

Winter Sports Injuries & Getting in Shape for the Season

James R. Meadows, MD

Orthopedic Surgeon
Alta View Sports Medicine





MOUNTAINSTAR

Lone Peak Hospital



There's snow in the mountains!

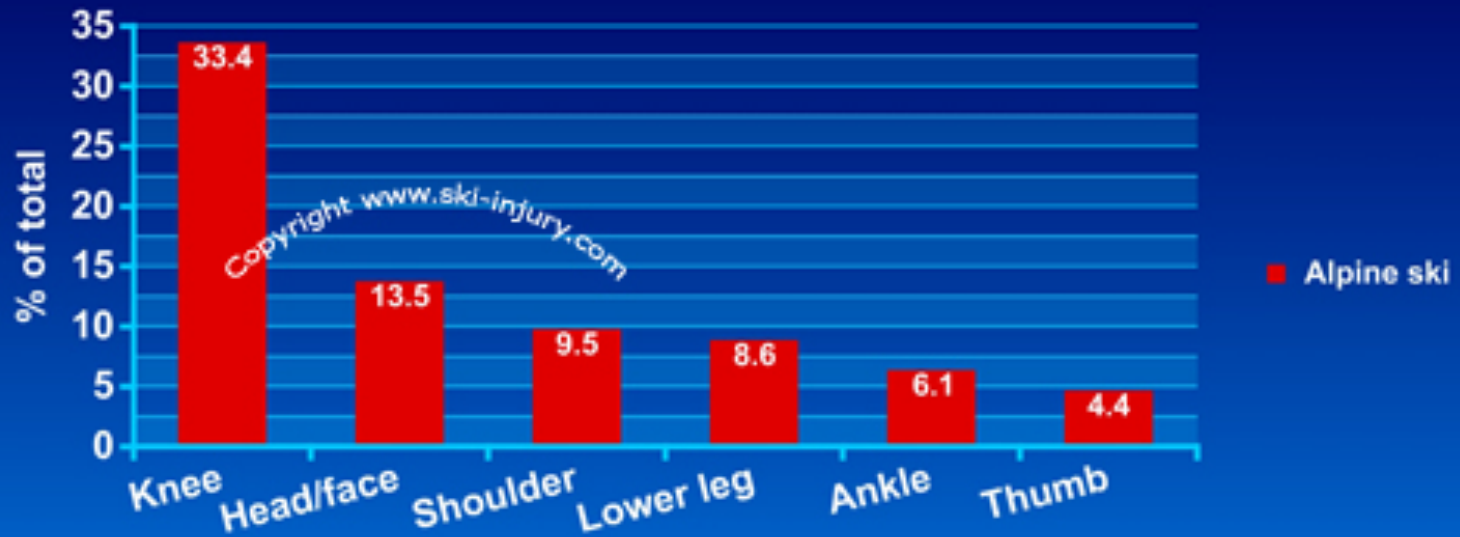
- It's TIME!
- TIME to get in shape for the winter season
- Good news is . . .
- There's still TIME to get in shape

Winter Sports Injuries are Common

- According to the U.S. Consumer Product Safety Commission, about 440,000 individuals are treated for winter sports related injuries each season
- 148,000 injuries from snow boarding
- 144,000 injuries from snow skiing
- 91,000 injuries from sledding and tobogganing
- 58,500 injuries from ice skating
- Don't forget frostbite and hypothermia

Injuries by Sport

Main injuries by snow sport



- Alpine Skiing

Injuries by Sport

Main injuries by snow sport



- Snowboarding

Head Injury



- 10-15% of winter sport injuries
- Collisions, Impact with Snow, Lift Accidents
- Minor head injuries
 - Abrasions, lacerations, low impact contusion

Head Injury

- Serious Head Injury
 - Any loss of consciousness, feeling of “loss of balance” or “dizzy”
 - Confused, nauseated/vomiting
 - Persistent headache > 2 days
 - Suspected skull fracture
 - Large scalp wounds
- Notify ski patrol on the mountain
- Seek medical attention

Head Injury

- Put a Lid on that Kid!
- Wear a Helmet



ACL Injuries

- Knee injuries ~ 40% of all skier injuries
 - 15% are ACL ruptures
- 70,000 ACL Injuries/year in skiing
 - Between 250,000 and 300,000 ACL injuries per year
 - 150,000 - 200,000 ACL surgeries per year
- 10x more common in skiing than snowboarding
- ACL injuries 3x more common in women skiers



