CEN: ED Safety, Disaster and Toxic Exposures

Fire evacuation, active shooter, workplace violence reporting, chlorine, phosgene and carbon monoxide, smallpox, Legionella, breath-hold blackout and evidence packaging

ICU Basics
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FIRE: MOVE SIDEWAYS FIRST

ORDER	MOVE	WHEN
1. Horizontal	Through the smoke or fire doors to a clear area on the same floor	First choice; protects patients in most fires
2. Adjacent building	Horizontal into a connected building	The floor itself is no longer safe
3. Vertical	To another floor, by evacuation stairwell	Staying on the floor is unsafe
4. Building-wide	Outside, to assembly areas and the alternate care site	Remaining in the building is unsafe; ordered under the hospital plan

- Elevators may be unsafe or out of service: vertical and building-wide moves use stairwells.
- Smoke compartments and fire doors isolate people from the fire: keep the patients behind them (standard teaching is to close the doors behind you), then account for every patient.

ACTIVE SHOOTER

- Run: get people out of the shooter's area when a safe route exists. In a hospital this may mean leaving patients who cannot move; discuss it with staff before any event.
- Hide: out of view behind a solid barrier; lock and block the door, lights off, silent. Units away from the shooter lock down.
- Fight: only as a last resort.

> **SAFETY** When police enter: stay calm, put down whatever you hold, keep hands visible and empty, follow commands and evacuate the way officers direct. Tell them about patients who could not be moved once they ask.

WORKPLACE VIOLENCE: REPORT EVERY EVENT

- Workplace violence is any act or threat at work, from verbal abuse to assault; violence by patients or families is NIOSH Type II.
- 30% or fewer nurses and physicians report. Barriers: "part of the job", no injury, fear of retaliation, slow forms, and uncertainty when the patient has delirium, dementia, psychosis or intoxication.
- Internal incident report for every event, injured or not: it is about tracking risk, not blame.
- Police report: the assaulted nurse may report the crime to police herself, with leadership support. States set the penalty; some make injuring an ED provider a felony.
- EMTALA still applies: the medical screening exam and stabilizing care continue, with security present.

TOXIC GASES

GAS	EARLY PICTURE	CARE	WATCH FOR
Chlorine (pool chemicals, bleach)	Burning eyes, cough, chest tightness, wheeze	Clothes off and double-bagged, skin flush, eyes at least 15 min, O_2 by mask, aerosolized bronchodilator	Injury can progress for hours; admit persistent dyspnea, severe cough or chest tightness until symptom-free
Phosgene (smells like new-mown hay)	Mild irritation or none	Keep warm and at rest; O_2 and support; no antidote, no diuretics	Pulmonary edema 30 min to 48 h later; observe 48 h
Carbon monoxide	Headache, dizziness, nausea, confusion, no fever	100% O_2 until symptom-free	SpO_2 reads falsely normal: co-oximetry

> **EXAM TIP** Exposure to the gas alone carries little risk of secondary contamination (ATSDR). Liquid or soaked clothing is another matter (see Mass Casualty Triage for decon).

CARBON MONOXIDE FROM A HOME SOURCE

- Clue: several people from one heated home with flu-like symptoms and no fever.
- COHb of 2% or more in a nonsmoker, above 9% in a smoker, supports it; levels track severity poorly and fall with time and oxygen.
- Half-life about 4.5 h on room air, 1.5 h on 100% O_2, 20 min hyperbaric.
- Hyperbaric O_2: any loss of consciousness, altered mental status, ongoing chest pain or cardiac involvement, COHb above 25%; lower threshold in pregnancy. Pregnancy test for women of childbearing age.
- Before discharge: the home is evacuated and checked for the source. Teach CO alarms near every sleeping area, generators outdoors more than 20 ft from doors, windows and vents.

SMALLPOX OR CHICKENPOX?

- High risk (all three major criteria): febrile prodrome 1 to 4 days before the rash (38.3 °C or more with prostration, headache or backache); deep, firm, round vesicles or pustules; lesions at the same stage on any one body part.
- Minor criteria: densest on face and distal limbs, palms and soles, first lesions in mouth, face or forearms, toxic look.
- Low risk: no febrile prodrome, or a prodrome with fewer than four minor criteria; test for varicella if the diagnosis is uncertain.

> **SAFETY** High-risk rash: airborne infection isolation room (never the waiting room), N95, gown and gloves, and notify infection control and the health department now, without waiting for varicella testing.

LEGIONELLA: REPORTABLE, NOT CONTAGIOUS

- Inhaled warm-water mist: hot tubs, showers, cooling towers, fountains. Not spread person to person: standard precautions.
- Clues: pneumonia with confusion, diarrhea, hyponatremia; onset 2 to 14 days after exposure.
- Nationally notifiable: infection prevention and the health department get the case with travel and water exposures for the 14 days before onset.
- Urinary antigen detects serogroup 1 only: send lower respiratory culture too. Treat with a respiratory fluoroquinolone or azithromycin.

BREATH-HOLD BLACKOUT

Hyperventilating before underwater swimming blows off CO_2 and delays the urge to breathe, so hypoxia, then loss of consciousness, then drowning come with no warning. Typical victim: a healthy young man who swims well. Teach no pre-dive hyperventilation or breath-hold games, and never unsupervised.

EVIDENCE: DAMP CLOTHING

- Air-dry each item, then put it in its own paper bag. Never plastic (it traps moisture, and water drives the reactions that degrade samples); never two items together.
- Seal, label and date each bag; evidence stays with an identified person at all times and every hand-off is recorded (see Forensics, Abuse and Sexual Assault in the ED).

Sources (25) are listed with links at icubasics.com/sheets/cen-ed-safety-disaster.html. For education and exam preparation only. Not medical advice; follow current guidelines and your institution's protocols. ICU Basics is an independent study aid not affiliated with any certifying body.