



Use of Strict Spinal Precautions by Ski Patrols: Do They Work?

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ABSTRACT

For decades, hard backboards have been the standard of care for emergency medical personnel and ski patrollers treating known or suspected spinal cord injuries in the field. Recent studies have shown that prolonged immobilization on hard backboards can cause injuries to patients and are no longer recommended unless specific criteria are met. In 2018, the National Ski Patrol implemented guidelines consistent with the Position Statement of the National Association of EMS Physicians and the American College of Surgeons Committee on Trauma. The effectiveness of those guidelines for ski patrollers in the field are quantified in this survey study.

An anonymous survey was sent to 168 ski patrols across the United States. They were asked questions regarding how many backboards they used per season before and after the new guidelines were implemented. The majority of respondents (14 out of 19) reported a decrease of at least 5 backboards used in the season following implementation of the new guidelines. Patrols that conducted more than two backboard-specific trainings per year reported a larger decrease in backboards (6-10 per season) in the season following the new guidelines than patrols that conducted 1-2 yearly trainings (up to 5 per season).

The new guidelines and training from the National Ski Patrol resulted in a decrease in hard backboard use by the majority of surveyed patrols while still allowing ski patrols to utilize potentially life-saving devices when necessary.

OBJECTIVE

Assess the impact of new National Ski Patrol policy guidelines on hard backboard use at ski resorts across the United States.

INTRODUCTION

Skiing and snowboarding are popular yet dangerous winter sports that result in approximately 600,000 injuries annually in North America.¹ Commonly reported injuries at ski areas across the United States include neurological trauma, head injuries, amputation of a limb, or spinal cord injuries.² Injuries caused by skiing and snowboarding are treated on-site by members of the National Ski Patrol (NSP). Severe injuries require rapid assessment by patrollers and immediate transport from inaccessible terrain at the ski area to an ambulance or helicopter in order to reach a medical facility. For decades, the policy of the NSP has been to transport any patient with suspected or confirmed spinal cord injuries to hospitals using backboards and c-collars for spinal immobilization.³ However, the NSP announced in 2018 that it would be changing its criteria for using backboards in response to studies suggesting that immobilization on a backboard for prolonged periods of time can create new injuries.^{3,4}

STUDY DESIGN

An online survey was distributed electronically to 168 ski patrols across the United States using contact information obtained from the National Ski Patrol website. The survey was optional, and participants voluntarily completed the survey between April 2 and April 27, 2021. A total of 19 ski patrols responded to the survey and 19 are represented in the data. Respondents answered questions on the number of backboards used per season before and after the implementation of the new backboard guidelines (specifically for suspected spinal injuries), any feedback received from local emergency medical services (EMS), whether the mountain also has a paid patrol division, frequency of backboard-specific training, as well as confidence of their patrol in utilizing the new spinal protection guidelines.

