INTERPOL

DISASTER VICTIM IDENTIFICATION GUIDE

ANNEXURE 11

GUIDELINES FOR DEAD BODY MANAGEMENT AND VICTIM IDENTIFICATION IN CBRN DISASTERS

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Summary
The identification of human remains contaminated by chemical, biological, radiological and nuclear (CBRN) either by an industrial accident, terrorist attack or other means must remain to the same high standards as other mass fatality incidents. Identification by primary identifiers should be used and visual identification avoided.

Nations hold specific plans and governance for the management of these incidents. This document addresses the extra risk contaminated remains pose to first responders, other staff in the identification process, body transportation staff and more broadly the public.

This document aims to promote more effective planning, better preparedness, and a more rapid, integrated response to a CBRN incident (Australian Department of Health, 2018)
This document is not an attempt to provide a detailed incident response tool. Guidelines provided by national police agencies should be utilised.

Key aspects of different types of agents and materials	
Chemical	Chemical agents may range from industrial and commercial chemicals to chemical warfare agents. Chemical agents are easier to acquire and/or fabricate and can produce an acute impact. Chemical agents are likely to fall into one of the following categories: • Pesticides (including but not limited to organophosphates) • Toxic metals and metallic salt • Highly toxic pharmaceutics – e.g. Fentanyl • Toxic Industrial Chemicals (TICs) • Bulk industrial chemicals including gases e.g. chlorine, ammonia • Chemical Warfare Agents (as per CWC)
Health impact	Chemicals may be toxic, flammable or corrosive and could affect a range of body systems, particularly the lungs, nervous system and skin. The impact may range from incapacitating to lethal. The onset of symptoms may range from immediate to long term, depending on the material.
Dispersal method	May be dispersed through an explosive, mechanical or aerosol device, or left for air currents to carry if the form lends itself to that method of dispersal.
Key documents	Advice for Emergency Departments on the management of acute exposures to chemical agents of health concern is available in the sub-

	plan Australian Clinical Guidelines: For Acute Exposures to Chemical Agents of Concern. National Code of Practice for Chemicals of Security Concern
Biological	Biological agents for the purposes of this plan include toxins of natural origin or pathogens that cause disease in humans. These include dangerous bacteria, viruses, fungi and biological toxins. Several biological agents/diseases could be adapted and used as terrorist weapons, including anthrax, tularaemia, plague, ricin and botulinum toxin.
Health impact	Management of biological organisms which cause harm to humans, and the treatment of those affected is the essence of much of our health system. The difference in a CBRN incident will be their deliberate use. Many of the systems used to detect, assess and contain the natural spread of organisms will be the same; however, intelligence regarding the intent of the perpetrators may also be important to identify source, route of transmission and changes to the organism itself. Existing surveillance systems may need to be adapted to look for specific patterns, symptoms or exposures in order to identify affected individuals, such as large groups of unexplained cases or unexpected, unusual or unseasonal incidents of disease. Post an initial release, if appropriate, surveillance could be targeted to particular syndromes. Enhanced surveillance arrangements may be triggered by or based on intelligence received from security agencies. There will be a delay before individuals show symptoms related to exposure to most biological agents. This may lead to considerable spread of the organism before identification and containment. Investigations to trace the source of foodborne illnesses may take weeks or months. This may involve epidemiological studies, such as case control studies or cohort studies, along with environmental testing and traceback of contaminated foods. There are many different agencies involved in these investigations.
Dispersal method	Deliberate dispersal of a biological agent could involve the release of the agent, or the intentional infection of one or more persons. Deliberate release may produce different epidemiologic patterns to natural outbreaks. Well planned aerosolised release of an agent may produce large numbers of cases with clustered

