

# Snowboarding and Downhill Skiing Assignment

## Injuries and Prevention Exercises and Practices

Name: \_\_\_\_\_

### Introduction

Downhill skiing and snowboarding can result in both serious and minor injuries if you aren't prepared. Skiers and snowboarders often require specific conditioning and workout routines to not only perform better and prevent fatigue, but to help reduce the risk of injury on the slopes.

Strength, flexibility, endurance and agility drills for skiers and boarders are essential for both recreational and the expert skiers. Most skiers return to the slopes after months away. While some athletes participate in other sports during the off-season to stay in shape, many are weekend warriors. No matter what type of a skier you are, you could wind up with minor aches, pains or a serious injury if you don't spend a little time preparing for the demands of your sport.

Skiing and boarding require both technical and physical skills including strength, endurance, agility and balance.

### Part A - Common Skiing and Snowboarding Injuries

#### **1. ACL Injuries and other skiing and snowboarding knee injuries**

##### **What is the ACL**

The ACL, or anterior cruciate ligament, is a ligament located inside the knee joint. It is a major connector of the femur and the tibia and one of the key parts of the joint for maintaining a stable, yet flexible knee.

**What Causes an ACL Injury** ACL injuries are caused by several factors. The most common is a traumatic force being applied to the knee in a twisting moment, causing forceful hyperextension. Skiers are particularly susceptible to these types of strains when landing jumps, skiing moguls or during twisting falls. The injury can also occur due to a contact force such as being hit from the front or side. Finally, ACL injuries can happen during a fall by a novice skier, when the bindings do not release.

**What Does it Sound and Feel Like?** The most common sound heard when there is a severe ACL injury is an audible "pop" at the moment of impact immediately followed by brief, acute pain. Swelling, pain, and instability of the knee are common. You will experience difficulty supporting your weight when standing, and the knee feels as though it will 'give out'. If you experience any of these symptoms, you should have a friend flag down the ski patrol and head to a doctor's office immediately. An MRI is usually used to diagnose an ACL tear, but arthroscopy may be the only reliable means of detecting a partial tear.

**What is the Prognosis?** It is possible to function with even a complete tear, however, it will limit mobility and, even after the pain has subsided, expose one to the risk of the knee collapsing during any exercise. The injury is serious and usually requires surgical repair or reconstruction in an athletic person. Fortunately, the state-of-the-art in the 1990's is that a skier, after a properly done cruciate repair or reconstruction, can return to skiing within the year.

**What is the Treatment?** Depending on the severity of the injury, recovery can involve exercise, a brace, or surgical reconstruction of the ligament. If it is even a relatively moderate ACL tear, your season is over and daily therapy will become a routine. The initial treatment of an acute ACL injury often includes ice, anti-inflammatory medication, and physical therapy which is directed at restoring the range of motion of the injured knee.

A complete tear will most likely require surgical reconstruction of the ACL. This is a common procedure with an extremely high success rate. most common type of ACL reconstruction involves harvesting the central third of the patellar tendon with a bone block at each end of the tendon graft.

Nevertheless, surgery is never an appealing thought. There is some disagreement among doctors as to when surgery is necessary so get multiple opinions and do your own research on the subject before committing to surgery.

There is generally a long recovery period. Therapy will begin in a few days and progress over the months until low impact exercises can be done with any intensity. It could take a year before you are back on skis.

**Can I Prevent an ACL Injury?** There are several things you can do in the preseason and off season to decrease your risk of an ACL injury.

1. Do conditioning and strengthening exercises of the quadriceps and hamstring before ski season starts. This is the number one protection.
2. Ski easier at the end of the day, when you are typically fatigued. Avoid difficult trails, big air, lots of moguls, and speed skiing on ice. Take it easy in the late afternoon.
3. Do regular stretching exercises for the hamstrings, quadriceps, hip, back, shoulder. The more you stretch, the less likely you are to snap.
4. Use gear that is fit to you and is tuned up.
5. Check your bindings for release tension. Do not set them too tight!

Other skiing and snowboarding injuries outside of ligament injuries (ACL, MCL, PCL, Cruciate) are Meniscus injuries, Chondromalacia, Osteoarthritis, Patellofemoral pain, and Iliotibial Band Syndrome.

