PRIMARY RESPONSE INCIDENT SCENE MANAGEMENT (PRISM):
GUIDANCE FOR THE OPERATIONAL RESPONSE TO CHEMICAL INCIDENTS

VOLUME 2: TACTICAL GUIDANCE FOR MASS CASUALTY DISROBE AND DECONTAMINATION

Second Edition

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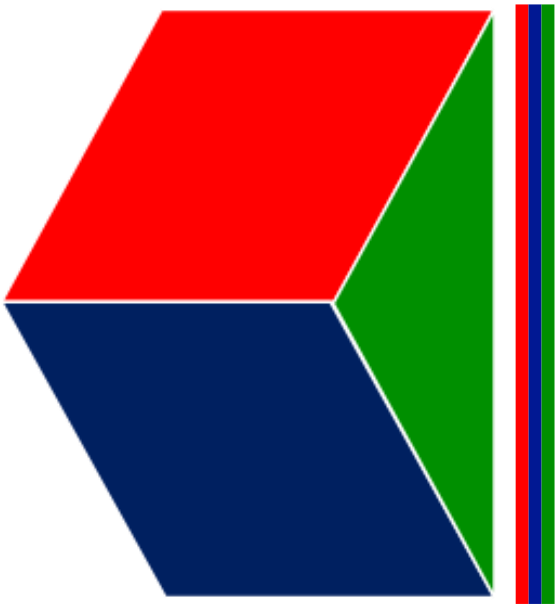

Primary
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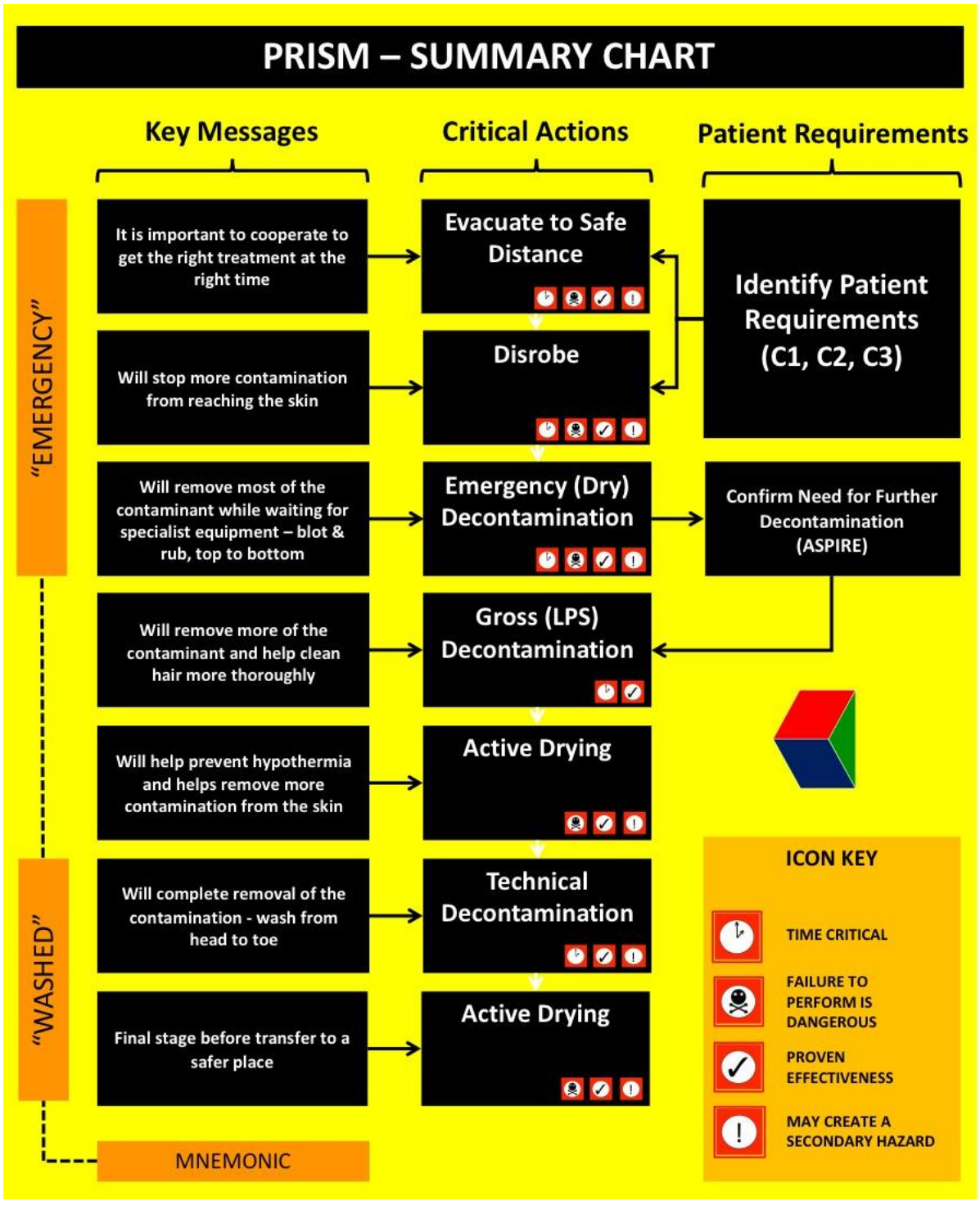
PRISM GUIDANCE – VOLUME 2

Second Edition

PRISM Incident Response Summary



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Foreword

The Primary Response Incident Scene Management (PRISM) series was written to provide authoritative, evidence-based guidance on mass patient disrobe and decontamination during a chemical incident. The PRISM documentation comprises three volumes:

Volume 1: Strategic Guidance

Presents a review of best practices, collates available evidence and identifies areas that require further investigation. The document is relevant to senior incident responders (e.g., Incident Commanders) and those responsible for emergency planning and civil contingencies, as it describes the supporting technical information that underpins the rationale for each stage of disrobe and decontamination and highlights potential issues or challenges.

Volume 2: Tactical Guidance

The second volume provides an overview of the processes involved in mass patient disrobe and decontamination and the rationale that underpins each process. The document does not include supporting technical information or potential challenges. Volume 2 has particular application in the training and exercising of first responders and officials involved with domestic preparedness and emergency management.

Volume 3: Operational Guidance

The salient features of mass patient disrobe and decontamination are presented in Volume 3, which aims to provide all Federal, State, Tribal and local first responders with a simple, readily accessible guide to critical aspects of the incident response processes.

The underpinning basis of the PRISM guidance documentation is scientific evidence accrued from a six-year program of research sponsored by the Biomedical Advanced Research and Development Authority (BARDA), the aim of which is to ensure that all patients exposed to potentially hazardous chemicals receive the most effective treatment possible at the earliest opportunity.

Table of Contents

Introduction and Overview

Overview

The purpose of this document is to provide tactical guidance for responding to a major incident involving exposure of civilians to hazardous chemicals, addressing the main response elements inherent to ensuring the best possible outcome for contaminated patients (Figure 1).