	onsets, even in the absence of person-to-person transmission. Establishing epidemiologic association amongst these cases could be problematic, depending on the site and extent of biological agent dispersion. Unlike other incidents there may be no defined incident site. If introduced through infected persons, the origin of the biological agent (index case) and the extent of the outbreak could be tracked using standard epidemiologic and laboratory methods.
Radiological	Radioactive materials are materials that spontaneously emit ionising radiation because of the naturally occurring process of radioactive decay.
Health impact	Radiological incidents may have both short term and long-term health effects. Short term: Exposure to high levels of radiation may cause cells to die or lose their ability to replicate. Organs containing these cells then cease to function correctly. This may cause nausea, vomiting and diarrhoea, reddening of the skin and bone marrow failure. Radiation burns take days to weeks to appear. Long term: Long term affects are believed to be caused when damaged cells survive in modified form and may over time develop into cancer. Consequences can vary, depending on the material, route of exposure, dose, but can potentially be very serious, in some cases fatal. Long term monitoring may be required. If ingested or inhaled radioactive iodine can concentrate in the thyroid gland and cause early or latent effects such as thyroid cancer.
Dispersal method	Exposure to radioactive materials may be through a sealed source or involve the dispersal of radioactive material. This may involve a radiological dispersal device, whereby harmful radioactive materials are dispersed by, for example, explosive, aerosol or other means. Dispersal with explosives isoftenreferred to as a ‘” dirty bomb.” Importantly, this does not involve a nuclear explosion. Malicious uses of radioactive material can also be simply placing the radioactive material in areas where people are exposed without knowing. However, depending on the strength of the source, exposure may need to be for a lengthy

	period before symptoms occur. Another use is as a poison, where the radioactive material is introduced into a person, such as in the Litvinenko case. Sealed sources may cause external (or dermal) exposure. Dispersed radioactive material also has the potential for intake of radioactive material through inhalation, ingestion or wounds (injection). Deliberate acts to irradiate persons could include: • contamination of food or water supplies with radioactive materials; • the use of conventional explosives or other mechanisms to disperse radioactive materials, such as a radiation dispersal device; • contamination of a site or the environment with radioactive materials; • sabotage of a nuclear facility aimed at causing an uncontrolled release of radioactive materials.
Nuclear	Nuclear material is a special case of radioactive material. It is any ‘special fissionable material’ or ‘source material’ as defined by the International Atomic Energy Agency. The former refers to Plutonium-239 and enriched Uranium and the latter to any other Uranium (e.g. depleted Uranium); Thorium; or materials or compounds incorporating Uranium or Thorium. Such materials are used in the nuclear power industry and nuclear weapons. A nuclear incident is considered to be one in which nuclear fission (i.e. splitting of atoms) or fusion has occurred, usually combined with a highly destructive explosion e.g. detonation of a nuclear weapon. Incidents involving less destructive radioactive explosions, such as dirty bombs, or leaking or exposed radiological materials, are considered as radiological incidents.
Dispersal method	While a nuclear incident is considered to be the detonation of a nuclear weapon where there is catastrophic physical damage, the deliberate release of stored nuclear waste would also be classified as a nuclear incident because of the material concerned

(Australian Department of Health, 2018)

Operational response

A response to a CBRN incident will be in accordance with the affected nation's protocols, likely with the local Police agency as lead. However, many other agencies should be involved to ensure effective command, control and communication is implemented. These agencies may include

- Fire Brigades (including HAZMAT)
- Affected jurisdiction health departments which may be supported by unaffected neighboring states;
- Emergency medical services (Ambulance/Paramedics)
- Other health departments such as communicable diseases agencies, environmental health agencies, laboratory service providers, biosecurity agencies, Radiation/nuclear agencies, food standards agencies, ICRC
- Non health agencies including emergency management agencies, defence forces, primary industry departments (water/agriculture etc.)

It is critical that the Disaster Victim Identification process is included in command centers to represent the needs of the coroner/medical examiner, ensuring other agencies are informed of the high standard of identification is needed and to ensure advice can quickly be provided to DVI practitioners. (Australian Department of Health, 2018)

Risk

"Contaminated remains" refers to those remains with residual chemical, biological or radioactive agent present in a concentration and/or form that poses a known or plausible hazard to personnel Further the hazard posed by remains classified as contaminated would be in excess of that addressed by routine precautions (e.g., protective equipment and procedures preventing contact with BBPs) required for normal mortuary affairs operations (e.g., gloves, eyewear, and apron). (Hauschild, MPH, Watson, PhD and Bock, JD, 2012)

Residual chemical, biological or radioactive agent hazards are classified as external or internal. External being those hazards located on skin, hair or clothing of the human remains with internal hazards, those inside the remains or fluids, potentially remaining present after external hazards are adequately removed. (Hauschild, MPH, Watson, PhD and Bock, JD, 2012)

Pathways of exposure

Remains recovery.

