

BRIEF REPORT

# Utah Ski Patrol: Assessing Training Types and Resources

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**Background.**—Skiers and snowboarders incur a variety of injuries and medical emergencies each year at ski resorts. The ski patrol is primarily responsible for initial triage, assessment and stabilization of these problems.

**Objective.**—The purpose of this study was to subjectively evaluate the type of training, resources, and equipment available to local ski patrols within Utah.

**Methods.**—Ski patrol directors at ski resorts in Utah were asked to complete a voluntary computerized survey.

**Results.**—Of the 14 ski areas in Utah, ski patrol directors representing 8 resorts responded. The majority of patrols in Utah use Outdoor Emergency Care (OEC) as their primary education and certification source. Most programs also include site-specific training in addition to basic certification. All responding resorts had basic first responder equipment, including splinting devices, basic airway management, and hemorrhage control. Six of 8 responding resorts had affiliated clinics, and all had access to aeromedical transport. All of the responding ski patrol directors believed the current training level was adequate.

**Conclusions.**—Utah area ski patrollers frequently see trauma-related injuries and have the resources to assess and provide initial immobilization techniques. Many resorts have affiliated clinics with advanced providers, and all have access to aeromedical support to rapidly transfer patients to trauma centers. Medical directors may be of use for training as well as developing extended scope of practice protocols for advanced airway use or medication administration. Patrols may benefit from additional resort-specific training that addresses other frequently seen injuries or illnesses.

*Key words:* skiing, snowboarding, ski patrol, Utah ski patrols, Outdoor Emergency Care, OEC, ski patrol training

## Introduction

Skiers and snowboarders sustain a variety of traumatic and medical emergencies each year at ski resorts.<sup>1–4</sup> Ski patrollers have a difficult job. They must evaluate patients who are heavily clothed in often cold and harsh environmental conditions. The decisions they make in these difficult situations can significantly affect the patient's outcome. Prior studies have found discrepancies and issues with proper training. Welch et al<sup>5</sup> found an industry standard for wilderness first aid training does not yet exist and may contribute to some ski patrols being inadequately prepared for the injuries they encounter on the mountain. Kupper et al<sup>6</sup> found that inadequate training resulted in the incorrect diagnosis in more than 10% of injuries treated by ski patrols. McCowen et al<sup>7</sup> found that

ski patrollers often erred in the triage of adolescent and pediatric patients. When comparing injury patterns of ground vs air transport, they found that patients transported by air were more likely to have multiple injuries and also were more likely to be discharged home from the emergency department. They suggested that an “out-of hospital rule set” would be helpful in assisting first responders to identify patients who require advanced interventions and rapid transport provided by aeromedical transport. Despite these other findings, Usatch et al<sup>8</sup> found that ski patrollers are receptive to training and able to retain knowledge from one ski season to the next.

The Outdoor Emergency Care (OEC) curriculum was developed by the National Ski Patrol in the 1980s. The curriculum is based on the US Department of Transportation's emergency medical technician (EMT) skills necessary for the nonurban environment.<sup>9</sup> The OEC curriculum includes skills related to the outdoor environment as well as to illnesses and injuries

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associated with outdoor activities. Additionally, OEC includes training on packaging and transporting patients on snow, typically in toboggans. As a result, it has become the primary curriculum for the majority of ski patrols across the United States.<sup>9</sup> (Specifics of the OEC curriculum can be found at [www.nsp.org](http://www.nsp.org).)

There are other certifications in both prehospital emergency care and wilderness care. In the prehospital emergency care arena, there are the US Department of Transportation's emergency medical responder (EMR) and emergency medical technician (EMT) certifications. There is also a wilderness first responder course that is offered by a variety of wilderness education groups. An EMR is a certification designed to give trained persons the ability to provide simple, noninvasive interventions for sick or injured persons in the prehospital setting while awaiting additional EMS resources; the EMT training skills are focused on the management and transportation of these patients. The EMT training includes all skills of the EMR with additional skills to "minimize secondary injury and provide comfort to the patient and family while transporting the patient."<sup>10</sup> The major difference between these training levels is the ability to provide medical transportation and to assist with or administer oxygen, aspirin, nitroglycerin, and in some cases, albuterol. The wilderness first responder certification is used by outdoor educators, guides, and search and rescue teams. It teaches the basic principles and skills required to assess and manage medical problems in extreme environments. It is a first responder certification similar to an EMR with a slightly different curriculum.

Understandably, ski patrollers are faced with significant challenges. They are evaluating fully clothed patients and are unable to expose them because of environmental conditions. However, the decisions they make on the ski slopes immediately after an injury can make a significant difference in the treatment and transport time to definitive care. The purpose of this study is to understand the types of ski patrol training in Utah, as well as the available resources on the various mountains and the injuries commonly seen at ski resorts, by surveying the directors of the 14 ski patrols in Utah. The information collected in these surveys was used to compare current training, medical direction, and equipment across various patrols in Utah and to determine whether the ski patrols would benefit from establishing an industry standard.

## Methods

The 14 ski areas in Utah included in this study were identified using the Utah Ski and Snowboard Association website.<sup>11</sup> All ski patrol director contact information was obtained through a combination of information on ski resort websites, author contacts with ski patrols, and phone calls

to ski patrol offices and clinics. Each ski patrol director was contacted through e-mail with an initial invitation to take the survey, and then 2 further follow-up invitations by e-mail. The patrol directors responded voluntarily. Of the 14 ski area survey invitations, 11 surveys were filled out from 8 ski areas; 2 resorts had more than one person who responded. When applicable, numbers were averaged for each resort that had multiple responses.

Questions asked in the survey included patrol size, overall number of incidents, patrol make up (ie, volunteer vs professional), level of provider (OEC, EMT, registered nurse, physician assistant/advanced practice registered nurse, physician), available supplies (splints, advanced airway, medications), and proximity to onsite clinic, hospital, and air medical support. See the online [Supplementary Appendix](#) for survey sample.

The survey was administered using a computerized survey (SurveyMonkey.com, Palo Alto, CA). Results were collected and analyzed on an Excel spreadsheet (Microsoft, Redmond, WA). We used descriptive statistics in our analysis. The study was exempt from Institutional Review Board approval (45 CFR 46.101[b], Category 2).

## Results

Of the 14 ski areas in Utah, 8 responded. Of these 8 areas, 1 was not a member of the National Ski Patrol. A list of the Utah ski areas and demographic data for the areas is given in Table 1.<sup>11</sup> The survey is included in the online [Supplementary Appendix](#).

### DESCRIPTIVE STATISTICS

The mean number of paid full-time patrollers per area was 36, with a range of 6 to 85. The mean number of paid part-time patrollers on staff was 15, with a range of 5 to 40. Five resorts reported having volunteer patrollers; the mean number of volunteer patrollers was 50, with a range of 3 to 100.

### TRAINING

The minimum level of training for hire required at all 8 areas was OEC. One resort also encouraged all paid patrollers to possess EMT certification. Seven of these 8 resorts had their own training in addition to either OEC or EMT. The specifics of this additional training were not supplied by the respondents. In addition to OEC, many resorts have patrollers with advanced levels of training. The level of training of the patrollers is presented in [Figure 1](#).

### PHYSICIAN ROLE

Five of the 8 resorts had either paid or volunteer physicians as active patrollers. Six of the resorts had a

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