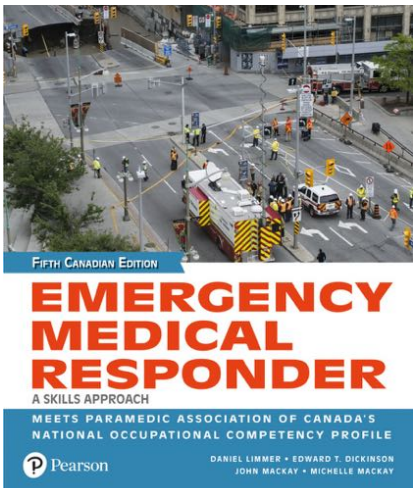
Emergency Medical Responder: A Skills Approach

Fifth Canadian Edition



Chapter 32

Water Emergencies

Objectives (1 of 3)

- Describe how drownings and near-drownings occur.
- Describe the three key components of scene assessment in a water emergency: patient condition, water condition, and resources at hand.
- Discuss some of the difficulties in assessing a patient who is in the water.

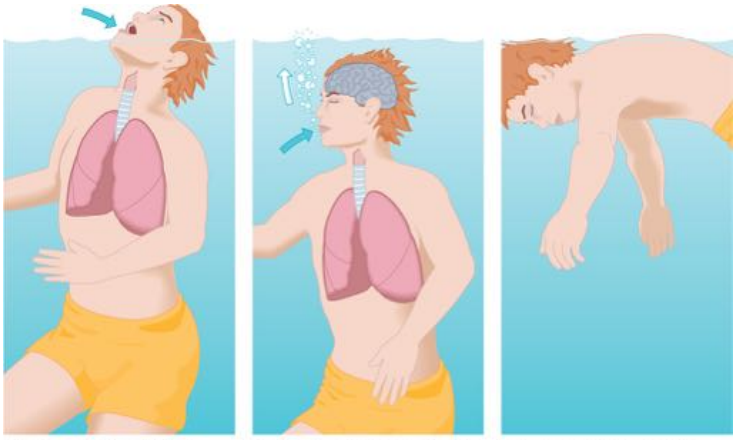
Objectives (2 of 3)

- Describe emergency care of near-drowning patients without injuries to the spine versus those with spinal injuries.
- List the five hazards commonly associated with fast-moving water.
- Discuss the differences between warm-water and cold-water rescues.

Objectives (3 of 3)

- Describe the assessment and emergency medical care of a patient with a diving emergency, including air embolism and decompression sickness.

Drowning



Drowning can be the result of cold, fatigue, injury, disorientation, intoxication, or limited swimming ability.

The drowning victim struggles to inhale air as long as possible. Eventually the victim inhales water or a muscle spasm of the larynx closes the airway.

Loss of consciousness, convulsions, cardiac arrest, and death may follow.

Figure 32–1 Drowning.

Freshwater vs. Saltwater Drowning

- **Freshwater** – water passes through lungs into the bloodstream, causing hemodilution and red blood cell destruction
- **Saltwater** – aspirated water is saltier than body fluids. Water leaves blood and enters lungs to help dilute the salt. Air in the lungs mixes with fluids, forming frothy foam. This provides barrier to oxygen exchange

Wet vs. Dry Drowning

- **Wet drowning** - when fluid is aspirated into the lungs
- **Dry drowning** - occurs when an underwater person experiences a severe muscle spasm of the larynx that closes it, preventing aspiration and respiration

Warm Water vs. Cold Water Drowning

- **Warm water** – diving reflex not activated, tissues not as well preserved
- **Cold Water** – drowning in water less than 20 degrees Celsius can more often result in successful resuscitation

Dealing with a Water Emergency

- **Patient condition** – consciousness, injuries, location
- **Water condition** – visibility, temperature, moving water, depth of water, other hazards
- **Resources on hand** – rescuers, special resources

Criteria for Performing a Water Rescue

- You are a good swimmer
- You are specially trained in water rescue
- You are wearing a personal flotation device
- You are accompanied by other rescuers

Rescue Close to Shore

- Reach
- Throw
- Row
- Go

Patient Assessment

- It is more difficult to detect and treat injuries in water
- Bleeding that occurs in water may immediately dilute and disperse
- Murky water can conceal broken bones
- Suspect spinal injury in diving accidents or if patient has been struck by a boat, water skier, surfboard, etc

Emergency Medical Care (1 of 4)

If the patient is conscious and you are certain there is no spinal injury…

- Remove the patient from the water ASAP
- Complete the primary assessment
- Conserve the patient's body heat
- Perform a secondary assessment while waiting for the ambulance

Emergency Medical Care

If the patient is unconscious…

Maintain a clear airway

Figure 32–4 In-line head-chin stabilization with two rescuers.

Emergency Medical Care (2 of 4)

If the patient is unconscious and face down…

Figure 32–5a Position yourself alongside the patient.

Figure 32–5b Extend the patient's arms straight up alongside his or her head to create a splint.

Emergency Medical Care (3 of 4)

If the patient is unconscious and face down…

Figure 32–5c Begin to rotate the patient toward you.

Figure 32–5d As you rotate the patient, lower yourself in the water.

Emergency Medical Care (4 of 4)

If the patient is unconscious and face down…

Figure 32–5e Maintain stabilization by holding the patient's head between his or her arms.