PRISM Volume 2 Structure

This document contains three sections which allow the end-user to rapidly identify critical information:

- Section I: Emergency response cards which summarize critical actions or considerations. Where appropriate, a circled number identifies the relevant explanatory note.
- Section II: A sequential list of explanatory notes which provide a justification, an alternative approach or identify a specific hazard.
- Section III: Pictorial guidance for delivery of key aspects of the operational response.

Patient Categories and Corresponding Response Pathways

A revised system has been introduced to allow first responders to rapidly categorize patients to ensure they receive optimal care (Table 1).

Table 1: Definition of patient categories.

Category	Definition	Response Pathway
C1	Patients who are able to understand instructions and perform activities without assistance.	Standard
C2	Patients who are either unable to understand instructions or unable to perform activities without accommodations or assistance.	
C3	Patients who are unresponsive, have life-threatening injuries or require extensive accommodations or assistance.	Non-Ambulatory

As more resources and personnel become available at the scene of an incident, consideration can be given to transferring C2 casualties to the Non-Ambulatory pathway (Figure 2).

Standard Response Pathway

The Standard Response comprises disrobe, emergency decontamination, gross decontamination and technical decontamination, either with or without limited assistance by first responders wearing appropriate personal protective equipment (Figure 3). The Standard response has been designed to provide an optimized, high-throughput patient pathway using generally available resources.

Non-Ambulatory Response Pathway

The Non-Ambulatory Response requires teams of appropriately equipped first responders to provide individualized treatment to patients. The process is the similar to the standard response in that it involves disrobe, emergency decontamination and technical decontamination, but requires a greater degree of first responder intervention (Figure 4). Thus, the Non-Ambulatory pathway has a relatively low throughput of patients, requires specialist assets and is resource intensive.

Section I: Response Action Cards

Immediate Actions

Explanatory Note(s)

- Identify & categorize patient requirements (C1, C2 or C3) as soon as practically possible. — 1
- Ask individuals if they require assistance to complete patient-focused actions.
- Do not delay C1 or C2 patient-focused actions while awaiting arrival of specialist resources. — 2
- Establish a Non-Ambulatory pathway for C3 patients as soon as practically possible. — 3
- Use the on-line ASPIRE decision-aiding tool or "Ready-Reckoner" to establish appropriate and proportionate patient-focused actions before committing to LPS or Technical decontamination. — 4

Key Points

- Good communication (verbal, signage or body language) is particularly important for instructing and reassuring C2 patients.
- Provide adequate response personnel to address patient requirements.
- Families should undergo patient-focused actions together wherever possible. — 5
- Everyone who is affected by the incident should have the right to receive accessible, inclusive, and equitable patient-focused actions.

Planning

Explanatory Note(s)

- Prepare pre-recorded or pre-scripted messages.
- Develop pictograms for use during incidents.
- Consider how communication can be best achieved within your community.

Key Messages

- Patients need to cooperate with first responders in order to get the best possible care.
- Cooperation will not just benefit the affected individuals: it will prevent family, friends and the local community from being affected.
- Explain that patients who do not cooperate will put others' lives at risk, as well as their own.

6

How to Communicate

- Be open and honest about what is known about the incident and what actions are being taken to resolve the situation.
- Use loudspeakers if available.
- Practical demonstrations and/or body gestures may be useful for explaining disrobe and decontamination stages.
- Provide pictorial instructions if available.

EVACUATION

Critical Actions

Explanatory Note(s)

- Take control and maintain effective communication.
- Move patients from the hot zone as soon as possible, preferably to a sheltered (external) area away from strong winds and rain.
- If evacuation is inappropriate, encourage patients in the hot zone to take shelter, close doors and windows, and keep themselves as far removed from the contaminant as possible. 7

Key Considerations

- The distance between the hot and warm zones needs to be sufficient to ensure the safety of patients but not so far as to adversely impact operational effectiveness or implementation of patient-focused actions. 8
- The evacuation point should ideally be uphill and upwind from the hot zone.
- Use an effective and accessible communication strategy to emphasize the importance of cooperation to maximize patient safety.

DISROBE

Critical Actions

	Explanatory Note(s)
• Remove clothing as soon as practically possible following exposure.	9-11
• Do not allow patients to undertake any form of decontamination until disrobe has been adequately achieved.	12
• Try to preserve patients' privacy & dignity.	13
• Communication: constantly reiterate the health benefits of disrobing to enhance patient compliance and ensure instructions are understood.	

Key Considerations

• Disrobing will immediately reduce exposure and the risk of secondary contamination and may improve the willingness of patients to remain at the scene of the incident.	
• A degree of privacy and good communication will enhance patient compliance.	
• The effectiveness of disrobing rapidly decreases and so this is a time critical task.	14
• Focus on compliant patients before dealing with individuals who refuse to cooperate.	15

EMERGENCY DECONTAMINATION

Critical Actions

	Explanatory Note(s)
• Emergency decontamination is time critical – do not delay.	16
• Ensure patients have adequately disrobed.	17
• Prioritize open wounds for decontamination, ideally using absorbent wound dressings.	18
• Decide which form of decontamination (dry or wet) is appropriate:	
▪ DRY decontamination is the default option using any readily available material	19
▪ Use wet decontamination for powders or overtly caustic chemicals.	
• Constantly provide instructions and communicate with patients to emphasize clinical benefits of emergency decontamination.	

Basic Protocol

• Instruct C1 & C2 patients to decontaminate from top to bottom, concentrating on areas most likely to be contaminated (e.g. hair/head, face, neck, hands) and to repeat until additional resources (e.g. LPS) become available.	20,21
• C3 patients should be treated by trained first responders using the non-ambulatory dry decontamination protocol.	
• Provide constant supervision and communication to ensure patient compliance.	22
• Focus on compliant patients before dealing with individuals who refuse to cooperate.	

GROSS (LADDER PIPE SYSTEM) DECONTAMINATION

Key Points

	Explanatory Note(s)
• LPS decontamination is the standard method for gross decontamination.	
• Is LPS decontamination necessary? Use ASPIRE decision aiding tool and professional judgement.	4
• LPS decontamination is time critical – establish a corridor as soon as practically possible.	23
• Ensure patients have fully disrobed: do not allow clothed individuals to undergo LPS decontamination.	8
• Ideally, emergency decontamination should be performed before LPS, but do not unnecessarily delay LPS if emergency decontamination has not been performed.	
• Constantly provide instructions and communicate with patients to emphasize clinical benefits of LPS decontamination.	

Basic Protocol

• Patients should enter the LPS corridor and rub themselves from top to bottom, concentrating on areas most likely to be contaminated (e.g. hair/head, face, neck, hands).	24
• Patient should be encouraged to remain in LPS corridor for at least 15 seconds.	
• If appropriate material is available, instruct patients to undertake active drying on exiting the LPS corridor.	
• Transfer patients to technical decontamination.	25
• Focus on compliant patients before dealing with individuals who refuse to cooperate.	

ACTIVE DRYING

Planning

Explanatory Note(s)

- Provision of towels should be addressed when formulating an incident response plan.

Key Point

- Active drying represents a critical stage in the decontamination process and so it is essential that towels or other suitable materials are available to patients following wet decontamination procedures. 26

Basic Protocol

- Following any form of wet decontamination, provide towel or any available absorbent material.
- Dry from top to bottom. Tilt head back when drying hair. 27
- Used drying materials should be treated as hazardous waste.

