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Emergency and Rescue Response

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Outdoor leaders deal with complex situations in the field (Carden, 2017) and must also possess a vast array of skills and competencies to lead safe experiences (Williams-Orser 2021, Asfeldt, 2021). Outdoor learning (OL) programs often attempt to create experiences for people to overcome physical and mental challenges while living and traveling in natural and wild spaces without everyday conveniences. (Purc-Stephenson et al., 2019).

If a remote field emergency arises, our access to necessary resources can be a challenge despite recent technological advances or seemingly improved access to remote regions when compared to urban areas (Curran et al, 2018). Especially in the vast Canadian wilderness we may find ourselves far from Emergency Medical Services (EMS), however we can gain confidence with our response efforts with solid training, a foundation of risk management knowledge and knowing what tools to access in remote locations (D'Angelo, 2021). In this chapter we take a glimpse at the complexities of pre-trip response

preparedness and the various ways and means of pulling from jurisdictional emergency resources from the Canadian backcountry.

A Foundation of First Aid Standards and Training

Interpreting governmental regulations for first aid training is a challenge for practitioners in the OL sector. The Canadian Centre for Occupational Health and Safety states the minimum level of first aid training within Bill C-45 (Westray Bill) under the amended criminal code establishes legal requirements for workplace health and safety and the duty that organizations have to keep their workers safe (CCOHS, n.d.). The law asserts minimum first aid training standards for various environments and emergency response times. With respect to remoteness or wilderness first aid (WFA) training, we assume that rescue resources are limited in the field and we may find ourselves hours away from emergency medical service (EMS).

The training required for OL is multi-faceted, including but not limited to training in first aid, emergency response, risk management, navigation, leadership, facilitation, and activity specific technical skills (Priest & Gass, 2018). It is generally agreed within the OL community that first aid training is a core competency (Ritchie et al., 2014) when working in remote locations; yet WFA training should be a target competency, one that is essential for outdoor leaders to possess in the backcountry. The first aid training marketplace is highly available to leaders throughout the country but it takes a high level of individual commitment and time to get trained to appropriate levels. Several levels of WFA training are available through certifying organizations in Canada.

- The 16-hour standard level WFA training is geared towards the outdoor enthusiast who intends to go on short adventures (Wilderness Medical Associates, n.d.).
- The 40-hour Advanced Wilderness First Aid/Wilderness Advanced First Aid (AWFA/WAFA) training option is for outdoor professionals in wilderness areas targeting the special needs in remote areas reaching beyond typical emergency medical services (Siriusmedx, n.d.).
- The 80-hour Wilderness First Responder (WFR) course is aimed at leaders in remote areas including outdoor educators, guides, military, professional search and rescue teams, researchers, and those involved in disaster relief (Canadian Red Cross, n.d.).

From these foundational WFA programs, one could progress through to higher levels of professional training such as Wilderness Emergency Medical Responder/Technician (WEMR or WEMT) that aligns with the Paramedic Association of Canada (n.d.) competencies. However, these likely exceed minimum standards set out for the OL sector.

Many professional outdoor organizations have attempted to create first aid policies which have yet to be fully aligned across their respective sectors. The Alberta Camping Association

(2012) accreditation standards stand with a 40 hour wilderness first aid training for trip leaders in remote locations. The Ontario Camp Association (2023) standards go a bit further and define first aid attendants as unregulated care providers and further mandate first aid qualifications for backcountry trips. This accreditation for Ontario camps has a mandatory 16-hour wilderness first aid training for the trip leader (section 5.5-5.6), and standard first aid and CPR for assistant leaders (section 5.7-5.8). These standards go on to “highly recommend” 40- or 80-hour wilderness first aid training for at least one leader to have if the duration or context of the trip warrants it (p. 129).

