SECTION TWO

GUIDELINES

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*Metaloids.
Do not enter hazardous environments or carry out decontamination procedures without proper protective equipment. It is beyond the scope of this text to recommend the exact type of protective equipment required for such hazardous material indexed. Other resources (i.e., CHRIS manual, material safety data sheets) and chemical compatibility charts must be checked. Equipment must be appropriate and compatible with the chemical(s) involved. Selection should be made by a knowledgable person using appropriate reference materials. Training in the proper use of protective equipment is essential to your safety.

Individual patients exposed to particular toxicants may not exhibit all of the signs and symptoms described. In addition, because of patient variability, an exposed patient may exhibit signs and symptoms other than those listed.

The decision not to use emetics has been based on recent studies regarding their use and the often uncontrolled environment of field operations. Do not orally administer any fats, oils, or alcohols for ingested toxins; dilute with water only when indicated.

To the best of our knowledge, drug indications, dosages, and precautions are current as of publication. The reader is urged to consult the package information provided by the manufacturer for the latest changes.

These guidelines contain suggested treatments. Operating protocols, standing, and/or verbal orders must be established by local Emergency Medical Service (EMS) Physician control.
Explosives
UN Class 1

SUBSTANCE IDENTIFICATION
Any chemical compound, mixture, or device that is designed to function by explosion or detonation (with instantaneous release of gas and heat) or that, by chemical reaction within itself, is able to function in a similar manner, even if not designed to function by explosion. Found in liquid or solid forms. Includes dynamite, TNT, black powder, fireworks, and ammunition.

ROUTES OF EXPOSURE
Skin and eye contact
Inhalation
Ingestion
Skin absorption

LIFE THREAT
Explosion, causing multisystem trauma. Resulting chemical exposure may be highly toxic.

SIGNS AND SYMPTOMS BY SYSTEM
Cardiovascular: Circulatory collapse and arrhythmias.
Respiratory: Tachypnea and dyspnea.
CNS: Headache, dizziness, progressive stupor, and coma.
Gastrointestinal: Nausea, vomiting, diarrhea, and gastroenteritis.
Eye: Chemical conjunctivitis and ocular damage.
Skin: Dermatitis and skin eruptions.
Other: Nitrogen compounds may cause methemoglobinemia.

DECONTAMINATION
• Wear positive-pressure SCBA and protective equipment specified by references such as the DOT Emergency Response Guidebook or the CANUTEC Initial Emergency Response Guide. If special chemical protective clothing is required, consult the chemical manufacturer or specific protective clothing compatibility charts.
• Delay entry until trained personnel and proper protective equipment are available.
• Remove patient from contaminated area.
• Quickly remove and isolate patient’s clothing, jewelry, and shoes
• Gently brush away dry particles and blot excess liquids with absorbent material.
• Rinse patient with warm water. 30°C/86°F, if possible.
• Wash patient with Tincture of Green soap or a mild liquid soap and large quantities of water.
• Refer to decontamination protocol in Section Three.

IMMEDIATE FIRST AID
• Ensure that adequate decontamination has been carried out.
• If victim is not breathing, start artificial respiration, preferably with a demand-valve resuscitator, bag-valve-mask device, or pocket mask as trained. Perform CPR as necessary.
• Immediately flush contaminated eyes with gently flowing water.
Explosives

- Do not induce vomiting. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain an open airway and prevent aspiration.
- Keep victim quiet and maintain normal body temperature.
- Obtain medical attention.

**BASIC TREATMENT**
- Establish a patent airway. Suction if necessary.
- Watch for signs of respiratory insufficiency and assist ventilations if necessary.
- Administer oxygen by nonrebreather mask at 10 to 15 L/min.
- Monitor for pulmonary edema and treat if necessary (refer to pulmonary edema protocol in Section Three).
- Monitor for shock and treat if necessary (refer to shock protocol in Section Three).
- Anticipate seizures and treat if necessary (refer to seizure protocol in Section Three).
- For eye contamination, flush eyes immediately with water. Irrigate each eye continuously with normal saline during transport (refer to eye irrigation protocol in Section Three.)
- Do not use emetics. For ingestion, rinse mouth and administer 5 ml/kg up to 200 ml of water for dilution if the patient can swallow, has a strong gag reflex, and does not drool (refer to ingestion protocol in Section Three).