Danger of Fast Moving Water (1 of 4)

- Strainers
- Obstructions
- Holes
- Low-head dams
- Extremity traps

Danger of Fast Moving Water (2 of 4)

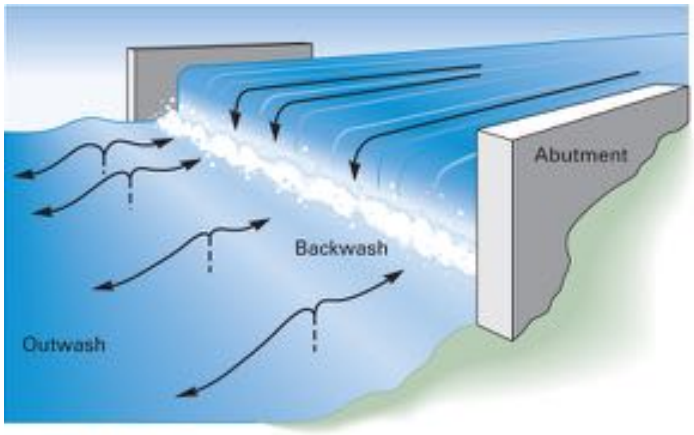


Figure 32–7a A low-head dam.

Danger of Fast Moving Water (3 of 4)

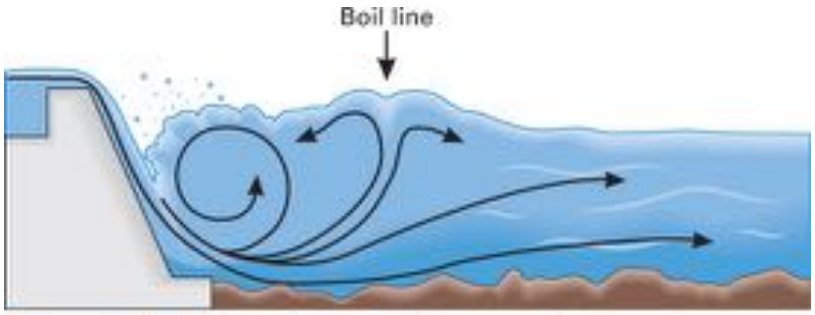


Figure 32–7b A hole formed by water flowing over a low-head dam.

Danger of Fast Moving Water (4 of 4)

Figure 32–8 Entrapment in fast-moving water.

Ice Rescue (1 of 2)

- **Reach and throw** – inflated fire hose
- **Row** – small inflatable craft (air boat/hovercraft) with ropes to pull it from shore
- **Go** – use dry neoprene ice rescue suit tethered to shore

Ice Rescue (2 of 2)

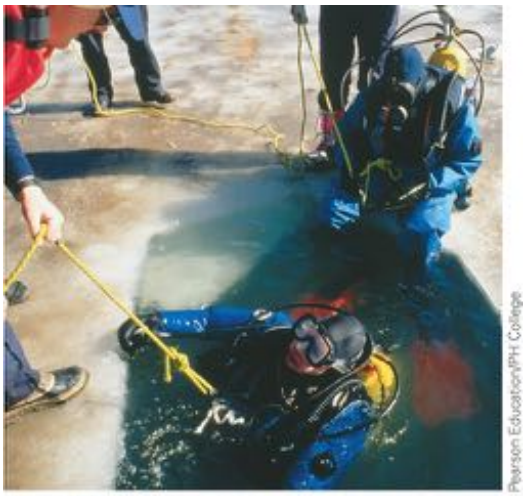


Figure 32–9 An ice rescue.

Barotrauma

Can occur when divers experience increasing underwater pressure

or

When they ascend from deep water improperly

Air Embolism (1 of 4)

Signs and Symptoms may have a *rapid onset*

- Difficulty breathing
- Blotching or itching skin
- Frothy blood in the nose and mouth
- Pain in the muscles and joints
- Chest pain or pain in the abdomen

Air Embolism (2 of 4)

Signs and Symptoms may have a *rapid onset*

- Swelling and grating sound in the neck
- Numbness or tingling in the extremities
- General weakness paralysis
- Possible convulsions

Air Embolism (3 of 4)

Signs and Symptoms may have a *rapid onset*

- Dizziness
- Vomiting
- Blurred or distorted vision
- Loss or distortion of memory

Air Embolism (4 of 4)

Signs and Symptoms may have a *rapid onset*

- Slurred speech, lack of coordination
- Unconsciousness
- Cardiac or respiratory arrest
- Behavioural changes

Decompression Sickness (1 of 3)

Signs and Symptoms are *gradual* in *onset*

Usually occurring 12 to 24 hours post-dive

- Difficulty breathing
- Chest pain
- Itchy, mottled skin with a minor skin rash
- Swelling of tissues, with pits in swelling
- Severe, deep pain in the joints and muscles

Decompression Sickness (2 of 3)

Signs and Symptoms are *gradual* in *onset*

Usually occurring 12 to 24 hours post-dive

- Nausea and vomiting with abdominal pain
- Fatigue, dizziness, collapse sometimes leading to unconsciousness
- Headache
- Blurred vision

Decompression Sickness (3 of 3)

Signs and Symptoms are *gradual in onset*

Usually occurring 12 to 24 hours post-dive

- Hallucinations
- Ringing of the ears or partial deafness
- Staggering gait
- Numbness, paralysis
- Inability to urinate

The Squeeze

The squeeze occurs when diver descends or ascends while proper pressure in the body's air cavities is not maintained. Injury to the tissues of air cavities results.

Signs and Symptoms of the Squeeze

- Mild to severe pain in the affected area
- Blood or fluid discharge from the nose or ears
- Bleeding from the tiny blood vessels in the eyes
- Extreme dizziness, disorientation
- Nausea
- Ear pain (most common), ringing in the ears, possible deafness

