

Most emergencies afloat can be avoided by good seamanship. However accidents can happen, so be prepared to handle them.

Marine safety regulations provide safety equipment requirements and advice designed to keep boats safe and prepared to handle emergency situations.

Below are a number of basic steps to employ in an emergency situation:

- do not panic, remain as calm as possible
- consider the weather conditions and how they may affect the capabilities of the boat
- have safety equipment ready and life jackets on
- attract attention from any passing ship or persons on land, if close by, either by waving or by using a flare if the situation becomes desperate
- check to make sure there is no danger of fire or explosion
- if hull is holed, block entry with any suitable material that will slow down the entry of water
- if you have V-sheet, place it on top of the boat and secure properly
- if you have VHF radio, use it to call for help.

5.1 Engine failure

Even the best-maintained engine can fail, so it is important to learn the basics of engine repair—practise troubleshooting problems and carrying out emergency repairs. Always carry essential tools.

Before attempting to carry out any running repairs while on the water use an anchor to check drift and face the bow into the sea to help to keep water off the engine. Work under a waterproof cover large enough to keep spray off the engine as a wet ignition can often frustrate attempts to restart an engine.

Learn to distinguish the sound of an engine not running normally.

It is good practice to carry an auxiliary motor maintained in good operational order and ready for immediate use if required.

5.2 Abandoning the boat

- Make sure that everyone is wearing a life jacket before going over the side.
- Send a distress call if the boat has a radio.
- Send off distress flares only if they are likely to be seen.
- Activate your EPIRB if carried.
- Unless there is an uncontrollable fire, don't leave your boat. Most boats involved in accidents don't sink and

can be seen better than a person in the water. A partially submerged boat can also be used for support.

- Restrain any impulse to swim ashore. Distances over water usually appear shorter than they actually are. It is always safer to stay with the boat unless you are sure that land is within swimming distance.
- Huddle together to reduce heat loss. Avoid excessive physical activity, such as swimming, that will increase body heat loss.

5.3 Fire

Fire prevention can be achieved through good housekeeping. It is essential to know how to fight a fire and have the correct equipment on board but never having to fight fire is a far better course of action.

Good housekeeping includes:

- have the correct fire extinguishers on your boat, know how to use them, maintain them and locate them in accessible areas—not near the source of a potential fire
- keep the bilge and engine room clean and free of rags, newspapers and other combustible materials
- regularly check that engine rooms and batteries are properly ventilated
- use only appliances such as stoves and heaters that are approved for marine use
- never use cigarette lighters or matches while searching in lockers, use a battery powered torch
- check fuel systems at regular intervals for leaks and spillage
- any spare fuel should be carried in approved containers
- check the electrical system regularly for faults and keep all components as clean as possible.

Common causes of fires among smaller boats include:

- engine backfiring in air laden with combustible vapour
- hot exhaust pipe igniting adjacent combustible materials
- on inboard powered boats, fuel lines can leak or rupture and spray fuel over hot exhausts
- spontaneous combustion of oil rags in badly ventilated compartments
- a spark caused by static electricity during refuelling
- fuel vapours collecting in the bilge due to spillage while refuelling
- leaking LPG which is heavier than air and will find the lowest point in the boat, usually the bilge
- short-circuiting and overloading of the electrical system
- smoking in bed.



Remember, to avoid potential fire hazards—all fuel systems, electrical systems and LPG systems should be correctly designed, installed and maintained by qualified persons.

When refuelling your boat:

- turn off all engines, motors, fans, heating devices, electrical equipment and LPG appliances
- don't smoke or allow naked flames on or in the vicinity of your boat
- fuel spilled, either accidentally or from overflowing the fuel tanks, produces vapours which can enter the bilge and may be ignited by a spark—often from the boat's electrical system
- have a fire extinguisher handy
- wipe up all spills
- leave room in tanks for fuel expansion
- check bilges for leakage and fuel odours—ventilate until fuel odour is gone, before starting engines
- never refill portable fuel tanks in the boat—take them ashore for filling and wipe off any spillage before replacing them aboard.



