GUIDELINES FOR THE PRE-HOSPITAL MANAGEMENT OF PERSONS CONTAMINATED WITH CHEMICAL AGENT DURING ARMED CONFLICT AND OTHER VIOLENCE

REFERENCE

ICRC

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CONTENTS

FOREWORD AND ACKNOWLEDGEMENTS

The ICRC has compiled these guidelines for health facilities that receive contaminated persons or are likely to do so. The aim is to provide such facilities with the knowledge they need to create a mass-casualty decontamination operation that is appropriate to the context, reduces risk to people who have been contaminated and protects care providers from secondary contamination.

The need for these guidelines became apparent as increasingly frequent releases of harmful chemicals during armed conflicts and other violence demonstrated that existing practices lacked adaptability. Limitations became apparent in the equipment used (because of problems with end-user licences) and in relation to cultural and religious differences. In addition, existing practices focus on managing a single release of a contaminant, ignoring the fact that contaminants may be released in an already unstable situation and that victims of contaminants may be in disparate physical and mental states. The ICRC Weapon Contamination (WeC) Unit has brought together lessons learned from working in affected areas, conducting risk assessments and providing training in the pre-clinical management of contaminated victims. We have used this experience, together with best practice from around the world, to develop an approach that can be implemented in any situation, even with limited resources.

These guidelines assume that large numbers of victims are self-presenting at a health facility. To ensure that the largest possible number of victims receive help, and to ensure that medical treatment is available in close proximity before and after decontamination, these guidelines should be implemented at health facilities. Setting up a decontamination facility in an existing health facility will also, to some extent, ensure that parties to the conflict do not misuse the associated equipment.

The guidelines were prepared for the ICRC by Frida Larsson, under the supervision of Johnny Nehmé. The ICRC is extremely grateful to the following for having peer reviewed this document:

- The Irish Defence Forces
- The Norwegian CBRNe Centre at Oslo University Hospital
- Spiez Laboratory in the Swiss Federal Office for Civil Protection

Their valuable input considerably enhanced these guidelines.

ACRONYMS

CBRN	Chemical, Biological, Radiological and Nuclear
CWA	Chemical Warfare Agent
ICRC	International Committee of the Red Cross
ISO	International Organization for Standardization
MCD	Mass Casualty Decontamination
PPE	Personal Protective Equipment
TIC	Toxic Industrial Chemical
SOP	Standard Operating Procedure
WEC	Weapon Contamination
WHO	World Health Organization

ICONS

Absorbent material 

Baby bathtub with constant drainage 

Blanket 

Brush for single use 

Disposable towels 

First Aid 

Garments to cover parts of the body to comply with local cultural and religious norms 

Jerrycan for water 

Liquid soap 

Mask 

Mask (nurse) 

Permanent marker

Personal Protective Equipment 

Person without mask 

Person without mask (nurse) 

Person without mask (site) 

Plastic bags, large, thick bags for waste 

Plastic bags, small, thick bags for belongings 

Pressurized water spray bottle 

Single-use scissors with curved blades 

Sign to guide contaminated people to the area 

Sponge for single use 

Stool 

Stretcher 

Stretcher with holes 

Stretcher stands 

Tub with drainage, large 

Tub, small 

1. INTRODUCTION

1.1 SCOPE

This document sets out guidance and factors to consider when planning, preparing and providing pre-hospital assistance for people who have been contaminated with a chemical agent during an armed conflict or other violence. It covers the technical and practical aspects of decontamination, but not the medical training required to identify and treat chemical injuries.

Please do not use these guidelines independently without receiving initial training from the Weapon Contamination (WeC) Unit, International Committee of the Red Cross (ICRC).

1.2 HOW WE WROTE THESE GUIDELINES

We first conducted an open-source search, which identified 53 written, relevant, non-ICRC sources – some military and some civilian. These sources cover procedures complied by first responders, the armed forces of various countries and health-service providers, aimed at neutralizing or physically removing a contaminant as quickly and effectively as possible. Our search also covered documents from internationally recognized organizations working in this field, from specific countries and from collaborations between countries, but was limited to documents in Danish, English, French, Norwegian and Swedish.

We studied these resources with the aim of designing an approach tailored to the contexts in which the ICRC operates, but the resulting guidelines are also suitable for use outside the ICRC. After drafting the methodology on the basis of best practices developed in other contexts, we once again analysed the procedure and incorporated lessons learned from ICRC experience.

To keep these guidelines comprehensible and easy to read, and to facilitate their use in the field, we have only listed the references at Annex A. While we have not cited the references in the body of the text, they were essential to us in compiling these guidelines.

1.3 TERMS AND DEFINITIONS

These guidelines use the words “shall”, “should” and “may” to indicate the intended degree of compliance. This use is consistent with the language in the standards and guidelines of the International Organization for Standardization (ISO):

a) “Shall” indicates a requirement, method or specification that must be applied in order to conform to these guidelines.
b) “Should” indicates a preferred requirement, method or specification.
c) “May” indicates a possible method or course of action.

ambulatory	Capable of walking.
cold zone	An area free from contaminant, where first responders are not required to wear additional PPE. Management, medical and other staff all operate in this zone. Instructional illustrations generally use green to identify the cold zone. Also known as the *support zone*.
contaminant	A toxic/poisonous substance.
contamination	The action or state of making or being made impure by polluting or poisoning.
contamination reduction zone	Synonym for *warm zone*.
decontamination	The neutralization or removal of dangerous substances, radioactivity or germs from an area, object or person.
exclusion zone	Synonym for *hot zone*.
hot zone	The area immediately surrounding the hazard release area, within which contamination is not controlled. People within this area shall be evacuated or shall be required to wear the highest level of PPE needed for the specific incident. Instructional illustrations generally use red to identify the hot zone. Also known as the *exclusion zone*.
non-ambulatory	Not capable of walking.
support zone	Synonym for *cold zone*.
suspected non-ambulatory	Capable of walking, but may have trouble performing the decontamination procedure without assistance because of their physical state.
warm zone	The area where decontamination is conducted, but in which contamination is not controlled. First responders working in this zone usually require a reduced level of PPE. Instructional illustrations generally use amber/orange to identify the warm zone. Also known as the *contamination reduction zone*.
worried-well	People who not need medical treatment, but who visit a doctor (or, in this context, a decontamination facility) reassured.

2. ASSESSMENTS, PLANNING AND MANAGEMENT

2.1 RISK MANAGEMENT AND PLANNING

The risk management approach allows a health facility to identify the hazard that is involved in a potential incident, analyse the probability of this incident occurring, and evaluate the consequences of such an event for hospital staff and the general population. It is essential to conduct such an analysis, in order to plan an appropriate response before an incident occurs or re-occurs.

Good planning ensures that the resources available match:
- the type of hazard
- the nature of the context
- the potential number of victims
- the severity of their contamination
- existing control and mitigation measures.

The aim is to provide appropriate aid for victims of a CBRN incident or the release of a chemical warfare agent (CWA) or toxic industrial chemical (TIC), while providing hospital staff with adequate protection.

These guidelines will allow a health facility to prepare itself thoroughly, so as to increase its resilience to the consequences of such an incident in a specific context. However, the guidelines do not explain how to reduce the probability of an incident occurring.

In all planning, **staff safety is the priority**. It is therefore essential to develop standard operating procedures (SOPs) covering safety and good practice, based on these guidelines, and to continuously train staff in the implementation of those SOPs. In addition, it is useful to provide health staff with written instructions that they can consult at any time. Staff safety must remain the priority even during unplanned events that occur during the decontamination process and which may pose additional risk.

Any risk assessment is based on the circumstances identified at a specific time. It is therefore necessary to update or review it at regular intervals. Additionally, if the health facility lies inside the incident hot zone everyone shall be evacuated; all staff and patients exposed must be seen as victims.

2.1.1 CONTEXTUAL RISK ASSESSMENT

A contextual assessment tells us how probable it is that a specific type of incident will occur, taking into account:
- current and historical events
- the availability of CBRN/CWA/TIC
- casualties known to have been affected by CBRN agents
- the extent to which parties to the conflict intend to use such agents
- allegations that parties to the conflict have used such agents
- the potential for unintentional TIC release.