## **1. Head Injuries (Concussions)**

## **What Is a Sports Concussion?**

Concussions are traumatic head injuries that occur from both mild and severe blows to the head. Some head injuries may appear to be mild but research is finding that concussions can have serious, long-term effects, especially repeat head injuries or cumulative concussions.

A concussion is typically caused by a severe head trauma during which the brain moves violently within the skull. The brain cells all fire at once, much like a seizure. Some studies show that patients who suffer a concussion appear to have the brain activity of people in a coma.

A concussion may result from a fall in which the head strikes against an object or a moving object strikes the head. A suddenly induced turning movement such as a blow that twists the head (like a punch to the side of the face) is more likely to produce unconsciousness. However, significant jarring in any direction can produce unconsciousness.

## **Concussion Signs and Symptoms**

### **Early Concussion Symptoms May Include:**

1. Confusion
2. Disorientation
3. Memory loss
4. Unconsciousness
5. Unequal size pupils
6. Headache
7. Dizziness
8. Tinnitus
9. Nausea
10. Vomiting
11. Vision changes

### **Late Concussion Symptoms May Include:**

1. Memory disturbances
2. Poor concentration
3. Irritability
4. Sleep disturbances
5. Personality changes
6. Fatigue

## **3. Wrist Injuries**

One of the most common causes of wrist pain in athletes is a sprained wrist. A wrist sprain typically occurs after a fall on an outstretched hand stretches or tears the ligaments of the wrist. Common causes of wrist sprains include falls during sports such

as inline skating, snowboarding, soccer, football, baseball, and volleyball. When an athlete falls on the outstretched hands, the muscles, tendons and ligaments in the wrist take the majority of the impact, and can be stretched and possibly torn. If these tissues are inflexible or weak, the risk of injury increases.

It's helpful to understand the difference between a sprain and a strain.

**A sprain** is an injury to a ligament, the tough, fibrous tissue that connects bones to other bones. Ligament injuries involve a stretching or a tearing of this tissue.

**A strain** is an injury to either a muscle or a tendon, which is the tissue that connects muscles to bones. Depending on the severity of the injury, a strain may be a simple overstretch of the muscle or tendon, or it can result in a partial or complete tear.

**Signs & Symptoms of a Sprained Wrist Prevention** In the wrist, a sprain is much more common than a strain due to the number of ligaments that support the bones in the wrist. A wrist sprain typically causes pain, tenderness, and swelling over the wrist after a fall. It will be red, tender and warm to the touch. There may be bruising, decreased range of motion, and a dull deep ache in the wrist.

If you have these symptoms after a fall on a hand, you should see a physician for an exam to make sure there is not fracture. One particular fracture to the scaphoid (or navicular) bone in the wrist can be fairly serious if not treated properly. For this reason, any wrist injury should be seen by a physician for an evaluation.

Wrist sprains (like other sprains) are graded according to severity: Grade 1 (mild) -- over-stretching / micro-tears of ligaments Grade 2 (moderate) -- partial ligament tears and mild joint instability Grade 3 (severe) -- severe or complete ligament tears and significant joint instability

## **Sprained Wrist Treatment**

R.I.C.E is the first line treatment of a sprained wrist. This includes:

**Rest.** Stop activity and don't use the injured wrist for 48 hours or until the pain and swelling has subsided.

**Ice.** Ice the wrist by applying a cold pack (wrapped in a towel) or a bag of crushed ice to the wrist for 15 minutes, several a day for several days, until swelling subsides. Don't ice your injury for more than 20 minutes at a time.

**Compression.** Use an elastic compression bandage to wrap the wrist and limit swelling. Start the wrap at the base of the fingers and stop just below the elbow. The wrap should be snug, but be careful not to cut off circulation to the fingers.

**Elevation.** Keep the injured wrist higher than your heart as often as possible during the day and at night for the first two days after the injury. This will help drain fluid and reduce swelling around the wrist.

**Over-the-counter pain medications.** These may include Ibuprofen (Motrin, Advil), Naproxen (Aleve, Naprosyn), Acetaminophen (Tylenol), or Aspirin. \*Always check with your physician before taking any medication.