Fuel related fires could also start when a boat is cruising. These fires generally result when some component of the fuel system starts to leak and vapours trapped in the ship's bilge are ignited. Regularly inspect and maintain fuel systems and avoid using temporary or 'stop gap' solutions to fix leaks.

Electrical installation

Fires and explosions aboard small boats are frequently caused by short circuits or overloading. To ensure protection from these hazards, have all electrical installation and maintenance carried out by a qualified marine electrician.

Fighting the fire

- Raise the alarm (to others on board and to rescue organisations).
- Manoeuvre the boat to operate with the least wind effect (generally down wind).
- If within an enclosed or confined space, close all the hatches, vents and ports to reduce oxygen.



- If a burning object can be safely moved, get it over the side quickly.
- Shut off fuel lines and gas lines as soon as possible as flexible fuel lines may collapse and add to the fire.
- Try to extinguish the fire with fire fighting appliances and remember to direct the extinguisher into the heart of the fire, not the flames.
- Maintain a watch on the area once the fire has been extinguished to monitor any reflashes.
- If the boat needs to be abandoned, do not motor alongside another boat. Do not leave the boat on the leeward (downwind side) as the boat may drift onto you or any fuel may spread in the water.
- Consider isolating the battery and shutting down the generator if the fire is in that location. Dependant on the location, power to run fire fighting and communication equipment may be advantageous.

Helping another boat on fire

Be extremely cautious approaching boats on fire and keep to the windward side. Most fires on small boats originate from fuel, heating appliances, stoves, leaking gas or fat. Fuel and gas fires spread very quickly. Even a minor spill can create a rapid spread of flames.

Theory of fire

There are four elements of fire. If these elements are brought together in sufficient quantities, then a fire will occur.

The elements are:

1. fuel
2. heat
3. air (oxygen)
4. chemical reaction.

Removing these elements will extinguish the fire:

1. removal of **fuel**—starving
2. removal of **heat**—cooling
3. removal of **oxygen**—smothering.



Fire triangle - remove one and you stop the fire

LPG

LPG is the most dangerous substance on boats if not handled correctly. Leakages cause suffocation and explosions.

LPG is stored in cylinders under pressure as a liquid. When the cylinder valve is opened, some of the liquid boils off as a gas vapour. When ignited, LPG can be used to fuel a number of appliances including stoves, refrigerators and water heaters.

In the event of an accidental gas leak, stop all motors, close all cylinder valves, turn off all appliances and ventilate the boat. Do not operate any electrical switches until the air is clear.

In the event of fire, LPG cylinders should be removed from the heat source. If this is not possible, keep the cylinder cool by spraying water on it.

If flames are threatening to engulf a gas cylinder, the boat should be evacuated.

Safe gas practice includes:

- Turn off all appliances and close the cylinder valve before you leave the boat.
- Display 'no smoking' and 'turn off the gas' signs below.
- Check that appliance cocks are closed before opening the cylinder valve.
- Develop a routine of turning off the gas at the cylinder before turning off at the appliance when finished. This lets the appliance burn out and reduces pressure in the pipeline.
- Keep areas around appliances clean (especially of grease or fat) and free of flammable materials.
- Know the smell of LPG.
- Make a periodic check of appliances, lines, connections and joins using soapy water applied with a paintbrush—bubbles indicate leaks. Never use a match to check for leaks.
- Install a gas detector.

5.4 Capsize

Capsize is a major contributor to boating fatalities, so make sure your boat is appropriate for the conditions and has built-in flotation (positive flotation).

A boat will capsize from either one or a combination of the following:

- Overloading slows the boat down and reduces the amount of freeboard (area above the waterline). A low freeboard increases the possibility of swamping the boat or taking on water, slowing the boat even more.
- Improper weight distribution can make the boat even more unstable. You must locate persons and equipment in order to balance the boat and keep water out.
- Waves can be a major factor in capsizing, especially if they are unexpected. Anticipate all waves and aim the bow into them. Always check the weather before and during boating.