External residual chemical, biological or radioactive agent hazards represent the primary source of exposures to mortuary personnel transporting or handling remains during recovery activities. Specifically, any residual liquid chemical agent on the decedent's clothing, hair, and remains (potential direct skin absorption pathway) and the associated off-gassing vapors (potential inhalation and ocular exposure pathways) are the most critical hazards at this point. (Hauschild, MPH, Watson, PhD and Bock, JD, 2012)

Management of Remains and personal effects

Decontamination and Transport. The purpose of decontamination is to eliminate, neutralize or break down harmful agents (current guide) and a decontamination plan including the packaging, storage and shipping should be developed and implemented. Decontamination methods will depend on the contaminate and method of contamination. Decontamination on site may be driven by requirements at the receiving facility. (Office of Assistant Secretary of Defense, 2022)

Decontamination operations are organized in assembly line format. If decontamination is possible (depending on the number of victims and the contaminant), bodies should make their way through the decontamination line with minimal manual handling and as quickly as possible. The system must allow for the exposure of all body parts.

A gurney with large mesh could be set up on a rail system to rinse and saturate bodies with decontamination agents, eliminating the need to handle bodies.

Responders at the start of the decontamination line must wear the same personal protective equipment (PPE) as required in the exclusion zone. Those located at the end of the decontamination line may not require the same level of PPE

The decontamination line is set up in the controlled zone, also upwind from the exclusion zone.

Ideal conditions include:

- availability of running water
- protection of ground against leakage
- slanted surface to facilitate runoff and cleaning
- drainage and wastewater recovery system
- electricity

(G. Ponsell, C. Fillon, and Y. Schuliar, 2011)

The following is an example of methodologies to reduce the risk of exposure to staff working with contaminated remains:

1. Use normal pathogenic protective clothing (e.g., universal precautions) when handling the remains. Additionally, double glove and wear a surgical mask.
2. Use care to remove the deceased clothing so that any dust is not agitated and resuspended into the air. Place the clothing in a plastic bag and seal it. Then double bag the clothing. During embalming and other processing of the remains, be sure to collect all liquid wastes and any solid wastes in autoclave containers and run them through the autoclave process. Likewise, do the same for all runoff associated with washing autopsy tools or related equipment. Mark all bags and containers with a contamination sticker or tag and save them for retrieval by relevant radioactive waste disposal staff/contractors.
3. Take care not to cross contaminate items or surfaces in the laboratory. For example, do not make entries on a computer keyboard without first removing the outer layer of gloves.
4. Double bag the body bags used for transporting the remains to the mortuary facility and mark with a contamination sticker or tag. Likewise, do the same for any gowns, gloves, or other protective clothing used while executing these special instructions.
5. Ensure that no single staff member is in close proximity of the body or collected waste containers for more than a total of 10 hours. Within one meter would be indicative close proximity.
6. Incineration of the remains is not recommended. If incineration is desired, approval from the state health department may be necessary.

(Office of Assistant Secretary of Defense, 2022)

Considerations

Personal effects (clothing, identification documents, jewelry, watches, telephones, etc.) are removed from bodies at the start of the decontamination line (undressing phase).