**ADVANCED TREATMENT**
- Consider orotracheal or nasotracheal intubation for airway control in the patient who is unconscious or in respiratory arrest.
- Positive-pressure ventilation techniques with a bag-valve-mask device may be beneficial.
- Monitor cardiac rhythm and treat arrhythmias as necessary (refer to cardiac protocol in Section Three).
- Start an IV with D$_5$W TKO. Use lactated Ringer’s if signs of hypovolemia are present. Watch for signs of fluid overload.
- Consider drug therapy for pulmonary edema (refer to pulmonary edema protocol in Section Three).
- Use cautious fluid administration to treat hypotension with signs of hypovolemia. Watch for signs of fluid overload (refer to shock protocol in Section Three).
- Treat seizures with diazepam (Valium) (refer to diazepam protocol in Section Four).
- Use proparacaine hydrochloride to assist eye irrigation (refer to proparacaine hydrochloride protocol in Section Four).

**SPECIAL CONSIDERATIONS**
- Be aware of explosion hazard. Minimum safe distance is 1 mile. Be prepared to treat multisystem trauma injuries.
Flammable Gases
UN Class 2.1

SUBSTANCE IDENTIFICATION
Any compressed or liquefied gas that meets the requirements for lower flammability limit, flammability limit range, flame projection, or flame propagation as specified in C.F.R. Title 49, Sec.173.300(b). Examples: acetylene, butane, hydrogen, LPG, and propane.

ROUTES OF EXPOSURE
Skin and eye contact
Inhalation

LIFE THREAT
Respiratory failure and arrest.

SIGNS AND SYMPTOMS BY SYSTEM
Cardiovascular: Circulatory collapse and arrhythmias.
Respiratory: Tachypnea and dyspnea. Some act as asphyxiants or cause respiratory failure and pulmonary edema.
CNS: Headache, confusion, dizziness, progressive stupor, coma, and seizures may be present.
Gastrointestinal: Irritant to mucous membranes. Can cause nausea and vomiting.
Eye: Chemical conjunctivitis and corneal damage.
Skin: Skin irritation and frostbite from the freezing effect of the expanding gas.

DECONTAMINATION
- Wear positive-pressure SCBA and protective equipment specified by references such as the DOT Emergency Response Guidebook or the CANUTEC Initial Emergency Response Guide. If special chemical protective clothing is required, consult the chemical manufacturer or specific protective clothing compatibility charts. Flash protection may be necessary.
- Delay entry until trained personnel and proper protective equipment are available.
- Remove patient from contaminated area.
- **If there are signs and symptoms of skin contamination or concomitant liquid/solid exposure:**
  - Quickly remove and isolate patient’s clothing, jewelry, and shoes.
  - Gently brush away dry particles and blot excess liquids with absorbent material.
  - Rinse patient with warm water, 30° C/86° F, if possible.
  - Wash patient with Tincture of Green soap or a mild liquid soap and large quantities of water
  - Refer to decontamination protocol in Section Three.

IMMEDIATE FIRST AID
- Ensure that adequate decontamination has been carried out.
- If victim is not breathing, start artificial respiration, preferably with a demand-valve resuscitator, bag-valve-mask device, or pocket mask as trained. Perform CPR as necessary
- Immediately flush contaminated eyes with gently flowing water.
Flammable Gases

- Do not induce vomiting. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain an open airway and prevent aspiration.
- Keep victim quiet and maintain normal body temperature.
- Obtain medical attention.

BASIC TREATMENT
- Establish a patent airway. Suction if necessary.
- Watch for signs of respiratory insufficiency and assist ventilations as necessary.
- Administer oxygen by nonrebreather mask at 10 to 15 L/min.
- Monitor for pulmonary edema and treat if necessary (refer to pulmonary edema protocol in Section Three).
- Monitor for shock and treat if necessary (refer to shock protocol in Section Three).
- Anticipate seizures and treat if necessary (refer to seizure protocol in Section Three).
- For eye contamination, flush eyes immediately with water. Irrigate each eye continuously with normal saline during transport (refer to eye irrigation protocol in Section Three).
- Treat frostbite with rapid rewarming (refer to frostbite protocol in Section Three).

ADVANCED TREATMENT
- Consider orotracheal or nasotracheal intubation for airway control in the patient who is unconscious or in respiratory arrest.
- Positive-pressure ventilation techniques with a bag-valve-mask device may be beneficial.
- Monitor cardiac rhythm and treat arrhythmias as necessary (refer to cardiac protocol in Section Three).
- Start an IV with D$_5$W TKO. Use lactated Ringer’s if signs of hypovolemia are present. Watch for signs of fluid overload.
- Consider drug therapy for pulmonary edema (refer to pulmonary edema protocol in Section Three).
- For hypotension with signs of hypovolemia, administer fluid cautiously. Watch for signs of fluid overload (refer to shock protocol in Section Three).
- Treat seizures with diazepam (Valium) (refer to diazepam protocol in Section Four).
- Use proparacaine hydrochloride to assist eye irrigation (refer to proparacaine hydrochloride protocol in Section Four).