Paddle Canada (2023), the largest supporter of the recreational paddling community in Canada, mandates their instructors to have wilderness first aid and CPR (16-hour) training as a minimum whenever they are teaching in a location where it will take more than one hour to reach medical care. The Association of Canadian Mountain Guides (n.d.) first aid requirement for Mountain Guide and Hiking Guide Programs is an Advanced Wilderness First Aid course with a minimum of 80-hours or an Occupational First Aid Level 3. Individual organizations seem to initiate their own policies for first aid personnel which hopefully align or at least match with federally mandated first aid training.

A Systems Approach to Risk Management

Applying a systems-based approach to pre-trip planning sets a solid stage for safe OL programming. Instead of reacting as a crisis unfolds, outdoor leaders and their associated organizations may incorporate crisis management systems into their pre-trip planning process so that any and all unexpected events may be adequately dealt with (Jackson & Heshka, 2021; Jackson et al., 2021; Salmon et al., 2017). North American researchers have suggested various approaches to managing risks for consideration by the OL sector, however, it remains for individuals or organizations to adopt their own sector specific application of risk management with a focus on rescue, emergency or crisis management planning.

Models such as the Adventure Risk Exposure and the Adventure-REACT models (Brown, 1999) are suggested for specific application in whitewater rafting. Howard's (2009) case study hopes that owners [of rafting businesses] "opt in" to incorporate industry standards for risk mitigation. An industry-educational analysis from Harper (2005) produced five key elements for curriculum design of outdoor adventure risk management for application in the post secondary sector predominantly reflecting industry and institutional needs for risk management in western Canada. Jackson and Heshka's (2021) book, *Managing Risk-Systems Planning for Outdoor Adventure Programs*, can be specifically used by Canadian outdoor programmers. These system approaches to emergency planning can help us to avoid serious incidents (also to maximize our learning and enjoyment of the trip) and guide us to leverage the important safety resources at our disposal in case of calamity. Taking an active approach to integrating risk management systems and striving to reduce serious incidents should remain a key strategy for the OL sector across Canada.

Industry Partner Rescue Resources

Canadian industry organizations have developed publicly accessible tools, and resources for use in emergency planning, preparedness, and implementation. An example is the AdventureSmart program, in partnership through federal government, provides various planning tools for outdoor pursuits, such as paddling, outdoor survival, and snow sports. It is "a program designed to reduce the frequency and severity of Search and Rescue incidents" (Adventuresmart, n.d.). Backcountry skiers, ice climbers and snowmobilers have access to avalanche awareness and preparation resources through Avalanche Canada (Avalanche Canada, n.d.). The Avaluator tools are designed to be used in two stages: planning the trip at home and making decisions during the trip. The Association of Canadian Mountain Guides has several online resources available to its members, such as gear reviews and checklists, technical publications and even real-time mountain conditions reports. All are designed to assist outdoor recreationalist to make reasonable

and informed decisions in the field. White water enthusiasts are not left out of the mix and access online resources through their host organizations, such as Whitewater Ontario (2018), and Alberta Whitewater (2021). These organizations provide paddlers with emergency action plan templates and visual maps of local conditions on stretches of river or rapids, thus maximizing white water enthusiast's fun and enjoyment, but concurrently helping them to avoid paddling in perilous areas.

Responding to an Emergency

When a wilderness emergency arises time is of the essence. Certain environments demand immediate action, such as lost people, avalanches (AvySavvy, 2023) or when someone is submerged in a rapid due to foot entrapment. This list can be exhaustive. Positive outcomes demand that rescue personnel should be trained, practiced, and provisioned in order to understand the key steps for responding to an incident.

The critical steps, according to the Ontario Search and Rescue Volunteer Association (2012), in any emergency action plan starts with having a leader capable of organizing effective rescue efforts. Before departing for a trip the designation of a suitable and trained leader, and properly provisioning the trip, will help to create effective outcomes, when a stressful incident arises. Thankfully, some common steps exist that leaders may take when dealing with an incident. However, caution in explicitly following these steps must be considered, due to the dynamic nature of how they unfold in a highly complex outdoor environment.