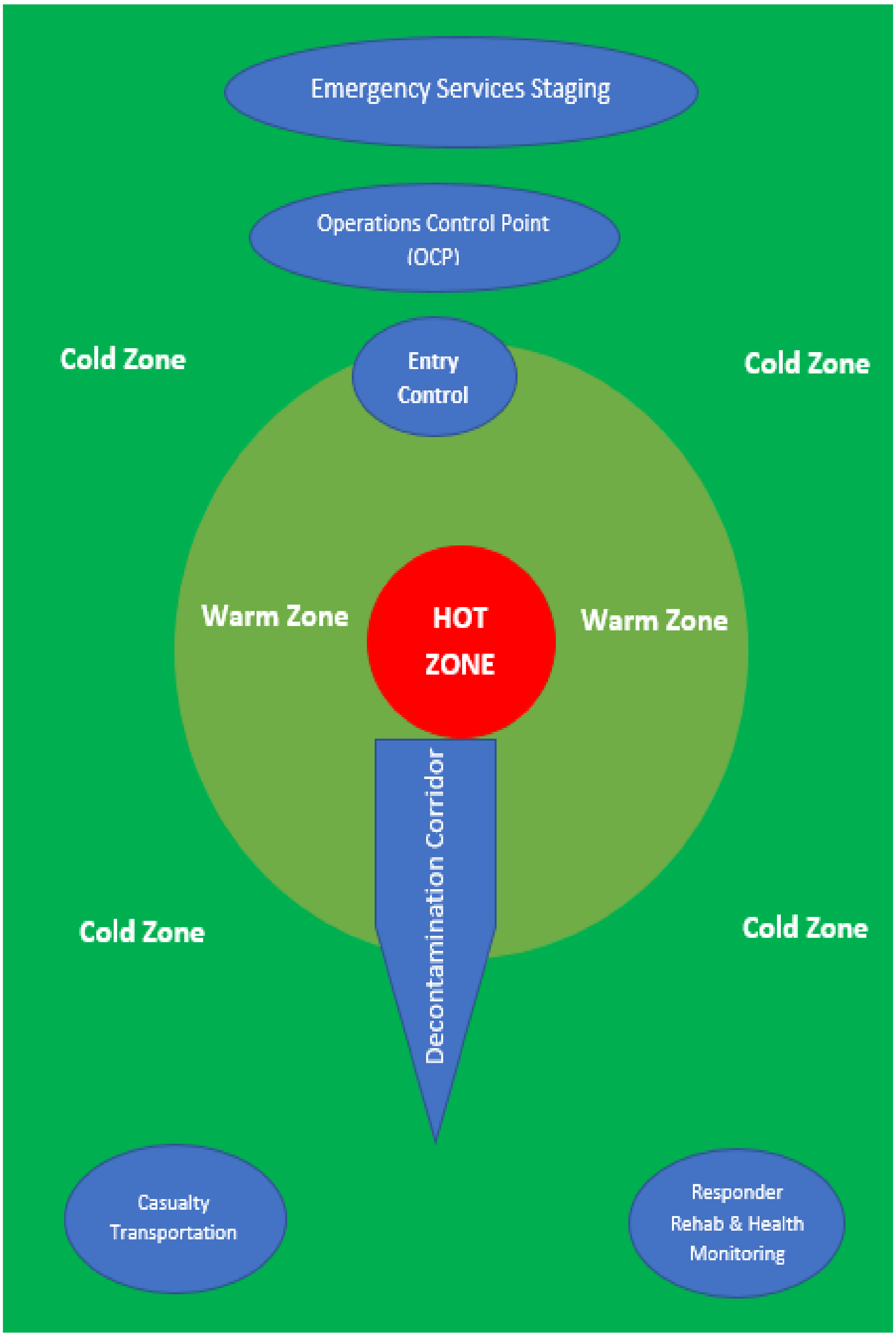
Personal effects are placed in leak-proof containers, which undergo external decontamination prior to leaving the controlled zone.

Specialized firms may be required to process personal effects in a secure environment.

Only personal effects of value (e.g. jewelry) and forensically relevant elements are decontaminated.

Depending on the risk, most personal effects will have to be destroyed.
(G. Ponsell, C. Fillon, and Y. Schuliar, 2011)

Once appropriate decontamination and verification have been accomplished, normal procedures and standard precautions for processing and transport of remains to public or private sector medical examiners, funeral homes or decedents' families can be followed. (Hauschild, MPH, Watson, PhD and Bock, JD, 2012)



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