SPECIAL CONSIDERATIONS
- Be aware of fire and explosion hazard. Liquefied gas products have boiling liquid expanding vapor explosion (BLEVE) potential.
Nonflammable Gases
UN Class 2.2

SUBSTANCE IDENTIFICATION
Any nonflammable, nonpoisonous compressed gas that exerts in the container an absolute pressure of 280 kPa (41 psi) or greater at 20°C/68°F. May be compressed, liquefied, pressurized cryogenic, or compressed gas in solution. Examples: helium, xenon, argon, nitrogen, carbon dioxide.

ROUTES OF EXPOSURE
Skin and eye contact
Inhalation

LIFE THREAT
Pulmonary edema and respiratory failure. Many products may act as simple asphyxiants.

SIGNS AND SYMPTOMS BY SYSTEM
Cardiovascular: Circulatory collapse and arrhythmias.
Respiratory: Tachypnea, hypoxia, and dyspnea. Irritation to the respiratory tract. Signs of pulmonary edema.
CNS: Headache, confusion, dizziness, progressive stupor, coma, and seizures.
Gastrointestinal: Irritant to mucous membranes. Can cause nausea and vomiting.
Eye: Chemical conjunctivitis and corneal damage.
Skin: Skin irritation and frostbite from the freezing effect of the expanding gas.

DECONTAMINATION
- Wear positive-pressure SCBA and protective equipment specified by references such as the DOT Emergency Response Guidebook or the CANUTEC Initial Emergency Response Guide. If special chemical protective clothing is required, consult the chemical manufacturer or specific protective clothing compatibility charts.
- Delay entry until trained personnel and proper protective equipment are available.
- Remove patient from contaminated area.
- Quickly remove and isolate patient’s clothing, jewelry, and shoes.
- If there are signs and symptoms of skin contamination or concomitant liquid/solid exposure:
  - Gently brush away dry particles and blot excess liquids with absorbent material.
  - Rinse patient with warm water, 30°C/86°F, if possible.
  - Wash patient with Tincture of Green soap or a mild liquid soap and large quantities of water.
  - Refer to decontamination protocol in Section Three.

IMMEDIATE FIRST AID
- Ensure that adequate decontamination has been carried out.
- If victim is not breathing, start artificial respiration, preferably with a demand-valve resuscitator, bag-valve-mask device, or pocket mask as trained. Perform CPR as necessary.
- Immediately flush contaminated eyes with gently flowing water.
- Do not induce vomiting. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain an open airway and prevent aspiration.
Nonflammable Gases

- Keep victim quiet and maintain normal body temperature.
- Obtain medical attention.

**BASIC TREATMENT**
- Establish a patent airway. Suction if necessary.
- Watch for signs of respiratory insufficiency and assist ventilations if necessary.
- Administer oxygen by nonrebreather mask at 10 to 15 L/min.
- Monitor for pulmonary edema and treat if necessary (refer to pulmonary edema protocol in Section Three).
- Monitor for shock and treat if necessary (refer to shock protocol in Section Three).
- Anticipate seizures and treat if necessary (refer to seizure protocol in Section Three).
- For eye contamination, flush eyes immediately with water. Irrigate each eye continuously with normal saline during transport (refer to eye irrigation protocol in Section Three).
- Treat frostbite with rapid rewarming (refer to frostbite protocol in Section Three).

**ADVANCED TREATMENT**
- Consider orotracheal or nasotracheal intubation for airway control in the patient who is unconscious or in respiratory arrest.
- Positive-pressure ventilation techniques with a bag-valve-mask device may be beneficial.
- Monitor cardiac rhythm and treat arrhythmias as necessary (refer to cardiac protocol in Section Three).
- Start an IV with D5W TKO. Use lactated Ringer’s if signs of hypovolemia are present. Watch for signs of fluid overload.
- Consider drug therapy for pulmonary edema (refer to pulmonary edema protocol in Section Three).
- For hypotension with signs of hypovolemia, administer fluid cautiously. Watch for signs of fluid overload (refer to shock protocol in Section Three).
- Treat seizures with diazepam (Valium) (refer to diazepam protocol in Section Four).
- Use proparacaine hydrochloride to assist eye irrigation (refer to proparacaine hydrochloride protocol in Section Four).

