



INFORMATION SHEET 2

# CHECK THE ICE

## INFORMATION SHEET - CHECK THE ICE

### ICE: A REAL DANGER

Drowning and water-related incidents usually happen during activities done in warm weather, such as swimming and boating. It can, however, occur when people walk, play, fish, snowmobile or practice other activities on ice during winter.



### FACTS

One out of 15 victims of fatal water-related incidents died while venturing on a frozen area that is dangerous.<sup>1</sup> In Canada, even if most ice-related deaths occurred while snowmobiling, more than a third occurred while playing, walking or fishing on or near the ice (1997-2001)<sup>2</sup>. It is important to always be careful when going on or near the ice, since most ice-related deaths could be avoided.

### PREVENTION

Ice is always dangerous (except for ice rinks built on the ground), no matter its characteristics. Always try to practice your activity on an ice that is regularly verified by competent authorities, such as the municipality or the *Fédération des clubs de motoneigistes du Québec*. However, if this is impossible, make sure the ice is safe by taking the following elements into account.

### THE COLOR OF THE ICE

- An ice that is **clear** and **bluish** is usually the most resistant.
- An ice that is **white** and **opaque** (snow ice) contains a higher percentage of air, and its resistance depends on its density. White ice that contains very little air is almost as resistant as bluish ice.
- **Grey ice** usually contains water because it has thawed at some point; it must be considered as dubious and dangerous.

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<sup>1</sup> SOCIÉTÉ DE SAUVETAGE. *Comprendre la glace, guide de survie* (2007) p.2

<sup>2</sup> IDEM p.6

## THE ENVIRONMENT

- The **body of water's depth and size** influence ice formation. The deeper the lake is, the longer it will take before it is frozen. Water near the shore will freeze faster, and once frozen, will also melt faster.
- **Currents** thin the ice from underneath. River ice is usually weaker than lake ice because of the current's effect.
- **Obstructions**, such as docks or rocks, absorb heat from the sun, causing the water around it to freeze slower, and the ice to melt faster.
- An **air temperature** that stays beneath 0°C makes the ice stronger than when temperatures fluctuate above and below the freezing point.
- The **melting and re-freezing** of the surface ice caused by temperature fluctuations create a layered ice, which is flawed and weaker.
- The **sun's warming effect** weakens the ice. Ice is usually stronger in the morning than in the afternoon.
- **Water on the ice**, which usually results from precipitations, weakens the ice by accelerating its melting and thinning it.
- **Snow** creates a blanket that increases the ice's temperature. A snow blanket that reaches half the thickness of the ice makes the ice potentially dangerous.
- **Wind** can move the water, thus slowing its freezing process. It can also move snow, causing the creation of a snow blanket on the ice.

## THE CHEMICAL COMPOSITION OF THE ICE

The water's chemical composition influences the state of the ice. Ice made from clean water is stronger than when it is made of contaminated water. The water's salt content can also affect its freezing point.

Even though clear ice on the more shallow lakes is considered as the strongest, **no ice is 100% safe**. Always take into account the ice thickness; measure it by drilling a hole into the ice, and always be accompanied by someone. Drill a tiny hole until you reach water in different places. Do this every 9 meters on the frozen surface on which you plan on going, since ice must be checked at various places to ensure its safety. The thickness and strength of the ice can significantly vary from one place to another on a same body of water. Never forget that some of the ice characteristics are less reliable towards the end of the winter season, since the ice is older.

## ADEQUATE CLOTHING

Since risks of an unexpected immersion into cold water are higher when being on or near the ice, wear adequate clothing in order to lessen the effects of an immersion into cold water. Specialized isolating and floating clothing is now available on the market for people who practice snowmobiling. These clothes do not only offer protection against the cold and the wind; they also slow the effects of cold water. If you exceptionally plan on going onto the ice, do not hesitate to put



on a personal flotation device (PFD) or a lifejacket. The PFD will not protect you against the cold water, but will allow you to float, which helps getting out of the water. It is therefore primordial that you insist your children wear a PFD when they play onto the ice.

## SUPERVISION

Make sure you never venture alone on ice; that way, if an incident happens, there will be someone who can help you or who can go get help. Tell people about your itinerary, and avoid venturing on ice when it is dark outside, since darkness makes evaluating the ice thickness a lot harder. Make sure children are always with a friend and supervised by an adult. Children need to be close enough to an adult so they can easily be reached; if they are not, it means they are going too far on the ice. Do not forget to establish clear boundaries so children do not unintentionally venture too far on the ice. Never forget that there is water under the ice!

## GETTING OUT OF THE WATER

The founding principles of ice rescue can be perfectly described with these two words: be ready. Do not wait for a tragedy to occur before learning ice rescue. When immersed in cold water, the 1-10-1 rule applies: 1 minute to calm down and catch your breath, 10 minutes of fine motor skills and 1 hour before losing consciousness.