Immediately following an incident the leader, often with the assistance of group members, will survey the scene and ensure safety for themselves and their group; concurrently the immediate rescue personnel may be established. A further analysis of the surroundings ensues and designating critical zones (for operations, searches or barriers) in the area of concern are set up to prevent others from entering into a hazardous area. The American Canoe Association (2020, pg 3) suggests a two phased approach to rescues.

- Phase 1 - S.T.O.P: Stop, Think, Observe, and Plan.
- Phase 2 - L.A.S.T: Locate, Access / Assess, Stabilize, and Transport.

Gaining access to the victim(s) is imperative for prevention of further injury or at worst case dealing with a fatality. Brookes, a leading Australian researcher on fatalities and fatality prevention, suggests that “calls for outside assistance may be delayed due to ‘risk management’ however fatality prevention requires that early recognition and dispatch of outside rescuers be done as soon as possible” (Brookes, 2003, pg. 41). Leaders should be trained in the roll-out of emergency management plans, but also be prepared to call for outside resources to assist with any serious incident.

Jurisdictional Rescue Resources

When field capabilities are exceeded, as an incident unwinds, consider pulling in outside rescue resources. Canadian rescue resources are within reach through multiple jurisdictions. The National Search and Rescue Program (NSP) integrates organizations and resources to provide search and rescue (SAR) services to Canadians (Public Safety Canada, 2021). Canada’s SAR collaborative approach is built around a framework for minimizing the risk of injury or loss of life and providing an effective service across the nation.

The framework is supported by government at all levels, first responders, and a trained network of SAR volunteers to provide a comprehensive safety net for Canadians (Public Safety Canada, 2021)

The aggregate of the NSP partners field about 15,000 calls to action per year (Quadrennial, 2013) and it has a national reach for assisting approximately 25,000 people. The Canadian Armed Forces (CAF) alone responds to about 1,000 airborne SAR missions each year. The NSP integrates operations between the Canadian Coast Guard for marine missions, and among the RCMP or territorial and provincial police forces for land and inland waterway instances. These

are commonly known as Ground Search and Rescue (GSAR). Because of Canada’s vast land base it may be warranted that one of three major Joint Rescue Coordination Centres (JRCC) will be utilized. An average of 9,000 annual responses are reported through the JRCCs in Halifax, Trenton, and Victoria. However municipalities (i.e. major urban centres) may have jurisdiction over SAR operations, if an incident occurs within these specific regions. Volunteer resources may be brought in to support the search and rescue operations at any level. Established volunteer organizations are available across Canada through the Search And Rescue Volunteer Association of Canada (SARVAC, 2017) and the Civil Air Search and Rescue Association (CASARA, 2023) which provide 24/7 support services during SAR operations. Canadian Rangers from the Canadian Armed Forces are specifically utilized in sparsely populated or remote northern SAR areas.

Access to remote areas for SAR operations is often decided based on the severity of the situation, remoteness and availability of resources through the multi-jurisdictional approach. Following an incident, field calls for help are routed to emergency services (ex. 9-1-1). The call is then conveyed to the proper SAR partner for investigation and response. Further assessments of the subject’s location, the situation’s conditions, and resources’ availabilities are conducted and a decision is made to launch a response, where local resources are allocated through the host jurisdiction.

Partner organizations will organize the appropriate level of resources applied to the incident. An air ambulance or police helicopter may fly into more remote areas, a regional police force snowmobile may be utilized on local logging roads or bush trails, or specialized equipment may be used when terrain and conditions become too arduous for access with regularly deployed equipment. As seen in April, 2018 a major SAR operation ensued (with positive results) in an area north of Sudbury, Ontario. The equipment used for access to this complex scene was a large 4-wheeled vehicle specifically designed to navigate harsh conditions such as swamps, snow

and mud (The Manitoulin Expositor, 2018). If resources are stretched or unavailable in a jurisdiction then the responsible partner can tap into further available resource partners to complete a rescue operation.

Enter the Electronic Age

Outdoor leaders have several cutting-edge options for contacting outside rescue resources. Personal electronic locating devices, satellite phones/communicators and cellular phones have diversified and arguably improved in recent years (CRTC, 2020). This section will discuss some current options and lay out the typical functionality of common (and lesser known) devices being used in OL programming.