**SPECIAL CONSIDERATIONS**
Liquefied products may present boiling liquid expanding vapor explosion (BLEVE) hazard.
SUBSTANCE IDENTIFICATION
Any liquid having a flash point above 60° C/140° F and below 93° C/200° F.
Examples: brake fluid, glycol ethers, and camphor oil.

ROUTES OF EXPOSURE
Skin and eye contact
Inhalation
Ingestion
Skin absorption
LIFE THREAT
CNS depression may lead to respiratory arrest or may cause convulsions, cardiac arrhythmias, and pulmonary edema.

SIGNS AND SYMPTOMS BY SYSTEM
Cardiovascular: Cardiac arrhythmias, tachycardia, and hypotension.
Respiratory: Upper respiratory tract irritation. Dyspnea, tachypnea, and rales that may progress rapidly to massive pulmonary edema. Burning sensation in the chest.
CNS: CNS depression to coma. Confusion, disorientation, headache, drowsiness, weakness, and seizures.
Gastrointestinal: Pain and irritation of the mucous membranes. Nausea, vomiting, and diarrhea.
Eye: Chemical conjunctivitis and corneal damage.
Skin: Irritation and dermatitis. Cyanosis of the extremities.

DECONTAMINATION
- Wear positive-pressure SCBA and protective equipment specified by references such as the DOT Emergency Response Guidebook or the CANUTEC Initial Emergency Response Guide. If special chemical protective clothing is required, consult the chemical manufacturer or specific protective clothing compatibility charts. Flash protection may be necessary
- Delay entry until trained personnel and proper protective equipment are available.
- Remove patient from contaminated area.
- Quickly remove and isolate patient’s clothing, jewelry, and shoes.
- Gently blot excess liquids with absorbent material.
- Rinse patient with warm water. 30° C/86° F, if possible.
- Wash patient with Tincture of Green soap or a mild liquid soap and large quantities of water.
- Refer to decontamination protocol in Section Three.

IMMEDIATE FIRST AID
- Ensure that adequate decontamination has been carried out.
- If victim is not breathing, start artificial respiration, preferably with a demand-valve resuscitator, bag-valve-mask device, or pocket mask as trained. Perform CPR as necessary.
- Immediately flush contaminated eyes with gently flowing water.
Combustible Liquids

- Do not induce vomiting. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain an open airway and prevent aspiration.
- Keep victim quiet and maintain normal body temperature.
- Obtain medical attention.

**BASIC TREATMENT**
- Establish a patent airway. Suction if necessary.
- Watch for signs of respiratory insufficiency and assist ventilations if necessary.
- Administer oxygen by nonrebreather mask at 10 to 15 L/min.
- Monitor for shock and treat if necessary (refer to shock protocol in Section Three).
- Monitor for pulmonary edema and treat if necessary (refer to pulmonary edema protocol in Section Three).
- Anticipate seizures and treat if necessary (refer to seizure protocol in Section Three).
- For eye contamination, flush eyes immediately with water. Irrigate each eye continuously with normal saline during transport (refer to eye irrigation protocol in Section Three).
- Do not use emetics. For ingestion, rinse mouth and administer 5 ml/kg up to 200 ml of water for dilution if product was ingested and the patient can swallow, has a strong gag reflex, and does not drool (refer to ingestion protocol in Section Three).

**ADVANCED TREATMENT**
- Consider orotracheal or nasotracheal intubation for airway control in the patient who is unconscious or in respiratory arrest.
- Positive-pressure ventilation techniques with a bag-valve-mask device may be beneficial.
- Monitor cardiac rhythm and treat arrhythmias as necessary (refer to cardiac protocol in Section Three).
- Start an IV with D5W TKO. Use lactated Ringer’s if signs of hypovolemia are present. Watch for signs of fluid overload.
- Consider drug therapy for pulmonary edema (refer to pulmonary edema protocol in Section Three).
- For hypotension with signs of hypovolemia, administer fluid cautiously. Watch for signs of fluid overload (refer to shock protocol in Section Three).
- Treat seizures with diazepam (Valium) (refer to diazepam protocol in Section Four).
- Use proparacaine hydrochloride to assist eye irrigation (refer to proparacaine hydrochloride protocol in Section Four).

**SPECIAL CONSIDERATIONS**
- Avoid epinephrine and related beta agonists (unless patient is in cardiac arrest or has reactive airways disease refractory to other treatment) because of the possible irritable condition of the myocardium. Use of these medications may lead to ventricular fibrillation.
- Be prepared to treat thermal injuries.
Flammable Liquids
UN Class 3

SUBSTANCE IDENTIFICATION
Any liquid having a flash point of not more than 60.5°C/141°F. Examples: benzene, gasoline, toluene, trichloroethylene, and acetone.