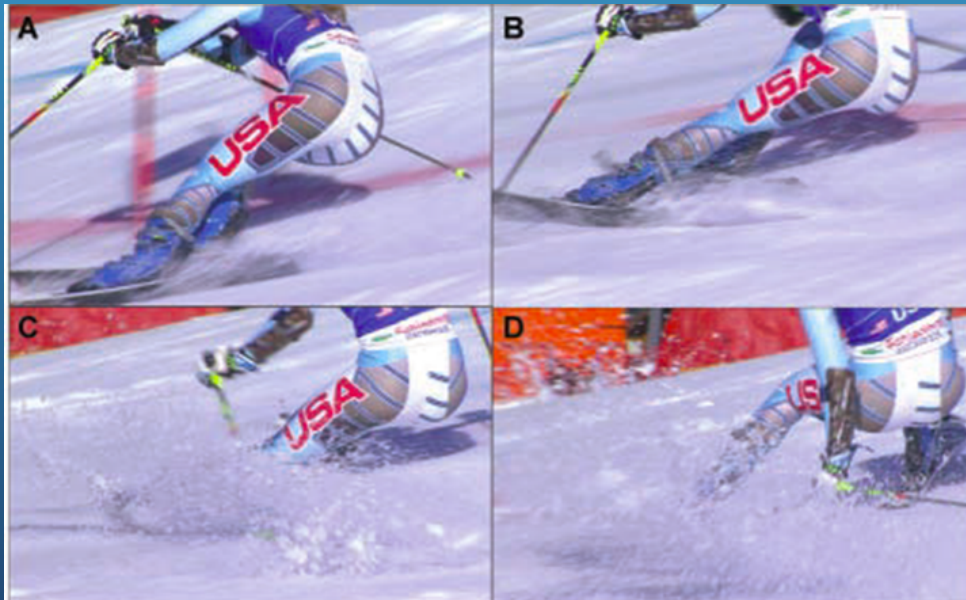
ACL Injury in Skiing

- Phantom Foot Profile
 - Uphill arm back
 - Skier off-balance to the rear
 - Hips below the knees
 - Uphill ski unweighted
 - Weight on inside edge of downhill ski
 - Skier tries to stand back up instead of falling
 - POP! in downhill knee



ACL Injury in Skiing

- Slip / Catch mechanism
 - Inside edge of the outer ski catches
 - Knee flexion angle increases rapidly
 - Forcing the knee into valgus and tibial internal rotation
- More common with modern carving skis



ACL Injury in Skiing

- Boot induced
 - Hard landing when off-balance to the rear
 - Instinctive extension of uphill knee
 - Uphill ski tail hits first
 - As force moves to heel it is directed through the tibia anteriorly



Ettlinger CF, Johnson RJ, Shealy JE. A method to help reduce the risk of serious knee sprains incurred in alpine skiing. *Am J Sports Med.* 1995;23:531-537

ACL Prevention in Skiing

- ACL Awareness
- 1. Don't fully straighten your legs when you fall. Keep your knees flexed.
- 2. Don't try to get up until you've stopped sliding. When you're down--stay down.
- 3. Don't land on your hand. Keep your arms up and forward.
- 4. Ensure your skis are properly fitted with the appropriate DIN settings for release
- 5. Don't jump unless you know where and how to land. Land on both skis and keep your knees flexed.

ACL Prevention

- Would a knee brace help?
- They offer a sense of feedback from the knee
- They remind the skier to be more cautious while skiing
- No research demonstrating a protective effect in the uninjured knee



Effect of Functional Bracing on Knee Injury in Skiers With Anterior Cruciate Ligament Reconstruction

- AJSM 2006, Vail, Colorado
- Functional Knee Bracing on Skiers with ACLr
 - Prospective Cohort, level 3
- 820 ACLr employee skiers
 - 1991-97, pts screened, educated, and self-selected bracing
 - 31% of skiers chose bracing

Sterett, WI, Steadman, JR et al. Effect of Functional Bracing on Knee Injury in Skiers with Anterior Cruciate Ligament Reconstruction. *AJSM* 2006; 10:1581-85

Knee Brace Use in Skiing

- Knee injury rate
 - Nonbraced skiers—9%
 - Braced skiers—4%
 - Odds ratio 2.74
- Injuries Requiring Surgery
 - Nonbraced skiers—4%
 - Braced skiers—1%
- Reporting bias