## SELF-RESCUE ON ICE



1. Keep calm and call for help.

2. Break the thin ice around you and constantly swim to stay at the surface.



3. Extend your arms as far as possible on the ice, and try getting out of the water by kicking vigorously.

4. Pull yourself forward until your hips are out of the water and keep kicking. Remain calm.



5. Roll or crawl away as far as possible from the hole. Do not stand up.

If you are near someone who is in distress because the ice has collapsed, your safety comes first. Do not venture on the ice; hand or throw an object to the person in distress. Support the person by explaining how to get out of the water. Call for emergency help.

## ABOUT HYPOTHERMIA

Hypothermia is the medical term that identifies a condition that can develop after a person has fallen into cold water or has been exposed to cold air temperatures. It can eventually lead to death if not immediately recognized and treated. The heat loss that occurs from exposure to cold water or air results in lowering of the body's core temperature. Vital organs and systems begin to lose their ability to function. This process can take a few hours. Hypothermia occurs when the amount of heat produced by the body is less than the amount of heat that is lost to the environment.

Signs and symptoms of hypothermia vary among individuals, but the most reliable sign is the body's core temperature. Normal body core temperature is around 37°C. Below this, the body is in mild to moderate hypothermia; skin discolouration (for example, lips that become blue) and uncontrollable shivering are usually associated with hypothermia.

## FACTORS THAT INFLUENCE HYPOTHERMIA

- **Water temperature:** the colder the water is, the worse the cold shock response, the faster the physical and mental impairment, and the faster the development of hypothermia.
- **Clothing:** the amount and type of clothing influence how fast the body loses heat.
- **Emotional control:** stress and panic may make the cold shock response worse.
- **Excessive movement in the water:** swimming or thrashing about in cold water increases heat loss, which accelerates the body's internal temperature drop.
- **Age/body size:** a child's body will lose its heat faster than that of an adult.
- **Body fat:** A small, thin person will develop hypothermia faster than a large, overweight person.

## TREATMENT

Basic treatment for mild to moderate hypothermia:

- Bring the victim in a dry and warm environment.
- Remove wet clothing and dry off victim.
- Be gentle with the victim (avoid abrupt movements).
- Do not rub the victim's body.
- Warm the victim by:
  - Providing them with warm (non-alcoholic) beverages, if the victim is alert (able to communicate).
  - Wrapping them in warm blankets.
  - Placing them in huddle position with other people, creating a small circle
  - Applying heater packs on the victim's head, neck and torso.
- Call prehospital medical care services if the victim is unconscious, confused or if their state does not rapidly improve.



In short, **always be wary of ice!** It is never 100% safe. The most important precaution to take to ensure safety on ice is to simply avoid venturing on it.

## **BIBLIOGRAPHY**

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**APPENDIX 1 - RECOMMENDED MINIMUM ICE THICKNESS**


## Recommended Minimum Ice Thickness for New Clear Hard Ice.

*No ice is without some risk.  
Be sure to measure clear hard ice in several places.*

**3" (7 cm) or less  
STAY OFF!**





<b>4" (10 cm)</b> ice fishing walking cross country skiing	<b>5" (12 cm)</b> one vehicle - snowmobile or ATV	<b>8-12" (20-30 cm)</b> one vehicle - car or small pick-up	<b>12-15" (30-38 cm)</b> one vehicle - medium truck
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*Moderation is always  
in good taste.*

## **APPENDIX 2 - BASIC TIPS FOR VENTURING ON ICE**

1. Ideally, you never should venture alone on ice. Inform someone about where you are going and when you plan on coming back before leaving.
2. Avoid walking on ice at night or when it is snowing, since your reduced visibility will prevent you from detecting dangers.
3. If you are practicing a leisure activity, such as fishing, cross-country skiing or walking on ice, make sure you stay on the path indicated by the activity center.
4. A flotation suit designed for practicing activities in cold water is an excellent investment for those with an adventurer's soul, since it will keep you afloat and increase your resistance to hypothermia in case of an accident.
5. Never forget that alcohol accelerates hypothermia – moderation is always in good taste!
6. If you are practicing an activity on ice with children, make sure they are at all times supervised by someone in charge and that they never leave the area where ice has been verified. Insist that they wear a lifejacket, PFD or thermal flotation suit.

## **APPENDIX 3 - MYTHS ABOUT ICE**

- 1. Ice thickness is uniform on a body of water.**

Reality: Ice thickness is rarely uniform. Ice can be very thick at one place and very thin just a few meters away.

- 2. A bitter cold weather means the ice is solid enough.**

Reality: Abrupt temperature changes can weaken the ice and crack it. Additionally, other factors that are unrelated to the air temperature, such as the wind, a snow layer, current and water level variations can weaken the ice and make it unable to bear weight.

- 3. The better you swim, the better your chances of being able to rescue yourself if you fall through ice.**

Reality: Swimming proficiency plays only a small part in ice-related issues, since cold water causes coordination problems. This makes it difficult for someone who falls into cold water to swim and get out of the water, regardless of their swimming abilities.

- 4. Snow on a frozen lake or river makes the ice surface stronger.**

Reality: Snow acts like an insulating blanket; this means it actually hinders its formation and growth.

- 5. Venturing on ice at night is not dangerous if you know where you are going and what the ice is like.**

Reality: It is particularly dangerous to venture on ice at night. Ice conditions change daily, and darkness at night makes it difficult to detect obstacles or hazards.