ROUTES OF EXPOSURE
Skin and eye contact
Inhalation
Ingestion
Skin absorption

LIFE THREAT
CNS depression may lead to respiratory arrest or may cause seizures, cardiac arrhythmias, and pulmonary edema.

SIGNS AND SYMPTOMS BY SYSTEM
Cardiovascular: Cardiac arrhythmias, tachycardia, and hypotension.
Respiratory: Upper respiratory tract irritation. Dyspnea, tachypnea, and rales that may progress rapidly to massive pulmonary edema. Burning sensation in the chest.
CNS: CNS depression to coma. Confusion, disorientation, headache, drowsiness, weakness, and seizures.
Gastrointestinal: Pain and irritation of the mucous membranes, nausea, vomiting, and diarrhea.
Eye: Chemical conjunctivitis and corneal damage.
Skin: Irritation and dermatitis. Cyanosis of the extremities.

DECONTAMINATION
- Wear positive-pressure SCBA and protective equipment specified by references such as the DOT Emergency Response Guidebook or the CANUTEC Initial Emergency Response Guide. If special chemical protective clothing is required, consult the chemical manufacturer or specific protective clothing compatibility charts. Flash protection may be required.
- Delay entry until trained personnel and proper protective equipment are available.
- Remove patient from contaminated area.
- Quickly remove and isolate patient’s clothing, jewelry, and shoes.
- Gently blot excess liquids with absorbent material.
- Rinse patient with warm water, 30°C/86°F, if possible.
- Wash patient with Tincture of Green soap or a mild liquid soap and large quantities of water.
- Refer to decontamination protocol in Section Three.

IMMEDIATE FIRST AID
- Ensure that adequate decontamination has been carried out.
- If victim is not breathing, start artificial respiration, preferably with a demand-valve resuscitator, bag-valve-mask device, or pocket mask as trained. Perform CPR if necessary.
- Immediately flush contaminated eyes with gently flowing water.
Flammable Liquids

- Do not induce vomiting. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain an open airway and prevent aspiration.
- Keep victim quiet and maintain normal body temperature.
- Obtain medical attention.

BASIC TREATMENT
- Establish a patent airway. Suction if necessary.
- Watch for signs of respiratory insufficiency and assist ventilations if necessary.
- Administer oxygen by nonrebreather mask at 10 to 15 L/min.
- Monitor for shock and treat if necessary (refer to shock protocol in Section Three).
- Monitor for pulmonary edema and treat if necessary (refer to pulmonary edema protocol in Section Three).
- Anticipate seizures and treat if necessary (refer to seizure protocol in Section Three).
- For eye contamination, flush eyes immediately with water. Irrigate each eye continuously with normal saline during transport (refer to eye irrigation protocol in Section Three).
- Do not use emetics. For ingestion, rinse mouth and administer 5 ml/kg up to 200 ml of water for dilution if the patient can swallow, has a strong gag reflex, and does not drool (refer to ingestion protocol in Section Three).

ADVANCED TREATMENT
- Consider oro-tracheal or nasotracheal intubation for airway control in the patient who is unconscious or in respiratory arrest.
- Positive-pressure ventilation techniques with a bag-valve-mask device may be beneficial.
- Monitor cardiac rhythm and treat arrhythmias if necessary (refer to cardiac protocol in Section Three).
- Start an IV with D$_5$W TKO. Use lactated Ringer's if signs of hypovolemia are present. Watch for signs of fluid overload.
- Consider drug therapy for pulmonary edema (refer to pulmonary edema protocol in Section Three).
- For hypotension with signs of hypovolemia, cautiously administer fluid. Watch for signs of fluid overload (refer to shock protocol in Section Three).
- Treat seizures with diazepam (Valium) (refer to diazepam protocol in Section Four).
- Use proparacaine hydrochloride to assist eye irrigation (refer to proparacaine hydrochloride protocol in Section Four).

SPECIAL CONSIDERATIONS
- Avoid epinephrine and related beta agonists (unless in cardiac arrest or reactive airway disease refractory to other treatment) because of the possible irritable condition of the myocardium. Use of these medications may lead to ventricular fibrillation.
- Be prepared to treat thermal injuries.
Flammable Solids
UN Class 4

SUBSTANCE IDENTIFICATION
A solid material, other than an explosive, that is liable to cause fires through friction, retained heat from manufacturing, or processing or that can be ignited readily. When these substances are ignited, they burn so vigorously and persistently that they create a serious hazard. Some products may be water reactive, whereas others may react in air. Examples: phosphorus, lithium, potassium, magnesium, titanium, and calcium resinate.