TABLE 5
Characteristics of Injured Braced and Nonbraced Skiers

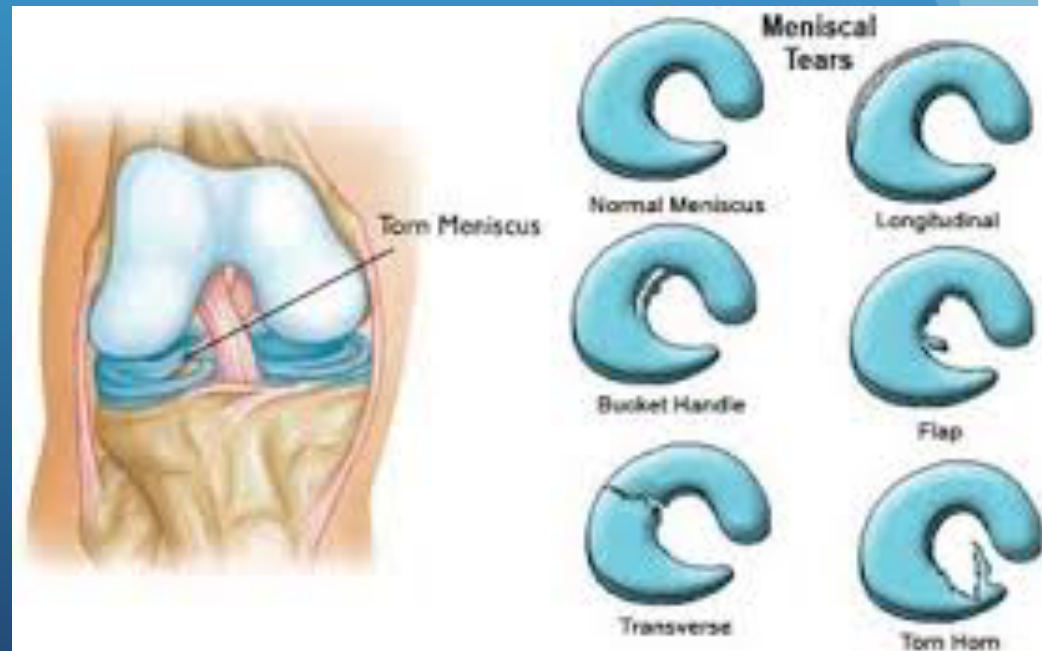
	Brace Injured	Nonbraced Injured	<i>P</i>
n	10	51	
Age, y	33.5	35.5	.444
Gender, % (male:female)	60:10	51:49	.735
>+1 Lachman, %	40	22	.243
>+1 pivot shift, %	10	12	.676
Required surgery, %	30	49	.226
Required ACL reconstruction, %	0	22	.114

Knee Brace Use in Skiing

A properly-fitted functional ACL stabilizing brace may decrease the risk of knee injury in patients who have undergone a previous ACL reconstruction or who have ACL insufficiency

Meniscal Injuries

- 5-10% of knee injuries
- Rotational stress applied to a flexed, weight bearing knee
 - “Catching an edge”
- Symptoms:
 - initial pain that may improve
 - occasional swelling
 - initial difficulty bearing weight
 - “locked knee”



Tibial Plateau Fractures

- Fracture of the proximal tibia into the knee joint
- Compressive load to the knee
 - Landing off a jump
 - Falling instead of landing off a jump
 - Rapid valgus knee force (concomitant ACL injury)



Shoulder Injuries

- ~ 10% of winter sport injuries
- Fall directly onto shoulder
- Fall onto an outstretched arm
- Or jumping off things you know you shouldn't be jumping off



Dislocations & Fractures

- Shoulder Dislocation
- Acromioclavicular (AC) Joint Fracture (Separated Shoulder)



Wrist Injuries

- Incidence twice as high among snowboarders vs skiers
 - ~25% of all snowboard injuries
 - ~70% of wrist injuries are fractures
- Fall onto outstretched arm
 - Sledding, bailing off a snowmobile, ice skating





- Learn to fall properly



Sledding Injuries

- Most occur in youth under 14 yrs of age
- Most occur in collisions with other sledders or children in the run outs in the sled path
 - Also collisions with trees, rocks, fences



Sledding Injuries

- Young children are very vulnerable to injury
- Head and neck injuries can change your life instantly—don't chance it!
- Supervise your children
- Don't sled on public streets
- Slide forward-facing, not head first
- Ensure the sled hill is free of trees, rocks, fences, posts

Get the Most Out of This Winter

- Never participate in a snow sport alone
- Wear appropriate protective gear—helmets, gloves, goggles, padding
- It's COLD! Dress for it
 - Multiple layers of light, loose and water-resistant clothing to accommodate changes in your body's temperature
- Stay hydrated
- Know your equipment

Getting Your Body Ready for Winter

- Don't wait . . . It's not too late
- Increase your aerobic endurance
 - Maximizes your body's ability to consume and distribute oxygen to your muscles
 - At least 30 minutes a day

What!?