Both skiing and snowboarding can result in sports injuries, but they tend to have slightly different injury patterns. Skiers are more likely to have knee injuries (from twisting motion during falls), and snowboarders tend to have more upper body injuries (as a result of falling on an outstretched hand). There are also many injuries common to both types of winter athletes.

## **Part B - Injury Prevent of Snowboarding and Skiing Injuries**

**Preventing Injuries** The best way to prevent skiing or snowboarding injuries is with proper conditioning programs that are begun before you hit the slopes.

### **Skiing and Snowboarding Conditioning Exercises**

**Muscular Strength** Muscular strength improves your ability to relax and still maintain control, while making quick adjustments needed on uneven terrain. All the major muscle groups of the body, especially the core, are used for skiing. A great strength exercises is a single leg squat. A second great strength exercise is a weighted quadiceps squat.

**Explosive Power** When strength training is combined with speed, quickness and agility training, power is developed and expert level skiers are born. Exercises that create power include:

1. **Plyometrics** are commonly referred to as explosive types of exercise drills often used in the conditioning program for skiers along with weight training because the combination of squatting and cycling develops the quality leg and hip power necessary for high performance skiing. Many fitness experts use plyometric exercise to build power and speed, improve coordination and agility and effectively improve performance. It is important to point out that plyometrics, if performed incorrectly by the wrong individuals, can increase the risk of injury. One great exercise is to stand on a bench or box (12 inches or so), jump down and then immediately back up. Do this 10-30 seconds at a time, rest and repeat. Experts can try to do one-leg jumps.

2. **Flexibility** The best stretches for skiers and boarders focus on the lower extremities and snow boarders need to stretch the upper body as well. One great core stretch is a core twist. Stand with your knees slightly bent and your arms crossed in front of you. Slowly look over one shoulder and let your whole body follow until you feel a good stretch in the back and side. Hold 5 seconds and repeat in the other direction. Hamstring and Quadiceps stretches are also recommended for skiers.

3. **Endurance** For cardiovascular endurance good preparation exercises include: road, mountain or stationary biking. It build the heart and lungs and focuses on the leg muscles used during skiing. To Warm-up with an easy spin of 5 minutes and then add

high intensity efforts (sprint) for about 30 seconds. Spin easy for a minutes and repeat 2-5 times depending upon your fitness level. Cool down about 5 minutes and you have a great workout.

**4. Technical Skills** Technical skills start with lessons from a certified instructor.

**5. Balance Training** Working on balance can include one-legged squats or work on balance boards. Also see the Top Balance Training Products.

**6. Agility Exercise** To improve side to side agility stand in a relaxed half squat position and step quickly side-to-side (maintain the squat). As you improve, jump side-to-side keeping the inside foot off the ground and the focus of your weight on your outside foot/inside edge. Perform for 30 seconds, rest and repeat several times.

**7. Hill or Stair running**

**8. Weighted Step ups**

### **Part C - ACL Injury Prevention Training Program**

While this ACL injury prevention program was designed for soccer players, the training routine, principles and concepts apply very closely to skiing and snowboarding expert terrain. The ACL Injury Prevention Program is a highly specific 15-minute training session that replaces the traditional warm-up. The program goal is to teach athletes strategies to avoid injury by:

1. Avoiding vulnerable positions
2. Increasing flexibility
3. Increasing strength
4. Including plyometric exercises in training
5. Increasing proprioception

### **Part D - Spring Skiing and Snowboarding Safety Tips**

With warmer weather, sunny skies and fewer crowds, many skiers and snowboarders say spring is the best time to be on the mountain. However, the conditions during the spring vary greatly as the snow melts during the day and freezes overnight. Boarders and skiers need to be aware of potential hidden dangers. Here are some safety reminders for anyone hitting the slopes late season.

1. **Prevent Sunburn** The intensity of the sun at high altitudes, combined with reflection off the snow, can result in sunburn if you don't cover up.
2. **Prevent Abrasions and Lacerations** Exposed skin may feel great while skiing, but falls on spring snow can cause scrapes and cuts.
3. **Prevent Dehydration** Regardless of the time of year, it's important to drink

plenty of fluids when engaging in physical activity.

