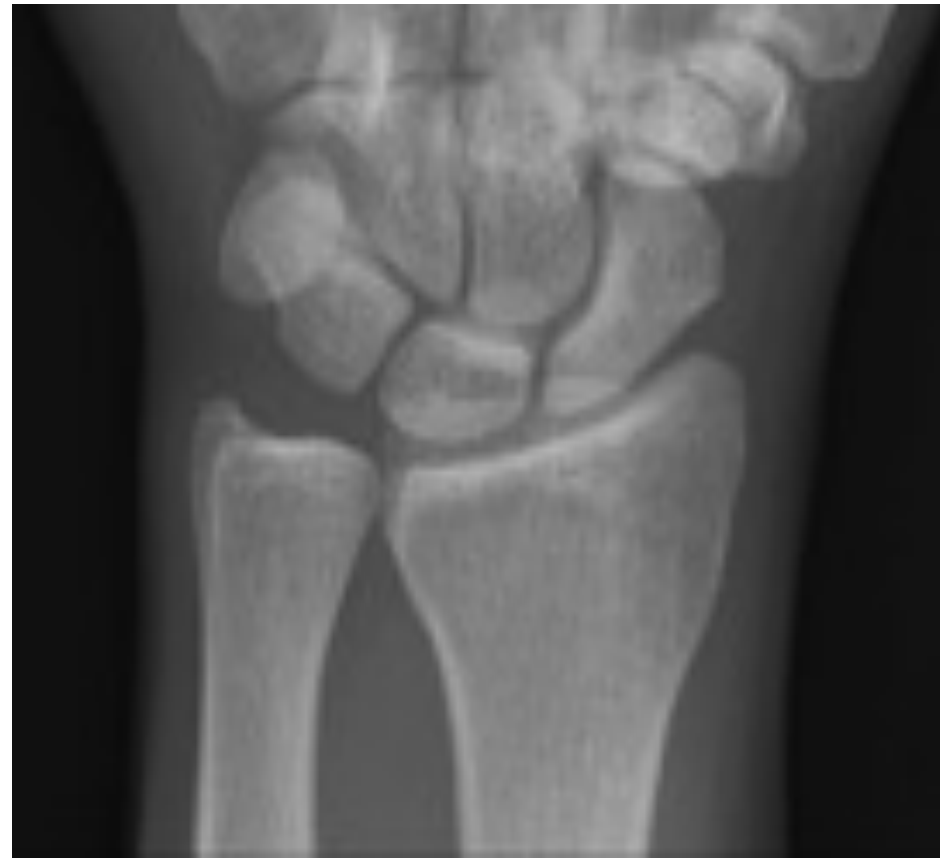
Immature Skeleton



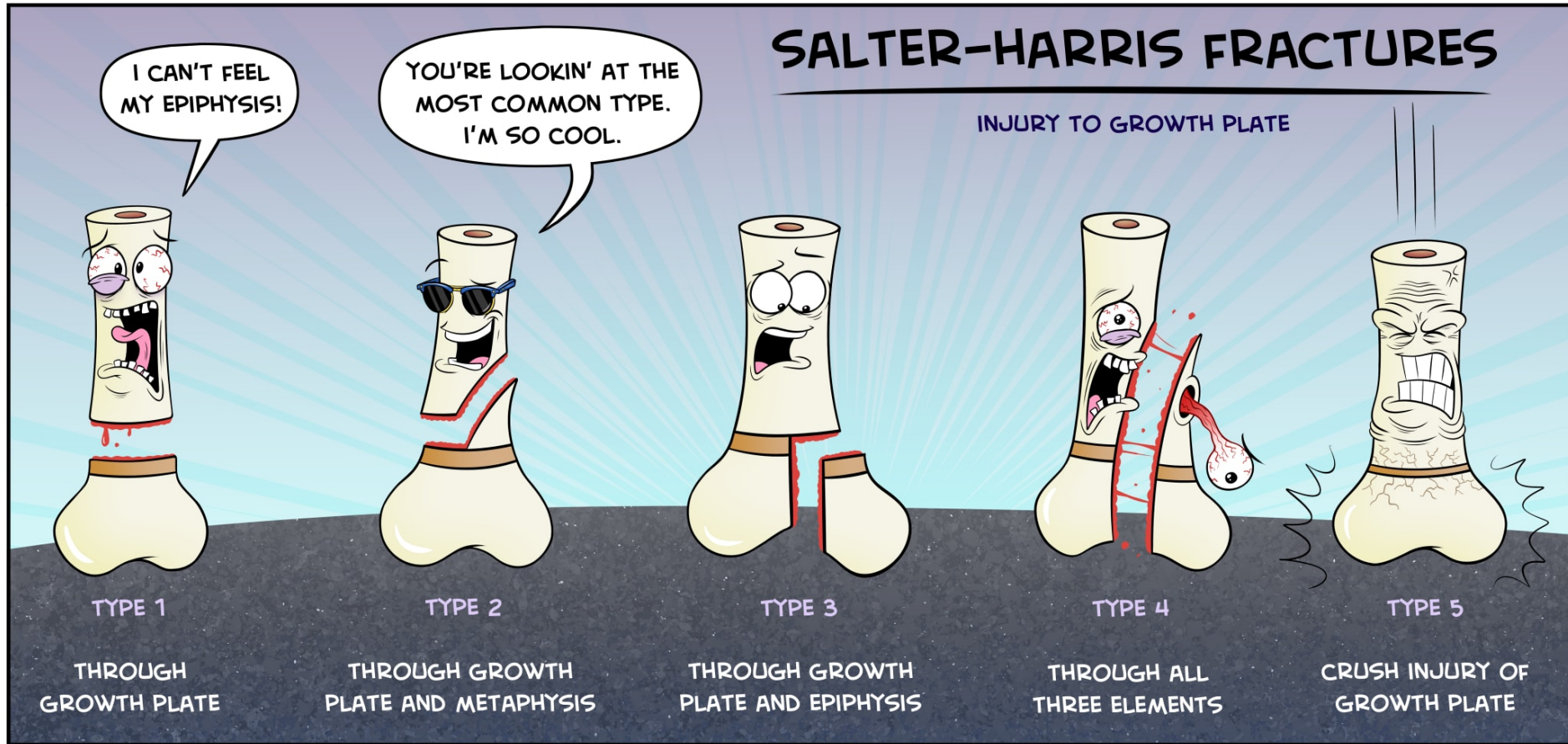
Immature Skeleton