The second step is to match the results of the probability assessment to an evaluation of the consequences of each type of incident – for hospital staff and for the general population. This process results in a risk matrix (see below). The risk matrix identifies the initial risk the health facility is facing under the current risk and management system, and allows it to adopt a suitable response plan.

RISKS RELATED TO A CBRN/TIC INCIDENT				PROBABILITY				
				A. V. unlikely	B. Unlikely	C. Possible	D. Likely	E. V. likely
		For hospital staff Exposed to CBRN/TIC hazards	**For civilians** Exposed to CBRN/TIC hazard and/or suffering other physical trauma	• No alleged or confirmed use of CBRN agent / TIC • No known casualties	• No alleged or confirmed use of CBRN agent / TIC • No confirmed casualties	• Alleged use of CBRN agent / TIC • No confirmed casualties	• Confirmed use of CBRN agent / TIC • Regional hostilities • No confirmed casualties	• Confirmed use of CBRN agent / TIC • Local hostilities • Confirmed casualties
CONSEQUENCES	5. Catastrophic	Fatalities or life-changing injuries.	Mass casualties and/or fatalities. Local medical capacity overwhelmed.	5A	5B	5C	5D	5E
	4. Severe	Injuries requiring immediate pre-hospital care, evacuation and clinical care.	Serious injuries requiring clinical care and long-term rehabilitation.	4A	4B	4C	4D	4E
	3. Significant	Injuries requiring emergency local pre-hospital and clinical care.	Serious injuries requiring clinical care, with no long-term disability.	3A	3B	3C	3D	3E
	2. Moderate	Injuries requiring local clinical care.	Injuries requiring local treatment.	2A	2B	2C	2D	2E
	1. Negligible	Minor injuries requiring no medical attention.	Minor injuries to one or a few persons, requiring no medical attention.	1A	1B	1C	1D	1E

The colours in the table indicate the level of risk and the need to implement mitigation measures to reduce the risk. Green indicates that the level of risk is low but needs to be monitored. Yellow indicates a higher level of risk and mitigation measures should be implemented and monitored. Red indicates that the risk level is high and mitigation measures shall be implemented.

2.1.2 TECHNICAL ASSESSMENT

A technical assessment tells us what the current system and health facility are providing and what on-site resources can be used in an updated risk-management plan and decontamination procedure.

When analysing a health facility's ability to provide the right response, we must answer a few practical questions.

Before any incident occurs:

- Is the medical authority aware of the decontamination needs and process?
- Does the medical authority agree to create a decontamination set-up in the facility?
- Is there any existing local capacity for patient decontamination?
- Is health facility known to the population as a referral health facility?

- Is there an open space outside of at least 850 m^2 (minimum length 70 metres, minimum width 12 metres)?
- If so, is this open space more than 10 m from any entrance to the health facility (so as not to impede the flow of other patients)?
- Is the health facility located higher than the mass casualty decontamination (MCD) area? If not, are there sufficient drainage facilities between the health facility and the area to ensure that waste water does not contaminate the health facility?
- Are there both female and male staff working in the health facility? To operate one complete MCD area, each shift must comprise at least five male staff, five female staff and five of any sex.
- Is running water available in the health facility?
- Are facilities available for storing supplies purchased specifically for performing decontamination?
- What materials required to create and manage an MCD area are currently **not** available at the location?
- Is it possible to put the health facility under lockdown (keeping entrances/exits guarded) or at least to limit access, to make sure staff and patients inside are not contaminated?
- Is there a local weather-monitoring authority? If not, refer to the closest airport for this service.

If an incident has already occurred:
- Is this health facility located outside the hot zone?
- What are the current weather conditions?

Once the technical assessment is complete, use it to start deciding how to lay out the MCD area and what equipment to purchase or update.

These planning activities will increase resilience to the consequences of an incident. With the help of the risk matrix above, it is possible to evaluate the action taken to determine what the risks are and whether the planned response will reduce risk.

2.1.3 INFORMATION MANAGEMENT

WeC information management involves setting up a mechanism for information exchange, consultation and coordination within a health facility and between health facilities in the same region/country, to handle health matters related to events that might involve chemical agents. Senior personnel within the health facility conduct this activity, rather than staff directly involved in the decontamination of victims.

Specific objectives:
- Rapidly undertake and coordinate all responses to events that might involve chemical agents
- Exchange information on preparedness and plans for response
- Consider, and advise on, all aspects of public health preparedness for emergencies related to such events
- Establish a dedicated network, operating 24 hours a day, seven days a week, using encrypted telephone, fax and internet connections, for communication between health facilities and between them and the ministry of health
- Establish an early warning system to relay information regarding suspected and alleged events or cases and preliminary indications regarding the nature and extent of contamination
- Establish an alert system to relay information regarding confirmed events or cases in unfolding situations

- Establish a notification system to relay information regarding confirmed, investigated and controlled events and cases
- Create case definitions that include descriptions of trigger symptoms or other phenomena or indications connected to specific chemical agents

Setting up an information management system that achieves the above objectives will result in the following:

- A coordination mechanism will exist in the region, providing information regarding referral health facilities and the tasks performed by first responders.
- The system will include a list of hazards and a mapping of events, based on the contextual assessment.
- The system will include information regarding the capacity of each facility, based on the technical assessment.
- It will be possible to use the information gathered to produce revised guidelines on decontamination, restoration of services and the strengthening of health-related systems.
- The system will enable health facilities to communicate easily with other countries, the ICRC and the World Health Organization (WHO).
- The system will facilitate communication with the public regarding a chemical release.
- The system can be used to identify the signs of chemical contamination from alerts, notifications and victim symptoms.

2.2 DISTRIBUTION OF TASKS

All levels of staff from every shift and department, including non-medical staff, shall undergo training conducted locally, based on these guidelines and local SOPs. This will ensure overlap and avoid a situation in which only a few key staff are familiar with the procedures.

It is important to minimize disruption to the health facility's operations. It is therefore best to deploy non-medical staff as decontaminators wherever possible, so that medical staff are available to provide medical treatment after decontamination is completed.

The table below indicates the areas of responsibility for each role in the MCD area (the colour codes are mirrored in the decontamination procedures).

Site manager/controller/controller	Nurse	Decontaminator
• Mobilizes staff • Distributes equipment • Monitors: - PPE - decontamination - waste management • Manages central stocks • Monitors weather conditions	• Performs PPE + buddy check • Performs decontamination triage and confirms patients' clinical status • Takes clinical care management decisions • Ensures no cross-contamination occurs during decontamination	• Performs PPE + buddy check • Supports clinical care according to instructions from nurses • Decontaminates - victims - operators - equipment • Collects waste • Manages stock in decontamination corridors • Manages dead bodies

2.3 PERSONAL PROTECTIVE EQUIPMENT

The risk management procedure shall be the deciding factor in deciding PPE level, and all PPE-wearing staff shall have the same level of protection. The aim is to protect staff as thoroughly as possible without creating unnecessary strain on them as a result of wearing PPE. When selecting PPE, it is important to check that it will provide sufficient protection for longer than the calculated duration of one shift in the specific context. In addition, it is necessary to test the equipment to check that staff can work in it.

Before staff are sent to work in a decontamination corridor, they shall have undergone sufficient and continuous training in the use of the PPE they will be using. The site manager/controller shall keep track of time to make sure that equipped staff do not work too long in the warm zone and that there are always personnel available to take over if an unplanned change becomes necessary or if additional staff are required due to an incident in the MCD area.

Recommended equipment

- Chemical-resistant suit that meets the following specifications:
  - *Protective clothing for use against liquid chemicals – Type 3 and Type 4. EN 14605:2005+A1:2009* **or equivalent**
  - *Protective clothing for use against solid particulates – Type 5. EN ISO 13982-1:2004+A1:2010* **or equivalent**
- Chemical-resistant inner and outer gloves and boots/shoes
- Full-face air-purifying respirator (hood) that meets the requirements of *Respiratory protective devices. Powered filtering devices incorporating a helmet or a hood – BS EN 12941:1998+A2:2008* or equivalent
- Portable hydration system to wear under the PPE
- Communication equipment
- Cooling vest, depending on the context

The equipment shall not be subject to any end-user licensing or customs restrictions.

