Department of Health
Government of Western Australia

GUIDELINES FOR ACUTE TERTIARY HOSPITALS TO FORMULATE CBR PERSONAL PROTECTION EQUIPMENT AND DECONTAMINATION POLICIES AND PROCEDURES

MASS CASUALTY

CHEMICAL BIOLOGICAL AND RADIOLOGICAL EVENTS

This document provides updated general guidelines and advice from the document issued on 7 November 2001 to enable hospitals to respond to and manage a contamination incident. The aim is to ensure hospitals have in place the capabilities for managing the health aspects of Chemical, Biological or Radiological incidents.
The primary concern is for the health, safety and wellbeing of staff and to prevent secondary contamination of emergency departments, hospital facilities and equipment.

These guidelines are presented in three sections, personal protective equipment, decontamination and acute cases – ambulance arrivals

1. PERSONAL PROTECTIVE EQUIPMENT (PPE)

can be defined as 'any clothing, equipment and/or substance designed to be worn to protect responders from risks of injury or illness.

Under the State Enhancement Program, the Commonwealth will be supplying each State and Territory 30 Breath Easy butyl rubber hooded positive pressure respirators as well 120 SE400 positive pressure respirators as a permanent loan in July 2003. These respirators are for use by all Emergency Management Agencies and distribution will be coordinated by the Fire and Emergency Services Authority

The SE400 is primarily for first responders and would be used in the 'hot zone'. This unit cannot be worn by people with facial hair or spectacles, unless we purchase Trispec Eyewear inserts, which then require lenses to be inserted from each person who would use the unit. The vision is also rather restrictive and the unit is very costly, therefore it is not recommended for medical personnel.

The BE10 filters are compatible with the SE400 and the Australian Defence Force and can be worn by people with facial hair and spectacles. They are similar to the Jupiter system, currently used by some hospitals for SARS protection, except they have a butyl rubber hood, which is required when dealing with chemicals. Visibility is also much more enhanced than the SE400.

BE Turbo & Hose

Butyl Rubber Hood

Chemically resistant hooded suits (Tychem Barrier Man C manufactured by Dupont) are recommended as they are designed to protect workers from hazardous substances, or sensitive products and processes from contamination by people. They are typically used, depending on toxicity of chemicals and conditions of exposure, for protection against fine particles, liquid splash or fine liquid spray.
They are used by the St John Ambulance Service, come in four different sizes and have an average breakthrough time of 360 minutes (can be worn for 360 minutes).

To ensure a complete seal against fluid ingress, the hood to mask, cuffs to gloves and ankles to boots closures require proper taping, using a suitable liquid impermeable tape.

They are relatively cheap and can be disposed of after use by incinerating or burying in controlled landfill with no harm to the environment, however restrictions on disposal will depend upon contaminant introduced during use.

Nitrol gloves & rubber boots will complete the requirements of PPE.

a. The use of PPE:

- should only be considered as a ***safety*** measure. It should be used to protect staff until the exposure to risk is determined not to require this level of protection;
- may be considered as a temporary measure, ***until control of potential exposure is achieved;***
- must be in accordance with manufacturer or supplier instructions.
- assistance from team members or a designated dresser to don and remove the suit may be required. It is important that staff, who may be expected to wear PPE, have adequate training in the use of the equipment.

b. Reuse of PPE

PPE must be decontaminated in line with manufacturer instructions prior to reuse.
The Tyvek/Tychem C suits are relatively cheap and should be discarded after use.

c. Limitations of PPE

Wearing PPE puts an additional strain on the incumbent as body's ability to cool itself through respiration and perspiration and unless personnel are aware of signs and symptoms of dehydration and heat exhaustion heat stress and performance degradation is inevitable. Team members should regularly check each other by being aware of the following physical signs:

- weakness
- lassitude
- headache
- giddiness
- nausea/vomiting and cramps

Rotation of team members is vital and no person should be in the suit for no more than thirty minutes. Rest and plenty of fluids are important and necessary after this period.

d. Recommendation

- To maintain uniformity recommended, it is suggested that hospital PPE kits consist of 3M positive pressure Breath Easy 10 butyl rubber hood masks (similar to those which are currently in use by the Teaching Hospitals for suspected SARS cases apart from the filter system) as these can be safely used by persons with facial hair and/or spectacles.
- Tychem Barrier Man C hooded suits manufactured by Dupont

2. DECONTAMINATION

Decontamination in the context of these guidelines means the physical and/or chemical process of removing, destroying, neutralising or reducing to a safe level an agent that contaminates people as well as equipment involved in a CBR incident. With the release of a chemical weapon in a populated area, casualties may present en masse with little or no advance notification. whist others will arrive by ambulance.