Should your boat capsize, take a head count to make sure everyone is there, check for injuries and stay with the boat.

If you can, turn the boat upright and bail it out. Once most of the water is out, climb back in. Or, if close to shore, just climb in the boat and paddle. It will be exhausting but at least you will be safely ashore.



Never swim away from a capsized boat.

Small dinghy-type boats have sufficient flotation to keep afloat if upturned. To right an upturned boat, grab the keel and roll the boat toward you. As the boat starts to turn, grab hold of the gunwale and continue to roll the boat until it is right side up.

You then have an opportunity to bail the ship out.

When reboarding a boat at any time, board over the stern where the freeboard is lower and the ship is most stable. Never board or attempt to board over the side.

Refer to the abandoning the boat section on page 73.

5.5 Person overboard

Most boating fatalities happen when people fall overboard, even in calm waters close to shore. When people fall overboard, the worst thing to do is jump in after them. The potential drownings immediately double.

Person overboard procedure

Fast action and constant observation is the priority.

- Whoever first sees or hears someone go overboard must alert the master and not lose sight of the person until alongside.
- Turn the bow of the boat quickly toward the side the person went overboard and stop the boat. Turning toward the person will push the stern and propeller away.
- Immediately throw a life-saving device toward the person to give assistance with keeping afloat. At night, turn on and throw over a floating torch near the victim. Use another available light to illuminate the area.
- Quickly establish your position either by reference to shore marks or by a GPS position. An accurate position will be essential if the search requires outside assistance.

Victims may be hurt, cold and exhausted. If they cannot help themselves, it is difficult to get them back into the boat and you may need some sort of apparatus (for example a rope ladder or a loop of rope) to assist.

Do not go into the water to assist the person unless absolutely necessary. If the victim is unable to board or needs further assistance and someone must go into the water, make sure that person has on a personal flotation device and is attached to the boat with a line.

5.6 Grounding

Grounding can cause material damage to the boat (hull and propellers), environmental damage to the sea floor and injury to occupants through sudden jarring.

To avoid running aground:

- Know how to read the beacons marking the channel. If in doubt slow down until you are sure of the channel ahead.
- Familiarise yourself with the area at low tide. This will give you a better perspective of where navigable water is.
- Talk to more experienced boat owners about what to look for that means shallow water. For example: ripples on the surface, surface formations changing suddenly, different water colour.
- Wear polarised sunglasses which highlight shallow areas.
- Use a chart and an echo sounder to read depths.
- Don't guess the depth of water, test it at slow speed.

If you go aground in a displacement hull boat or a yacht, there is a risk of the boat 'falling over' if the boat goes high and dry with the outgoing tide. In most cases, the boat will rise and float again on the high tide. However, if the boat's freeboard is low, water can enter the boat and sink it as the tide rises.

Hardwood planks can be propped under the gunwales to hold the boat upright in the event of being beached high and dry, especially yachts which will not balance on their keel.

5.7 Personal survival

Personal flotation devices

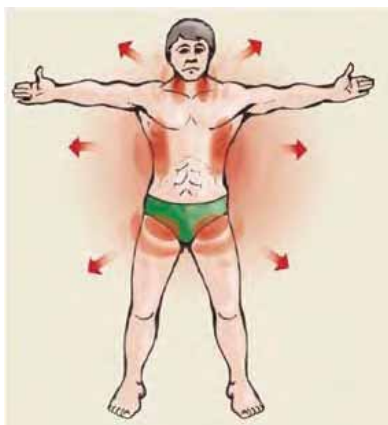
Most boating deaths occur in incidents involving small boats, and more than 80% of drowning victims were not wearing a personal flotation device. Everyone on board small boats should wear an approved personal flotation device that fits properly suitable for the type of boating.