On each shift in the MCD area, 14 staff need to be wearing PPE.

For 24 hours of decontamination operations, divided into one-hour shifts, the PPE requirements are as follows:

- 300 chemical-resistant suits and filters – single use
- 50 rechargeable batteries and turbo units – to be decontaminated between shifts
- 50 pairs of chemical-resistant inner and outer gloves – to be decontaminated between shifts
- 50 pairs of chemical-resistant boots/shoes – to be decontaminated between shifts

Notes

- Select equipment with no end-user licensing or customs restrictions (i.e. items classified as "industrial use") to facilitate the setting-up of the decontamination facility.
- Stock PPE in various sizes so that all personnel can operate in correctly-fitting clothing.

- Active contamination from the initial source of contamination should not be a risk, as staff should not be subjected to the hot zone, thus lowering the need for a higher level of protection. If subjected to the hot zone, staff shall evacuate; they shall not perform decontamination at the site of contamination.
- Equipment manufactured to the standards listed has liquid-tight and spray-tight connections when subjected to all known CWA/TIC and gives sufficient respiratory protection for a specific time.
- Victims approaching the health facility will typically arrive after some time has passed since exposure, which means that the concentration of agent on their bodies and clothing will have fallen as a result of distance from the incident and of absorption/evaporation.
- Using a hood with a large visor will eliminate the need to test the seal between a mask and the face, and to shave facial hair, and will enable the user to wear normal glasses or a scarf. This will eliminate any limitations on use for cultural or religious reasons or because a user needs to wear glasses.
- Using a hood-type respirator will make it easier to communicate with victims.
- Using a cooling vest will prolong working time when using the equipment and is a requirement in high temperatures, to reduce the risk of heat exhaustion.

2.4 STOCK MANAGEMENT

If it is to be of use in helping contaminated victims, stored equipment must be checked regularly. Failure to do so could lead to death or injury as a result of using equipment that has deteriorated in storage or has passed its expiration date. Some types of equipment come with storage instructions, including frequency of inspections. These instructions shall be followed, to ensure that the equipment maintains its protective specifications. Equipment supplied without such information shall be checked at least every three months. Keeping a register of each item including quantity, expiration date, date of last inspection, date for next inspection and storage location will facilitate stock management.

Limiting access to the stock is vital in order to be certain that all equipment is available when needed. It is equally important to ensure that immediate access to the equipment can be provided. This means not limiting access to a single person. It is for that reason that the role of site manager/controller includes responsibility for central stocks.

Stock shall be replaced as soon as possible after equipment has been used during decontamination, to ensure that there is sufficient stock available to respond to another incident.

A number of PPE kits shall be available for continuous training. Expired or damaged equipment may be used for this purpose, but training equipment shall be clearly marked as such and shall not be used for operations.

3. DECONTAMINATION PROCEDURE

3.1 DISROBING AND DECONTAMINATION PROCEDURE FOR VICTIMS

A decontamination corridor typically consists of several stations, each forming a specific part of the decontamination procedure.

This procedure, designed for victims of an incident, consists of seven stations.

1. Decontamination triage
2. Disrobing
3. Immediate decontamination – wet or dry
4. Technical decontamination
5. Drying
6. Re-robing
7. Medical triage

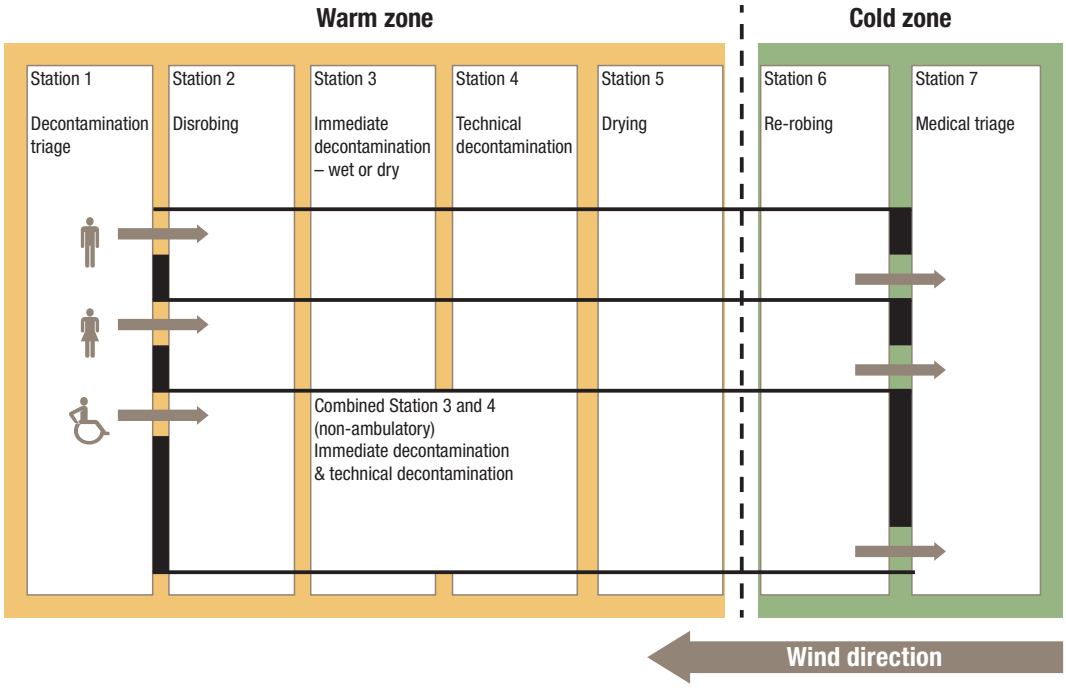
The sections below explain each decontamination station in detail. The present section lists only the equipment needed to build the decontamination corridors in the MCD area.

When siting an MCD area:

- choose a location that does not significantly limit the movement of ambulances and of non-contaminated people seeking medical care
- take ground slope into consideration, to ensure that water can drain from the decontamination corridors to the waste water collection point
- if possible, build the MCD area so that the wind blows from the cold zone towards the warm zone – this reduces the risk of secondary contamination due to off-gassing.
  - If the MCD area is in direct proximity to the hot zone, wind direction is of vital importance, because of the risk of direct contamination from the incident site.
  - The significance of wind direction diminishes with distance from the incident site.
  - Wind direction is variable and changes constantly, especially in urban settings.

The diagram below gives an overview of the MCD area. Black lines indicate physical barriers created by corridors, while grey lines correspond to thematic sections, which do not necessarily have physical barriers between them.

Overview of disrobing and decontamination procedure



Each corridor should be at least 3 metres wide and each station should be at least 10 metres long, to provide enough space for victims and staff and to reduce the risk of secondary contamination from off-gassing material along the decontamination corridor. Increase the distances between the stations if there is enough space.

When creating the waste water collection point, calculate the volume of water it can hold so you can calculate how much hypochlorite to add when decontaminating the waste water.

The table below indicates the number and distribution of personnel during one shift in the MCD area described above.

STATION	1	2	3	4	5	6	7	TOTAL
Site manager / controller	0	0	0	0	0	0	1	1
Nurse	1	1 (located in non-ambulant corridor)				1	According to health facility planning	3
Decontaminator, either sex	1	0						1
Decontaminator, female corridor	0	1		1		1	0	3
Decontaminator, male corridor	0	1		1		1	0	3
Decontaminator, non-ambulant corridor	0	4 (2 male + 2 female)				0	0	4

It is possible to increase or decrease the number of personnel in the MCD area, depending on how many decontamination corridors were deemed necessary to manage potential victim flow during the assessment carried out beforehand. However, the numbers in the table above are the minimum required for a full set-up.

The number of victims that the facility can decontaminate per hour will vary greatly, depending on a number of factors. One key factor that can speed up the flow of people through the MCD area is thorough and repeated training of personnel. It is important to avoid compromising quality for the sake of speed, and it is also important to give clear instructions to the victims. Factors that can affect the procedures negatively include language barriers, victims' injuries and differences when disrobing due to differences in victims' clothing.

The following rule applies to every step in this procedure:
Staff safety is the first priority. If life-threatening situations occur, you must consider changing procedures to protect staff.