Planning

Explanatory Note(s)

- Planning should include the provision of resources that will optimize the technical decontamination process (e.g. disrobe and re-robe kits, wash cloths, soap/detergent, towels).

Key Points

- Technical decontamination should be performed following Emergency and LPS decontamination, as part of the "Triple Protocol". 28
- Focus on compliant patients before dealing with individuals who refuse to cooperate.

Basic Protocol

- If disrobing of C1 and C2 patients has not already taken place, provide disrobe packs and instructions on how to safely remove clothes.
- Optimized parameters: shower water temperature of 35–40ºC (95–104ºF), duration of 60–90 seconds (maximum), addition of mild detergent to the shower water and the provision of a washcloth for each patient.
- C1 and C2 Patients should be instructed to wash from head to toe. C3 patients should be treated by trained first responders using the non-ambulatory technical decontamination protocol. 29
- All patients should actively dry following decontamination. 26
- Emergency responders should be aware of the potential for the accumulation of vapor within technical decontamination units. 30
- Washcloths should be treated as contaminated waste.

Section II: Explanatory Notes

1	Definitions of C1, C2 and C3 patients are given in Table 1 of this document (p9) which can be used in conjunction with the associated flow chart (Figure 2).
2	The Standard Response for C1 and C2 patients is summarized in Figure 3.
3	The Non-Ambulatory Pathway is summarized in Figure 4.
4	The ASPIRE decision-aiding tool provides a recommendation on the potential effectiveness of decontamination and should be considered in conjunction with a professional opinion on the risk-to-benefit ratio of performing cold water decontamination. The ASPIRE calculator can be found on the *CHEMM* website (https://chemm.nlm.nih.gov). Alternatively, a "Ready Reckoner" can be used (Figure 5) by trained individuals. Do not delay the disrobe and emergency decontamination process when deciding if wet decontamination should be performed.
5	Grouping families may have several operational benefits and may reduce patient anxiety. Grouping individuals of the same language may also facilitate communication and provide patient reassurance.
6	Start communicating immediately with patients, even if all the facts are yet to be established. It is better to communicate uncertainty rather than unverified information.
7	The decision to shelter in place or evacuate will need to be made on a case-by-case basis using a dynamic risk assessment in accordance with local procedures.
8	The need to minimize the distance between the hot and warm zones needs to be balanced against achieving a safe evacuation distance for patients. Longer distances will degrade operational effectiveness. Shorter distances may not sufficiently reduce exposure to the contaminant.
9	Immediate disrobe and decontamination is essential for reducing or preventing ill health and will improve patient compliance. Removal of clothing by patients may also reduce the likelihood of self-evacuation and thus reduce the spread of contamination.
10	Disrobing is a critical part of the decontamination process – failure to disrobe will cause continued exposure to the contaminant, will reduce the effectiveness of dry decontamination and may actually increase exposure during wet decontamination.
11	Disrobing is undoubtedly the most effective initial action that can be readily performed and it is absolutely critical that this is done as soon as practically possible. For C1 and C2 patients, the aim should be to encourage removal of as much clothing as the patients are comfortable with, but the clinical outcome will be improved with each layer removed. Disrobing will also reduce the inhalation hazard arising from off-gassing of volatile chemicals. Disrobing of C3 patients is outlined in Note 20.
12	It is absolutely vital that clothing is removed before undertaking any form of decontamination in order to prevent transfer of the contaminant to the underlying skin.

13 Consider using any available material to allay modesty/privacy concerns. Think outside the box: are there any emergency vehicles in attendance that may have foil blankets? Are there any retail outlets nearby where makeshift items such as blankets, bed sheets, plastic sheets (e.g. tarpaulins and trash can liners) or clothing could be acquired?

14 Following exposure, the protective effects of disrobing will decrease by approximately 20% every 10 minutes (Figure 6).

15 Explain the personal and community health benefits of disrobing, but do not allow non-cooperative individuals to cause a delay in processing other patients.

16 The rapidity with which emergency decontamination needs to be started cannot be overemphasized: for some chemicals, the clinical benefit of decontamination can decrease by 50% within the first 10 minutes of exposure (Figure 7). Effective decontamination will also reduce the inhalation hazard arising from off-gassing of volatile chemicals. Use the EMERGENCY mnemonic as an aid memoire (Figure 8).

17 To be effective and meaningful, emergency decontamination must be performed after contaminated clothing has been removed.

18 Open wounds provide a "short cut" through which chemical contaminants can enter the body. Consequently, contaminated wounds must be prioritized for attention. Ideal materials for the decontamination of open wounds include wound dressings, gauze pads or hemostatic products which have an absorbent mechanism of action. A list of potential materials is given in Figure 9.

19 For non-caustic, liquid contaminants (including chemical warfare agents), emergency *dry decontamination should be the default approach* as it is safer and at least as effective as wet decontamination and the resulting waste is easier to contain than water. Dry decontamination is less likely to spread contamination over hair and skin surfaces. A flow chart to determine the most appropriate form of emergency decontamination is required is given in Figure 10.

20 The recommended protocol for emergency dry decontamination of C1 and C2 patients is summarized in Figure 11. C3 patients will require treatment from trained first responders wearing appropriate PPE (Figure 12). In both cases, use the "10:10" method of blotting an area of skin or hair for 10 seconds followed by rubbing the same area for another 10 seconds. If available, use a clean piece of decontamination material for each area of the body. Ensure that the used decontamination material is placed into a suitable trash receptacle.

21 C1 and C2 patients awaiting wet decontamination should be encouraged to repeat the emergency decontamination process until wet decontamination facilities become available. Aside from further improving clinical outcome, this will help focus patient attention.

22 Communication: providing reassurance and repeating instructions to patients is known to improve compliance and effectiveness.

23 Instigate disrobe and emergency decontamination while awaiting LPS deployment to fully utilize this time for the benefit of the patients.

24 A pictorial guide to LPS decontamination is provided in Figure 13.

25 Technical decontamination is likely to be the rate-limiting factor during a large-scale incident. Therefore, LPS decontamination should generally be performed on patients waiting to undergo technical decontamination.

26 Research has demonstrated that the act of drying with a towel may be the most important step for removing skin and hair contamination during wet decontamination. For this reason, assume that all used drying materials are heavily contaminated and handled in accordance with local rules for hazardous waste.

