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# DEAD MEN HIKING: CASE STUDIES FROM THE AMERICAN WILDERNESS

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Hiking is a popular outdoor sport activity and one of the fastest growing outdoor activities in the United States. Compared to other activities such as mountain climbing and rock climbing, the risks associated with hiking are perceived as minimal. However, as participation has increased, the research literature has started to document an increasing number of hiking related injuries and illnesses. The case reports in this study identify the factors that contribute to the death of four hikers in different regions of the American wilderness. Environmental factors and factors related to acute bad judgment syndrome played a major role in the death of all four hikers. Understanding these factors and overcoming the false perception of hiking risks is key to the future prevention of hiking fatalities.

**Key words:** *hiking, death, fatality, wilderness, behavior*

**Introduction**

Hiking is a popular outdoor sport worldwide [1]. Since the 1940s hiking has been one of the fastest growing outdoor activities in the United States with a reported participation of approximately 30 million hikers [2,3]. Hiking is also considered a form of exercise in many regions of the world that helps maintain a healthy lifestyle [1]. For example, whether hiking long or short distances, hiking is considered a continuous low intensity form of exercise that has positive effects on the cardiovascular and cardiopulmonary systems as well as the active and passive structures of the locomotor system [1,4]. Hiking participants are also thought to benefit psychologically and sociologically from spending time in outdoor environments.

Given the increasing popularity of hiking, the research literature has started to document an increasing number of injuries and illnesses incurred by hiking participants [2,5-7]. For instance, hiking related injuries have been shown to account for 10% of all injuries in high profile destinations such as Yellowstone National Park [8]. Hiking is also associated with 10% of all recreational fatalities and 48% of all search and rescue operations in U.S. National Parks [9-11]. Nonetheless, outside of injuries and illnesses, the formal documentation of hiking related fatalities and the factors contributing to hiking related deaths is scarce [12]. As such, the purpose of this study is to utilize a case study approach to examine the factors contributing to the death of four hikers in four different locations.

**Case Report 1**

A 44-year old male and an adult male hiking partner attempted a day hike to the summit of Cas-

cade Pass in North Cascades National Park (State of Washington). Both hikers were Hawaii-based geologists with considerable experience in Alaska and the southern United States. However, neither hiker was familiar with the Cascade Mountains. Prior to beginning their July hike to Cascade Pass, the men charted a scenic airplane tour over Cascade Pass and the surrounding region.

Following their scenic fly over, the hikers drove to the trailhead and began their hike to Cascade Pass. They arrived at the summit of Cascade Pass at approximately 1800 hours. Prior to the return portion of their hike, the two hikers quarreled over the return route with the 44-year old hiker wanting to change plans and return by going off trail and taking a perceived short cut. In opposition, his hiking companion wanted to follow the established hiking trail for the return portion of the hike. The two hikers eventually separated with each one taking a different return route from the summit area of Cascade Pass. After following the established trail and arriving back at the trailhead, the second hiker waited for his hiking partner. When his partner did not return by nightfall, he slept in their rental vehicle and reported his hiking partner as missing and overdue to park rangers the following morning.

After receiving notification of the missing hiker, park rangers launched a ground and aerial search and rescue operation. Three hours later the body of the missing hiker was located. By following tracks in the snow, park rangers determined that the hiker descended Cascade Pass on a steep unmarked trail that eventually led down a snow finger. The hiker then appeared to go back up the snow slope until the pitch became too steep. He then attempted to descend via another slope that was cov-

ered with stunted mountain hemlock and huckleberry brush. Footing in the area was difficult with the ground partially covered by snow and dense vegetation. The vegetation mat obscured cliffs and other hazards and the hiker eventually stepped out over a series of short cliffs and fell 4.5 meters. The hiker landed on his head and then rolled an additional 9 meters before coming to rest face down over a fallen tree.

The body of the deceased hiker was lowered to an area where it could be recovered by a litter lowered from a helicopter. The search and rescue team noted a zone of contusion and abrasion superior to the right eyebrow measuring 4 x 2 cm, a 7 cm long curvilinear laceration extending from the left temporal region to the outer canthus of the left eye, superficial abrasions scattered on the right side of the chest, and superficial abrasions over both pretibial areas. The hiker was dressed appropriately for a day hike in summer snow conditions. Following an autopsy report, the cause of death was listed as an acute brainstem injury resulting from a basilar skull fracture as a consequence of blunt head trauma. The cost of the search and recovery operation was US \$1,182.00.

### Case Report 2

A 21-year old American male and University of Texas student entered Big Bend National Park, Texas, in January and applied for a backcountry hiking permit. Intending to hike solo, the potential hiker initially asked for a seven-day hiking permit along a difficult hiking route. He was eventually denied this permit due to a lack of hiking experience and an unfamiliarity with the local terrain. Instead, he was issued a pass for the same duration but along a much easier hiking route. When the permit was issued, the park ranger in contact with the hiker noted concern about the mental state of the hiker because he was insistent on a 7-day, six-night hike even though he was not exactly sure where he wanted to go. In addition, his hiking and camping gear were in poor condition. When questioned further about his ability and experience, the hiker reported he was a Physics major with high honors and that he had just passed the physical examination for the U.S. Marine Corps flight training program. He did not describe any prior experience.