Equipment

Essential

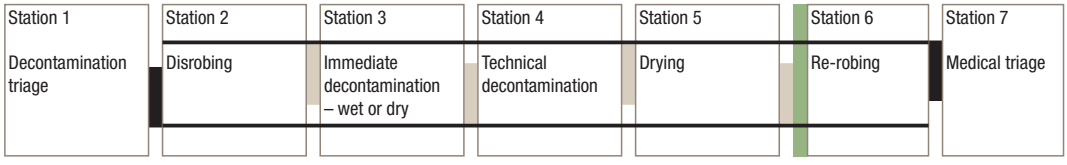
- Tarpaulins that meet the following specifications:
  Plastics film and sheeting – Determination of impact resistance by the free-falling dart method, part 1 and 2 – ISO 7765-1:1988 and ISO 6383-2:1983
- Fixing material for tarpaulins: rope, tape, nails, gantries, etc.
- Ladders, chairs or step-ladders
- Material to weigh the tarpaulins down
- Digging equipment

Complementary

- Tent to use at Stations 6 and 7 (including generator, electric cables, sockets and fuel)
- Dividing walls
- Conveyer
- Waste-water collector

Notes

- To preserve the dignity of victims and accommodate cultural practices and religious beliefs – which will increase compliance with disrobing and decontamination – use curtains to separate sexes and to ensure privacy from bystanders.
- To further increase compliance, create temporary divisions between each station in the corridors for ambulatory victims (marked in beige below) if possible.



- If the technical assessment shows that the space available for the MCD area makes it impossible to achieve the minimum recommended sizes for the decontamination premises, the dividing walls become essential – to avoid cross-contamination – rather than complementary.
- The persons building the structure will need something to stand on (step-ladders, chairs, etc.) in order to put up walls of sufficient height.
- Waste water shall be collected. If no proper collection system is available, collect it in a tarpaulin until it has been decontaminated.
- If it is not possible to line an existing ditch or equivalent with the tarpaulin, it will be necessary to dig a hole.
- A tent can be used to reduce exposure to the weather and to provide acceptable working conditions for medical personnel in the cold zone.
- If available, use a conveyor to reduce the strain on staff when handling non-ambulatory victims.

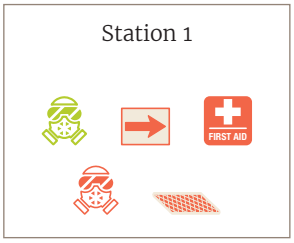
In the following sections the level of staff and PPE needed for each station is indicated by a symbol and its background colour, for example a respirator with yellow background means one nurse wearing PPE.

3.1.1 STATION 1 – DECONTAMINATION TRIAGE

Equipment

Essential
- Signs to guide contaminated people to the area
- Equipment for chemical first aid
- Equipment for chemical field medical care
- Stretcher with pre-fabricated drainage holes

Complementary
- Means of creating a barrier between the MCD area and the surrounding area
- Laminated victim cards



Instructions provided to victims
- Follow the signs and spoken instructions

Information provided to victims
- What is going to happen in the area
- Why decontamination is important for the individual, the responders and other people
- Information regarding the incident – what is known and what is unknown

Instructions for staff

Ambulatory
- Identify victims in need of chemical first aid/field medical care
- Provide chemical first aid/field medical care
- Ask:
  - from where the person travelled
  - whether they have any symptoms
  - whether they were already ill or injured prior to the incident
- Identify victims capable of decontaminating themselves and suspected non-ambulatory persons who can do so provided a buddy system is being used
- Segregate sexes and send people to their designated decontamination corridors
- If culturally accepted, keep families with young children, guardians/dependents and people speaking the same language together if all need to be decontaminated
- Be aware that a number of people classified as worried-well will show up at the MCD area and insist on being decontaminated
- Remember that non-contaminated victims suffering from other physical wounds will arrive in larger numbers – do not focus all your resources on decontamination

Non-ambulatory
- Identify victims incapable of decontaminating themselves – and suspected non-ambulatory victims if a buddy system is not used – and send them to the designated decontamination corridor
- Identify victims in need of chemical first aid/field medical care
- Provide chemical first aid/field medical care
- Lay victims to be decontaminated on stretchers, on their backs

Notes

- To protect bystanders and to ensure compliance with instructions, it is important to provide as much information as possible during the whole decontamination process, and for instructions to be as clear as possible.
- The ability to administer chemical first aid/field medical care is crucial in order to save lives, but only the minimum for lifesaving is to be administered at this station, to avoid unnecessary use of time and resources.
- Treat victims as individuals, not as a homogenous group, to ensure that each person receives the right treatment. This will make it possible to treat everyone faster, which is the most crucial factor when dealing with contamination.
- If first responders ask questions of the victims, this can increase their confidence in the first responders and elicit vital information on the specific needs of the individual. For example, a person with a hearing impairment can be identified and their specific needs addressed.
- Victim cards, on which information regarding medical care provided and the decontamination procedure followed is entered during the decontamination process, will facilitate follow-up on medical and decontamination status when the person arrives at the medical triage station.
- Evaluate the possibility of using a buddy system during the contextual assessment. Such a system may increase the effectiveness of decontamination, accelerate the procedure and reduce the psychological impact on the individual undergoing decontamination.
- Sex segregation plays a vital role in ensuring willingness to undergo decontamination, in view of cultural and religious taboos on disrobing in the presence of the opposite sex.
- Prioritize the decontamination and clinical management of children, as they have a higher ratio of body surface area to body volume than adults. As a result, children are at greater risk of excessive loss of heat and fluids and they are affected more quickly and easily by toxins that are absorbed through the skin. In addition, children have thinner skin than adults, which further increases the risk of increased absorption of agents through the skin.
- If the contextual assessment has established it to be culturally accepted, keep families with young children, guardians/dependents and same-language groups together as much as possible, to facilitate communication and to create a better psychosocial environment for the victims. For example, a contaminated father presenting with a young daughter could have the daughter join him in the male decontamination corridor if culturally accepted.
- Do not reject a suspected worried-well person; allow them go through decontamination (assigned a low priority), both because there is no way of being sure that they are not contaminated and because this will boost their psychological state.
- Handle contaminated dead bodies respectfully, separate them from living victims and place them in a temporary mortuary at Station 1, out of sight of other victims. Decontaminate dead bodies after all living victims, using the same decontamination procedures as for a non-ambulatory victim.

3.1.2 STATION 2 – DISROBING

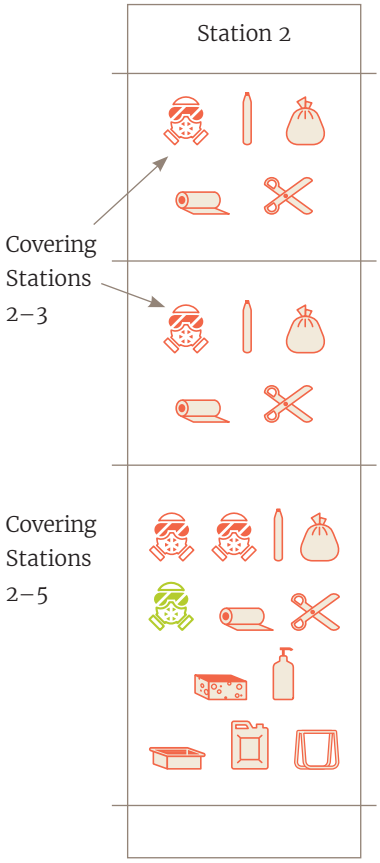
Equipment

Essential

- Water
- Liquid soap
- Single-use scissors with curved blades
- Permanent marker
- Sponge for single use
- Jerrycan for water
- Tub with drainage
- Large, thick plastic bags for waste that meet the following specifications: *Plastics film and sheeting that meets the following standard: Determination of impact resistance by the free-falling dart method, part 1 and 2 – ISO 7765-1:1988 and ISO 6383-2:1983* **All plastic bags used in the procedure shall conform to the above standard**
- Small, thick, transparent plastic bags for belongings
- Stretcher stands

Complementary

- Bag tags or marking tape



Instructions for victims:

- Undress, starting from your head and working downwards
- Do not pull your clothes over your head; use scissors to cut your clothing open – you will receive new clothes at the end of the decontamination process
- Put each item of clothing in a large plastic bag as you take it off
- Put valuable belongings in a small bag
- When you have finished undressing, close the large bag, put it in a second large bag and close that bag
- When you have finished undressing, close the small bag, put it in a second small bag, close that bag and mark it with your name and phone number
- Move to the next station

Information for victims:

- Clothes act as an absorbent barrier between your skin and the contaminant; by removing them, you can reduce your exposure by up to 90%
- The reason for removing all your clothes is that if you were to continue decontamination with your clothes on, you would absorb more of the contaminant through your skin; you would also put other people at risk
- Contaminants can concentrate in hair, including facial hair, so cutting or shaving hair off could greatly reduce contamination but if you shave, be careful not to cut yourself
- You need to put clothes and valuable belongings into bags so contaminant cannot escape into the air and harm people
- We ask you to mark the bag with valuable belongings so you can recover items that can be decontaminated
- If you can, help anyone who is in difficulty; this will make decontamination quicker for everybody

Instructions for staff

Ambulatory

- Staff (other than nurses) should be of the same sex as the victims
- Give verbal instructions to the victims and monitor disrobing
- Assist with disrobing if necessary
- Remove full bags, to ensure that there is enough space in the station
- Discard used scissors
- If a victim refuses to undress, try to explain the reason for undressing
- If a victim refuses to be totally naked, allow them to keep their underwear on
- If a victim refuses to take anything off, tell them they can wait until all other victims have finished, and go through decontamination alone after them

Non-ambulatory

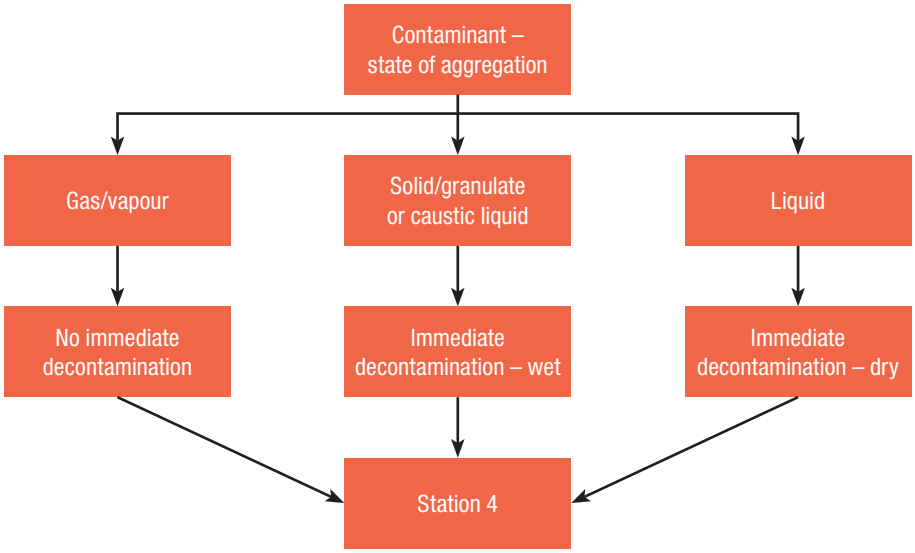
- Staff (other than nurses) should be of the same sex as the victims
- Carry the victim on the stretcher to a set of stands
- Place a tub under the stretcher
- Two decontaminators perform decontamination, monitored by the nurse
- Cut the victim's clothes open, starting from the head and working down
- Make sure the outer layer of the clothes does not come into contact with bare skin
- Decontaminate your own hands and forearms before the next step
- Move the victim onto their side to remove their clothes
- Place the clothes in large double plastic bags
- Place valuable belongings in small double plastic bags
- Decontaminate the exposed stretcher with water and soap before laying the victim on their back again
- Discard scissors and sponge
- Empty tub when full

Notes

- For cultural and religious reasons, making sure that staff are of the same sex as the victims is a vital element in ensuring victims are willing to undergo decontamination.
- The reason for starting disrobing from the head and working down towards the feet is to minimize the possibility of exposing airways and eyes to contaminants. That is also the reason why victims should not pull their clothes over their heads when disrobing.
- To decrease the risk of off-gassing from clothes, belongings need to be sealed off properly, hence the use of double plastic bags.
- Bags with valuable belongings should be tagged, both so that belongings that can be decontaminated can be returned to their owners, and to help track potential evidence.
- Decontamination of equipment and decontaminators will reduce the risk of cross-contamination.
- Arguing with a victim will affect other victims waiting to disrobe, putting everybody at greater risk of exposure/extended exposure. It is therefore critical to quickly move through the different steps for handling non-compliance with disrobing and to allow other victims to start the process.
- The buddy system can increase the effectiveness of decontamination, accelerate the procedure and reduce the psychological impact on the individual undergoing decontamination.

3.1.3 STATION 3 – AMBULATORY VICTIMS: IMMEDIATE DECONTAMINATION – WET OR DRY

Use the flow chart below to select the appropriate type of immediate decontamination.



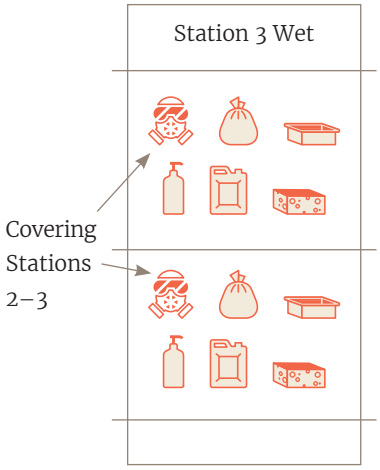
If type of contamination is difficult to establish, use whatever immediate decontamination method is available – wet or dry. The main point of immediate decontamination is to remove visual and obvious contamination as quickly as possible.

3.1.3.1. Instructions for immediate WET decontamination

Equipment

Essential
- Water
- Liquid soap
- Sponge, soft brush or cloth, for single use
- Jerrycan for water
- Large, thick plastic bags for waste
- Tubs with drainage

Complementary
- Tepid water



Instructions for victims
- Using clean water, rinse ONLY the parts of your body that look affected/contaminated, over the tub; start from your head and work down to your feet, rinsing the front of your body first and then the back, and if you have any wounds, clean from the wound outwards
- Use a sponge with soap and water to wipe the affected areas, over the tub
- Discard the sponge and rinse the areas with clean water, over the tub
- Repeat if you can still see contamination
- Move to the next station

Information for victims
- The purpose of immediate decontamination is to remove as much visible contamination as possible, as quickly as possible
- Immediate decontamination will help to stop contaminants spreading to the rest of your body when you take a shower during the next step of the decontamination procedure
- If you can, help anyone who is having difficulty; this will allow quicker decontamination for everybody

Instructions for staff
- Staff (other than nurses) should be of the same sex as the victims
- Give verbal instructions to the victims and monitor immediate decontamination
- Assist with immediate decontamination if necessary
- Seal, double-bag and remove full waste bags to reduce off-gassing in the station
- Empty tubs when full

Notes

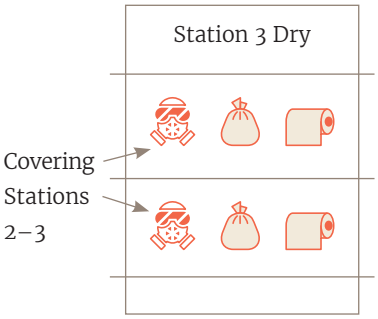
- For cultural and religious reasons, making sure that staff are of the same sex as the victims is a vital element in ensuring that victims are willing to undergo decontamination.
- It is important to remove any visible contaminant before a full body shower, to reduce the effect of gross contaminant without contaminating unaffected skin.
- Immediate decontamination is quick and easy, and therefore prevents initial decontamination being hindered or delayed if the decontamination facilities are not yet finished.
- Collecting solid and water waste prevents secondary contamination.
- The buddy system can increase the effectiveness of decontamination, accelerate the procedure and reduce the psychological impact on the individual undergoing decontamination.
- If the ambient temperature is low, tepid water may be essential to reduce the risk of hypothermia.