27 A recommended method for active drying is illustrated in Figure 14.

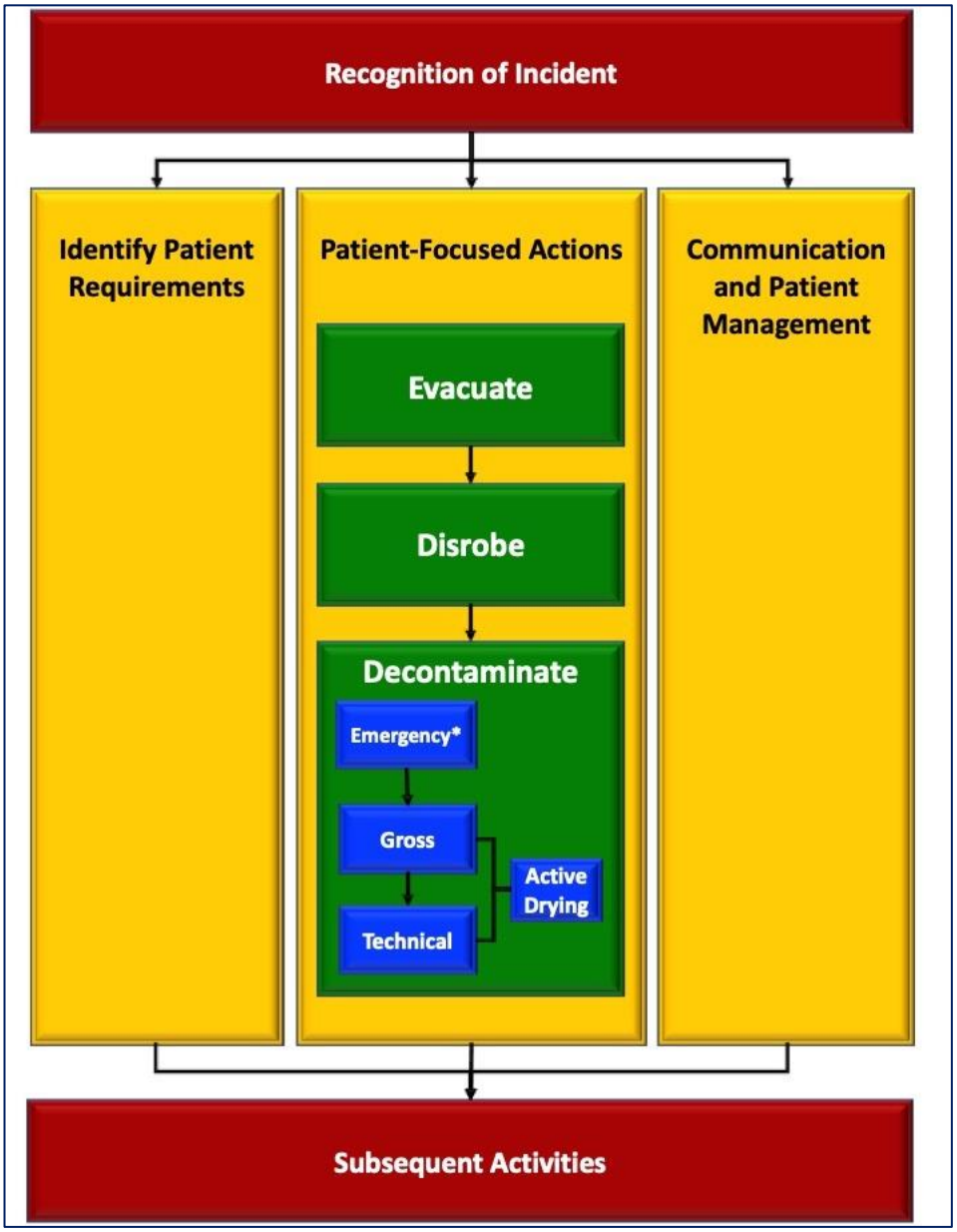
28 The triple protocol comprises emergency (default dry) decontamination, followed by LPS and then technical decontamination. Progression of patients through all three stages results in maximum removal of contaminants, makes optimum use of resources and time, and sequentially reduces the risk of secondary contamination to patients and first responders.

29 The recommended protocol for C1 and C2 casualties is summarized by the "WASHED mnemonic (Figure 15). The treatment of C3 casualties should be undertaken using the protocol outlined in Figures 16a&b.

30 Adherence to the triple protocol should reduce the extent to which off-gassing occurs within technical decontamination units. However, it is advisable to ensure good ventilation of the units and, if available, to use appropriate DIM equipment to monitor vapor concentrations during the response.

