



Clinical Practice Guidelines: Environmental/CBRIE Incidents

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CBRIE Incidents

July, 2022

A **chemical, biological, radiological, incendiary or explosive (CBRIE)** incident involves chemical, biological, radiological, incendiary or explosive materials with potential to cause widespread damage, injury, illness or death. CBRIE incidents may be unintentional as in an industrial incident or intentional as in a terrorist attack.

CBRIE materials can be classified into five (5) distinct categories:^[1]

Category	Description	Example
<i>Chemical</i>	Substances including military chemical warfare or agents of legitimate but harmful household or industrial chemicals	e.g. sarin, cyanide, hydrogen sulphide, chlorine, crowd-control agents
<i>Biological</i>	Dangerous bacteria, viruses, fungi or biological toxins	Anthrax
<i>Radiological</i>	Radioactive materials	Nuclear incidents
<i>Incendiary</i>	Any device capable of causing fire	
<i>Explosive</i>	Reactive substances capable of generating an explosion	

Clinical features



- The role of QAS clinicians is patient on-site clinical care, and establishment of casualty collection, initial triage, treatment and transport from the CBRIE incident cold zone.

Common clinical presentations from exposure to various chemical substances:

Substance	Clinical presentation
<i>Cyanide, hydrogen sulfide, opioids</i>	Coma/seizures
<i>Nerve agents</i>	Coma/seizures and cholinergic findings
<i>Chlorine, ammonia, crowd-control agents, lewisite</i>	Rapid onset of respiratory distress with eye, nose or throat irritations
<i>Phosgene</i>	Delayed onset chest tightness and pulmonary oedema
<i>Sulfur mustard agents, Phosgene, crowd-control agents, hydrogen fluoride, lewisite</i>	Skin erythema, burns, conjunctivitis
<i>BZ (3-Quinuclidinyl benzilate)</i>	Disorientation and anticholinergic findings
<i>Hydrogen sulfide</i>	Rotten-egg odour followed by a sudden collapse, conjunctivitis, pulmonary oedema

Risk Assessment



- QAS clinicians must only enter a contaminated zone on the authority of, and under the supervision of the lead agency.
- Clinicians are not expected to make decisions about the appropriate level of PPE that is required for any given CBRIE incident.
- Clinicians must always follow the instructions and directions of the lead agency incident commander.
- If you come into contact with a contaminant or with affected or contaminated casualties, you must consider yourself contaminated and therefore a casualty. Remain at scene, commence self-decontamination and isolate yourself until given further instructions.

Cues to suspect a possible CRB incident include:

Cues	Description
<i>Dead animals/birds/ lack of insects</i>	Numerous dead animals in the same area
<i>Physical symptoms</i>	Numerous individuals experiencing unexplained serious health problems, which may range from mild and nonspecific (e.g. nausea) to severe and life-threatening (convulsions, difficulty in breathing, death)
<i>Illness associated with a confined geographic area</i>	Lower attack rates for people working indoors versus outdoors, or outdoors versus indoors

Cues	Description
<i>Unexplained odours</i>	Smells may range from fruity to flowery to sharp /pungent to garlic/horseradish-like to bitter almonds/peach kernels
<i>Unusual liquid droplets</i>	Numerous surfaces exhibit oily droplets/film; numerous water surfaces have oily film
<i>Low-lying clouds</i>	Low-lying cloud/fog-like conditions that are not explained by the surroundings.

Triage for chemical events:

Chemical events	Description
<i>Immediate</i>	Likely to survive with local decontamination, prompt field decontamination, initial medical stabilisation and antidote administration. Most likely to result from: cyanide, nerve agents. Any person with suspicious liquid on their skin must be considered immediate until local decontamination has occurred and the patient has been reassessed.
<i>Delayed</i>	If these patients need rapid decontamination, they are immediate until local decontamination has occurred. These patients can obey commands, have no respiratory distress, have peripheral pulses and no major haemorrhage but have injuries that are more than minor. Typically, these patients cannot walk without assistance.
<i>Minimal</i>	Patients who meet all criteria for delayed care and have only minor injuries are considered minimal once appropriately decontaminated.

Scene Safety

If a CBRIE incident is suspected, use the 3-step approach (*refer to the algorithm below*) before proceeding further.

Initial Management

- Notifications: using METHANE approach
- Seeking specialist advice/assistance
- Establish on-site incident command
- Establish the following control zones and perimeter security, in consultation with lead agency:
 - Hot/contaminated zone
 - Warm zone: uphill and upwind, location is consultation with QFES. Decontamination and triage occurs in this zone.
 - Cold/support zone: decontaminated patients received, treated and transported to definitive care



Additional information

Note: ensure appropriate PPE and officer safety during the decontamination process. Decontamination should occur within the warm zone where possible.

Decontamination steps:

- Remove all clothing
- Copious irrigation of skin with luke warm water and, if available, mild soap
- Any available adsorbent material (e.g. towels, tissue paper) should be applied, allowed to remain on the skin for 30 seconds to two minutes, and removed by wiping, flushing with water, or (preferably) gentle but thorough washing with soap and water.
- Mass decontamination is an important aspect of field incident response and often consists of stations for disrobing followed by showering or assisted decontamination.

CPG: Clinician safety
CPG: Standard cares

STEP 1

Is there only one collapsed casualty?

CBR contamination unlikely:
Approach using normal procedures

STEP 2

Are there only two collapsed casualties?

CBR contamination possible:
• Approach with caution
• Consider all options

STEP 3

Are there three or more collapsed casualties?

CBR likely?

Consider:

- DO NOT approach the scene
- If possible: withdraw, contain and report
- Transmit METHANE information
- Request specialist help
- Do not compromise your safety or of that of your colleagues or the public
- If contaminated, isolate yourself and commence self-decontamination

METHANE:

- Major incident confirmation
- Exact location
- Type of incident
- Hazards identified
- Access via
- Number of patients (adult/paediatric), nature and priority of injured
- Emergency services/resources required

Note: Clinicians must only perform procedures for which they have received specific training and authorisation by the QAS.