ROUTES OF EXPOSURE
Skin and eye contact
Inhalation
Ingestion
Skin absorption

LIFE THREAT
Shock and severe tissue burns. Severe respiratory irritant that can cause pulmonary edema and respiratory arrest. Electrocardiogram changes and sudden death have also been observed with some products.

SIGNS AND SYMPTOMS BY SYSTEM
Cardiovascular: Cardiac arrhythmias and shock.
Respiratory: Acute pulmonary edema, dyspnea, tachypnea, and irritation of the respiratory tract.
CNS: Headache, dizziness, fatigue, photophobia, and seizures.
Gastrointestinal: Nausea, vomiting, abdominal pain, and increased salivation.
Eye: Lacrimation, conjunctivitis, and severe corneal injury.
Skin: Severe chemical and thermal burns and jaundice.
Other: Hypoglycemia. Symptoms, especially pulmonary edema, may be delayed. The ability to detect the product by smell may be lost after a short exposure time (olfactory nerve fatigue).

DECONTAMINATION
- Wear positive-pressure SCBA and protective equipment specified by references such as the DOT Emergency Response Guidebook or the CANUTEC Initial Emergency Response Guide. If special chemical protective clothing is required, consult the chemical manufacturer or specific protective clothing compatibility charts.
- Delay entry until trained personnel and proper protective equipment are available.
- Remove patient from contaminated area.
- Quickly remove and isolate patient’s clothing, jewelry, and shoes.
- Gently brush away dry particles and blot excess liquids with absorbent material.
- If water-reactive products are embedded in the skin, no water should be applied. The embedded products should be covered with a light oil (mineral or cooking oil), and the patient transported for surgical debridement. If products are not
embedded, gently brush away as many as possible and flush with copious amounts of water to rapidly remove any residual product.

- If phosphorus particles are embedded in the skin, continuous water irrigation, water emersion, or sterile water-soaked dressings should be applied during transport to hospital for surgical debridement. Do not use oil for phosphorus exposure, since this may promote dermal absorption.
- Rinse patient with cool water unless contraindicated as above.
- Wash patient with Tincture of Green soap or a mild liquid soap and large quantities of water.
- Refer to decontamination protocol in Section Three.

**IMMEDIATE FIRST AID**

- Ensure that adequate decontamination has been carried out.
- If victim is not breathing, start artificial respiration, preferably with a demand-valve resuscitator, bag-valve-mask device, or pocket mask as trained. Perform CPR if necessary
- Immediately flush contaminated eyes with gently flowing water.
- Do not induce vomiting. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain an open airway and prevent aspiration.
- Keep victim quiet and maintain normal body temperature.
- Obtain medical attention.

**BASIC TREATMENT**

- Establish a patent airway. Suction if necessary.
- Watch for signs of respiratory insufficiency and assist ventilations if necessary.
- Administer oxygen by nonrebreather mask at 10 to 15 L/min.
- Monitor for pulmonary edema and treat if necessary (refer to pulmonary edema protocol in Section Three).
- Monitor for shock and treat if necessary (refer to shock protocol in Section Three).
- Anticipate seizures and treat if necessary (refer to seizure protocol in Section Three).
- For eye contamination, flush eyes immediately with water. Irrigate each eye continuously with normal saline during transport (refer to eye irrigation protocol in Section Three)
- Do not use emetics. For ingestion, rinse mouth and administer 5 ml/kg up to 200 ml of water for dilution if the patient can swallow, has a strong gag reflex, and does not drool (refer to ingestion protocol in Section Three).
- If product was ingested, protect yourself from contact with vomitus, since it may cause burns.

**ADVANCED TREATMENT**

- Consider orotracheal or nasotracheal intubation for airway control in the patient who is unconscious, has severe pulmonary edema, or is in respiratory arrest.
- Positive-pressure ventilation techniques with a bag-valve-mask device may be beneficial.
- Monitor cardiac rhythm and treat arrhythmias as necessary (refer to cardiac protocol in Section Three).
- Start an IV with D5W TKO. Use lactated Ringer’s if signs of hypovolemic are present. Watch for signs of fluid overload.
- Monitor for signs of hypoglycemia (decreased level of consciousness, tachycardia, pallor, dilated pupils, diaphoresis, and/or readings below 50 mg/dl on dextrose strip
or glucometer) and administer 50% dextrose if necessary. Draw blood sample before administration (refer to 50% dextrose protocol in Section Four).

