

Ski and Snowboard Injuries

Each year, more than 650 Ontarians are hospitalized with a skiing or snowboarding injury – snowboard-related falls edge out ski-related falls as the most common injury type.

Results

In Ontario, there were 674 skiing or snowboarding injury hospitalizations during the 2002/03 fiscal year. Males accounted for 76% of these hospitalizations. There was a peak in the number of injury hospitalizations among young males 10-19 years of age (Figure 1).

Approximately 89% of the injury hospitalizations occurred as a result of a fall involving a snowboard or skis (Table 1). A fall involving a snowboard was a slightly more common cause of injury hospitalization than a fall involving skis. Striking against or being struck by an object represented 8% of the injury hospitalizations and striking against or bumping into another person accounted for the remaining 3% of skiing and snowboarding injury hospitalizations.

For snowboard-related falls, an upper limb injury was the diagnosis most responsible for hospitalization in 41% of cases (Figure 2). In particular, fractures of the wrist and forearm were most common. For skiing-related falls, a lower limb injury was the diagnosis most responsible for hospitalization in 58% of cases. For these cases, fractures to the lower leg or ankle were most common.

The 674 cases accounted for more than 2,200 days in an acute care hospital, with an average length of stay of 3.3 days. Some of the longest lengths of hospital stay were observed for injuries caused by striking against or being struck by an object (average of 4.3 acute care hospital days). About 95% of cases were discharged home and 4% were transferred to another inpatient facility (e.g., rehabilitation centre).

Approximately 79% of the skiing and snowboarding injury hospitalizations occurred from January to March.

In Ontario, the age-standardized hospitalization rate for skiing and snowboarding injuries was 6.0 per 100,000 population (Table 2). By region, the highest number of injuries was observed in the Central East region and the highest injury rate was seen in the North. The lowest number of skiing and snowboarding injury hospitalizations was seen in the Central South region and the lowest rate was seen in Toronto.

FIGURE 1. Skiing/snowboarding injury hospitalizations by age (Ontario, 2002/2003)

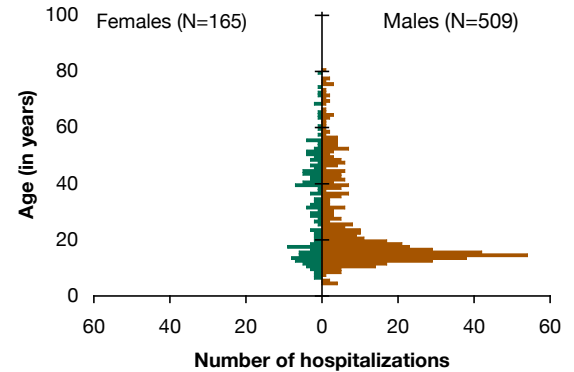
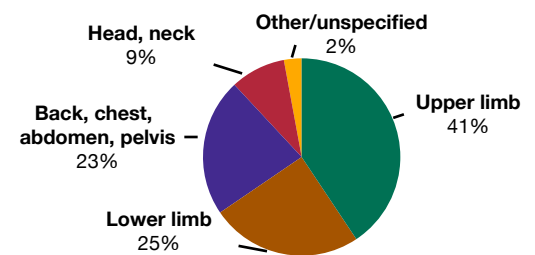


TABLE 1. Type of skiing/snowboarding injury hospitalization (Ontario, 2002/03)

Type of ski/snowboard injury	Number	%
Fall involving snowboard	310	46
Fall involving skis	291	43
Collision with object in skiing/snowboarding	52	8
Collision with person in skiing/snowboarding	21	3
Total	674	100

FIGURE 2 Site of injury by type of skiing/snowboarding hospitalization (Most responsible diagnosis, Ontario, 2002/03)

Fall involving snowboard (N=310)



Fall involving skis (N=291)

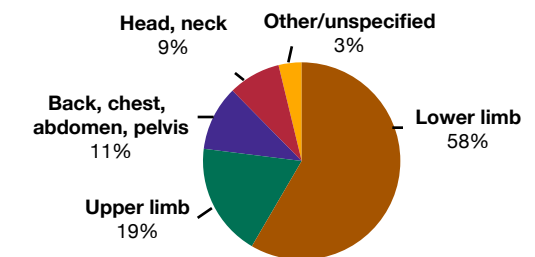


TABLE 2. Regional comparison of skiing/snowboarding injury hospitalizations (Ontario, 2002/03)

	South West	Central South	Central West	Central East	Toronto	East	North	Ontario
Number	61	45	110	159	89	103	92	674
Rate per 100,000 ^a	4.1	4.0	5.3	8.6	3.8	6.8	10.1	6.0
Average age (in years)	24	24	27	28	29	28	23	26
% male	79	84	76	81	62	71	78	76

a. Age-standardized rate per 100,000 population. Note: Region of residence unknown/outside of Ontario for 15 hospitalizations.