Three days into the hiker's schedule a major snowstorm struck the Big Bend National Park area. The storm had been predicted only on the morning that it arrived and by 1400 hours the temperature had fallen to -7°C. By 2000 hours 35 cm of snow had fallen in the area. Based on the suddenness of the storm's arrival, it was decided that a ground search should be conducted in order to contact those persons known to be hiking in backcountry wilderness areas. The following day all backcountry wilderness hikers were found and escorted to safety with the exception of the 21-year old solo hiker.

The second day after the storm a massive ground and air search utilizing fixed-wing aircraft, helicopters, K-9 search and rescue dogs, and several teams of ground personnel was launched in an attempt to find the missing hiker. However, no signs of the missing hiker were found until five days later when a ground search team discovered human footprints on the surface of a sandy ground cover. These footprints eventually led to the body of the missing hiker. When found, a strong odor of decay was present 9 m away from the body which was situated 2 m under a rock overhang and lying in a semi-fetal position on its right side. There was no indication of any injury sustained by the victim but his face showed a strong indication of post-mortem lividity on the right side of the face. The thoracic portion of the body was rigid, either from being frozen or due to rigor mortis. The victim was wearing only a flannel shirt, blue jeans, and light hiking boots. A round metal canteen was still strapped to the victim's body and a hunting knife was still attached to his belt. There was no indication the victim had made any attempt to construct a shelter or build a fire. A later search of the victim's tent found a light tan jacket, a wind breaker, a thin cotton liner, a sleeping bag and backpack, a bag of pinto beans, canned food, and a pair of tennis shoes. The final cause of death was listed as death from natural causes as a result of environmental exposure. The total cost of the search and recovery operation was US \$67, 299.00.

### Case Report 3

A 51-year old male from Switzerland, his wife, and another female hiking companion approached a park ranger at the Needles District Visitor Center in Utah's Canyonlands National Park and inquired about trail conditions. The 51-year old male was a visiting professor at Brigham Young University and together the group had already spent several days hiking in the park. The temperature outside the visitor center was -1°C and there was approximately 10 cm of snow on the ground with 1.5 cm of new snow from the previous night. As of 0800 hours that morning there was no wind and the sky was clear and sunny. The park ranger spent 15 minutes discussing trail conditions with the hiking party and specifically warned them about hazardous trail conditions due to ice and snow. A major concern was the icy slickrock conditions on sections of trails with a northern exposure. The male hiker informed the park ranger that all three hikers in the party were wearing good hiking boots. The park ranger re-stated his concerns about the trail conditions prior to the hiking party departing for their hike.

After leaving the visitor center, the hikers set out toward an area known as Lost Canyon. At the trailhead the group passed a winter hiking advisory sign and continued down the trail. A short time later the group

encountered icy trail conditions and backtracked into a location known as Squaw Canyon with the intent of crossing over into Big Spring Canyon. However, they again encountered extremely icy conditions and stopped to discuss returning to the trailhead via the route they had followed from the visitor center. At that point the male hiker in the group stepped off trail to scout the surrounding area and slipped on a snow covered section of sliprock. Unable to arrest his downward slide, the hiker fell 14 meters before hitting a snow covered ledge. He then fell another 5 meters before coming to rest on more slickrock below.

The body of the hiker was found lying at the base of the rock in a semi-supine posture. His vital signs were checked for five minutes with no pulse or respiration present. The body was twisted to the right at the waist and the head was twisted medially to the right and was partially supported by the victim's daypack. The victim's eyes were open and his pupils were dull, fixed, and dilated. His skin color was grey and cold to the touch. There was no capillary refill at the nail beds or lips. In addition, the victim had severe lacerations evident on the forehead, across the top of his skull, and at the lower parietal/occipital base of the skull accompanied by blood loss. The final cause of death was reported as multiple blunt force injuries of the head and pelvis. The body was extracted by a litter carry out.

#### Case Report 4

Two German nationals arrived at Olympic National Park (State of Washington) with the intent to make several coastal and inland hikes. On their second day in the park, the men began a hike from the Soleduck Falls area to the Hoh Rangers Station. Prior to beginning their day hike the two men visited with rangers at the park information center and were told that their planned hike was not advisable due to current winter conditions. The hiking route selected by the men climbs 914 m in altitude over an 11 km distance before crossing over the High Divide Range. This is considered a difficult route even in summer conditions when the trail is clear and free of snow. During winter conditions it is considered an extremely technical route that is complicated with severe weather and avalanche conditions.