- Consider drug therapy for pulmonary edema (refer to pulmonary edema protocol in Section Three).
- For hypotension with signs of hypovolemia, administer fluid cautiously. Watch for signs of fluid overload (refer to shock protocol in Section Three).
- Treat seizures with diazepam (Valium) (refer to diazepam protocol in Section Four).
- Use proparacaine hydrochloride to assist eye irrigation (refer to proparacaine hydrochloride protocol in Section Four).
SUBSTANCE IDENTIFICATION
A substance that yields oxygen readily to stimulate the combustion of matter.
Examples: lithium peroxide and calcium chloride. Many products have corrosive properties. Products may be explosively sensitive to heat and shock.

ROUTES OF EXPOSURE
Skin and eye contact
Inhalation
Ingestion

LIFE THREAT
Pulmonary edema, circulatory collapse, laryngeal edema. Corrosive to skin, mucous membranes, and internal organs.

SIGNS AND SYMPTOMS BY SYSTEM
Cardiovascular: Hypovolemic shock and circulatory collapse. Tachycardia with weak pulse.
Respiratory: Acute pulmonary edema, asphyxia, chemical pneumonitis, and upper airway obstruction caused by edema.
CNS: Symptoms of hypoxia, stupor, lethargy, and coma.
Gastrointestinal: Acute toxicity from ingestion results in burns to the GI tract. Nausea, vomiting, and diarrhea, possibly with blood.
Eye: Conjunctivitis, opacification of the cornea, and possibly blindness.
Skin: Full- and partial-thickness burns.

DECONTAMINATION
- Wear positive-pressure SCBA and protective equipment specified by references such as the DOT Emergency Response Guidebook or the CANUTEC Initial Emergency Response Guide. If special chemical protective clothing is required, consult the chemical manufacturer or specific protective clothing compatibility charts.
- Delay entry until trained personnel and proper protective equipment are available.
- Remove patient from contaminated area.
- Quickly remove and isolate patient's clothing, jewelry, and shoes.
- Gently brush away dry particles and blot excess liquids with absorbent material.
- Rinse patient with warm water, 30°C/86°F, if possible.
- Wash patient with Tincture of Green soap or a mild liquid soap and large quantities of water.
- Refer to decontamination protocol in Section Three.

IMMEDIATE FIRST AID
- Ensure that adequate decontamination has been carried out.
- If victim is not breathing, start artificial respiration, preferably with a demand-valve resuscitator, bag-valve-mask device, or pocket mask as trained. Perform CPR if necessary.
- Immediately flush contaminated eyes with gently flowing water.
- Do not induce vomiting. If vomiting occurs, lean patient forward or place on left side
Oxidizers

(head-down position, if possible) to maintain an open airway and prevent aspiration.
- Keep victim quiet and maintain normal body temperature.
- Obtain medical attention.

**BASIC TREATMENT**
- Establish a patent airway. Suction if necessary.
- Watch for signs of respiratory insufficiency and assist ventilations if necessary.
- Administer oxygen by nonrebreather mask at 10 to 15 L/min.
- Monitor for pulmonary edema and treat if necessary (refer to pulmonary edema protocol in Section Three).
- Monitor for shock and treat if necessary (refer to shock protocol in Section Three).
- For eye contamination, flush eyes immediately with water. Irrigate each eye continuously with normal saline during transport (refer to eye irrigation protocol in Section Three).
- Do not use emetics. For ingestion, rinse mouth and administer 5 ml/kg up to 200 ml of water for dilution if the patient can swallow, has a strong gag reflex, and does not drool (refer to ingestion protocol in Section Three).
- Do not attempt to neutralize because of exothermic reaction.
- Cover skin burns with dry, sterile dressings after decontamination (refer to chemical burn protocol in Section Three).

**ADVANCED TREATMENT**
- Consider orotracheal or nasotracheal intubation for airway control in the patient who is unconscious, has severe pulmonary edema, or is in respiratory arrest. Early intubation, at the first sign of upper airway obstruction, may be necessary.
- Positive-pressure ventilation techniques with a bag-valve-mask device may be beneficial.
- Monitor cardiac rhythm and treat arrhythmias as necessary (refer to cardiac protocol in Section Three).
- Start an IV with D$_5$W TKO. Use lactated Ringer's if signs of hypovolemia are present. Watch for signs of fluid overload.
- Consider drug therapy for pulmonary edema (refer to pulmonary edema protocol in Section Three).
- For hypotension with signs of hypovolemia, administer fluid cautiously. Watch for signs of fluid overload (refer to shock protocol in Section Three).
- Use proparacaine hydrochloride to assist eye irrigation (refer to proparacaine hydrochloride protocol in Section Four).
Organic Peroxides
UN Class 5.2

SUBSTANCE IDENTIFICATION
An organic compound containing oxygen (O) in the bivalent -O-O structure. It may be considered a derivative of hydrogen peroxide, in which one or more of the hydrogen atoms have been replaced by organic radicals. Many products are corrosive. Products also supply oxygen to support combustion of other materials. These agents may be explosively sensitive to shock and heat. Examples: benzoyl peroxide, peracetic acid, and methyl ethyl ketone peroxide.