There are three types of personal flotation devices listed in the safety equipment section (page 33).

Hypothermia

Boaters have a greater exposure to the elements than most. Boating in the cooler weather means a higher risk of developing hypothermia from wind-chill, capsize and damp and wet clothes.

Hypothermia or exposure is the effect of severe heat loss from the body, particularly from the core organs. Immersion in cold water causes the body to lose heat up to 25 times faster than normal and the shock of sudden immersion in cold water can be a serious threat to people who are older, unfit or under stress from falling overboard or abandoning ship. Cold winds on wet clothing and exposure to the elements for long periods can also result in hypothermia.



Various techniques can maximise survival time in the water. The main ones are:

- HELP (heat escape lessening posture) minimises the main areas of heat loss—the head, sides of the chest and the groin. If wearing a PFD Type 1, taking the HELP position will cause you to roll over face down unless you tilt your head back and rest it on the life jacket's collar.
- Treading water is a well-known technique requiring continuous movement of the arms and legs. If not wearing a life jacket, try to hold on to a buoyant object to maintain the head above water.



- Huddle is where persons in the water, by huddling closely together so that chests and arms are protected, can increase survival time by up to 50% by reducing the rate at which the body loses heat.



5.8 First aid

First aid training

Coping with accidents and emergencies at sea needs a cool head and clear thinking. Expert assistance will probably not be at hand so skippers and crew of small boats need to have the basic first aid skills required to respond with knowledge and confidence. Red Cross, St John Ambulance, Queensland Ambulance and other providers conduct regular courses in first aid—the skills they teach could save a life.

Keep an appropriate first aid kit on board, with equipment to provide initial treatment for common injuries. You can make up your own in a suitable, strong waterproof container, or buy one ready-packed from a first aid provider.



If first aid is required at sea, make sure the boat is under proper control and seek medical assistance as necessary.

Signs and symptoms of hypothermia

Immersion in cold water can quickly affect the brain creating a dangerous situation as the person may not realise they are in danger. Hypothermia can be difficult to recognise because it is often mistaken for drowsiness. However, the following signs and symptoms will help you make an assessment:

- intense shivering (mild hypothermia)
- no shivering (severe hypothermia)
- quiet, difficult to rouse, may be unconscious
- pale, cold skin
- slow pulse, can be irregular
- slow, shallow respirations
- blurred, or double vision
- slurred speech
- confusion
- increasing drowsiness and lack of coordination.

Treatment for hypothermia

Aim to reduce any further heat loss and try to commence rewarming slowly by:

- Putting the patient in shelter, protected from wind and rain
- Minimising movement and disturbance
- Preventing further heat loss by removing wet clothing in a stable environment, and warming the person gradually by wrapping in an aluminium 'space blanket', layers of dry clothes, blankets, newspaper or a sleeping bag. Never put the person close to a fire or in a hot bath
- Dry the patient if wet
- Using your own body heat to warm the patient. Huddle together or share a sleeping bag. Pass warm breaths across patient's mouth and nose
- Gently warming the area of high heat loss, that is, head and neck, sides of chest, armpits, and groin. Do not warm, rub or massage limbs
- Giving warm, sweet drinks (never alcohol) if conscious.

Commence resuscitation if necessary and organise transportation of the victim to medical aid without delay. Their survival could depend on it.

Heat exhaustion

The danger signs of heat exhaustion include faintness, giddiness, headache, nausea and cramps. The patient may appear pale and clammy, with excessive sweating, rapid breathing and pulse.

With further dehydration, the skin becomes hot and dry.

- Move the patient to the shade, lying them down
- Remove unnecessary clothing and sponge torso with cool water
- If possible, improvise a fan for cooling the skin
- Call for help - dial triple zero (000)
- Give frequent drinks of water.

Unconsciousness

Once an emergency has occurred, check to ensure the scene around the unconscious person is safe of hazards and there is no risk to yourself, bystanders and the casualty

Check the casualty for a response by touching the casualty's shoulders and asking in a loud voice if they are alright.

