

The difference of knee injuries in skiers and snowboarders

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BACKGROUND

In Switzerland...

- **1,774 ski-lifts**
- **27 million skier days per year**
- **70,000 injuries per year**
- **20-35% knee injuries**



Are they different?



Evidence



Skiers: 41% knee injuries (>50% women)

Snowboarders: 11% knee injuries

ORIGINAL ARTICLE Scandinavian Journal of Surgery 104: 127–131, 2014

**INCIDENCE OF RECREATIONAL ALPINE SKIING AND
SNOWBOARDING INJURIES: SIX YEARS EXPERIENCE IN THE
LARGEST SKI RESORT IN FINLAND**

A. Stenroos, L. Handolin

Department of Orthopedics and Traumatology,

WILDERNESS & ENVIRONMENTAL MEDICINE, 24, 417–421 (2013)

BRIEF REPORT

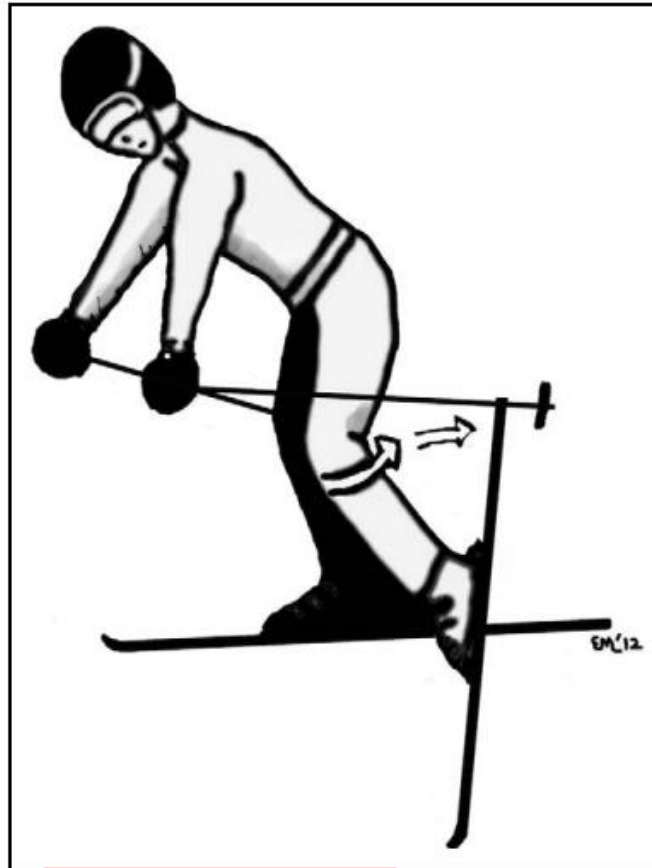
**Injury Patterns in Recreational Alpine Skiing and
Snowboarding at a Mountainside Clinic**

Tim Coury, MD; Anthony M. Napoli, MD; Matthew Wilson, MD; Jeff Daniels, MD; Ryan Murray, MD;
Dave Milzman, MD

Skiers: 29 - 43% knee injuries

Snowboarders: 8 - 13% knee injuries

Mechanism of injury



33%

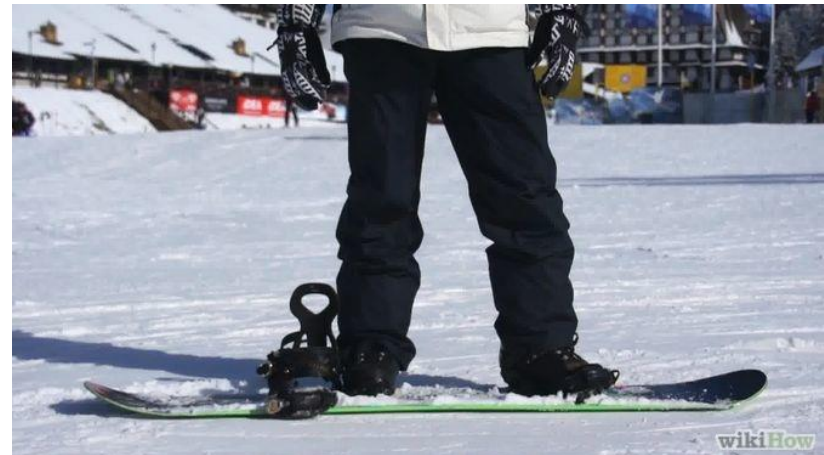
Figure 1 Valgus–external rotation: Forward fall with the inner edge of ski tip catching on snow.