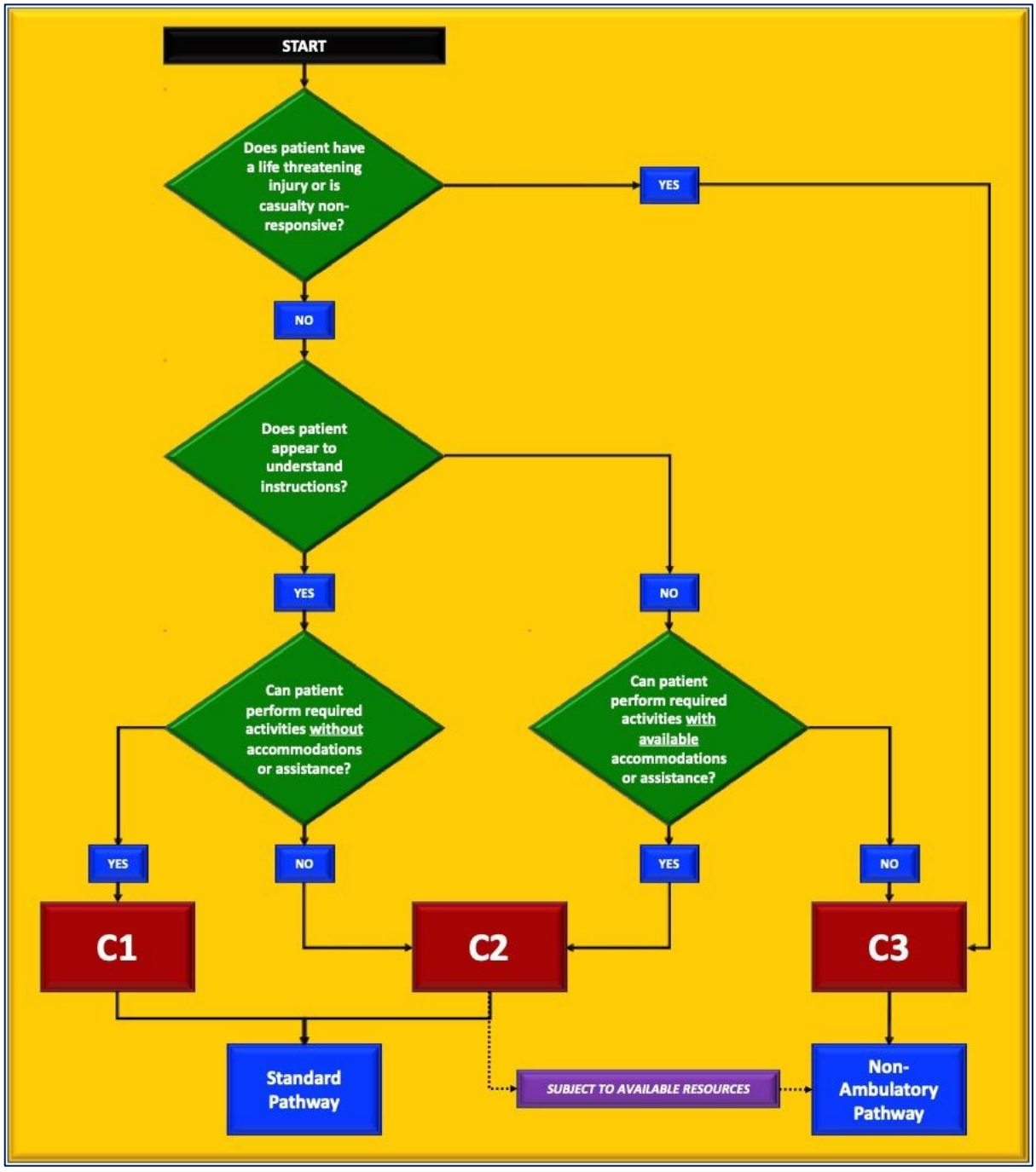
Section III: Figures

Overview of Primary Operational Response. **Figure 1**



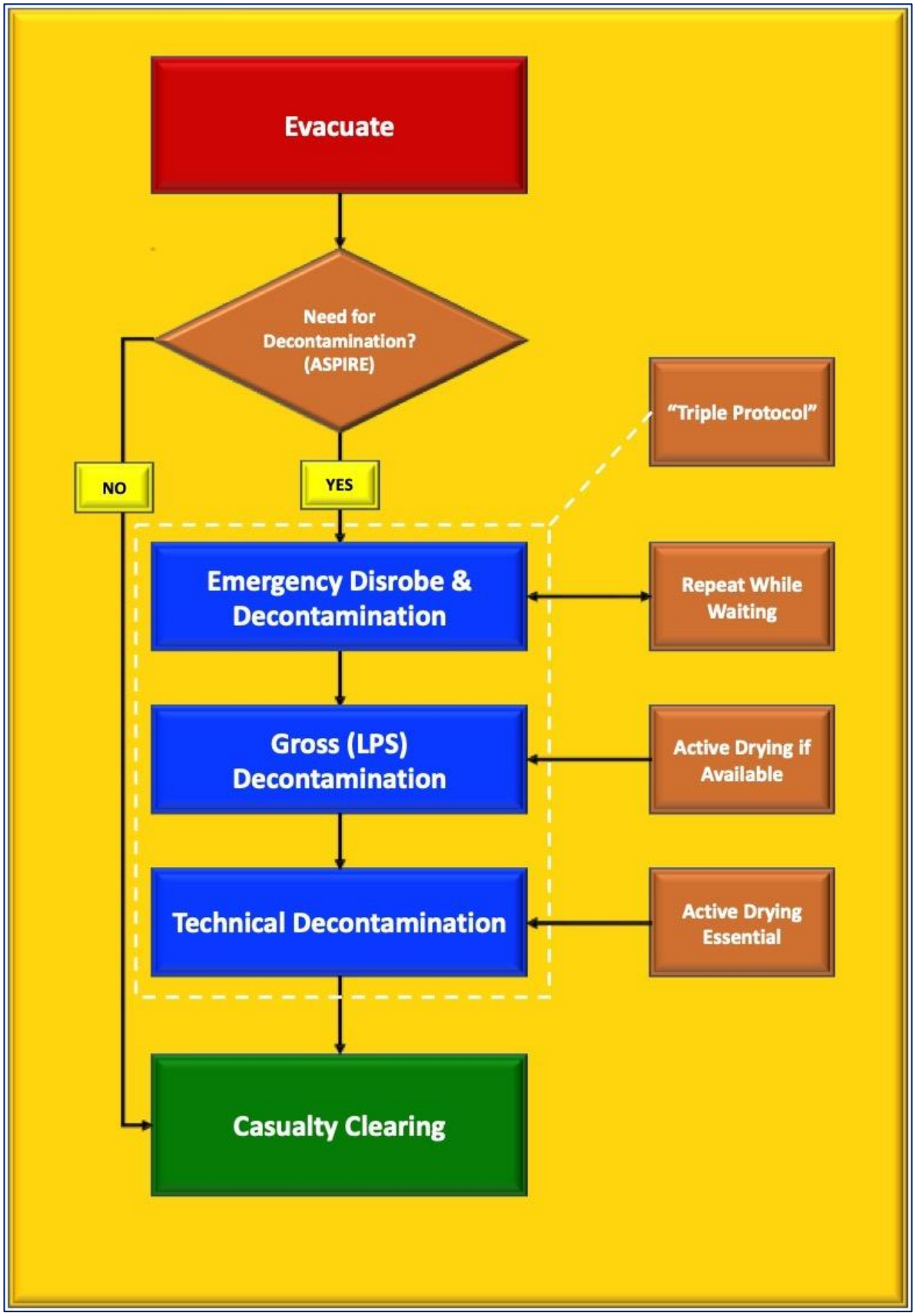
Note that "recognition of incident" and "subsequent activities" are outside the scope of this guidance document. The patient-focused actions are delivered via "standard" or "non-ambulatory" response pathways.