Immature Skeleton



Salter Fractures



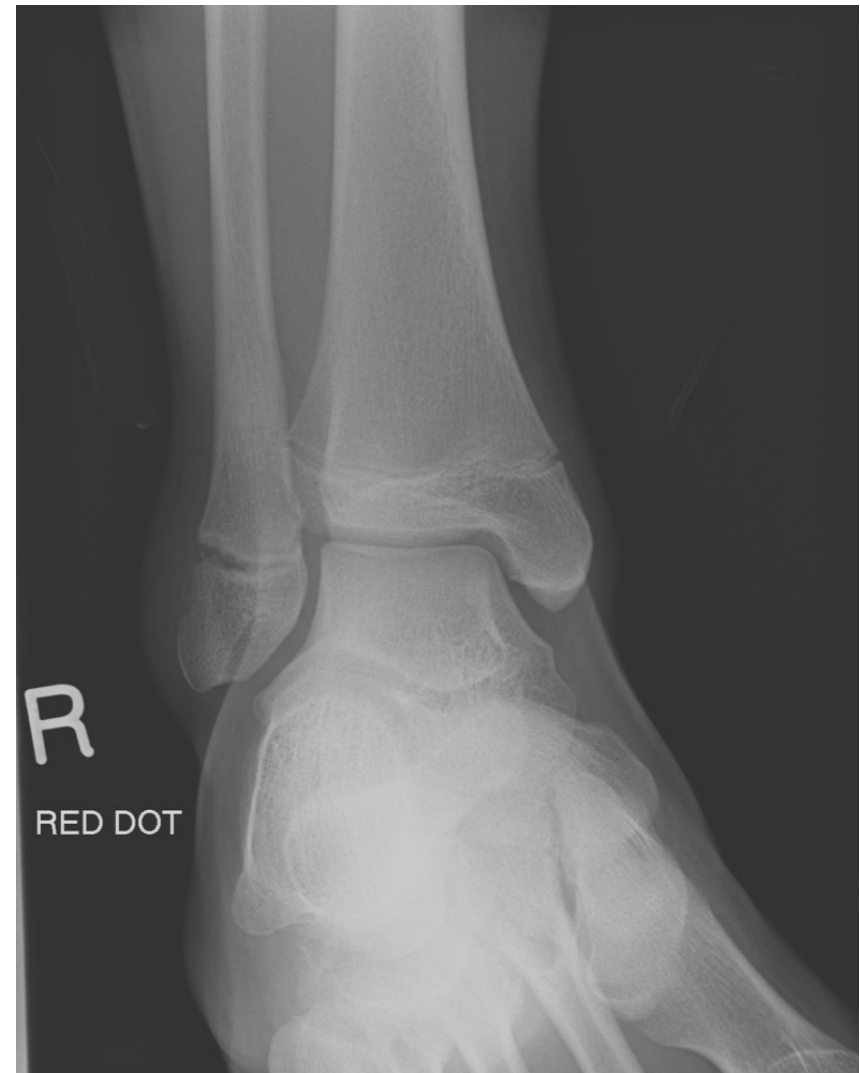
Salter Fractures

- Distal radius (thumb side of wrist)