3.1.3.2. Instructions for immediate DRY decontamination

Equipment

Essential
- Any absorbent material
- Large, thick plastic bags for waste

Complementary



Instructions for victims
- Blot and rub hands until clean, then discard material
- Blot and rub face and neck until clean, then discard material
- Blot and rub left arm until clean, then discard material
- Blot and rub right arm until clean, then discard material
- Blot and rub torso and back until clean, then discard material
- Blot and rub left leg and foot until clean, then discard material
- Blot and rub right leg and foot until clean, then discard material
- Move to the next station

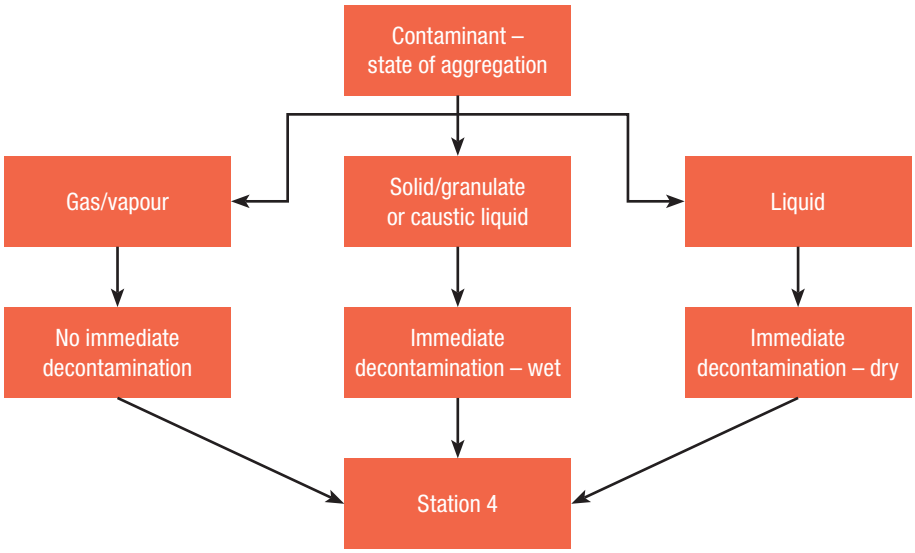
Information for victims
- The purpose of immediate decontamination is to remove as much visible contamination as possible, as quickly as possible
- Immediate decontamination will help to stop contaminants spreading to the rest of your body when you take a shower during the next step of the decontamination procedure
- If you can, help anyone who is having difficulty; this will allow quicker decontamination for everybody

Instructions for staff
- Staff (other than nurses) should be of the same sex as the victims
- Give verbal instructions to the victims and monitor immediate decontamination
- Assist with immediate decontamination if necessary
- Seal, double-bag and remove full waste bags to reduce off-gassing in the station

Notes
- For cultural and religious reasons, making sure that staff are of the same sex as the victims is a vital element in ensuring that victims are willing to undergo decontamination.
- It is important to remove any visible contaminant before a full body shower, to reduce the effect of gross contaminant without contaminating unaffected skin.
- Immediate decontamination is quick and easy, and therefore prevents initial decontamination being hindered or delayed if the decontamination facilities are not yet finished.
- Collecting solid and water waste prevents secondary contamination.
- The buddy system can increase the effectiveness of decontamination, accelerate the procedure and reduce the psychological impact on the individual undergoing decontamination.

3.1.4 STATIONS 3 AND 4 – NON-AMBULATORY VICTIMS: IMMEDIATE DECONTAMINATION AND TECHNICAL DECONTAMINATION

Use the flow chart below to select the appropriate type of immediate decontamination.



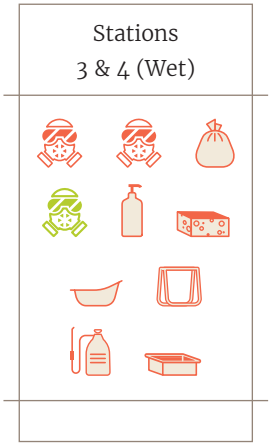
If type of contamination is difficult to establish, use whatever immediate decontamination method is available – wet or dry. The main point of immediate decontamination is to remove visual and obvious contamination as quickly as possible.

Equipment

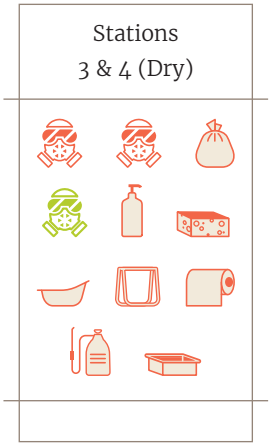
Essential
- Water
- Liquid soap
- Any absorbent material
- Sponge, soft brush or cloth, for single use
- Large, thick plastic bags for waste
- Pressurized water spray bottle (≤ 4 Bar)
- Large tub with drainage
- Baby bathtub with constant drainage
- Stretcher stands

Complementary
- Tepid water
- Hose or showerheads

Covering Stations 2–5



Covering Stations 2–5



Instructions for victims

- [If alert] Please lie still and only move if we ask you to

Information for victims

- The purpose of immediate decontamination is to remove as much visible contamination as possible, as quickly as possible
- Immediate decontamination will help to stop contaminants spreading to the rest of your body when you take a shower during the next step of the decontamination procedure
- Technical decontamination will remove further contaminants from your body

Instructions for staff

Immediate WET decontamination followed by technical decontamination

- Staff (other than nurses) should be of the same sex as the victims
- Ensure there is pressure in the water source used for technical decontamination
- Two decontaminators perform decontamination, monitored by the nurse
- Rinse ONLY visually affected/contaminated areas, with clean water, head to toe and if wounded starting from the wound out
- Use a sponge with detergent solution and wipe the affected areas
- Discard the sponge and rinse the area with clean water
- Place the victim on their side
- Repeat the procedure on the victim's back
- Keep the victim in the side position and rinse the WHOLE back of the body with water for 30 seconds, from head to toe
- Sponge the victim with detergent solution and rinse it off with water
- Decontaminate the exposed stretcher, rinse it with water and roll the patient back onto it
- Rinse the WHOLE front of the body with water for 30 seconds, from head to toe
- Sponge the victim with detergent solution, discard the sponge and rinse them with water
- Empty the tub when full of waste water

Immediate DRY decontamination followed by technical decontamination

- Staff (other than nurses) should be of the same sex as the victims
- Ensure there is pressure in the water source used for technical decontamination
- Two decontaminators perform decontamination, monitored by the nurse
- Blot and rub liquid from the victim using absorbent material, head to toe and if wounded starting from the wound out, then discard the material
- Place the victim on their side
- Repeat the procedure on the victim's back
- Keep the victim in the side position and rinse the WHOLE back of their body with water for 30 seconds, from head to toe
- Sponge the victim with detergent solution and rinse it off with water
- Decontaminate the exposed stretcher, rinse it with water and roll the patient back onto it
- Rinse the WHOLE front of the body with water for 30 seconds, from head to toe
- Sponge the victim with detergent solution, discard the sponge and rinse them with water
- Empty the tub when full of waste water

Notes

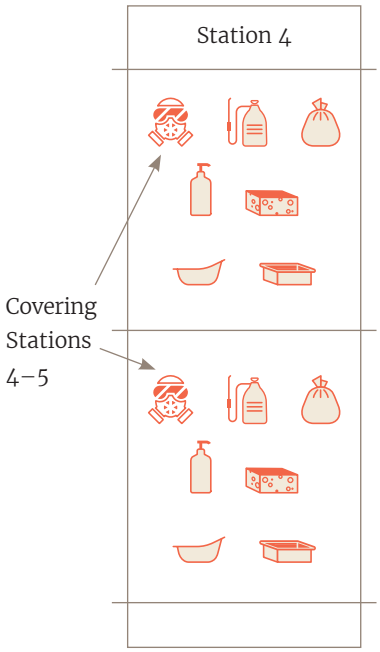
- For cultural and religious reasons, making sure that staff are of the same sex as the victims is a vital element in ensuring that victims are willing to undergo decontamination.
- It is important to remove any visible contaminant before a full body shower, to reduce the effect of gross contaminant without contaminating unaffected skin.
- Collecting solid and water waste prevents secondary contamination.
- Turning the victim ensures easy access to all body parts that may be contaminated.
- The aims of the washing procedure are to remove as much non-visible contaminant from the victim as possible and to enable medical personnel to provide care without danger of secondary contamination.
- Tepid water applied at low pressure increases the effectiveness of the decontamination procedure. If the ambient temperature is low, tepid water reduces the risk of hypothermia.
- Using baby bathtubs to decontaminate toddlers and babies will facilitate the process.