“I’m Too Busy!”

- Find something you enjoy
- Walking, running, cycling, swimming, jump rope, elliptical



Aerobic Conditioning

- Maintaining cardiovascular fitness is the best way to prevent injury due to fatigue
- Many injuries occur at the “end of the day” as one begins to tire and muscles “give out”
- Prevent fatigue injuries before they happen by getting in shape NOW

Improve Your Flexibility

- Improves your ability to act and react during activity while minimizing tearing of your tendons and muscles
- Back stretches
- Hip/Groin
- Hamstring/Quad stretching
- Calf/Lower leg

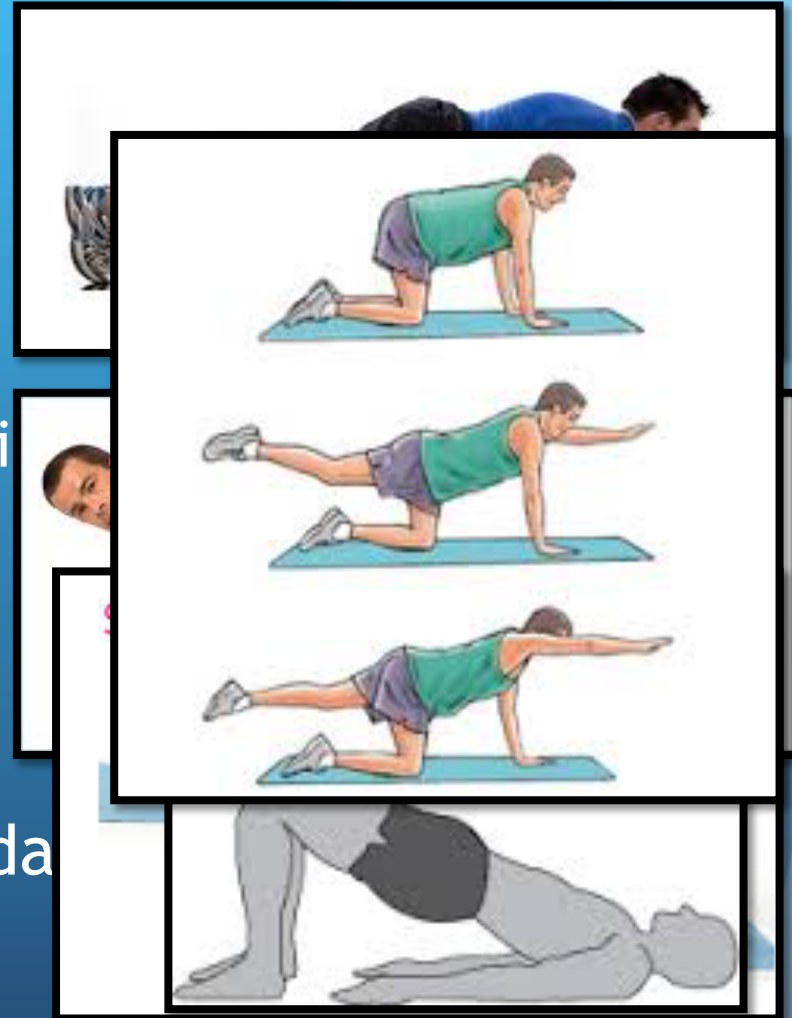


Core Strengthening

- Includes your abdominal muscles, obliques, lower back, hip & pelvis
- Improves your posture, overall body stability, endurance, and balance

Core Strengthening

- Planks
 - Progress to side-lying
- Crunches
 - Reverse crunches, add medi
- Bridging
- Quadruped
- 2-3 sets of 60 sec, 2 times da

