Nordic Skiing Injuries
Background
Upper Extremity
Lower Extremity
Nordic Skiing
Snowboarding

Epidemiology
1. Average older than alpine/snowboarding
2. Educate skiers in prevention of injury
   o 75% overuse
      ▪ Properly wax skis to decrease backward slipping
      ▪ Proper warm-up and cool down
      ▪ Equipment fitted to skier and skier style
      ▪ Review technique
      ▪ Review training for errors
         • Poor weight transfer prolongs time ankle is in pronated position on edge of ski rather than gliding
            o Gliding decreases stress on hip/lower extremity
      ▪ Treatment
         • Rest
         • Stretching/strengthening exercise
         • Gradual return
   o 25% trauma
      ▪ New skating technique allows speeds 60-80 km/hr on downhill slopes

Overuse Injuries
1. Medial tibial stress syndrome
2. Achilles tendonopathy
3. Patellofemoral syndrome
4. Skiers Toe (Hallux rigidus)
5. Sesamoiditis
6. Groin strain
7. Low back pain

1. Medial tibial stress syndrome (shin splints)
   o Mechanism of injury
      ▪ Inflammation of tibial periosteum from repetitive muscle contraction
   o Symptoms
      ▪ Pain over posterior medial aspect of distal 1/3 of leg
   o Physical
      ▪ Tenderness along posterior medial crest of tibia in middle or distal 1/3 of leg
   o Imaging
      ▪ AP/lateral radiographs
      ▪ Bone scan
      ▪ MRI - often preferred
   o Treatment
      ▪ Decrease training
- NSAIDs
- Ice
- Massage
- Cushioned anti-pronation inserts
- PT-foot/ankle ROM and strengthening
- Calf sleeve
- If severe-non weight bearing until symptoms subside
  - FPIN EBM Inquiry: How Can You Help Athletes Prevent and Treat Shin Splints?

2. Achilles tendinopathy
  - FPIN EBM Inquiry: What is the Best Way to Treat Achilles tendinopathy?

3. Patellofemoral syndrome
  - FPIN EBM Inquiry: What Exercises are Most Effective for Relieving the Pain of Patellofemoral Syndrome?

4. Skiers Toe (Hallux rigidus)
  - Epidemiology
    - Arthritic change of first metatarsophalangeal joint
  - Mechanism of injury
    - Repeated dorsiflexion stress
  - Symptoms
    - Pain on toe-off phase of walking
  - Physical Exam
    - Swelling at MP joint of great toe
    - Discomfort with passive dorsiflexion/plantar flexion
    - Limited MP dorsiflexion
    - Palpable dorsal osteophytes
  - Imaging
    - AP and lateral X-rays
    - Show osteoarthritis with dorsal osteophytes on lateral view
  - Treatment
    - Large toe box in shoe
    - Orthotic that incorporates rigid shank
    - NSAIDs, ice, contrast baths
    - If persistent symptoms
      - Surgical cheilectomy

5. Sesamoiditis
  - Epidemiology
    - Inflammation, fracture, arthritis of sesamoids
      - In flexor hallicus brevis
  - Mechanism of injury
    - Forced dorsiflexion of great toe
  - Symptoms
    - Pain under first metatarsal head
    - Especially painful during kick phase of classical skiing
  - Physical findings
    - Focal tenderness under metatarsal head
    - Pain moves with sesamoid as toe flexed/extended
    - Dorsiflexion painful
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o Imaging
  ▪ AP, lateral, axial, oblique X-ray
    ▪ Consider comparison views
  ▪ Bone scan to rule out stress fracture or avascular necrosis

o Treatment
  ▪ No high heeled shoes
  ▪ Shoe insert with cut-away beneath sesamoids
  ▪ Stiff soled or rocker bottom shoe
  ▪ Tape great toe in plantar flexion
  ▪ If refractory
    ▪ Surgical excision of sesamoid

6. Groin strain
   o Epidemiology
     ▪ Strain of hip flexors (iliopsoas, sartorius, rectus femoris) adductors, abdominals
   o Mechanism of injury
     ▪ Repeated slipping on ice
   o Symptoms
     ▪ Pain over injured muscle
     ▪ Pain exacerbated with continued strenuous activities
   o Physical exam
     ▪ Hip flexors – increased pain with hip flexion against resistance or passive hip extension
       ▪ Rectus femoris – pain when muscle stretched
       ▪ Iliopsoas – deep groin or inner thigh pain
       ▪ Sartorius – pain superficial and more lateral than iliopsoas
     ▪ Hip adductors
       ▪ Tender in groin
       ▪ Increased pain with passive abduction
     ▪ Abdominals – increased pain with trunk flexion
   o Imaging
     ▪ AP X-ray of pelvis
     ▪ Frog leg lateral of involved hip
       ▪ Evaluate for fracture
     ▪ MRI if needed for further evaluation
   o Treatment
     ▪ Modification of activities
     ▪ Home exercise program
     ▪ Physical therapy

7. Low back pain
   o See also Lower Back Sprain/Strain
   o See also Herniated Disc Disease
   o Epidemiology
     ▪ Increased in younger skiers
   o Mechanism of injury
     ▪ Repeated hyperextension and flexion

Traumatic Injuries
1. Skier's thumb - common
2. AC separation  
3. Shoulder Dislocation  
4. Rotator cuff tears  
5. Clavicle fractures  
6. Knee sprains  
   - MCL most common  
   - FPIN EBM Inquiry: What is the Best Way to Evaluate an Acute, Traumatic Knee Injury?  
7. Ankle sprains and ankle fractures  
   - Inversion ankle sprain of deltoid common  
8. Spine fractures  
   - Lumbar vertebral compression fractures  
     - Vertebral body fractures  
   - Sacral/Coccyx fractures  
9. Laceration – from vegetation  
   - Facial laceration  
   - Corneal lacerations  
10. Cold injury

References

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