3.1.5 STATION 4 – AMBULATORY VICTIMS: TECHNICAL DECONTAMINATION

Equipment

Essential
- Water
- Liquid soap
- Sponge or wash cloth for single use
- Pressurized water sprayer bottle (≤ 4 Bar)
- Large, thick plastic bags for waste
- Large tub with drainage
- Baby bathtub with constant drainage

Complementary
- Tepid water
- Hose or showerheads



Instructions for victims
- Step into the tub/place the toddler or baby in the baby bathtub
- Keep your head back, to keep your hair away from your face
- The decontaminator will spray your front with water
- Wash your body from head to toe using liquid soap and a sponge/wash cloth
- Turn around when the decontaminator asks you to
- The decontaminator will spray your back with water
- Wash your body from head to toe using liquid soap and a sponge/wash cloth
- Discard the sponge/wash cloth and move to the next station

Information for victims
- During the shower, it is important to wash your whole body – every crease and fold – in order to decontaminate all skin as much as possible
- To decontaminate your hair most effectively, try to spread your fingers and massage your scalp
- If you can, help anyone who is having difficulty; this will allow quicker decontamination for everybody

Instructions for staff

- Staff (other than nurses) should be of the same sex as the victims
- Ensure there is pressure in the water source used for technical decontamination
- Wash the victim from head to toe and then repeat
- After 45 seconds, instruct the victim to turn
- Give verbal instructions to the victims and monitor technical decontamination
- Assist with technical decontamination if necessary
- Seal, double-bag and move full waste bags to reduce off-gassing in the station
- Keep the tub continuously draining

Notes

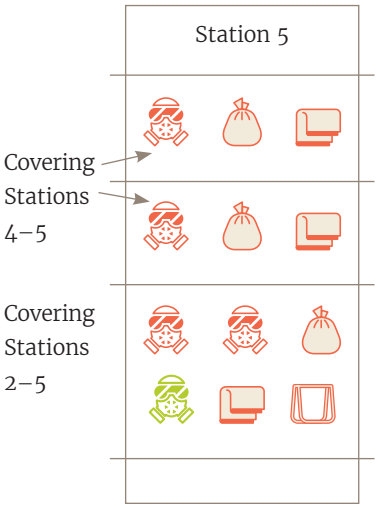
- For cultural and religious reasons, making sure that staff are of the same sex as the victims is a vital element in ensuring that victims are willing to undergo decontamination.
- Collecting solid and water waste prevents secondary contamination.
- Turning the victim ensures that the whole body has been rinsed with water.
- The aims of the washing procedure are to remove as much non-visible contaminant from the victim as possible and to enable medical personal to provide care without danger of secondary contamination.
- Tepid water applied at low pressure increases the effectiveness of the decontamination procedure.
- Using baby bathtubs to decontaminate toddlers and babies will facilitate the process.
- The buddy system can increase the effectiveness of decontamination, accelerate the procedure and reduce the psychological impact on the individual undergoing decontamination.

3.1.6 STATION 5 – DRYING

Equipment

Essential
- Disposable towels
- Large, thick plastic bags for waste
- Stretcher stands

Complementary



Instructions for victims
- Take a towel and start drying yourself from head to toe
- Use a fresh towel for each large body part: head, arms, torso, back and legs
- When you are dry, discard the towels and move to the next station

Information for victims
- After moving to the next station you must not return to the decontamination corridor, in order to protect people who have already been decontaminated
- If you can, help anyone who is having difficulty; this will allow quicker decontamination for everybody

Instructions for staff

Ambulatory
- Staff (other than nurses) should be of the same sex as the victims
- Give verbal instructions to the victims and monitor drying
- Assist with drying if necessary
- Seal, double-bag and move full waste bags to reduce off-gassing in the station

Non-ambulatory
- Staff (other than nurses) should be of the same sex as the victims
- Dry the victim from head to toe
- Lift limbs so you can dry the whole body
- Move the patient onto their side to dry their back, then discard the towel
- Carry the victim on the stretcher to the boundary of the next station
- Seal, double-bag and move full waste bags to reduce off-gassing in the station

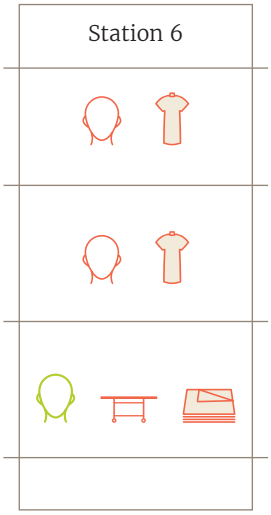
Notes
- For cultural and religious reasons, making sure that staff are of the same sex as the victims is a vital element in ensuring that victims are willing to undergo decontamination.
- Drying may transfer contaminant residue to the towel. Drying is therefore part of the decontamination process and takes place in the warm zone. The towel is contaminated waste.
- The buddy system can increase the effectiveness of decontamination, accelerate the procedure and reduce the psychological impact on the individual undergoing decontamination.

3.1.7 STATION 6 – RE-ROBING

Equipment

Essential
- Garments to cover those parts of the body that must be covered to comply with local cultural and religious norms
- Blanket
- Stretcher

Complementary
- Tent
- Heaters



Instructions for victims
- Take a set of clothes and dress yourself
- Move to the next station when you have finished

Information for victims
- The decontamination process is finished You will receive medical care at the next station if you need it
- If you can, help anyone who is having difficulty; this will allow quicker decontamination for everybody
- [New information regarding the incident – what is known and what is unknown]

Instructions for staff

Ambulatory
- Staff (other than nurses) should be of the same sex as the victims.
- Give verbal instructions to the victims and monitor re-robing.
- Assist with re-robing if necessary.

Non-ambulatory
- Move the patient to a new stretcher.
- Leave the old stretcher in the warm zone to be used by the decontaminators.
- Cover the victim.
- Transport the victim to the next station.

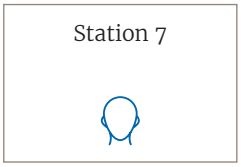
Notes
- For cultural and religious reasons, making sure that staff are of the same sex as the victims is a vital element in ensuring that victims are willing to undergo decontamination.
- The buddy system can increase the effectiveness of decontamination, accelerate the procedure and reduce the psychological impact on the individual undergoing decontamination.
- It is important to provide garments that will allow people to maintain their cultural and religious practices after decontamination; this will reduce their feelings of vulnerability and reduce the psychological impact.
- A heated and protected area will reduce the risk of hypothermia after the decontamination process.

3.1.8 STATION 7 – MEDICAL TRIAGE

Equipment

Essential
- In accordance with health facility guidelines
- Area for observation

Complementary
- Tent
- Heaters



Instructions for victims
- Follow instructions from the medical staff

Information for victims
- If you need medical care, medical staff will look after you
- If you have no symptoms, you will go to a temporary observation area in case any symptoms appear later
- [If possible, information regarding the types of delayed symptom that may occur and what to do if symptoms present themselves]
- [New information regarding the incident – what is known and what is not]

Instructions for staff

Ambulatory and non-ambulatory
- Separate victims according to the health facility's medical triage procedures
- Place non-symptomatic victims without other injuries in an observation area
- Begin medical treatment as required

Notes
- A heated and protected area will reduce the risk of hypothermia after the decontamination process.
- Follow the medical triage procedure normally used at the location. To do otherwise would create confusion and unnecessary delays in treatment.

3.2 DECONTAMINATION AND DISROBING PROCEDURE FOR STAFF IN PPE

A decontamination corridor typically consists of several stations, each forming a specific part of the decontamination procedure. This procedure, designed for decontaminating staff wearing PPE, consists of four stations.