Snowboarders:

Knee injuries occurred **significantly more when one foot was detached from the board** (32.8%) than when both were attached (7.3%). The **correlation between the stance** of the snowboarder and a resultant injury **was not significant**. There were 67.8% of all injured snowboarders who had a “regular” stance (lead foot left) compared with 62.5% in the control population.

ACL injuries occurred more often in **terrain parks**

Kim S. et al. Snowboarding injuries: trends over time and comparisons with alpine skiing injuries. Am J Sports Med. 2012;40(4):770-6.



Skill level

Table 4. Most common **skiing injuries** by skill level, 1995–2000 and 2010 combined

<i>Injury site</i>	<i>Beginner^a</i> (n = 172)	<i>Intermediate^b</i> (n = 692)	<i>Advanced^c</i> (n = 257)
Knee	56% (97)	30% (205)	35% (89)
Shoulder	10% (18)	12% (84)	12% (32)
Thumb	7% (12)	8% (58)	7% (17)

Table 5. Most common **snowboarding injuries** by skill level, 1995–2000 and 2010 combined

<i>Injury site</i>	<i>Beginner</i> (n = 116)	<i>Intermediate</i> (n = 174)	<i>Advanced</i> (n = 84)
Wrist	32%	21%	7%
Shoulder	11%	15%	15%
Knee	10%	12%	13%
Ankle	11%	10%	15%



NCBI Resources [x] How To [x]

PubMed.gov
US National Library of Medicine
National Institutes of Health

PubMed [v] Wijdicks CA, Rosenbach BS, Flanagan TR, Bower GE, New
Create RSS Create alert Advanced

Br J Sports Med. 2014 Jan;48(1):11-7. doi: 10.1136/bjsports-2013-093019. Epub 2013 Nov 26.

Injuries in elite and recreational snowboarders.

[Wijdicks CA](#)¹, [Rosenbach BS](#), [Flanagan TR](#), [Bower GE](#), [Newman KE](#), [Clanton TO](#), [Engebretsen L](#), [Laprade RE](#), [Hackett TR](#).

[+ Author information](#)

Elite-level snowboarders are often injured when performing difficult manoeuvres at high velocities and with amplified levels of force to the **lower limbs**.



Wijdicks CA et al. Injuries in elite and recreational snowboarders. Br J Sports Med. 2014;48(1):11-7

TABLE 4
Top 10 Skier Injuries in Adults^a

Rank	Injury	Prevalence (% of All Injuries)	Incidence (Mean Days Between Injuries)
1	Knee ACL	20.9	2442
2	Knee MCL	12.1	4237
3	MCP-UCL injury of thumb	6.6	7762
4	Shoulder soft tissue	6.4	7958
5	Leg contusion	6.0	8531
6	Upper body laceration	3.9	13,062
7	Concussion	2.7	19,228
8	Clavicle fracture	2.3	22,547
9	Wrist injuries	2.2	23,097
10	Ankle sprain	1.7	29,593

^aACL, anterior cruciate ligament; MCL, medial collateral ligament; MCP-UCL, metacarpophalangeal-ulnar collateral ligament.