Salter Fractures

- Distal fibula



Salter Fractures

Presentation

□ Wrist

- Chronic/overuse or “jam”
- Pain at “watch strap”

□ Ankle

- Acute/sudden injury
- More pain/less function than a sprain

Salter Fractures

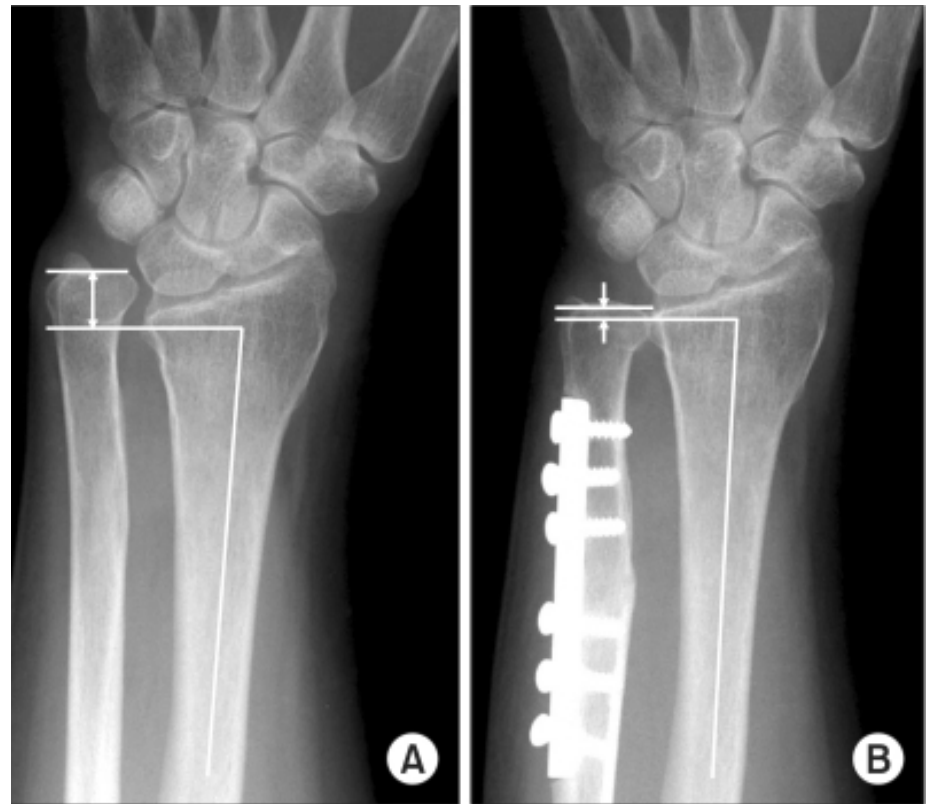
Treatment

- Immobilization
- Wean from immobilization to daily life
- Initiation of range of motion and strength exercise
- Gradual return to gymnastics while continuing advanced rehab

Salter Fractures

Complications

- Wrist
 - ▣ Growth arrest
 - ▣ Positive ulnar variance
 - ▣ Destruction of soft tissue pinkie side of wrist
- Ankle
 - ▣ Slow recovery
 - ▣ *Less instability