RESULTS

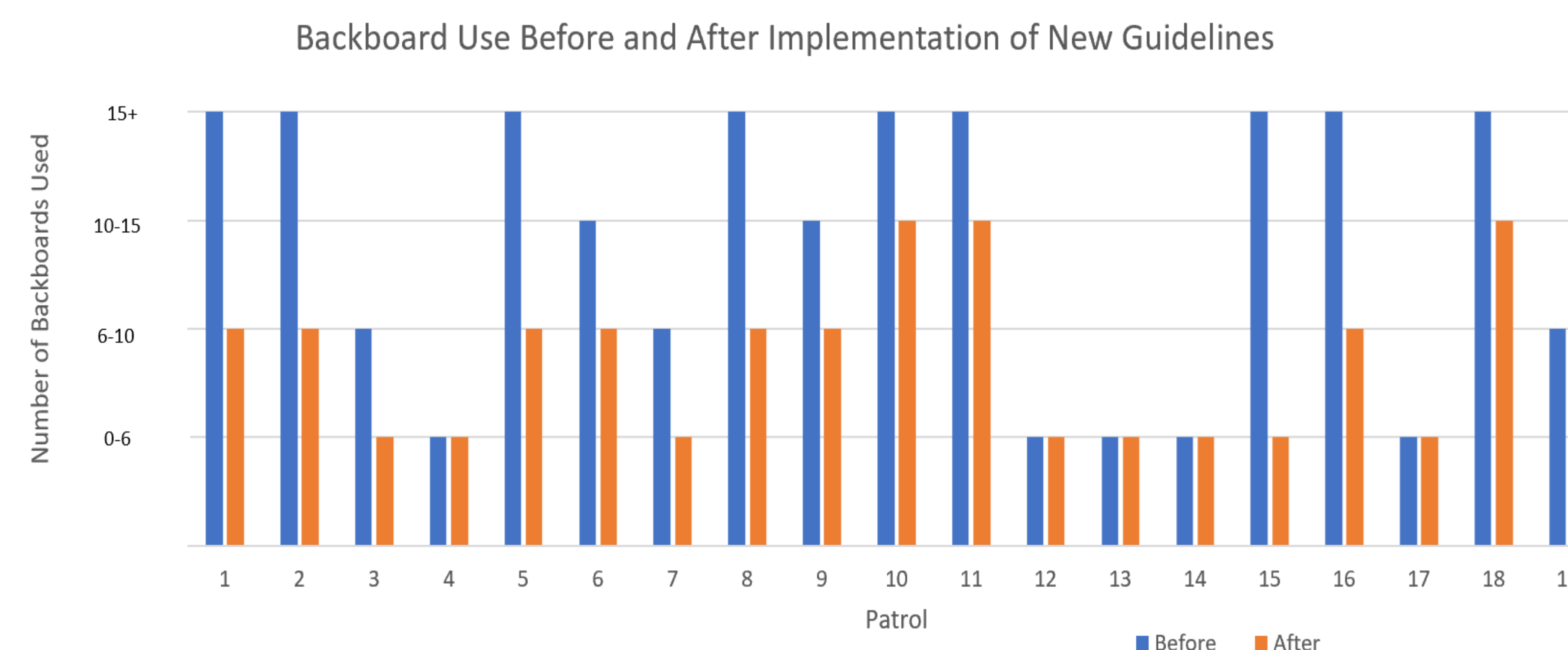


Fig. 1 Graphical representation of each responding patrol's reported average number of backboards used per year before the new guidelines and after the new guidelines.