Patient Categorization Flowchart. **Figure 2**

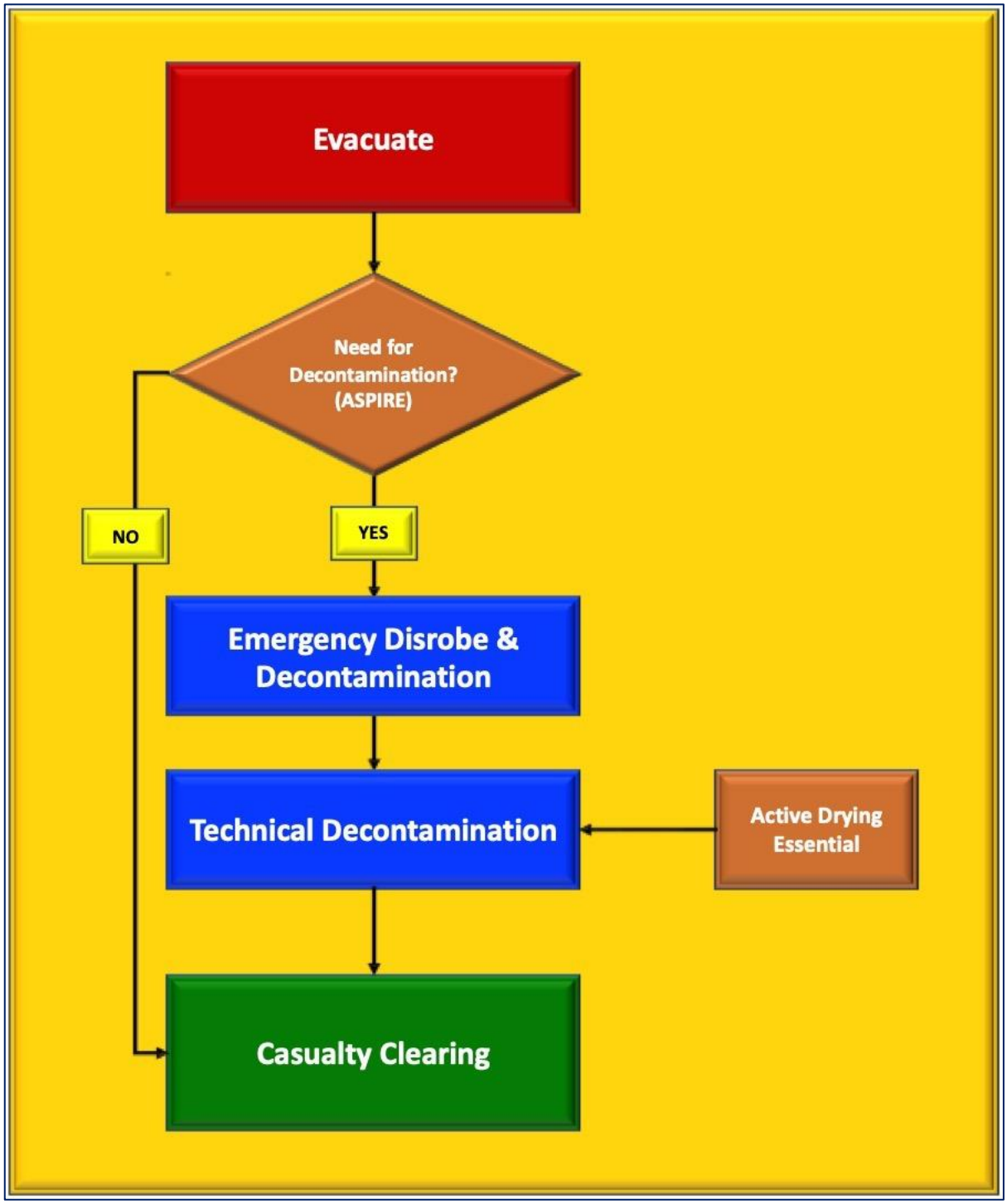


C1 patients should be able to perform activities (removal of clothing & decontamination) under instruction without assistance. C2 patients should be able to perform activities with accommodations or assistance that can be readily provided at the incident scene. Both C1 and C2 patients undergo the "standard" form of disrobe and decontamination. C3 patients undergo "non-ambulatory" disrobe and decontamination.

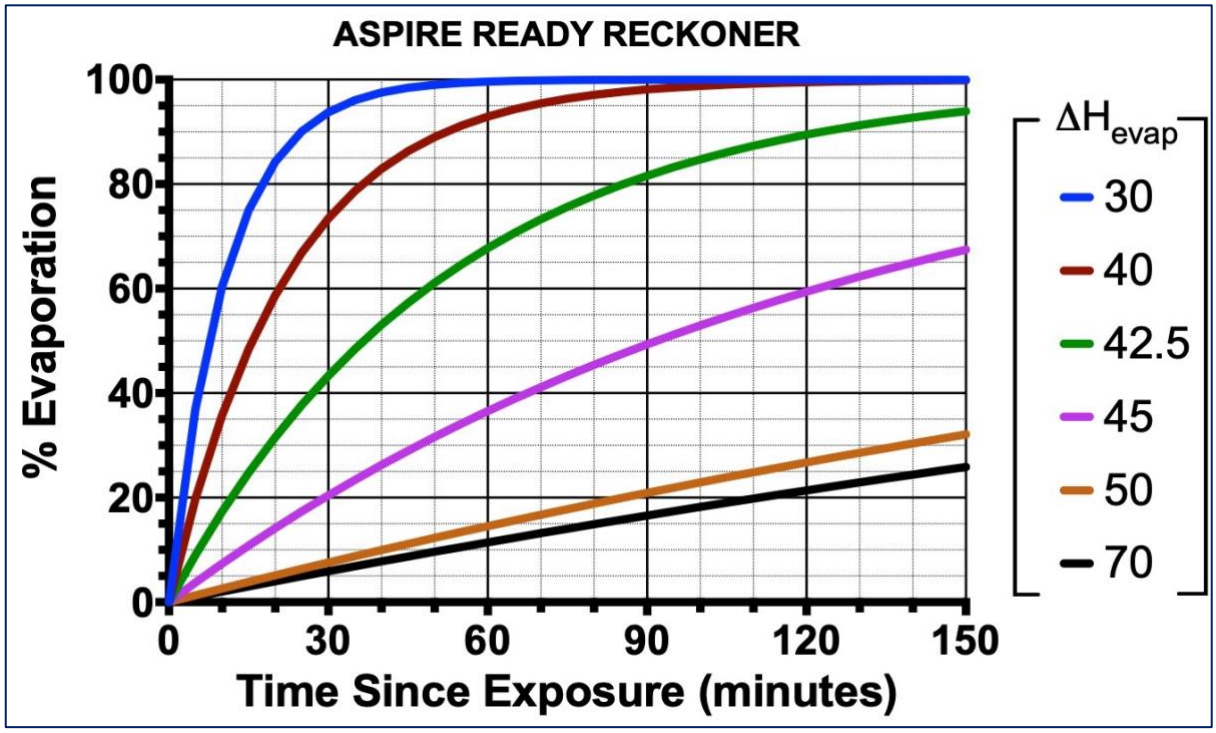
Standard Response Pathway **Figure 3**



Non-Ambulatory Response Pathway — Figure 4

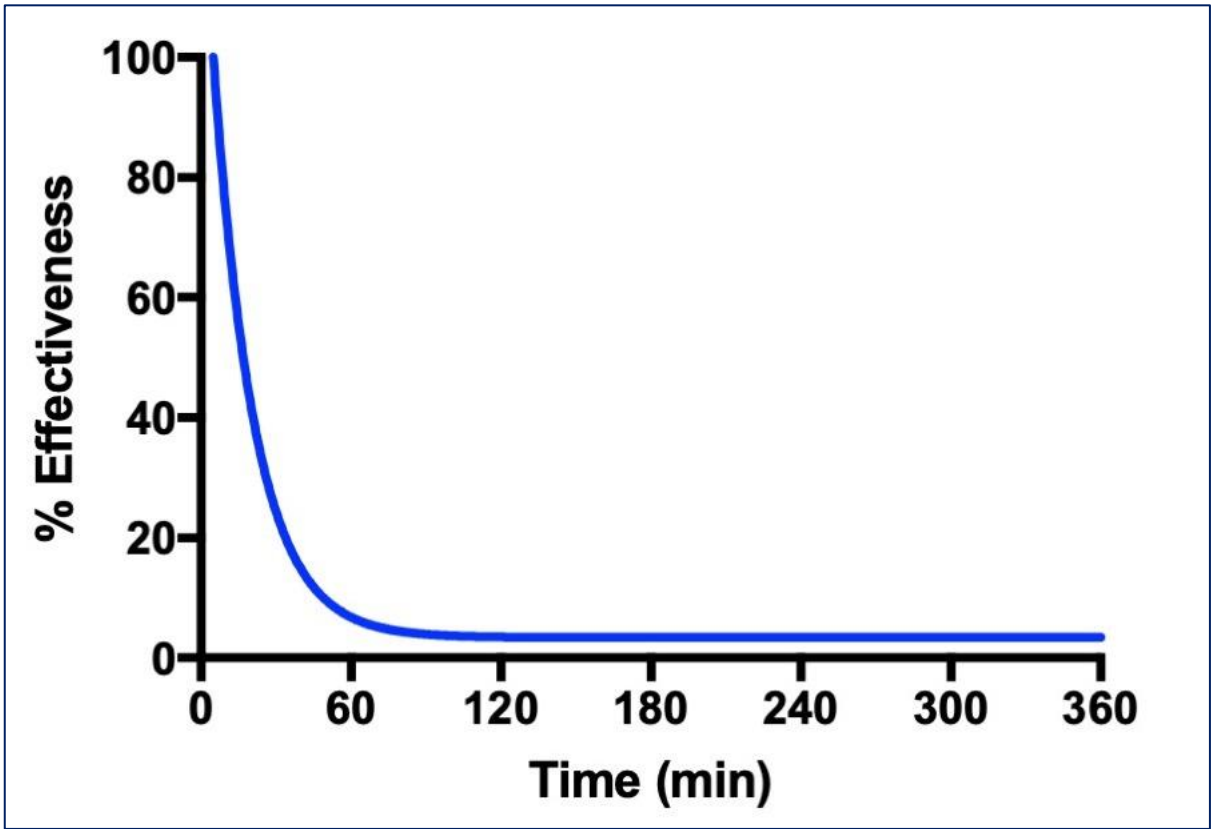


Note that the 'emergency disrobe & decontamination' and 'technical decontamination' procedures require trained first responders wearing appropriate PPE.

