

Adventure and Extreme Sports



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KEYWORDS

- Adventure sports • Extreme sports • Adventure travel • Injury • Prevention • Skiing • Surfing

KEY POINTS

- Adventure and extreme sports include a variety of sports in varying environmental conditions, using specialized equipment.
- Injuries in these sports generally involve overuse, trauma, and environmental or microbial exposure.
- Understanding common injury patterns unique to each sport may aid in prevention and diagnosis.

INTRODUCTION

Adventure and extreme sports represent an array of physical activities that differ from traditional sports; they continue to attract a strong following. These sports, such as snowboarding, BASE jumping, and kayaking, involve a variety of unpredictable, often inhospitable environments, variable external conditions, high velocities, stunts, and specialized equipment. The increasing interest and participation in adventure and extreme sports, and the associated injuries, necessitates further understanding by clinicians.

This article aims to consolidate the findings of recent studies to aid clinicians in understanding, preventing, and treating injuries related to common adventure and extreme sports. These include alpine skiing and snowboarding, whitewater paddle sports, surfing, and bungee jumping. Two additional sports, BASE jumping and skateboarding, are also covered although travelers pursue them less often. Most of these activities offer varying degrees of physiologic challenge to the aerobic and

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musculoskeletal systems, potentially reducing the risk of chronic medical conditions. Further research into these sports may offer insight into the relative risks and benefits to the participants' physical health.¹ During participation in these activities, injuries may result from overuse, trauma, or environmental or microbial exposure.²

ALPINE SNOWBOARDING AND SKIING

Overall Epidemiology

The National Ski Areas Association (NSAA) estimates that 44.7 serious injuries (paralysis, serious head injury, or other serious injury) occur among skiers and snowboarders each year.³ Reassuringly, the NSAA commissioned 10-year studies, which started in 1980, and have found that injury rates have declined for both skiing and snowboarding.⁴ The latest publication, with data from 2001 to 2010, indicated overall injury rates at 2.5 incidents/1000 visits for skiing and 6.1 incidents/1000 visits for snowboarding.⁴

Environment

According to the latest NSAA study, injuries to snowboarders more commonly occur on green (beginner) slopes compared with skiers (44.5% vs 40.6%), whereas skiers are commonly injured on blue (intermediate) slopes relative to snowboarders (51.6% vs 48.4%). There was no difference in injuries on black or double black (advanced, [Fig. 1](#)) slopes among skiers versus snowboarders. Most injuries occurred during on-hill activity (88% for skiing and 77% for snowboarding) as opposed to lift-related injuries (4.6% skiing and 4.1% snowboarding) or injuries related to terrain park use (4.9% skiing and 16.7% snowboarding) ([Table 1](#)). An increase in resort size is associated with lower incident rates.⁴

Demographics

Most participants are men and they sustain most injuries. Approximately 30% of participants on the slopes are snowboarders.⁴

Injury

Equipment and body mechanics differ between skiing and snowboarding, giving rise to varying risks and mechanisms of injury.⁵ In general, most injuries in skiing and snowboarding occur as a result of impact with the snow.^{4,6}



Fig. 1. Advanced, off-piste (nongroomed) skiing at Thredbo, New South Wales, Australia. (Courtesy of Robin Johnston (pictured), Whistler, British Columbia, Canada and Thredbo, New South Wales, Australia.)

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