



Alcohol “on board,” man overboard — boating fatalities in Canada

Drowning is the leading cause of death related to recreational activities in Canada and is exceeded only by motor vehicle crashes and drug overdose as the cause of death among young adult men.¹ Nearly 40% of all drownings result from boating accidents, and most of these involve motorized boats used for fishing and powerboating.¹ The high frequency of boating deaths is particularly noteworthy given the episodic use of watercraft — in contrast to the pattern of use for motor vehicles — in most areas of Canada.

Because they are unlikely to see survivors in hospital, physicians may be unaware of the high incidence of boating fatalities. Inaccessibility often prevents timely rescue, and most victims of boating submersions cannot be resuscitated. In addition, data on boating fatalities have historically been underreported, with physicians often listing the cause of death simply as “drowning.” In 1991, however, the Canadian Red Cross Society, the Royal Lifesaving Society of Canada and the National Association of Coroners established the Canadian National Surveillance System for Water-Related Fatalities, which has provided a much more reliable database.¹ In its first 2 years of data collection, this database recorded 429 deaths associated with boating, mostly among men in the prime of their lives. Of the 429 deaths, only 22 were considered non-drowning fatalities. Other causes of death included trauma secondary to collisions, hypothermia, heart failure presumed secondary to sudden immersion and propeller-related trauma (in one case only). Although the last of these is not well documented in the Canadian literature, recent US reports suggest that propeller-related trauma may be a significant contributor to deaths in boating-related accidents.²

Although the incidence of drowning deaths is higher overall in Canada than in the US, the frequency of boating-related deaths in the northern continental states and Alaska, as well as in Scandinavia, is equal to or greater than the Canadian rate.¹ This suggests that death is more likely in boating accidents in northern climates, likely because of lower water temperature and consequent hypothermia.

In Canada, the aboriginal population is at particularly high risk: in some northern communities the number of boating-related drownings exceeds the number of motor vehicle fatalities.^{3,4} There are several contributing factors unique to the aboriginal population, such as the regular

use of boats for income generation and the activities of daily living, but this subgroup is also characterized by high use of alcohol and low use of personal flotation devices (PFDs).¹

The typical victim of a boating fatality could be profiled as an adult male operating a small motorboat for recreational purposes. He would likely have evidence of alcohol “on board” (alcohol is detected in two-thirds of victims of boating-related drownings who are tested, and many of these have blood alcohol levels well above the legal limit¹), would likely not be wearing a PFD (only 8% to 10% of boaters wear PFDs properly) and would likely not be dressed for protection against the cold water, wind and waves that frequently cause a person to fall overboard or a boat to capsize.

Alcohol use and PFD non-use constitute the 2 primary modifiable risks for boating-related deaths. The contribution of alcohol to boating fatalities cannot be overstated. Alcohol not only impairs cognitive function, judgement and reaction time, but also directly inhibits survival in cold water by hastening heat loss through increased vasodilation and thermal conduction.⁵ Surveys have shown a societal tolerance for drinking and boating reminiscent of attitudes toward drinking and driving a generation ago.⁶ A concerted educational effort will be required to establish standards of behaviour in boats akin to those that now prevail toward driving a motor vehicle. Operating a boat while intoxicated is illegal under the Criminal Code of Canada, but compliance is poorly policed and rarely enforced.

In addition to providing buoyancy, PFDs possess insulating properties in cold water, and the foam material provides thoracic padding during a fall from a boat. As evidenced by attitudes toward drinking and boating, however, society has a much greater tolerance of risk-taking behaviour in boats than in motor vehicles, and the majority of those responding to a Red Cross survey disagreed that PFD use should be mandatory.⁶

Most boating drownings are sudden, unexpected events: in one-third of cases PFDs were found in the boat but were not worn.¹ Once the victim is out of the boat, cold water may quickly precipitate drowning in a number of ways. Immediate profound sympathetic outflow may produce cardiac arrhythmias and sudden death.^{7,8} An immediate, involuntary gasp often occurs, followed by hyperventilation, which may produce aspiration and laryngospasm.⁹ Even if this does not occur on initial immersion, survival time is limited in cold water, even among experienced swimmers. Although the core temperature may take an hour or more to drop significantly, cold water rapidly affects muscular coordination,¹⁰ imped-



ing the victim's ability to swim, climb to safety or resist head submersion by even small waves. Cold water and hypothermia are likely responsible, directly or indirectly, for most of the fatalities in the small proportion of drowning victims wearing PFDs and for the higher incidence of boating fatalities in Canada than in the US.

Clearly, the starting point in any effort to reduce boating fatalities must be to make the ingestion of alcohol before or while operating a boat as socially unacceptable as drinking and driving. The use of a PFD should be considered analogous to the use of a seatbelt in a motor vehicle, and children should be taught to remind their parents that their safety too is in jeopardy if PFDs are not worn. Boaters must be taught to anticipate wind, waves and cold water, and the use of protective suits and other insulating garments should be encouraged in our cold climate. Educational efforts should be targeted specifically to high-risk groups, including young adult and middle-aged men, as well as the aboriginal population. With a concerted effort, it should be possible to foster attitudes and behaviour that will reduce the human cost of boating accidents.

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