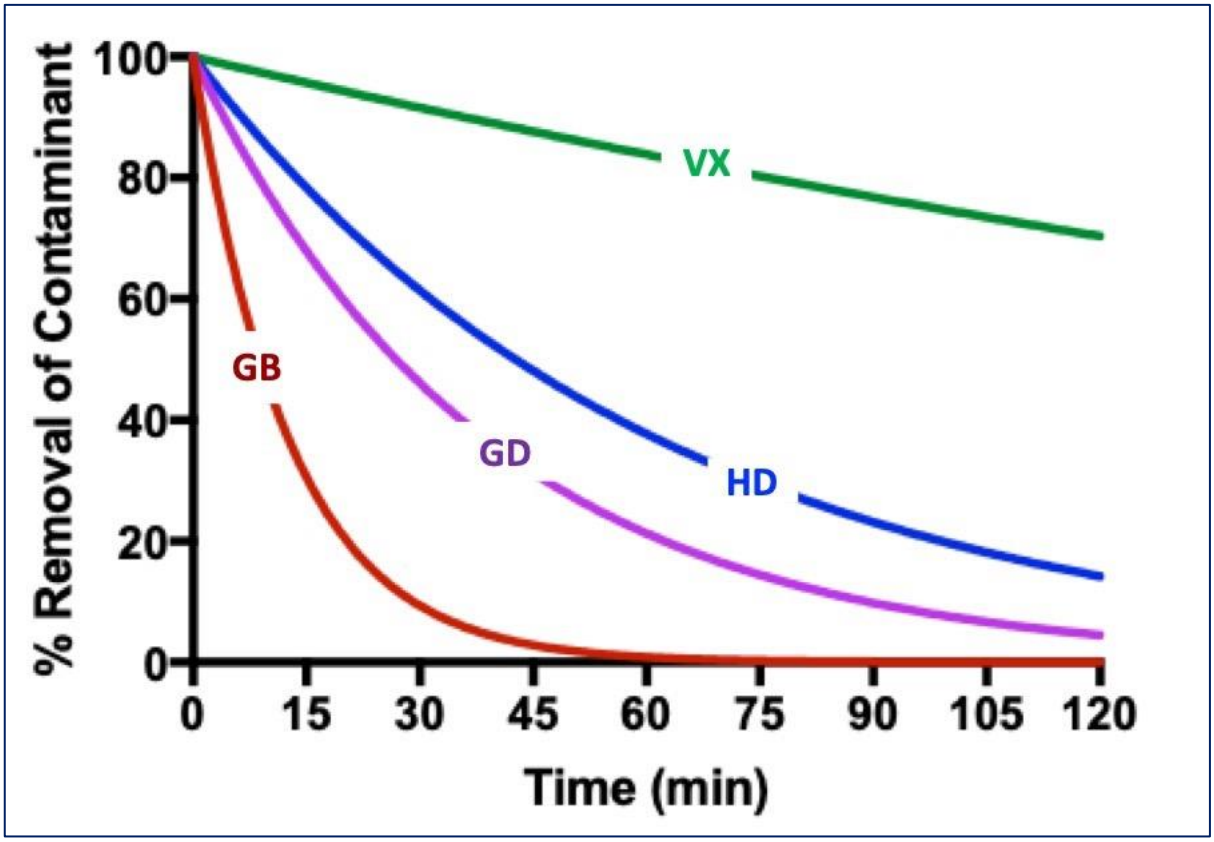


Manual ASPIRE model to calculate the need to perform wet decontamination following exposure to a chemical contaminant. To use this chart, the latent heat of vaporization (ΔHevap) value for the contaminant must be known. A list of ΔHevap values for common chemicals is provided at Annex A. Pick the colored line on the chart that has the next highest ΔHevap value to the contaminant. On the horizontal (bottom) axis of the graph, find the point corresponding to the time that has elapsed since exposure to the contaminant. Follow the line from that point up the graph until it intersects the relevant ΔHevap line and read off the corresponding percentage evaporation value from the vertical axis on the left. If the percentage evaporation approaches 100%, then wet decontamination may not be beneficial. However, if patients are showing signs and symptoms of exposure then it would be prudent to proceed with wet decontamination. An on-line version is available at: https://chemm.nlm.nih.gov

Effectiveness of Disrobe with Time **Figure 6**



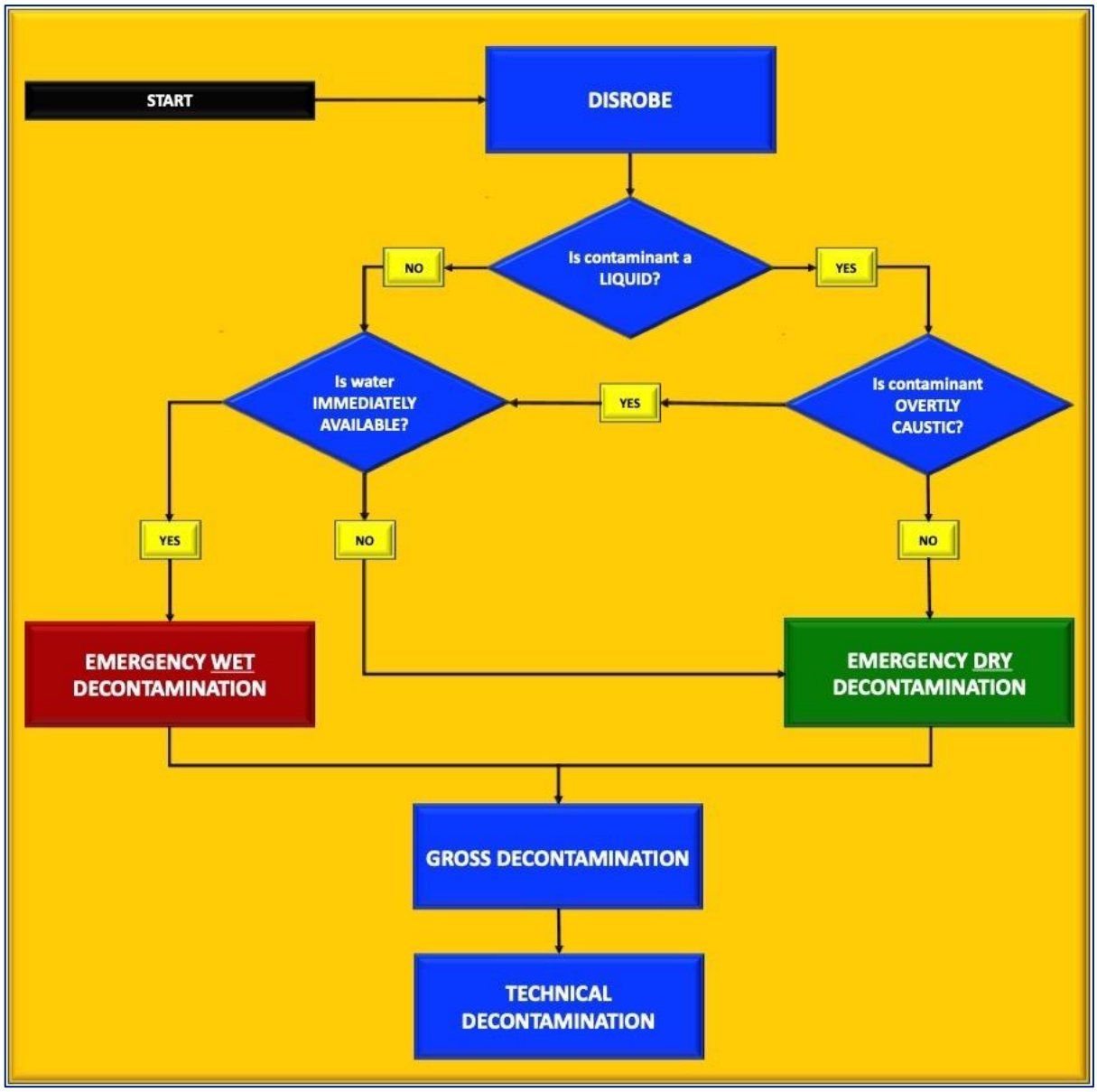
Effectiveness of Decontamination with Time **Figure 7**