4. **Know How to Layer Clothing** Dressing for spring skiing can be challenging as the temperature can change drastically throughout the day. Knowing how to layer your clothing can keep you warm and dry, or cool and dry, depending upon the conditions. Slushy conditions mean you may want to wear something waterproof, as well.
5. **Protect Your Eyes** The glare from the snow is certainly something to protect your eyes from, as it can be very intense. Learn what sort of lenses are best for skiing.
  - a. Sports Sunglasses
  - b. Ski Goggles
6. **Prevent Altitude Illness** If you are traveling to the mountains from low elevations, you may feel symptoms of altitude sickness, including dizziness, light-headedness, nausea, fatigue, and weakness. Recognizing and treating your symptoms quickly may prevent a ruined vacation. Drink plenty of water and get lots of sleep. Also See: Preventing Altitude Illness During Active Vacations.
7. **Shield Yourself from the Elements** Even though the temperatures are warming up, you need to beware of the possibility of cold weather emergencies, such as frostbite and hypothermia.
8. **Be Wary of Additional Risks** Experts attribute the increase of head and spinal cord injuries on the ski hill to increased speed and jumping among boarders and skiers.
9. **Know the Trail Conditions** Afternoon slush can freeze overnight and create a top layer that is frozen solid, often called "boilerplate." These conditions can cause problems for novice skiers and aren't that much fun for experts, either. Once the temperatures increase, this starts to soften. Mountain conditions late in the day can become slushy. Melting snow also means that once hidden obstacles start showing up. You need to be more vigilant and watch for exposed ground, rocks, trees and other hazards. Avoid skiing when snow is frozen solid or melting into puddle. Both types of conditions can lead to injuries.
10. **Know latest avalanche reports** In the mountains, there is a danger of avalanche any time of the year. But spring brings conditions that are often ideal for an avalanche. The warm afternoons soften, loosen and can create snow slides. To minimize your risk of getting trapped, always check the latest avalanche reports and weather forecast in the area where you'll be skiing before you go.

# **Snowboarding and Downhill Skiing Assignment**

## Injuries and Prevention Exercises and Practices

### Short Answer Questions

1. What are three reasons why Skiers and snowboarders often require doing specific conditioning and workout routines?
  - a.
  - b.
  - c.
2. What four types of fitness exercises are essential for both recreational and the expert skiers and snowboarders?
  - a.
  - b.
  - c.
  - d.
3. What is the ACL?
4. What causes an ACL injury?



5. What are 5 things can you do to prevent an ACL injury?

a.

B.

c.

d.

e.

6. What is 4 other knee injuries resulted from skiing and snowboarding outside of ligament injuries? (ACL, MCL, PCL, Cruciate)

a.

b.

c.

d.

7. What is a concussion is typically caused by?

8. What are 5 signs of an early concussion ?

a.

b.

c.

d.

e.

9. What are 5 signs of a late concussion ?

a.

b.

c.

d.

e.

10. What is the difference between a sprain and strain

11. R.I.C.E is the first line treatment of a sprained wrist, what does each letter in the an acronym

R.

I.

C.

E.

12. What are other 3 over the counter medications that skiers and snowboarders can take for pain

a.

b.

c.

13. What are 6 of 8 Skiing and Snowboarding Conditioning Exercises?

a.

b.

c.

d.

e.

f.

14. What are the 5 strategies to avoid injury that is being taught to skier and snowboard athletes?

a.

b.

c.

d.

e.

15. What are the 7 of 10 skiing and snowboarder tips to help prevent potential hidden dangers on the hill

a.

b.

c.

d.

e.

f.

g.

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ACETAMINOPHEN

ALTITUDE

ASPIRIN

AVALANCHE

BALANCE

COMPRESSION

CONCUSSION

CONDITIONING

DEHYDRATION

ELEVATION

FATIGUE

FLEXIBILITY

HEADACHE

IBUPROFEN

LAYERING

LIGAMENT

SKIER

STRAIN

PLYOMETRICS

SNOWBOARDER

STRENGTH

REST

SPRAIN

SUNBURN