If the casualty responds:

- place them in a safe and comfortable position and call for help.

If the casualty does not respond:

- shout or send for help - call triple zero (000)
- check the airway is open and clear of any obstructions
- check if unresponsive, not breathing normally or not moving
- look, listen and feel for breathing – if in any doubt, treat as if the casualty is not breathing.

Shake the victim firmly but gently and try to get a response to a loud call.

If there is no response, check for signs of life:

- Airway—make sure the nose and mouth are clear
- Breathing—loosen upper clothing and observe chest movement. Feel and listen for breath from the nose and mouth.

If breathing:

- gently roll them onto their side
- observe and reassess consciousness
- monitor vital signs regularly (pulse and breathing).

If breathing is absent begin resuscitation immediately:

- start compressions
- kneel beside the casualty
- place hands interlocked in the centre of the casualty's chest
- press straight down on the sternum (1/3 of the depth of the chest)
- give 30 compressions (at a rate of 100/minute)
- give two breaths
- continue cycle of 30 compressions then two breaths until person regains breathing or help arrives.

Continue observing for signs of life:

- If the patient can breathe alone, turn on their side. Vomiting may occur, and choking if lying on the back
- Ensure help is on the way
- Continue resuscitation until recovery occurs or medical aid arrives.

Cardiopulmonary Resuscitation (CPR)

If there is no breathing and no signs of life, begin CPR (see chart page 79).

Poisonous stings

Many sea creatures are venomous. Avoid handling creatures in rock pools and washed ashore on beaches, and do not swim where jellyfish are prevalent.

In tropical waters, box jellyfish and irukandji can give dangerous, even fatal stings. Box jellyfish (*left*) cause immediate onset of pain and symptoms. Irukandji symptoms can be delayed from five to 60 minutes. Flood the area with household vinegar; and observe the casualty's breathing. Seek urgent medical assistance and be ready to resuscitate.



© Queensland Museum, Gary Cranitch

The blue-ringed octopus and cone shell spine have potentially fatal toxins which can cause paralysis affecting the person's breathing within minutes. If bitten on a limb, use a wide bandage to apply firm pressure over the whole limb, then immobilise it with a splint. If necessary, apply resuscitation and seek urgent medical assistance.

Seasickness

There are several ways to prevent or minimise seasickness:

- Avoid alcohol and heavy, rich foods before and during the trip.
- Focus on the horizon, not on the water.
- Stay in the fresh air on deck, away from fumes.
- Keep occupied.
- Nibble on a dry biscuit, chew barley sugar or dried fruit. Ginger is also considered a good anti-seasickness remedy.
- Use medication before the trip (but be aware that some seasickness treatments can make you drowsy or have other unpleasant side effects).

If all else fails, the only cure for seasickness is to sit under a tree.

Bleeding

A small cut can be treated easily by washing with a disinfectant solution and closing with a suitable dressing. Pressure applied directly to the wound is the most effective way to stop bleeding. Elevation of the injured part will also help to control bleeding.

To treat life threatening bleeding:

- Call for help
- Expose wound
- Apply direct pressure over wound with a clean or sterile pad
- Lie the casualty down and raise the injured part above heart level if possible
- Apply a dressing and firm bandage, checking circulation to the limb every 30 minutes
- Treat for shock and monitor consciousness, pulse and breathing

If unable to stop the bleeding:

- Consider a constrictive bandage
- Remove clothing from part or limb
- Apply bandage (minimum 5 cm that is not too elastic) firmly to whole limb and tighten until bleeding stops
- Do not cover bandage to ensure it remains easily seen.

Burns

Treating burns should be done in such a manner as to relieve pain, prevent infection and prevent or treat for shock.

