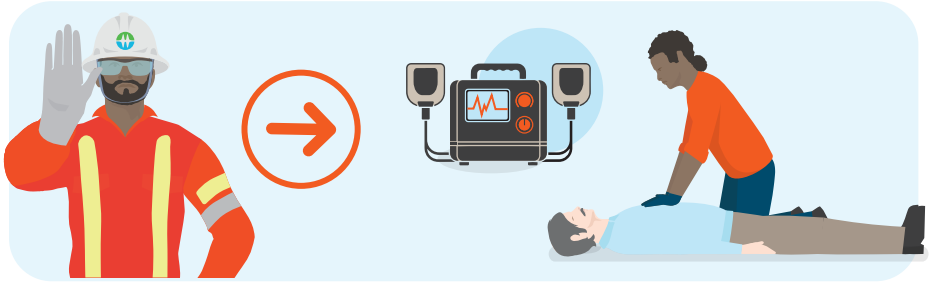
Emergency response:

Electrical injury management

BC Hydro
Power smart

1 Immediate first aid protocol



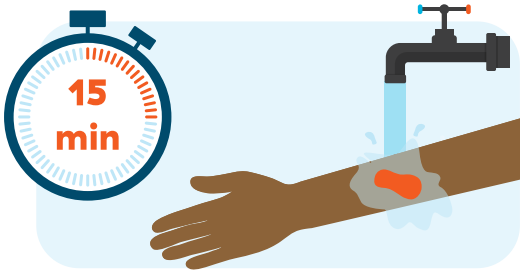
SECURE THE SCENE AND SUPPORT LIFE

Verify the scene is safe before approaching. Prioritize CPR and use an AED for cardiac or respiratory arrest.

2

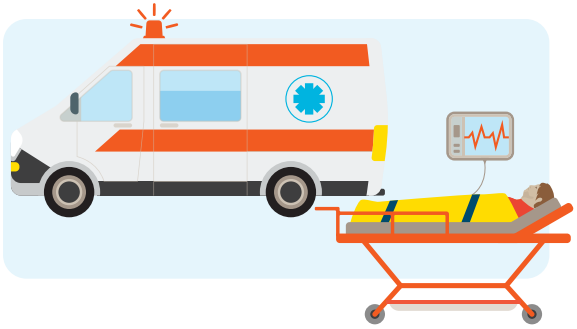
TARGETED BURN COOLING

Avoid hypothermia by cooling only the injury.



3 STABILIZATION AND TRANSPORT

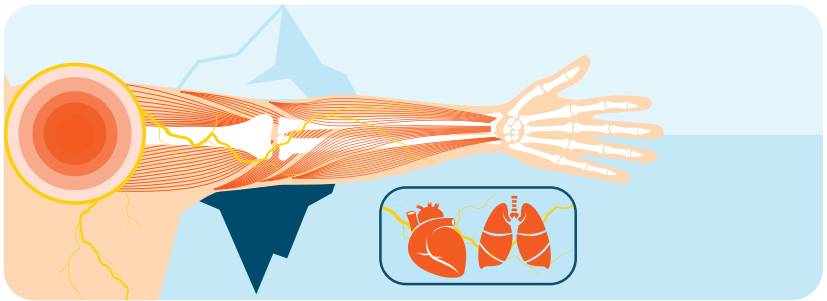
Remove non-stuck jewelry and cover burns loosely with sterile, non-stick dressings. Monitor the person closely on the way to the hospital.



4 Clinical assessment and severity

THE "ICEBERG EFFECT" OF ELECTRICAL BURNS

Electrical injuries are deceptive. Surface burns often mask severe internal trauma to the heart, lungs and nervous system. These are the immediate life-saving steps and clinical indicators necessary for rapid stabilization and to transport an injured person to the hospital, safely.



SIGNS OF CRITICAL INJURY

- Cardiac arrhythmias
- Respiratory apnea
- Seizures
- Profound muscle spasms or paralysis

5 MAJOR BURN CRITERIA Signs to seek hospital treatment immediately

- Partial or full thickness burns on ≥20% of body surface area
- Burns to the hands, feet, face, genitalia or joints
- Direct contact with high voltage (≥751V) sources

Electrical injuries—first 5 minutes for first responders

Skin findings often significantly underestimate the degree of internal injury.
3 types of electrical injuries: High voltage (≥751V), low voltage (≤750V) and electric arc.

In electric arcs there is no passage of current through body tissues. There are 2 types of current:

- AC current is used in standard household electricity.
- DC current is used in batteries.
  - Exposure to AC currents can induce tetany causing prolonged exposure to electrical sources, respiratory apnea and ventricular fibrillation.
  - Both types of current can cause severe blunt force trauma through blast forces.

Injuries involve direct tissue damage from electricity, tissue damage from thermal energy, and mechanical injury from trauma.

Remember to always stay back at least 10 metres from any downed power line, make sure 911 has been called, and wait to approach the scene until BC Hydro tells you it's safe.

Diagnostic process

Cardiac arrhythmias are common with atrial fibrillation being the most common. Other arrhythmias include sinus tachycardia, new right bundle branch blocks, AV conduction blocks, PVCs and QT prolongation.

Fatalities are often due to asystole and ventricular fibrillation.

Respiratory arrest caused by tetanic contractions of thoracic muscles, injury to CNS or cardiopulmonary arrest secondary to ventricular fibrillation or asystole.

Neurological findings include transient loss of consciousness, seizures, and focal neurological deficits—quadriplegia, hemiplegia, visual disturbances and paresthesias.

Cutaneous Burns—determine depth of burns and TBSA.

- Assess for compartment syndrome, rhabdomyolysis, fractures and dislocations secondary to falls or tetany.
- Have a high index of suspicion for GI vascular injuries and abdominal compartment syndrome.
- Assess for ocular injuries to the cornea, and for uveitis, retinal detachment, macular edema, optic nerve damage, and intraocular bleeding.
- Damage to the tympanic membranes is also common.

emergencycarebc.ca/clinical_resource/clinical-summary/electrical-injuries/

Major burn criteria

- ≥20% TBSA partial +/– full thickness burns, any age
- ≥10% TBSA partial +/– full thickness burns if ≥65 years old
- Burns to hands, feet, face, genitalia, or joints
- Full thickness burns ≥5% TBSA, any age
- Electrical burns—direct contact with high voltage source
- Chemical Burns
- Inhalation injury
- Any burn with associated major trauma

BC Hydro
Power smart

CX-7458 October 2026