a. Self Presenting Persons

In the Tokyo subway system sarin attack, a significant number of exposed individuals found their own means of transport to a Health Care Facility, unassisted by the emergency medical services. The assault resulted in 11 deaths and more than 5000 emergency medical evaluations of which 73.9% had no identifiable clinical injury. The

majority of those exposed apparently had either a subclinical exposure or psychogenic symptoms

- It is probable that self presenters will arrive at emergency departments without prior warning and they may arrive on foot, cars, taxis, or with friends. In addition many will have been transported by passers-by all of whom present unannounced and without any previous decontamination whatsoever, using the most direct and usual entry point
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- It is likely that approximately 80% of presenters will either not be decontaminated or only minimally contaminated.
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It must be assumed that any casualty who is ambulatory has minimal external contamination.

b. HOSPITAL PREPAREDNESS FOR SELF PRESENTERS

Hospital managers and the respective Hospital Executives, are encouraged to adapt these general guidelines to ensure that their hospital has the capacity to address the potential problem of contaminated individuals self presenting to their institution. It is important that self presenters are not admitted to ED or other parts of the hospital without first being decontaminated

> *Experience has shown that 80% of the decontamination process is achieved by merely removing the victims clothing. This should be followed by soap and water decontamination*

- Effort must be made to maintain the usual ambulance access.

- Public need to be marshalled and directed to a dedicated external holding area, but reasonably close to the eventual entry to the triage and treatment area within the hospital.
- The passage (flow) of suspected contaminated self presenters needs to be such that those who have been decontaminated do not mix with those as yet to be showered.

- Separate potentially contaminated persons by gender if possible. Young children should be permitted to accompany a parent of either sex, however consideration should be given to alternating between male and female groups, keeping in mind ethnic diversity and sensitivities appropriate to the situation.

- External shower area needs to have permanent fittings that cannot be operated/damaged by vandals. Partitions, drop cloths or curtains for privacy should be considered.

- The general method of decontamination is to have two sets of showers, a minimum of 6 metres and maximum of 10 metres apart. Industrial type shower heads are suggested as they provide large droplets of water rather than a fine spray that will spread. ***It would be wise to consider the issues of privacy and direction of run-off in***

selecting where showers will be placed. EPA suggests a filtration system to the drain (activated carbon or similar) may be an option to consider to avoid pollution, particularly for biological or radiological incidents.

- Facilities should be developed with minimum expenditure.
- Most people can go through the decontamination procedure with minimal assistance from attendants; however those who are impaired by agent exposure, injury, poor health or other handicaps may require the assistance of an attendant.
- Provision needs to be made for:
  - tape or portable barriers to control the flow of people to the external holding area through the decontamination station;
  - bins for "dumped non-returnable" clothing items;
  - large plastic bags for clients to maintain possession of clothing and other items;
  - some form of cover (disposable garment) that they may put on after showering;
  - clearly marked directions for decontaminated persons to the triage treatment areas within the hospital.
  - usual client identification procedures at the normal hospital emergency receiving area after they have been decontaminated.
- The likely low level of contamination, and the diluting effect of excessive volume of water used, means that the shower run off water can be discharged using the normal drainage with minimal concern for the environment or for downstream contamination risks.
- Should persons enter the Emergency Department prior to decontamination, there may be a risk of internal contamination within that area. It is suggested that the fire mode of the air conditioning system or the smoke (fire delete)"exhaust" fans be activated for a short period of time to flush or expel the volume of air from that area prior to reverting to the normal air flow operation.
- Additional decontamination of chairs and perhaps the floor areas may also be appropriate.
- Staff awareness/preparation and training is essential as the hospital cannot rely upon external emergency decontamination assistance in the short term.
- Hospital security staff will have a clear role setting up receival and decontamination "flow patterns" that are different to the norm.
- Security staff will also need to establish and maintain clear entry for ambulances.

3. ACUTE CASES – AMBULANCE ARRIVALS

These people, smaller in number, will have been transported possibly by ambulance or other form of transport, from the emergency site. They will have already been decontaminated at the site facility.

- Casualties/affected persons may be transported to a hospital.

- These people may well require an additional decontamination showering process before they are either triaged or treated.

- A second single industrial shower facility "to take small numbers" as close as possible to the usual ambulance receival point.

It is strongly recommended that individual hospitals during their planning process arrange for a representative from the Department of Health, Emergency Management Section and from FESA, Special Risks, to meet with the hospital team on site both during this planning phase and again after the work has been completed.

ACKNOWLEDGEMENT
A number of suggestions have been taken from the Victorian Government's initiative in preparation for the 2000 Olympic Games which included arrangements to counter Chemical, Biological & Radiological terrorist events.

REFERENCES:

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3. Dupont Persona Protective Gear Website
4. 3M Website

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