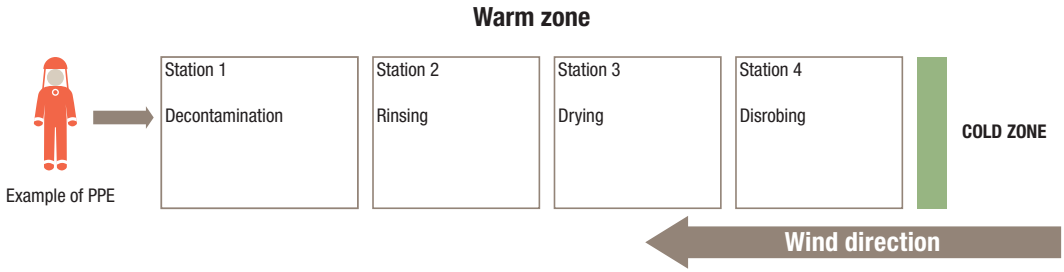
1. Decontamination
2. Rinsing
3. Drying
4. Disrobing

The sections below explain each decontamination station in detail.

When setting up a decontamination corridor:

- choose a location that does not significantly limit the movement of ambulances and non-contaminated people seeking medical care
- take ground slope into consideration, to ensure that water can drain from the decontamination corridors to the waste water collection point
- if possible, build the decontamination corridor so that the wind blows from the cold zone towards the warm zone; this reduces the risk of secondary contamination due to off-gassing
  - if the corridor is in direct proximity to the hot zone, wind direction is of vital importance, because of the risk of direct contamination from the incident site
  - the significance of wind direction diminishes with distance from the incident site
  - wind direction is variable and changes constantly, especially in urban settings.

Overview of decontamination and disrobing procedure – PPE



Each corridor should be at least 3 metres wide and each station should be at least 5 metres long, to provide enough space for staff who are divesting and for the decontaminator, and to reduce the risk of secondary contamination from off-gassing material along the decontamination corridor.

The following rule applies to every step in this procedure:
Staff safety is the first priority. If life-threatening situations occur, you must consider changing procedures to protect staff.

3.2.1 STATION 1 – DECONTAMINATION

Equipment

- Water
- Hypochlorite
- Brush for single use
- Pressurized sprayer for 3% hypochlorite solution
- Large, thick plastic bags for waste
- Large tub with drainage

Instructions for staff

Divesting staff member

- Step into the tub, take the brush and decontaminate the undersides of your boots
- Discard the brush
- Stand up straight, hold your arms out and spread your legs
- Turn around on command and stand in the same position
- Step out of the tub and move to the next station

Decontaminator

- Apply hypochlorite solution from TOE to HEAD, front to back
- Seal, double-bag and move full waste bags to reduce off-gassing in the station
- Empty tub when full

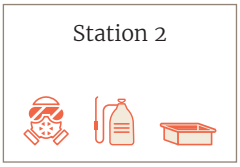
Notes

- Most contaminant is found under the shoes and on the hands. Decontaminating the shoes reduces further contamination.
- Applying the hypochlorite solution from toe to head ensures that the whole PPE is covered by fresh decontamination solution and parts are not only wet because a mixture of decontamination solution and contaminant has run down from parts sprayed above.

3.2.2 STATION 2 – RINSING

Equipment

- Water
- Pressurized water sprayer bottle
- Large tub with drainage



Instructions for staff

Divesting staff member
- Step into the tub
- Stand up straight, hold your arms out and spread your legs
- Turn around on command and stand in the same position
- Step out of the tub and move to the next station

Decontaminator
- Spray from HEAD to TOE, front to back
- Empty tub when full

Notes
- Applying water from head to toe ensures that all decontamination solution is washed off.

3.2.3 STATION 3 – DRYING

Equipment

- Disposable towels
- Large, thick plastic bags for waste

Covering Stations 3–4

Instructions for staff

Divesting staff member:
- Wipe the PPE dry
- Discard the towel

Decontaminator:
- Give verbal instructions to the divesting staff member
- Monitor drying
- Seal, double-bag and move full waste bags to reduce off-gassing in the station

Note
- Drying will remove as much contaminant as possible, which will in turn reduce the risk of secondary contamination when disrobing. This is especially important if air-purifying equipment cannot be kept on during disrobing of PPE.

3.2.4 STATION 4 – DISROBING

Equipment

- Stool
- Scissors with curved blades for single use
- Large, thick plastic bags for waste
- Smaller tub

Covering Stations 3–4

Instructions for staff

Divesting staff member

- Follow the instructions given by the decontaminator

Decontaminator

- Follow disrobing instructions for the specific PPE
- Give verbal instructions to the divesting staff member
- Put equipment that is reusable after additional decontamination in the tub
- Discard non-reusable equipment
- Seal, double-bag and move full waste bags to reduce off-gassing in the station

Notes

- The instructions for disrobing are specific to each type of PPE.
- The stool is used by the divesting staff member to sit on after the PPE has been removed from the upper body. The decontaminator removes the lower part of the PPE and the footwear worn by the divesting staff member.
- After disrobing, the divesting staff member turns 180 degrees on the stool, stands up and moves from the warm zone to the cold zone.

4. WASTE MANAGEMENT

4.1 EQUIPMENT DECONTAMINATION

Equipment that should be decontaminated:

- jerrycans
- sprayers
- stretchers
- stretcher stands
- tubs (large and small)
- stools.

If possible, victims' valuable belongings may also be decontaminated. If there is any uncertainty as to whether an object can be decontaminated, it should be treated according to the waste material procedure (i.e. burned or buried).

Equipment

Essential

- Water
- Hypochlorite
- Absorbent material
- Jerrycan for water
- Jerrycan for 3% hypochlorite solution
- Large, thick plastic bags for waste
- Large tub with drainage

Complementary

Instructions for staff

- Soak all equipment to be decontaminated in 3% hypochlorite solution
- Leave the material to soak for 30 minutes
- Rinse the material with water
- Wipe the material
- Double-bag the used absorbing material and dispose of it according to the waste material procedure
- Leave the decontaminated material to air dry until completely dry

Notes

- Textiles are particularly difficult to decontaminate, as they readily absorb and retain agents. They should therefore be discarded rather than decontaminated.
- Leaving the material to air dry promotes the evaporation of any contamination that has been missed.

4.2 WASTE WATER

Waste water shall be collected in a water collection point throughout the decontamination procedure. The collection point shall therefore be constructed when erecting the MCD area, as mentioned in Section 3.1 above. This section only gives instructions on how to treat the waste water and the material that remains after water decontamination is completed.

Equipment

Essential
- Hypochlorite
- Drainage
- Large, thick plastic bags for waste

Complementary
- Instrument for measuring hypochlorite concentration
- Water pump
- Water tank and vehicle

Instructions for staff

- Add hypochlorite to the waste water until a 3% hypochlorite solution is obtained
- Leave the water for 30 minutes
- Dispose of the water at the most suitable drainage facilities close to the location
- Double-bag the used water-collecting material and dispose of it according to the waste material procedure if it is not possible to decontaminate it

Notes
- Using an instrument to measure hypochlorite concentration ensures that it is correct.
- Disposing of the water in a suitable drainage facility may involve pumping it out of its collection pit/trench and transporting it to a different location.

4.3 WASTE MATERIAL

Waste material to dispose of comprises tarpaulins and all large plastic bags collected from the victim and staff decontamination corridors.

Equipment

Essential

- Water
- Hypochlorite
- Pressurized sprayer for 3% hypochlorite solution
- Large, thick plastic bags for waste
- Digging equipment
- Warning signs
- Marking tape and fence poles

Complementary

- Incinerator capable of maintaining a temperature of at least 980°C, fitted with exhaust filtration

Instructions for staff

- Ensure all waste material is packed in double bags
- Spray the outside of the outer bags with 3% hypochlorite solution
- Leave the material for 30 minutes
- After 30 minutes the bags can be handled by staff not wearing PPE
- Bury or burn the material
- If the material is buried, mark the area and ensure that the public cannot access it

Notes

- The prescribed incinerator temperature is essential to ensure the destruction of hazardous components.
- If the hazardous agent or the waste material contains sulphur, the incinerator will need a post-oxidation gas treatment system, as the exhaust will contain highly corrosive acid gases.
- Choose a location for the burial site and agree it with local authorities before burying any hazardous waste.
- Preventing public access to the burial site will ensure that the hazardous waste is not dug up, resulting in secondary contamination.

ANNEX A – REFERENCES

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