Personal Locator Beacons (PLB), Electronic Locator Transmitters (ELT) and Emergency Position Indicating Radio Beacons (EPIRB) are used for specific environments and situations; inland activities, aviation or aircraft beacons, and maritime/naval use respectively. These devices operate solely through the regulated Cospas-Sarsat emergency satellite system in Canada for which they are registered to an individual/vessel or organization. If deployed, the unit directly notifies Canadian rescue authorities about the who, where, and when of deployment. Most units are manually deployed by the user pushing a button, yet some are configured to deploy through force of impact or submersion in water.

A more popular series of communication devices for remote use are satellite communicators. Units such as SPOT, InReach, Zoleo and ACR Bivy Stick are all readily available and affordable options for communicating with others from worldwide field locations. These units allow users to press an emergency/SOS button that sends a distress signal to a third party emergency operator (located somewhere in the world) who then connects your location to the nearest rescue jurisdiction. If an SOS message is not deemed necessary or the leader needs to send specific messages to outside contacts, most of these devices are able to send pre-programmed messages or real-time text messages. Connectivity through the unit it-

self or via bluetooth mobile hookup are options for message generation.

Monthly subscription data plans are available once the based unit, costing hundreds of dollars, has been purchased and activated. Subscriptions can be temporarily suspended for nominal monthly rates, if owners do not intend to use the device for a period of time. Use of various versions and models of these units over the years in OL programming, has been both a boon and a bane. Users should consider these as a backup to good systems planning (as discussed earlier) and be prepared for idiosyncrasies in electronic communications. Battery charging needs regular monitoring, software uploading is often without notice and doesn't always proceed or succeed normally, monthly financial management of subscriptions is required, and pre-trip testing is an absolute must to check for functionality. Many readers will appreciate that these devices should not be the sole means of contacting EMS, but one can save the day, if your travel plans are disrupted by an emergency.

Satellite phones are used for voice to voice communication from remote locations. Just like any cellular phone, satellite phones connect you to and from outside cellular phone service, where the voice signal is routed through Iridium, Inmarsat, and Globalstar satellite systems. Typically, a monthly subscription rate for talk-time, messaging and connectivity is necessary. The same arguments or cautions can be made for these battery powered devices and also ensuring that a clear view of the sky is maintained will help to ease the possibility of dropped calls.

The newest range of portable satellite internet communications are the Iridium-GO, Strigo, Cobham or Hughes devices. These devices are operate through an independent field based satellite receiver which facilitates the transmission of high rate cellular data (voice, text or video) through a dedicated set of satellites (both ground and orbiting). These are designed to work synchronously with multiple devices from phones to laptops.

Conclusion

Dealing with the nuances of wilderness travel is a challenge in itself, but when a serious incident occurs, the degree of complexity quickly escalates. Outdoor leaders are tasked with managing these dynamic emergency situations from the field, thus demanding a high level of knowledge, training, and preparedness to influence positive outcomes. Knowing what specific resources are available from the current marketplace, local providers, and federal emergency service partners will help to support safe OL programming in Canada.

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Resources

SAR Volunteers Association of Canada <https://sarvac.ca/core-training-competency-standards/>

Coast Guard SAR <https://www.ccg-gcc.gc.ca/search-rescue-recherche-sauvetage/index-eng.html>

Canadian Rangers <https://www.canada.ca/en/army/corporate/canadian-rangers.html>

Royal Canadian Air Force SAR <https://www.canada.ca/en/air-force/programs/search-rescue.html>

Parks Canada SAR <https://www.pc.gc.ca/pn-np/mtn/securiteenmontagne-mountainsafety/programme-program/res-sar.aspx>

Parks Canada Safety <https://parks.canada.ca/voyage-travel/securite-safety>

Civil Air SAR Association <https://www.casara.ca/en>

National Defence Canadian Beacon Registry https://cbr-rcb.ca/cbr/presentation/other_autre/index.php