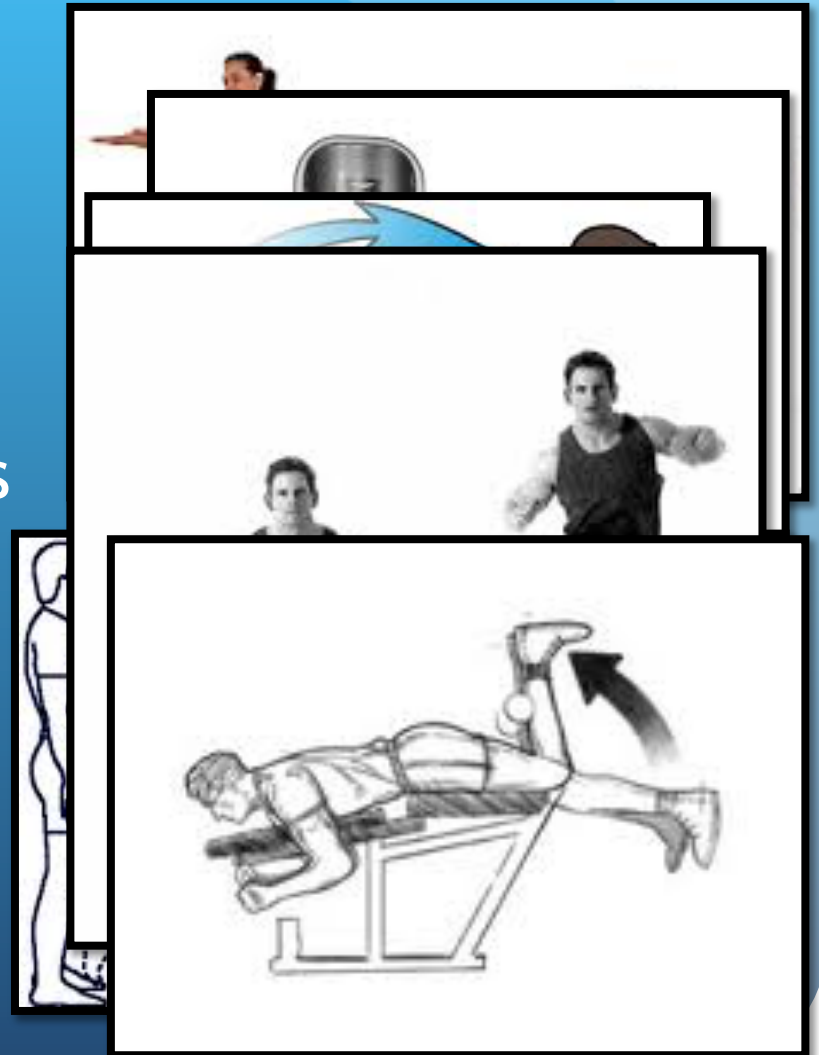


Strength Training

- Improves your muscles' ability to function in the absence of oxygen
- Increase in the size and strength of skeletal muscle
- Improve explosive motions, power, improve your fatigue strength
- Mix in strength training 3-4x/week for 10-20 min

Strength Training

- Wall Squats
 - Static and dynamic
- Leg Press
- Forward/Backward Lunges
- Box Jumps
- Lateral Side Jumps
- Hamstring Curls



Balance & Biofeedback

- Improves muscle coordination which allows them to work together to supply the strength you need
- May even prevent a few falls



Balance & Biofeedback

- Single leg mini squats
- Single leg hop
 - Hold landing for 5 sec
- BOSU trainer
- Wobble board
- Backward walking



The Big Day Has Arrived!



- You've checked your equipment
- You're in the best shape of your life!

- Don't just jump right in
- Warm Up



Warm Up

- Walk around
- Jumping jacks
- High-knee walk/skip
 - March in place
- Standing leg swings
- Rotating Lunges

*YOUR BODY IS YOUR MOST IMPORTANT
PIECE OF EQUIPMENT.
TAKE CARE OF IT.*

BUMPS FOR BOOMERS®
ski for life.

Book your Mogul Ski Lesson
Call 970-989-2529

Ski Fitness | Ski Conditioning Programs To Get You In Shape

[ShareThis](#) [Print This Page](#)

Skiers who regularly perform skiing exercises and/or make it a priority to participate in ski fitness exercise programs will ski better, experience less fatigue, minimize back and knee pain, avoid injury and extend their skiing longevity.

Best Deals on Lodging
We Highly Recommend
Aspen Central Reservations

Summary

- Dress warm, multiple layers—prevent cold induced injury
- Ski/Board/Sled/Ride on appropriate equipment
- Wear a Helmet!
- Make getting in shape for the winter season a reason to stay in shape all year round
- Know your limits!
- For any concerns seek medical attention

Thank you!

For further questions, or to schedule an appointment with
Dr. Meadows, call 801-571-9433