



National
Operational
Guidance

Control measure

Signs and symptoms of exposure



NFCC
National Fire
Chiefs Council

Developed and maintained by the NFCC



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Control measure knowledge

Symptoms of exposure to hazardous materials can provide important information to responders on the type of hazard and level of risk. Symptoms will also provide responders with key information to determine the priorities in dealing with those who have potentially been exposed. Exposure to chemical hazardous materials will usually lead to the onset of symptoms much quicker than from exposure to biological or radiological materials. At an unknown event, this can be used as an indicator of the type of hazardous material involved.

Important information can be gained from the type of symptoms that are displayed, the number of people exposed and the time from exposure to symptoms becoming apparent.

Four routes of exposure can lead to symptoms developing:

- Ingestion
- Contact with skin or eyes
- Inhalation
- Injection or through cuts

The route through which exposure occurs can also be a significant factor on the speed and type of symptoms displayed. For example, exposure through a cut may mean that some hazardous substances get absorbed into the blood stream more quickly, enabling symptoms to develop rapidly.

Symptoms from hazardous materials will be either acute or chronic:

- Acute: Substances whose effects develop quickly (usually within minutes to days) and worsen with increasing levels of exposure. These hazardous materials also have a level or threshold below which no harm is caused although, for example, in cases of highly toxic substance, this level can be very low.
- Chronic: Substances whose effects develop after significant periods of time and usually following repeated exposure, for example, substances that can cause cancer.

Step 1-2-3 Plus – Safety triggers for emergency personnel

First responders should follow the 'Step 1-2-3 Plus' process to judge what actions the situation



requires:

Step 1 - One person is incapacitated with no obvious reason:

- Approach using standard protocols

Step 2 - Two people are incapacitated with no obvious reason:

- Approach with caution using standard protocols

Step 3 - Three or more people in close proximity are incapacitated with no obvious reason:

- Use caution and follow step 'Plus'

Plus - Follow the CBRN First Responder Flow Chart to consider what actions can be undertaken to save life using the following principles:

- **Remove** people from the immediate area to avoid further exposure to the substance
- **Remove** outer clothing
- **Remove** the substance from skin using a dry absorbent material to either soak it up or brush it off. Use wet decontamination when a caustic agent is suspected
- Communicate reassurance and advise that immediate medical advice and help is on its way

See [Initial operational response to a CBRN incident](#) for the first responder flow chart

Visual indicators

The visual indicators, listed in National Operational Guidance: Hazardous materials – safe and controlled approach will assist responders in ascertaining whether CBRN materials might be present.

Some CBRN materials will not lead to any immediate signs or symptoms but this does not preclude the dangers associated with their ongoing dispersal. It should also be borne in mind that some agents may travel considerable distances.

Multiple individuals may show unexplained signs of skin, eye or airway irritation, nausea, vomiting, twitching, sweating, pinpoint pupils (miosis), runny nose (rhinorrhoea), disorientation, breathing difficulties, convulsions and death.

Strategic actions

Fire and rescue services should:

- Ensure they have policies and procedures that reflect the contents of the [CBRN\(e\) first responder aide-memoire](#) and other relevant publications
- Ensure that documents regarding initial operational response (IOR) are distributed to relevant responding personnel
- Have policies for ensuring that members of the public and personnel from other agencies involved in a potential release are informed of the emergency actions they can take to minimise the impact on themselves
- Ensure staff are aware of the principles of IOR, Step 1-2-3 Plus, "Remove, Remove, Remove" and the CBRN First Responder Flow Chart and that they are incorporated into all policies and procedures which address CBRN(e) incidents
- Ensure that staff have the skills, knowledge and understanding to recognise release indicators and signs and symptoms of exposure to CBRN materials/agents

Tactical actions

Incident commanders should:

- Observe individuals for signs of exposure or contamination and check for consistency against identification
- Consider Step 1-2-3 Plus: Safety Triggers for Emergency Personnel