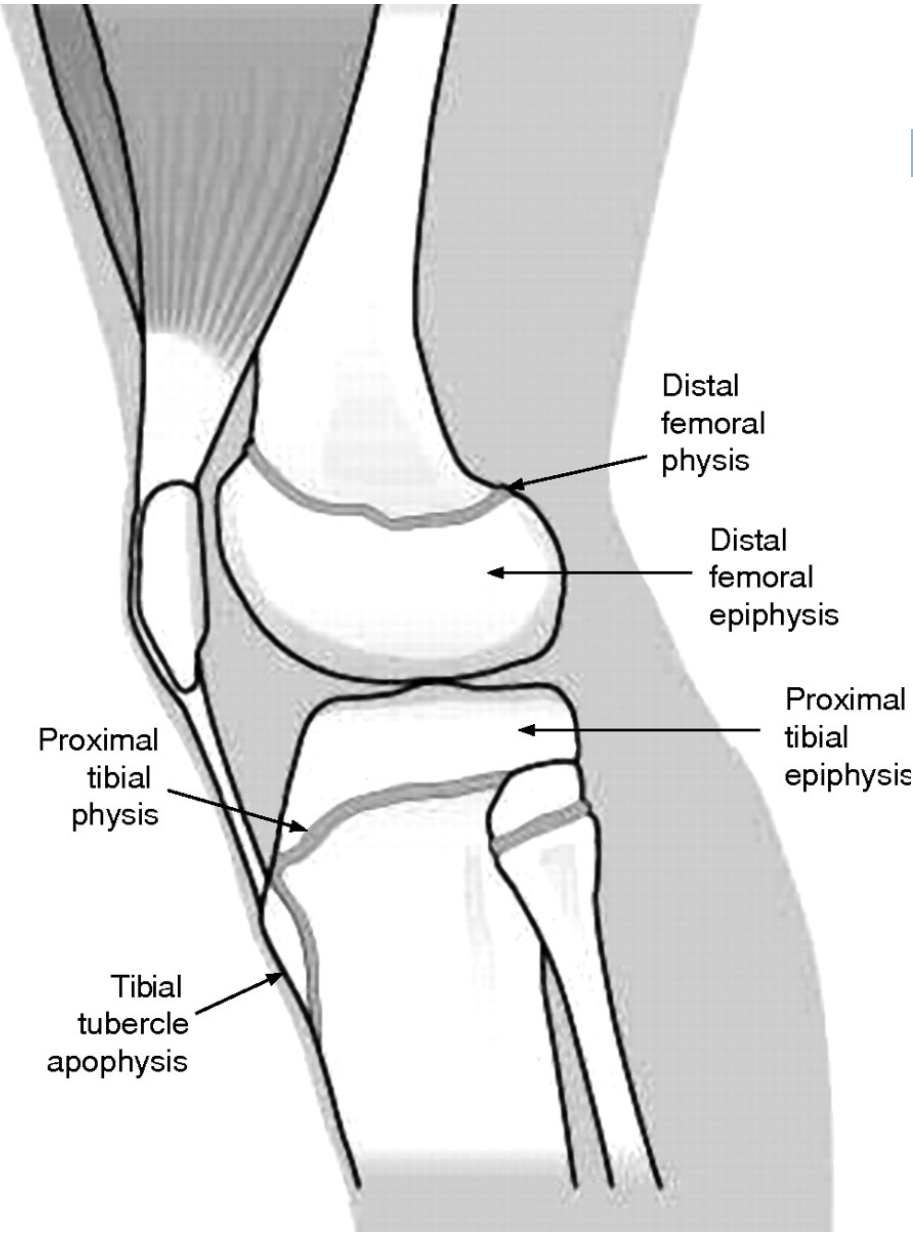
Salter Fractures

Prevention

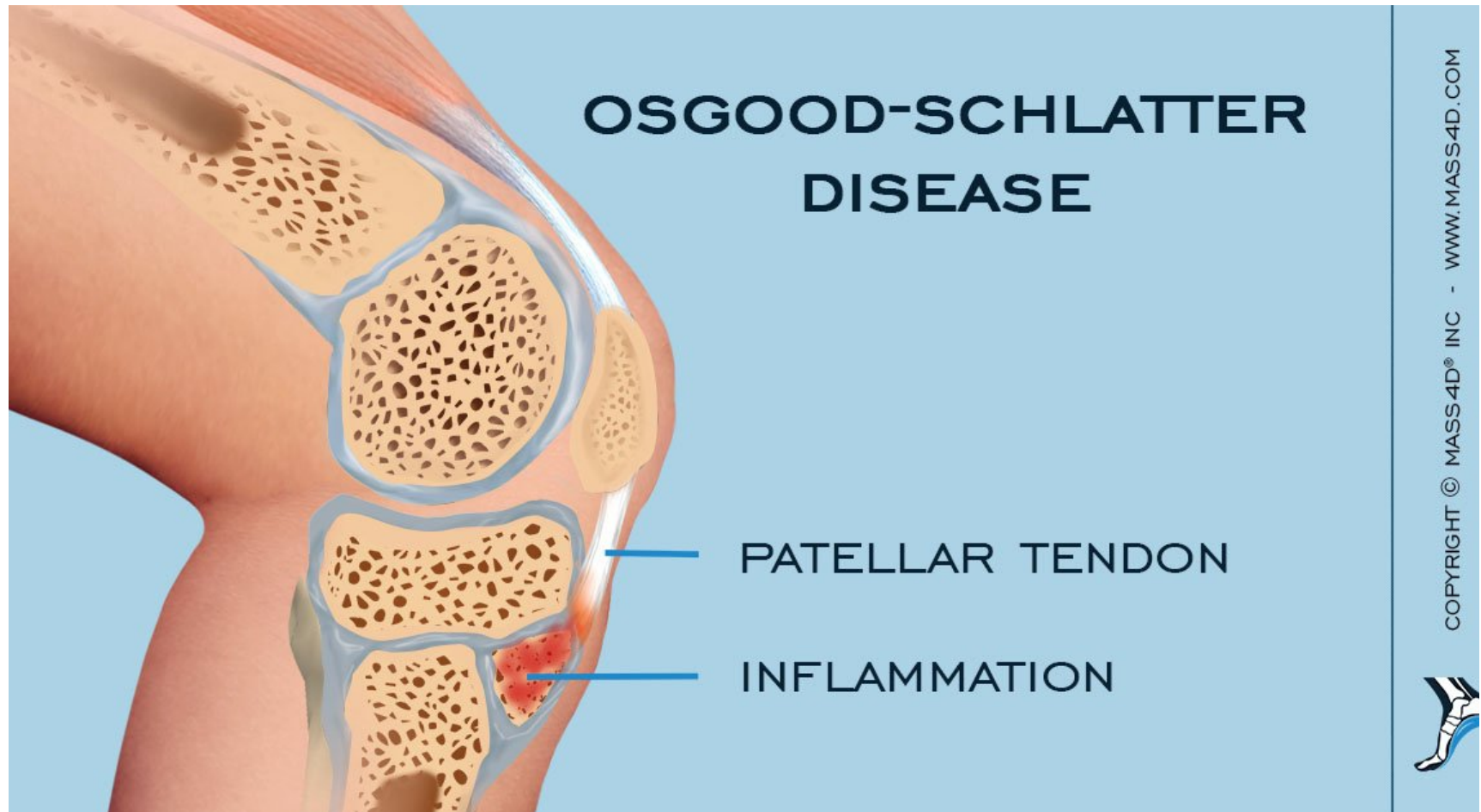
- Wrist
 - ▣ Shoulder/upper back flexibility
 - ▣ Strength in small muscles of hand
- Ankle
 - ▣ Stability and proprioception
 - ▣ Strength in small muscles of foot



