

# Humerus Fracture More Common in Snowboarding Accidents Than Skiing

## Physical Therapy in Wellesley for Skiing

Downhill skiing and snowboarding are popular winter sports in the United States. It's estimated that there are over five million skiers and snowboarders per winter season. Despite the increasing popularity, increased safety awareness has resulted in an overall decrease in injuries over the past 50 years. Latest statistics show that the rate dropped from 7.6 injuries for every 1,000 ski days in the 1950s to 3 injuries per 1,000 days in the 1990s. That being said, arm and shoulder injuries have increased from one in four injuries to one out of every two injuries. So while the rate of injuries to the lower body, not much has changed with the upper body. If we compare snowboarding injuries to skiing, however, injuries of the arm happen twice as often in snowboarding over skiing.

An earlier study, by Dohjima and colleagues, looked at 2,552 snowboard injuries and 5,048 skiing injuries during one winter season. Among the skiers, the *radius* (the forearm bone in the innermost part of the arm) was broken in 48 percent of cases, while the *ulna* (the forearm bone, more towards the outside of the arm) was broken in 7.7 percent of cases. The *clavicle* (collar bone) was broken in 1.4 percent of cases. Among the snowboarders, however, the radius was broken only in 5 percent of the accidents.

The authors of this article wanted to investigate the risk factors associated with fractures of the humerus resulting from snowboarding. Their list of potential risk factors included the gender of the skier/snowboarder, snow conditions, experience in skiing or snowboarding, cause of the accident, age, and the conditions of the day.

Patients who participated in the study were injured while skiing or snowboarding and they had been transported or presented to a base lodge at the bottom of a major ski area since the 1972/73 season (34 seasons total) for skiers and since 1988/89 for snowboarders (18 seasons). In all, there were almost 7 million skiers and over 700,000 snowboarders during this period. In all, among 18,260 snowboard injuries, the researchers identified 327 humerus fractures, 49 snowboarders (2.2 percent of snowboard injuries) (1.8 percent of all injuries). However, although the number of snowboarder humerus fractures was smaller in total, they accounted for more frequently, given the shorter period of time (18 years versus 34 years) and the lower number of snowboarders.

Shoulder dislocations were also common. Among the skiers, there were 640 dislocations over the 34 years and 42 of them were associated with a fractured humerus. Among the snowboarders, there were 56 dislocations over 18 years, but only one was associated with a fractured humerus.

The researchers analyzed the risk factors and found no differences between males and females in either skiing or snowboarding. There was no difference in the risk of a humerus fracture between skiers and snowboarders, although when looking at all injuries, more female skiers than male skiers did get hurt. There wasn't any difference in the risk of a humerus fracture between skiers and snowboarders, although when looking at all injuries, more female skiers than male skiers did get hurt. After the injuries, the patients were asked about the snow conditions, their skiing level (beginner through to expert), how often they skied, whether they were left sided or right sided.

The results showed that more humerus fractures and overall injuries occurred on dry powder/packed powder conditions than in snowboarders. Being a beginner or novice skier did not increase the risk of a broken humerus but the risk of an overall injury was higher. Snowboarders, however, had a higher risk of both a humerus fracture or an overall injury if they were beginners. Age did not affect humerus fracture in either group but it did lower the risk of overall injuries.

When looking at the causes of the accidents, there was a significant difference between skiers and snowboarders. Only 28.3 percent of humerus fractures were caused by jumps in skiers, while 28.3 percent were caused by jumps among snowboarders. The average age of those who had a humerus fracture was 37 years compared with the average age of uninjured skiers at 29.7 years. With snowboarders, it was 31.5 years for those who had a humerus fracture and 24 for those who had no injury.

The researchers looked at what side the humerus fractures were. Among snowboarders, most (71.4 percent) were on the right side, while 28.6 percent were on the left side for skiers. Someone who leads with their left foot is considered to be *regular footed*. Among skiers, 77.8 percent of the humerus fractures were on the left. Wrist injuries, however, were more likely to happen on the right side for skiers and on the left side for snowboarders.

footers.

The study showed that snowboarders had a higher rate of humerus fracture than skiers, almost 50 percent higher. The reason for this is not clear, but it is believed that this may have something to do with the apparatus - a snowboarder is locked into the bindings, while a skier can release their boots from the bindings. By not being able to get out of the bindings, the only way to break your fall is by putting out your arms. Because the force of the fall is transferred through the arms of snowboarders and skiers, the breaks are a bit different as well. Skiers tended to have breaks higher up in the arm, while snowboarders tended to have breaks lower down, near the wrist. As well, the locked in position and the sideways descent of snowboards contributes to the majority of humerus fractures occurring in snowboarders, unlike skiers who are facing forward as they move down the hill.

The authors were surprised at the finding that powder/packed snow contributed to a higher risk of a fracture, considering that most fractures occur in skiers and snowboarders usually occur as the result of falling on a hard surface, such as ice. The age differences weren't as surprising: skiers were older on average when injured and snowboarders younger than average when injured. Although they didn't have data to support this finding, the authors feel that the ages could be due to younger snowboarders being inexperienced and more likely to fall, while older skiers tend to have more experience and strength of the younger skiers.

Ref: Benjamin T. Bissell, MD et al. Epidemiology and Risk Factors of Humerus Fractures Among Skiers and Snowboarders. *Journal of Sports Medicine*. October 2008. Vol. 36. No. 10. Pp. 1879-1888.