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Preparation as Prevention – Reducing Morbidity and Mortality in the Vermont Outdoors

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Preparation as Prevention – Reducing Morbidity and Mortality in the Vermont Outdoors

Nathan Dreyfus, MD Candidate, Class of 2020

February-March 2019

Mentor: Benjamin Clements, MD



The University of Vermont
LARNER COLLEGE OF MEDICINE

- Recreational use of natural areas has long been popular among Vermont residents and visitors alike
- Pursuits include hiking, cycling, climbing, camping, skiing, aquatic and motorized vehicle recreation
- Vermont is a regional and national destination for mountainbiking, skiing, and hiking (Appalachian Trail)
- Each year, a small number of people suffer injury or death in wilderness settings, requiring subsequent rescue or recovery by Search and Rescue (SAR) resources
- While there is always a degree of unpreventable risk associated with outdoor pursuits, some incidents each year result from preventable causes – efforts to address these preventable causes are warranted

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- **While precipitants and outcomes of wilderness medical emergencies are numerous and diverse, wilderness rescues are most often called for individuals or groups inadequately prepared for conditions or contingencies. In many cases, failure to bring one of a few key items such as equipment for navigation or illumination after dark can create a preventable emergency with subsequent requirement for rescue or retrieval**



Costs and Considerations



- Wilderness emergency services in Vermont are largely volunteer-based, but State Police and municipal rescue agencies may also lead or assist in SAR responses
- In 2016, there were 111 calls in Vermont for SAR response to wilderness emergencies¹
- In addition to morbidity and mortality of the individuals or groups requiring rescue, every response exposes SAR team members to risk as well
- Public health costs are difficult to estimate, as there is no publicly accessible database in Vermont that compiles information on wilderness emergencies



Community Perspective

Neil Van Dyke - Search and Rescue Coordinator, State of Vermont
-Co-Founder, Stowe Mountain Rescue
-Past president, national Mountain Rescue Association

- Per Neil, many different factors and injuries result in calls for rescue, but a recurring theme is inadequate preparation – individuals and groups are only prepared for a day when everything goes right – i.e., they do not prepare for getting lost or injured or being outside longer than anticipated
- In particular, people often fail to bring a light source (i.e. headlamp), navigation tools (i.e. map and compass, GPS), or adequate clothing layers: variable weather, nightfall, and climbing to higher elevations may all cause rapid changes in conditions which people may not anticipate being exposed to
- While relatively rare, multiple hikers in Vermont have died of hypothermia in recent years within a few miles of a trailhead or road after becoming disoriented without the items mentioned above
- Cell phones may be useful navigational aids, but may also provide a false sense of security as individuals often have no backup plan if their battery runs out

Mike Cannon - Urban Search and Rescue Coordinator, State of Vermont
-Director, Colchester Technical Rescue

- Mike oversees SAR efforts in areas with mixed urban and wilderness portions, but his perspectives on common mistakes were similar to Neil's – while many times emergencies arise among well-prepared groups (there is unpreventable risk), many wilderness emergencies arise from lack of preparation
- In particular, lack of the following items contributed to need for rescue: navigation equipment, light sources, and warm layers/rain protection (closely aligned with Neil's statements on this subject)
- Swimming hazards in natural areas and jumping from heights into water also result in serious injuries and deaths each year in Vermont
- Mike stated that experience has led him to believe that it is possible to modify the behavior of outdoor recreationalists via effective educational initiatives, and that he feels he has observed such effects during his long career in SAR. As examples, he cited past efforts in Vermont related to hazardous swimming areas, and hiker education initiatives enacted in the white mountains of new hampshire
- Educational efforts for safe use of the backcountry should not be limited to public land agencies, but should be adopted as a common goal of the local outdoor community, including retail store, recreational organizations, and individual outdoorspeople

Intervention and Methodology

- The concept of the “Ten Essentials” was developed by outdoor professionals decades ago in an attempt to identify critical items for safe backcountry travel. An early iteration of this list was published in the third edition of *Mountaineering: The Freedom of the Hills* (1974), a seminal text for outdoor recreationalists
- A pamphlet describing the Ten Essentials (modified as needed for Vermont conditions), was created for distribution among local outdoor groups, retail stores, and at recreation sites
- At date of project submission, distribution of pamphlet still in progress



Evaluation of Effectiveness and Limitations

- Given the short time frame of the project, there is no plausible way to have assessed effectiveness of the intervention
- For a longer term project, the number of SAR calls for a number of years before and after the intervention could be compared. The number of hypothermia-related deaths in natural areas (or number of hypothermia patients requiring emergency transport by EMS) could also serve as potential outcome measures.
- Given the relatively small number of total SAR calls (and the confounding effect of gradually increasing numbers of outdoor recreationalists each year), any effect would likely be difficult to observe



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- **Limitation 1:** Any educational material disseminated via pamphlets (regardless of how many points of distribution) will only reach a small fraction of outdoorspeople recreating in a given geographic area
- **Limitation 2:** The intervention in this case is a paper product: despite using recycled paper, it is inherently non-durable, creates waste and therefore unlikely to be widely adopted by the outdoor community
- **Limitation 3:** While many of the items are readily available to potential outdoor recreationalists (i.e. extra clothing layers, extra water) others may be less accessible due to cost or availability (GPS, headlamps)



Future Projects

- Implementing a similar project over a longer time frame and within a more geographically confined area of high backcountry use (i.e., Lamoille County) would offer a more realistic chance of reaching a significant proportion of the area's backcountry users, as well as a better chance of being able to observe any effect over time
- Given the widespread use of cell phone apps designed for activity tracking, trail routefinding, and locating recreation areas, it would represent a more sustainable and potentially more effective strategy to embed educational materials regarding backcountry safety within the normal functionality of phone apps (those willing to partner for such an initiative) – educational materials on adequate gear, for instance, could be prompted by location and be tailored to regional conditions, current season, etc.
- Alternatively, a small, durable, wallet-sized card (similar to the hikesafe card in NH) could represent a more effective and more sustainable strategy than pamphlets for distributing hard copies of material – for example, the 10 essentials on one side, with other useful survival information on the other. Backcountry users would be much more likely to hold onto this type of document as well.



References

- 1. Hallenbeck, T. (2019, March 07). After a Hiker's Death, Vermont Finds Ways to Improve Search and Rescue. Retrieved February 25, 2019, from <https://www.sevendaysvt.com/vermont/after-a-hikers-death-vermont-finds-ways-to-improve-search-and-rescue/Content?oid=8499558>



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Yes /

Name: Neil Van Dyke

Name: Neil Van Dyke

No /

Name: _____

Name: _____

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Yes /

Name: Michael Kavan

Name: Michael Kavan

No /

Name: _____

Name: _____

