Ski & Snowboard Injury

Conditions and Preventive Strategies

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Skiing versus Snowboarding
Injury

• Increased popularity over 50 years
• Relative incidence
  – 3x higher injury rate in snowboarding
Injury

Main injuries by snow sport

% of total

Knee: 33.2
Head/face: 13.7
Shoulder: 9.1
Lower leg: 7.6
Wrist: 5.4
Thumb: 4.9

Alpine ski

Main injuries by snow sport

% of total

Wrist: 24.9
Head/face: 14.3
Shoulder: 13.1
Knee: 11.8
Ankle: 5.9
Back: 4.6

Snowboard

Copyright Dr Mike Langran 2005
Injury
Shoulder Girdle

• Incidence
  – Up to 11% of all injuries

• Mechanism
  – Direct impact
  – Axial load
  – Forced abduction
  – Rotation
Shoulder Girdle

- Clavicle Fracture
- Proximal Humerus Fracture
- Glenohumeral Dislocation
- Rotator Cuff Tear
Shoulder Girdle

- Clavicle Fracture
Shoulder Girdle

- Proximal Humerus Fracture
Shoulder Girdle

- Glenohumeral Dislocation
Shoulder Girdle

- Rotator Cuff Tear

![Diagram of the shoulder girdle]

![Image of rotator cuff tear]

![Image of rotator cuff tear repair]

*Intrinsic (degeneration)*

*Extrinsic (impingement)*

*Traumatic*
Wrist Injury

Snowboarding  Upper Extremity  Wrist  Fracture
Wrist Injury

Snowboarding  Upper Extremity  Wrist  Fracture
Skiier’s Thumb
Knee Injury

• Knee injury most common snow sport injury
• ACL tears account for 50% of all knee injury
• Mechanism
  – Slip-catching
  – Back-weighted landing
  – Dynamic snow plowing
• Knee internal rotation, valgus
ACL Tear

Back-weighted Landing

Dynamic Snow Plowing

Bere et al. BJSM, 2011
Knee Injury
Lower Leg Injury

• Decreased incidence in skiers from 1972 – 1994 by 43% due to boots and bindings

• Snowboarder’s Fracture
Lower Leg Injury

- Decreased incidence in skiers from 1972 – 1994 by 43% due to boots and bindings
- Boot-top Tibia Fracture
Head Injury

• Incidence
  – 28% of all skiing, 33% of all snowboarding injuries

• Snowboarding
  – Both feet fixed, facing sideways, fall backwards
Concussion

• Definition
  – “A complex pathophysiologic process affecting the brain, induced by biomechanical forces.”
  – Impairment of neurologic function that resolves spontaneously
  – Absence of structural injury visible on neuroimaging studies
  – May OR MAY NOT involve loss of consciousness

4th International Conference On Concussion In Sport (Zurich Consensus Statement, 2012)
Concussion

• Symptoms
  – Headache
  – Balance problems
  – Dizziness
  – Difficulty communicating
  – Foggy, diff concentrating
  – Drowsiness, fatigue
  – Memory difficulties
  – Nausea, vomiting
  – Sensitivity to light or noise
  – Sleeping difficulty
  – Visual problems
  – Emotional lability
    • Sad, irritable, nervous

• Criteria for ER
  – Severe neck pain
  – Deteriorating consciousness
  – Increasing confusion
  – Severe headache
  – Repeated vomiting
  – Unusual behavior change
  – Seizure
  – Double vision
  – Sensory / motor symptoms
Spine Injury

- Up to 17% of all injuries
- Lumbar, thoracic
- Intentional jumps
- Fall backward
- Flexion-distraction
Spine Injury

- Process fracture
- Compression fracture
- Burst fracture
- Disc disease
- Spondylolysis
Injury Prevention

• Bindings
  – fail to release in 78% knee injury
  – adjusted on weight, height, age, speed
  – Inspection and calibration each season

• Boots
  – Soft → 2x risk of ankle injury
  – Hard → 2x risk of knee injury
    → inc risk of tibia fx
  – Hybrid
Injury Prevention

• Wrist Guards

• Helmets

• Conditions

• Experience
Injury Prevention

• Parental Oversight
  – Avoid terrain that is beyond their ability
  – Encourage professional instruction
  – Encourage routine rest breaks with rehydration
  – Caution children against improper speeds
  – Caution children about risks of skiing OOB
Injury Prevention

• NSAA Responsibility Code
  – Always stay in control
  – People ahead of you have the right-of-way
  – Stop in a safe place for you and others
  – Whenever starting downhill or merging, look uphill and yield
  – Use devices to help prevent runaway equipment
  – Observe signs and warnings, and keep off closed trails
  – Know how to use the lifts safely
THANKS

Orthopaedic & Neurosurgery Specialists

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