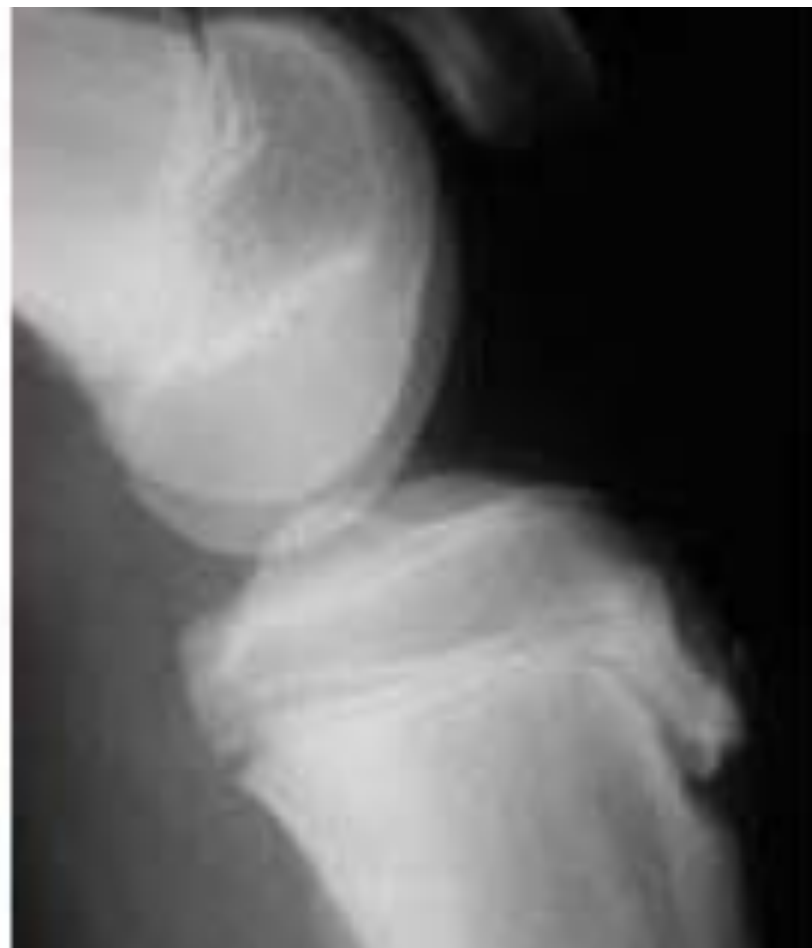
Apophysitis



Apophysitis



Apophysitis



Apophysitis

□ Locations

□ Hip

- Ilium
- Ischium

□ Knee

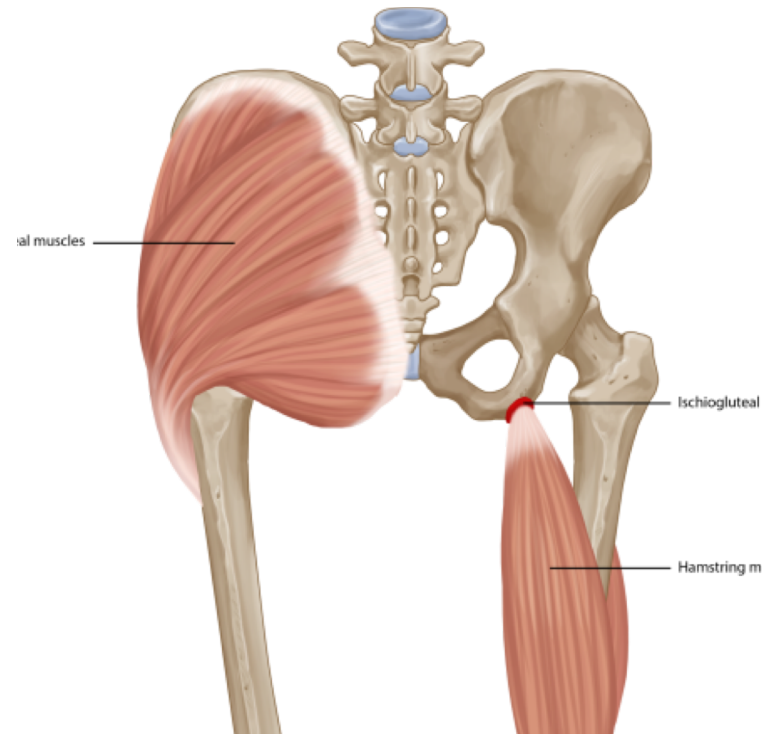
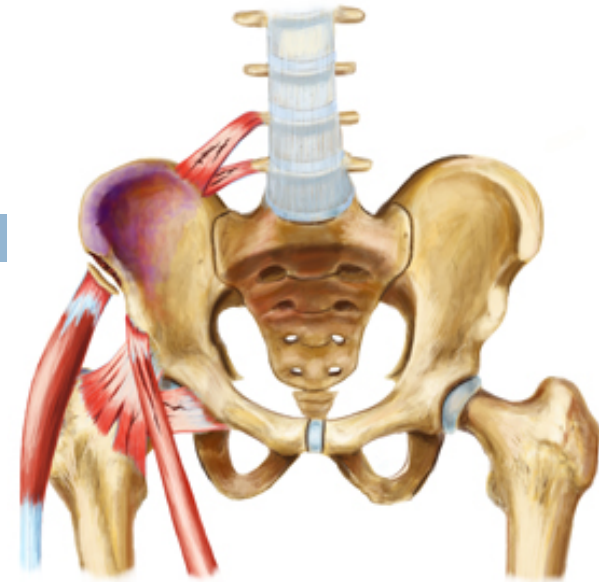
- Osgood Schlatter's
- Sinding-Larsen-Johansson's

□ Heel

- Sever's

□ Outside of foot

- Iselin's



Apophysitis

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Apophysitis

Presentation

- ▣ Wax and wane
- ▣ Painful when squeezing and when stretching the muscle
- ▣ Focal or pinpoint area of pain
- ▣ +/- Swelling

Apophysitis

- Treatment
 - Modify activity
 - Ice, ice, ice, and more ice
 - Massage and GENTLE stretch
 - Correct the poor mechanics
 - Counterforce straps or heel cups