ROUTES OF EXPOSURE
Skin and eye contact
Inhalation
Ingestion

LIFE THREAT
Pulmonary edema, circulatory collapse, laryngeal edema. Corrosive to skin, mucous membranes, and internal organs.

SIGNS AND SYMPTOMS BY SYSTEM
Cardiovascular: Hypovolemic shock and circulatory collapse. Tachycardia with weak pulse.
Respiratory: Acute pulmonary edema, asphyxia, chemical pneumonitis, and upper airway obstruction with stridor caused by edema.
CNS: Symptoms of hypoxia, stupor, lethargy, and coma.
Gastrointestinal: Acute toxicity from ingestion results in burns to the GI tract. Nausea, vomiting, and diarrhea, possibly with blood.
Eye: Conjunctivitis, opacification of the cornea, and possibly blindness.
Skin: Partial- and full-thickness burns.

DECONTAMINATION
• Wear positive-pressure SCBA and protective equipment specified by references such as the DOT Emergency Response Guidebook or the CANUTEC Initial Emergency Response Guide. If special chemical protective clothing is required, consult the chemical manufacturer or specific protective clothing compatibility charts.
• Delay entry until trained personnel and proper protective equipment are available.
• Remove patient from contaminated area.
• Quickly remove and isolate patient’s clothing, jewelry, and shoes.
• Gently brush away dry particles and blot excess liquids with absorbent material.
• Rinse patient with warm water, 30° C/86° F, if possible.
• Wash patient with Tincture of Green soap or a mild liquid soap and large quantities of water.
• Refer to decontamination protocol in Section Three.

IMMEDIATE FIRST AID
• Ensure that adequate decontamination has been carried out.
• If victim is not breathing, start artificial respiration, preferably with a demand-valve
resuscitator, bag-valve-mask device, or pocket mask as trained. Perform CPR if necessary.

- Immediately flush contaminated eyes with gently flowing water.
- Do not induce vomiting. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain an open airway and prevent aspiration.
- Keep victim quiet and maintain normal body temperature.
- Obtain medical attention.

**BASIC TREATMENT**

- Establish a patent airway. Suction if necessary.
- Watch for signs of respiratory insufficiency and assist ventilations if necessary
- Administer oxygen by nonrebreather mask at 10 to 15 L/min.
- Monitor for pulmonary edema and treat if necessary (refer to pulmonary edema protocol in Section Three).
- Monitor for shock and treat if necessary (refer to shock protocol in Section Three).
- Anticipate seizures and treat if necessary (refer to seizure protocol in Section Three).
- For eye contamination, flush eyes immediately with water. Irrigate each eye continuously with normal saline during transport (refer to eye irrigation protocol in Section Three).
- Do not use emetics. For ingestion, rinse mouth and administer 5 ml/kg up to 200 ml of water for dilution if the patient can swallow, has a strong gag reflex, and does not drool (refer to ingestion protocol in Section Three).
- Do not attempt to neutralize because of exothermic reaction.
- Cover skin burns with dry, sterile dressings after decontamination (refer to chemical burn protocol in Section Three).

**ADVANCED TREATMENT**

- Consider orotracheal or nasotracheal intubation for airway control in the patient who is unconscious, has severe pulmonary edema, or is in respiratory arrest. Early intubation, at the first sign of upper airway obstruction, may be necessary.
- Positive-pressure ventilation techniques with a bag-valve-mask device may be beneficial.
- Monitor cardiac rhythm and treat arrhythmias if necessary (refer to cardiac protocol in Section Three).
- Start an IV with D₅W TKO. Use lactated Ringer’s if signs of hypovolemia are present. Watch for signs of fluid overload.
- Consider drug therapy for pulmonary edema (refer to pulmonary edema protocol in Section Three).
- For hypotension with signs of hypovolemia, administer fluid cautiously. Watch for signs of fluid overload (refer to shock protocol in Section Three).
- Treat seizures with diazepam (Valium) (refer to diazepam protocol in Section Four).
- Use proparacaine hydrochloride to assist eye irrigation (refer to proparacaine hydrochloride protocol in Section Four).