Reported Confidence in Ability of Each Patrol to Implement New Guidelines

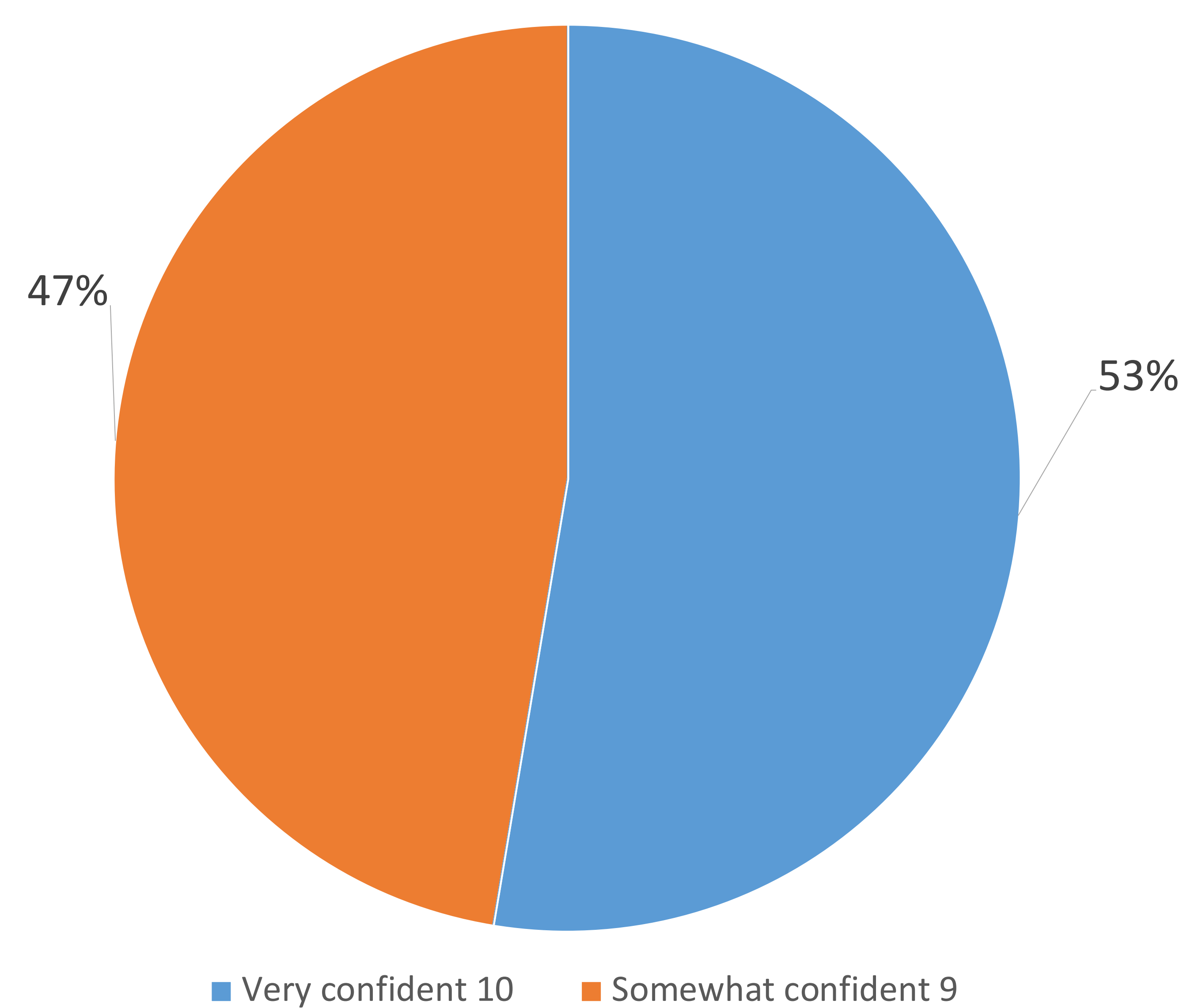


Fig.2 Each respondent's confidence that their patrols can safely implement the new guidelines.

DISCUSSION

- 73.6% (14/19) of ski patrols reported a decrease of at least 5 backboards used in the year following the implementation of strict spinal precautions.
- Paid patrol:** 78.9% (15/19) patrols reported having a paid division. The average reduction in backboards in both patrols that have a paid division and those that do not was approximately 5 backboards per year, with no statistically significant difference between the two groups.
- Size of resort:** The average number of backboards used each year decreased by approximately 5 backboards across all resorts regardless of size. The size of each resort was quantified by asking how many lifts operate at each location. Small resorts were determined to be 0-5 lifts, medium was 5-10, and large was 10 or more.
- Number of yearly backboard-specific trainings:** Patrols that conducted 1 and 2 trainings per year saw an average decrease of 5 backboards used per year while patrols that conducted 3 yearly trainings saw a decrease of 6-10 backboards used per year.
- Feedback from EMS:** Each patrol was asked if they received feedback from EMS personnel regarding backboard use when transferring patients. 36.8% (7/19) respondents answered that they received feedback. Of those respondents, 100% described positive feedback and affirmation that they were using backboards effectively and appropriately for transferring patients from the mountain to the hospital.
- Confidence in applying the new guidelines:** Each patrol was asked to rate their confidence that all their patrollers can effectively implement the new backboard guidelines. 53% (10/19) reported that they were "very confident" and 47% (9/19) reported they were "somewhat confident". No respondents reported that they were "not very confident".

This study was limited by multiple factors; patrols were asked to approximate their results for purposes of anonymity and a lack of standardized record keeping between patrols. A larger sample size would increase the power of this study. Directions for future research include investigating how to improve the quality of backboard training, use of backboards amongst different patient age groups, and comparing the effectiveness of hard backboards to alternatives such as inflatable immobilization devices.

CONCLUSION

Backboards and strict spinal precautions remain a crucial tool for ski patrollers to safely transport and treat patients. As training methods evolve and more research is conducted, the use of hard backboards for spinal injuries will decrease overall but should continue to be an available option if the situation requires it. This study demonstrates that improving guidelines for which patients are placed on backboards can help minimize unnecessary backboard use while still allowing ski patrols to utilize potentially life-saving devices.

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