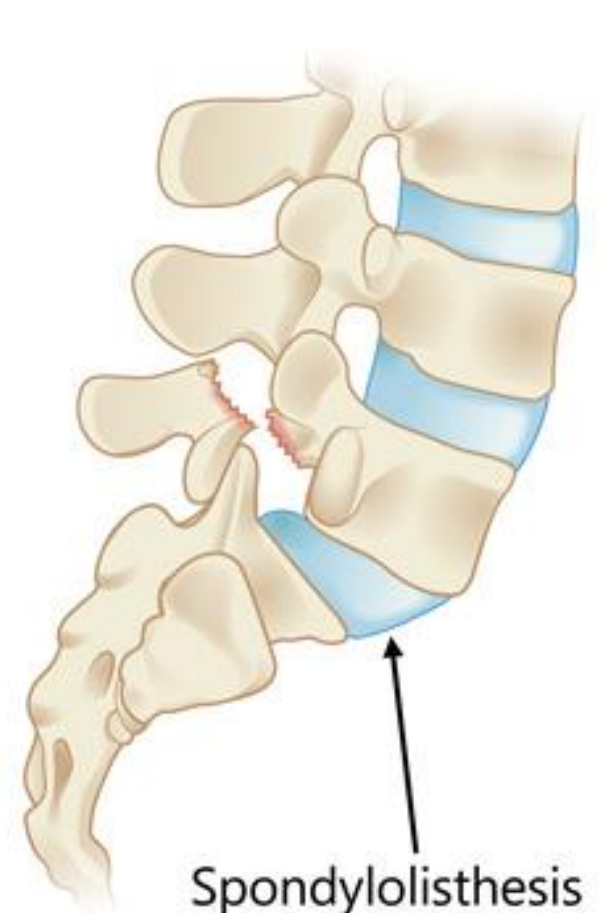
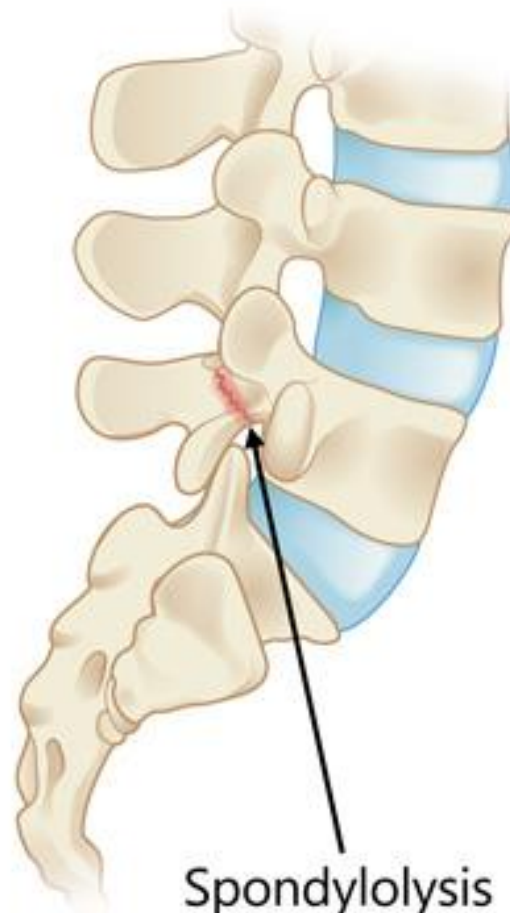
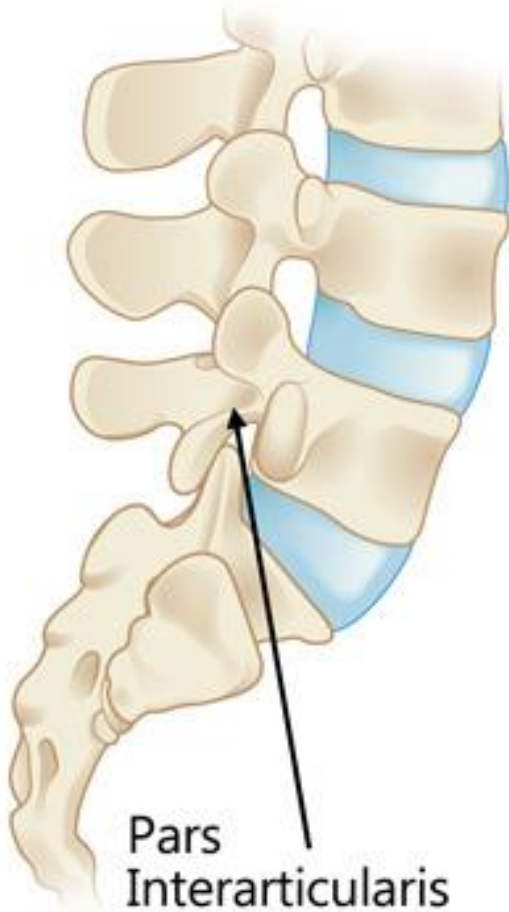


Apophysitis

- Prevention(?)
 - ▣ Early detection and action
 - ▣ Correction of technique
 - ▣ Adjustment of technique
 - ▣ Modifying flexibility strategies



Spine Fractures



Spine Fractures

- Presentation
 - Gradual onset low back pain
 - Midline
 - Worse with arching/extension
 - Painful outside of gymnastics