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TABLE 3. Regional comparison of skiing/snowboarding injury hospitalizations for select age groups (Ontario, 2002/03)

	South West	Central South	Central West	Central East	Toronto	East	North	Ontario
Rate per 100,000 population^a (Number)								
10-14 years	18.8 (20)	16.5 (13)	21.1 (30)	27.6 (38)	14.4 (20)	26.0 (27)	48.3 (30)	23.6 (182)
15-19 years	13.2 (14)	14.4 (11)	18.2 (25)	25.3 (33)	9.4 (13)	27.0 (27)	43.0 (28)	20.6 (155)
20-29 years	5.5 (11)	4.1 (6)	3.5 (10)	11.1 (25)	2.3 (9)	6.8 (14)	7.9 (9)	5.5 (86)
30-39 years	0.9 (<5)	2.2 (<5)	3.0 (11)	5.4 (17)	3.4 (16)	3.1 (8)	2.2 (<5)	3.3 (64)
40-49 years	3.5 (8)	2.3 (<5)	5.1 (16)	4.9 (15)	4.6 (17)	3.7 (9)	5.1 (7)	4.3 (76)
50-59 years	1.8 (<5)	3.1 (<5)	3.6 (8)	6.7 (14)	1.1 (<5)	5.0 (9)	7.6 (8)	3.9 (50)

a. Age-specific rate per 100,000 population. Note: Region of residence unknown/outside of Ontario for 15 hospitalizations.

Regional variations in injury patterns were observed by age (Table 3). In general, the numbers and rates of skiing and snowboarding injury hospitalizations were highest among the 10-14 and 15-19 year age groups.

Discussion

This Compass highlights patterns of skiing and snowboarding injury hospitalizations in Ontario. Similar patterns of injury have been reported in other analyses conducted in Ontario.¹⁻³

It is important to note that hospitalizations represent only one aspect of the issue. There are many injuries that go unreported or do not result in an overnight hospital stay. The data outlined in this Compass are valuable for presenting general patterns of injury in the province. However, it was not possible to specify the type of skiing (e.g., downhill or cross-country) or describe detailed circumstances surrounding the injury.

Several different factors may increase risks for injury. For example, intrinsic factors, such as age, gender, experience, and past injuries are worth considering.⁴⁻⁶ Also, equipment use such as improper binding adjustment, use of protective equipment, slope characteristics, and training or lessons may play a role.⁴⁻⁶

Different injury patterns are observed for skiers and snowboarders. Upper limb injuries are common in snowboarding. The use of wrist guards as protection from injuries has been examined but further research is required.⁷ For example, Hagel and colleagues found that wrist guards may protect against hand, wrist, and forearm injuries, but may increase the risk for elbow, upper arm, and shoulder injuries.⁷ In contrast, lower limb injuries are common in skiing. Equipment design, proper fit, and binding settings may be factors leading to injury.^{4,6}

References

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Managing the risk

Skiing and snowboarding are popular recreational activities enjoyed by Ontarians of all ages. Here are some tips that can be used to help reduce the risk for injury:

- ❖ Make sure you have all of the necessary equipment. Wear appropriate clothing. Ensure your equipment and protective gear fits properly and is adjusted to suit you.
- ❖ Take lessons to learn proper technique and etiquette on the slopes. Be in control when you are on the slopes and be respectful of others.
- ❖ Remain on slopes that are suited to your skill level and build up gradually to more advanced runs.
- ❖ Stay within the boundaries. Avoid closed runs or going out-of-bounds.
- ❖ Check out the landing area before you attempt a jump.
- ❖ Go skiing or snowboarding with a buddy in case you run into any trouble.
- ❖ Have a good base level of physical conditioning. Know your limits and take a break when you are tired.

For Further Information

SNOWSMART
www.snowsmart.ca
ThinkFirst Foundation of Canada-Injury Prevention Program for Skiers and Snowboarders
www.thinkfirst.ca

SMARTRISK Catalogue of Best Practices
www.smartrisk.ca/ListingSections.aspx?dd=4&sd=207

Published Studies
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Hagel BE, Pless IB, Goulet C, Platt RW, Robitaille Y. Effectiveness of helmets in skiers and snowboarders: case-control and case crossover study. *BMJ* 2005;330:281.

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Macnab AJ, Smith T, Gagnon FA, Macnab M. Effect of helmet wear on the incidence of head/face and cervical spine injuries in young skiers and snowboarders. *Inj Prev* 2002;8:324-7.

Young CC, Niedfeldt MW. Snowboarding injuries. *Am Fam Physician* 1999;59:131-6.

Methods

Hospitalization data included acute care hospitalizations for ski and snowboard injuries in Ontario from the 2002/03 fiscal year. Data were obtained from the Discharge Abstract Database at the Canadian Institute for Health Information (CIHI). Ski and snowboard injuries were classified according to the International Classification of Diseases, 10th revision (ICD-10) using codes W02.01, W02.04, W22.00, and W51.00. There were no in-hospital deaths reported. Regions were defined according to place of residence using the Ontario Ministry of Health Region Codes.