Ignoring the advice of park rangers, the two men began the 37 km hike over the difficult winter trail. Both men were modestly dressed in light weight clothing and were ill-equipped for the hike. After four hours and only completing 8 km, the first man in the group decided to return to their rental vehicle at the trailhead. The second male, later described as highly competitive, asked his hiking partner to pick him up at the end of the trail that evening. When he was last seen, the weather was clear and he was walking on snow without breaking through the crust. He was

reportedly wearing blue jeans, a sweater, a light jacket, hiking boots, two pairs of wool socks and his glasses. He was also carrying a day pack with a camera and tripod, a 3.7 liter jug of water, bananas, paper matches, two fire sticks, and non-topographic park maps.

The first hiker returned to their vehicle, drove to the other end of the trail at the Hoh Ranger Station, and waited for the second hiker to arrive. However, when the second hiker did not arrive by the following morning, the first hiker reported him as overdue to park rangers. The rangers immediately organized a search team consisting of 8 overhead personnel directing 43 searchers on the ground, 5 search and rescue dog handlers, and an aerial team consisting of several helicopters. Following a six day search in which the search and rescue teams encountered snow, rain, cloudy conditions, and winds gusting to speeds of 67 km, the decision to demobilize the search and rescue operation was made. A major factor in this decision was the high risk the operation posed to the search and rescue team members. However, two subsequent searches were conducted over six day periods the following May and June when winter conditions had ended and the snow melt was complete. When no body or any sign of the missing hiker was found, the local Prosecutors office issued a presumptive certificate of death.

#### Discussion

The examination of each case report identifies key factors that contribute to hiking fatalities. For example, environmental factors such as weather and human factors such as inexperience, a general unfamiliarity with the area, a lack of preparedness, and unsafe behavior were all identified as contributing factors in at least one case report. In the wilderness medicine and the wilderness activity literature, unsafe behaviors are often discussed as a clinical condition known as "acute bad judgment syndrome" [13]. The first of the two primary causes of acute bad judgment syndrome is when the involved party has a lack of situational awareness and does not truly understand the conditions or parameters of the circumstances of a decision [13]. As a result, the victims rarely realize their errors in perception until it is too late [13]. The victim in Case Report 1 displayed this condition when he made the decision to leave his hiking partner and hike off trail in winter conditions and in an area he was unfamiliar with because he perceived it to be a shorter route. In addition, despite being a geologist, he did not realize the challenges of hiking off trail in winter conditions where groundcover from snow and vegetation can mask cliff edges and unstable terrain.

The second primary cause of acute bad judgment syndrome is tied to the overestimation of abilities by an individual or a group. In this type of situation hikers may consider themselves capable of hiking a substan-

tial number of miles over a short time duration when in reality they cannot. Or, as a second example, a hiker may ignore the voice of reason and then fail to match their own ability with the degree of difficulty of the task they are taking on [13]. These elements were present in the victims involved in Case Report 3 and Case Report 4. Although only presumed dead, the victim in Case Report 4 ignored the advice of park rangers and specialists and continued on with a hike that was not advisable. He then continued hiking solo when he was ill-prepared and incapable of completing the remaining 29 km hike in a reasonable amount of time. In contrast, the victim in Case Report 3 ignored the advice of rangers and a warning sign at the trailhead about slippery trail conditions. In fact, from his reply to the rangers about wearing good hiking boots, the victim clearly felt that his hiking equipment would compensate for the degree of difficulty presented by the icy slickrock conditions.

One of the unfortunate characteristics associated with acute bad judgment syndrome is that it can occur in people who are intelligent and experienced as much as those who are less experienced. For instance, the victim in Case Report 2 is a prime example of this situation. The victim in this report was an academically achieved physics major with high honors and had just passed a demanding physical exam for entrance into the U.S. Marine Corps military flight training program. Nonetheless, the victim was unable to look beyond his own goals in choosing to hike solo for several days in an environment he was not familiar with and an environment he was not prepared to deal with. Late afternoon thunderstorms and sudden winter storms are common in the Big Bend region of Texas during winter yet the unfortunate victim was wearing only minimal clothing at the time of his death when there was adequate clothing and shelter back at his tent that could have helped him survive the storm.

Understanding the factors that contribute to hiking fatalities is the first step in developing preventive strategies. Second, a major challenge in getting hikers to acknowledge these factors is that the risks associated with hiking are perceived as minimal when compared to other outdoor sport activities such as mountain climbing and rock climbing. This false perception of hiking as a more accessible and less challenging activity continues to exist despite the fact that new and existing research is describing hiking as a high incident activity [2, 14-19]. All of the factors contributing to the death of the individuals in each case report are easily preventable but until the misperceptions that lead to the development of acute bad judgment syndrome are corrected, it is likely that the number of hiking fatalities will only increase.

## Declaration of interest

The authors report no conflicts of interest.

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## Authors' contribution

A – Study Design

B – Data Collection

C – Statistical Analysis

D – Data Interpretation

E – Manuscript Preparation

F – Literature Search

G – Funds Collection