TABLE 2
Top 10 Snowboarder Injuries in Adults

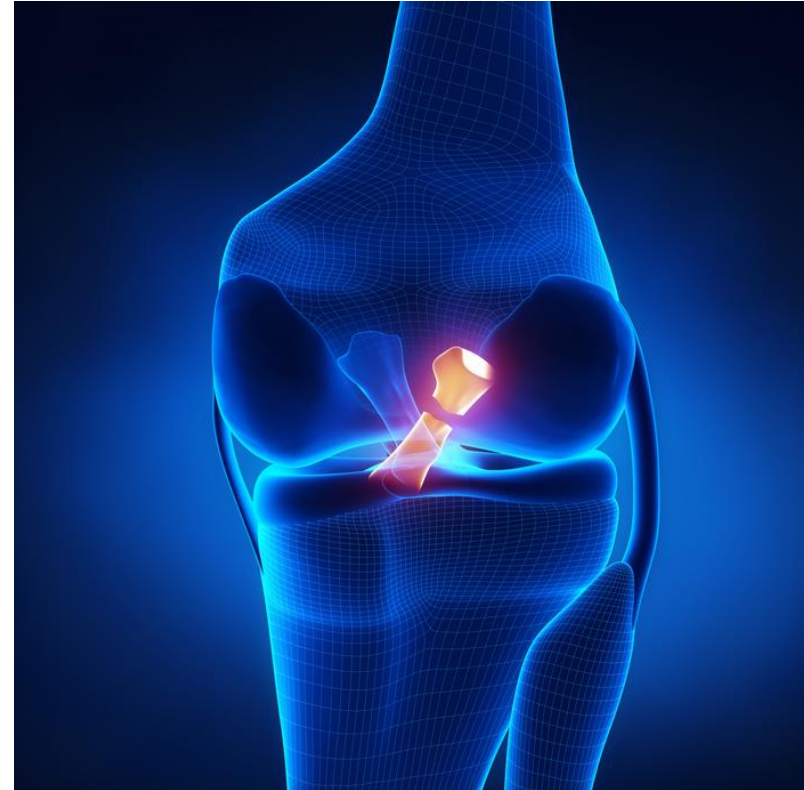
Rank	Injury	Prevalence (% of All Injuries)	Incidence (Mean Days Between Injuries)
1	Wrist injury	20.4	2925
2	Shoulder soft tissue injury	11.7	5090
3	Ankle sprain	6.2	9675
4	Leg contusion	5.1	11,698
5	Medial collateral ligament	4.3	13,751
6	Clavicle fracture	4.0	14,789
7	Upper body laceration	3.8	15,676
8	Concussion	3.7	15,996
9	Ankle fracture	2.6	23,053
10	Anterior cruciate ligament	2.4	24,494

Kim S. et al. Snowboarding injuries: trends over time and comparisons with alpine skiing injuries. Am J Sports Med. 2012;40(4):770-6.

ACL injuries

Skiers: 20.9%

Snowboarders: 2.4%



Kim S. et al. Snowboarding injuries: trends over time and comparisons with alpine skiing injuries. *Am J Sports Med.* 2012;40(4):770-6.

Swiss data

142 patients from 2009/10 season (17 snowboarders, 110 skiers, 15 other wintersports)

Knee injury	Carving Skiers	Alpine Skiers	Snowboarders	Other
Contusions	12 (13,5 %)	11 (52,4 %)	9 (52,9 %)	4 (26,7 %)
MCL / LCL	8 (9,0 %)	1 (4,8 %)	3 (17,6 %)	3 (20,0 %)
ACL/ meniscus	34 (38,2 %)	6 (28,5 %)	4 (23,5 %)	3 (20,0 %)
Fx / luxation	35 (39,3 %)	3 (14,3 %)	1 (5,9 %)	5 (33,3 %)

Gender matters...



Ruedl et al. Current incidence of accidents on Austrian ski slopes. Sportverl Sportschad. 2014;28;183-187

Conclusion

- **Skiers sustain knee injuries more frequently than snowboarders**
- **ACL injuries are most frequent, especially in women**
- **At higher skill levels, knee injuries increase in snowboarders**





Thank you!



ACL in women

Orthopaedics & Traumatology: Surgery & Research (2013) 99, 571–575



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ORIGINAL ARTICLE

Anterior cruciate ligament tear during the menstrual cycle in female recreational skiers

N. Lefevre^{a,b,*}, Y. Bohu^b, S. Klouche^a, J. Lecocq^c, S. Herman^{a,b}

ACL tear in women during skiing varies over the menstrual cycle, being **2.4-fold more frequent in pre-(follicular and ovulatory) than post-ovulatory phase**. Female skiers should take special care during this period. Oral contraceptives do not seem to exert a protective effect.