Gently and quickly cool the burned skin for up to 20 minutes with clean, fresh water. Resist using other substances, including sea water. Also consider:

- covering the area with clean, non-stick sterile dressing
- removing tight clothing and objects such as jewellery
- removing contaminated or smouldering clothing unless it is sticking to skin
- treating for shock if a severe burn
- flushing chemicals from skin, paying special attention to eyes
- do not break blisters
- avoid lotions, antiseptics and creams
- avoid excessive cooling which results in shivering
- seek medical advice.

Sun exposure

To treat sunburn, apply a cool, moist compress to the affected area but do not break any blisters. Give the patient plenty of fluids and seek medical attention quickly.

Shock

Untreated, shock can cause death from a collapse of the cardiovascular system carrying oxygen to the body's vital organs. The signs of shock may include cold, clammy skin, profuse sweating—a pale colour, bluish lips, rapid pulse, and laboured or rapid breathing.

To treat shock, lie the victim on his/her back and cover with blankets or clothing to keep warm. Elevate the feet about 30 cm higher than the head. Do not give the victim anything to eat or drink. Keep the victim comfortable until help arrives.

Broken bones

A broken bone injury should be immobilised to prevent further injury. Stop bleeding, if there is any, treat for shock and seek medical attention.

Call triple zero (000) in an emergency

ask for ambulance, stay with the person and resuscitate



1 Check for Danger

Ensure safety for yourself, bystanders and casualty.
If safe, remove casualty from water as soon as possible.



2 Check Response

Can you hear me?
Open your eyes.
What's your name?
Squeeze my hand.



3 Send for help NOW call triple zero (000)

Phone for an ambulance.
Remain calm while answering the questions:
- exact location of the incident
- phone number you are calling from
- what has occurred.
Follow the instructions from the ambulance service.



4 Clear Airway

If water or vomit is present in mouth, roll casualty on side, tilt face downwards and clear mouth with your fingers.



5 Check for normal Breathing

Look and feel for rising and falling chest.
Listen and feel for breath sounds.
If the patient is not breathing normally, commence resuscitation.



6 Start Compressions

Adults – place heel of hand in centre of chest. Place other hand on top of first.
Children 1 – 8 years – place heel of hand in centre of chest.
Infants <1 year – place 2 fingers in centre of chest. Compress 1/3 depth of chest. Compress 30 times.



7 Position the airway

Adults and children – tilt head backward. Place one hand on the forehead and use the other hand to lift the chin.
Infants <1 year – do not tilt head. Place one hand on the forehead and use the other hand to support the chin.



8 Start breaths

Adults and children – seal nose and give 2 breaths into mouth.
Infants <1 year – give 2 breaths into mouth and nose. Watch for chest to rise.



9 Repeat breaths & compressions

Repeat 30 chest compressions and 2 breaths.
Continue until ambulance arrives or person regains consciousness or it becomes impossible for you to continue.



10 Attach a Defibrillator as soon as available. Follow the prompts

If injured person shows signs of recovery, roll onto side and check if they are breathing. Reassure the person and bystanders.

Section 5 activities

Activity 1

Prepare emergency response checklists applicable to your own boat for each of the following situations—make sure you include steps that are applicable only to your own boat.

Example:

Abandoning the boat

- Ensure all persons are wearing PFDs.
- Make appropriate call on the marine radio, to notify rescue authorities of the situation.
- Light a flare if you know it will be seen.
- Activate EPIRB if necessary.
- Assemble all safety equipment that may be needed or useful.
- Keep everyone together and calm.
- Stay with the boat and huddle together. Swim only if close to the shore.

Fire on board

Disabled boat

Person overboard

Activity 2

A person on board your boat has fallen into the cold water and, when retrieved, you believe the person is suffering from hypothermia. What are the main principles in administering first aid to the victim?

Activity 3

List some of the signs a person might show if suffering from heat exhaustion.

1 _____

2 _____

3 _____

4 _____

5 _____

6 _____

Activity 4

What first aid steps would you take for heat exhaustion?

Activity 5

A person on board your boat has fallen unconscious. What do you do?