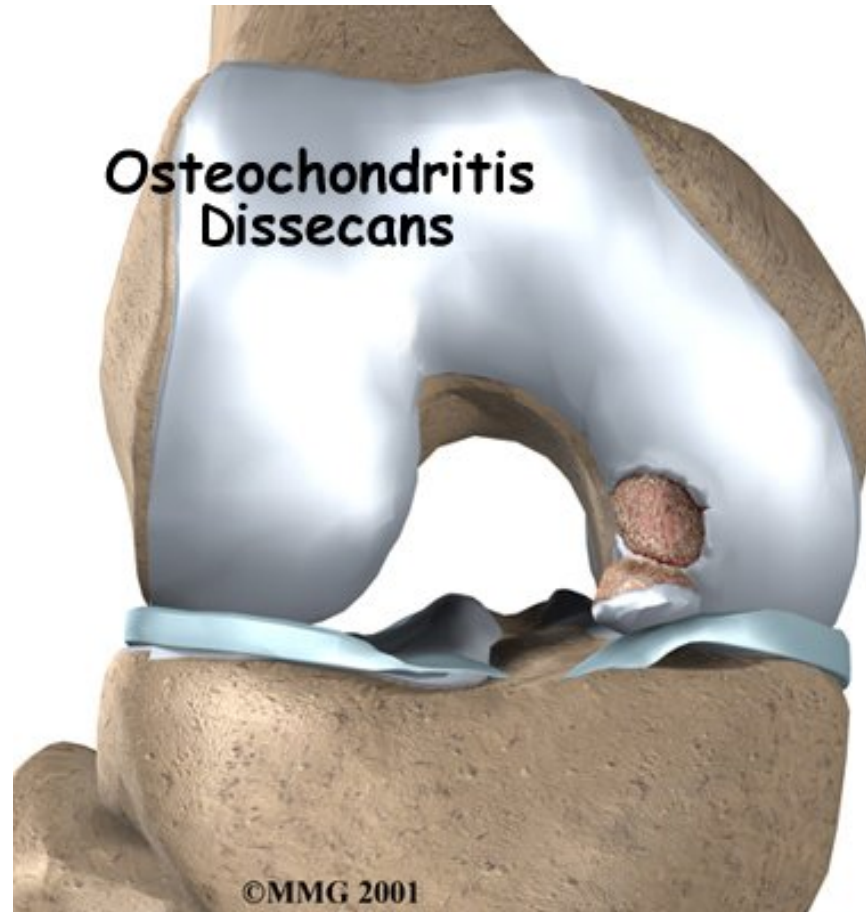
Spine Fractures

- Diagnosis
 - History
 - Physical exam
 - X-rays
 - MRI vs CT vs CT SPECT

Spine Fractures

- Treatment
 - “Immobilization”
 - Off-loading
 - Early initiation of rehab to stabilize spine, correct contributing deficiencies
 - Progression of rehab over minimum of 12 weeks
 - Follow-up imaging

OCD Lesions



OCD Lesions

- Capitellum (elbow)
- Femoral Condyle (knee)
- Talus (ankle)



OCD Lesions

Presentation

- ▣ Gradual onset of pain, then sudden worsening
- ▣ Pain with compression/loading of the joint
- ▣ Swelling
- ▣ Loose body sensation, ie locking

OCD Lesions

Diagnosis

- ▣ History
- ▣ Physical exam
- ▣ X-rays
- ▣ MRI and/or CT

OCD Lesions

Treatment

- ▣ Depending on grade or severity
- ▣ Immobilization
- ▣ Surgery
- ▣ Physical therapy to regain normal motion and stability
- ▣ Correction of mechanical factors that lead to the injury

OCD Lesions

Prevention

- ▣ Monitoring volume of impact and joint loading
- ▣ Correction of mechanical factors
 - Elbow – avoid hyperextension in support
 - Ankle – avoid/limit short landings
- ▣ Early detection = much better outcome and shorter recovery

Review

- Immature vs mature skeletons
- Salter Fractures
- Apophysitis
- Spine Fractures
- OCD Lesions

Review

- When to call the doctor?
 - Pain crosses the gym door threshold
 - Limping or otherwise obvious compensation
 - No improvement with ice and rest > 10 days
 - Location of pain
 - Watch strap
 - Pinpoint pain on a bone

Review

- Expectations for treatment
 - ▣ Diagnostic work-up
 - ▣ Bones need immobilization and off-loading in order to heal
 - ▣ Evaluation and correction of mechanical factors
 - ▣ Training modifications may be necessary throughout a growth period

Review

- Prevention
 - Monitor impact and loading volumes
 - Correct mechanical factors
 - Hyperextension of elbow
 - Poor shoulder/upper back flexibility
 - Overuse of hip flexors for core stability
 - “Butt under” technique for landings
 - Knees knocking on landings
 - Ankle stability and proprioception
 - Consider modification of flexibility training

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