EMEGENCY Mnemonic for Evacuation, Disrobe and Emergency Dry Decontamination **Figure 8**

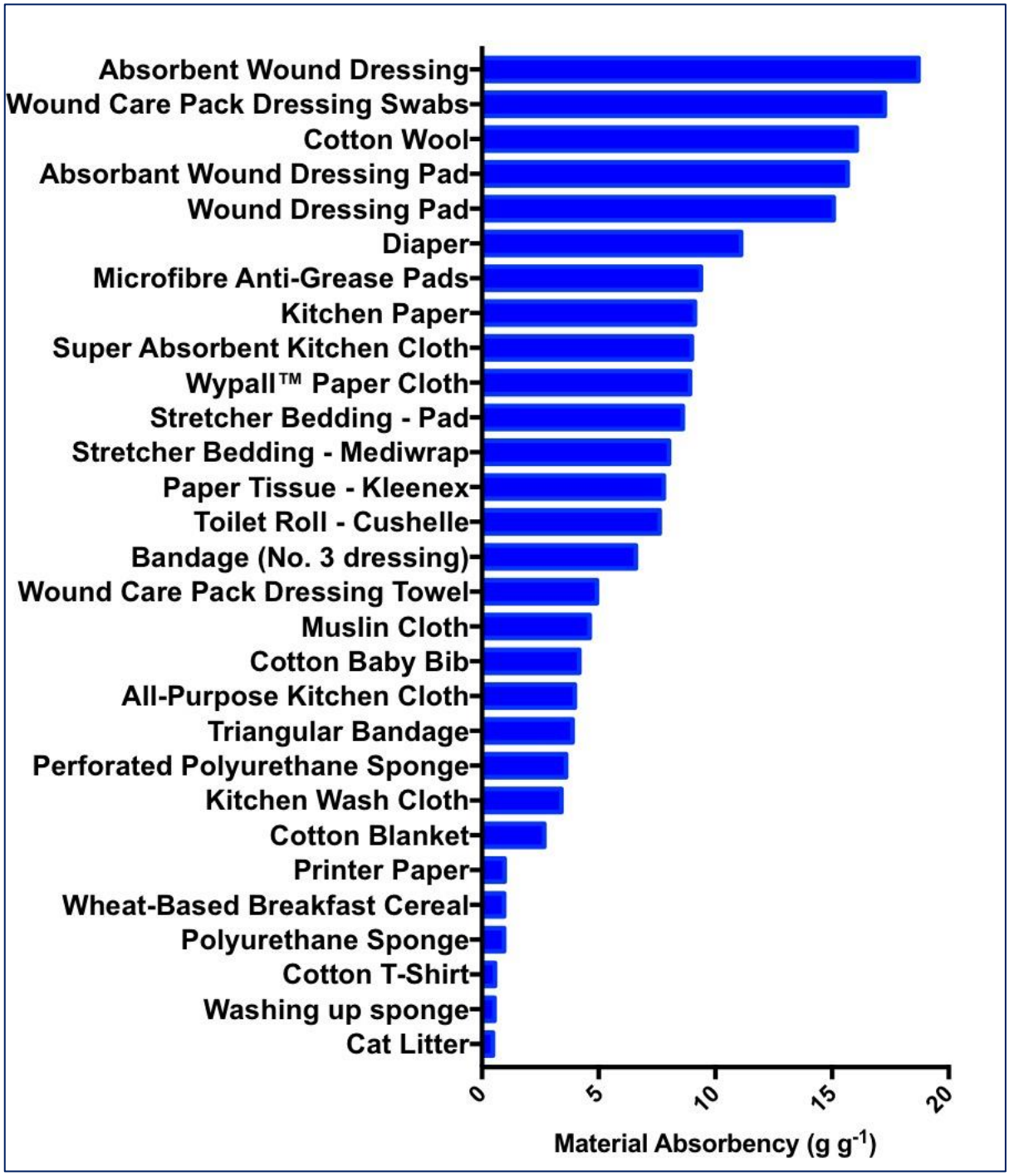
E	**Evacuate**: Patients should be instructed to leave the contaminated area if they have not already done so.
M	**Move** the patients as a group to a safe distance, away from any potential source of contaminant. Ideally this should be uphill and upwind and preferably in a sheltered (external) area away from strong winds and rain.
E	**Engage** with patients to explain what is happening and how they can help themselves by following instructions and advice. Some patients may not wish to cooperate for cultural, religious or other reasons: focus initial attention on compliant individuals. Maintain an awareness of patient requirements.
R	**Remove** as much clothing as possible. It is important to communicate the benefits of rapid disrobe to the patients in order to gain their cooperation. The more clothes that are removed the better, but be mindful of modesty concerns. Where possible, do not remove clothing over the head. If available, trauma scissors can be used to cut away clothing.
G	**Give** any available absorbent material to the patients. Ideal materials include "Wypall™" (absorbent paper tissue), wound dressings, incontinence pads, cotton wool, toilet paper, diapers and paper towels. Do not get close to patients when handing out the decontamination material.
E	**Establish** dry decontamination on all C1 and C2 patients as soon as possible. Using a blot and rub motion, start with the head (hair), face, then the hands, then any other exposed skin areas. If availability of material permits, instruct patients to use clean swatches of absorbent material for each body area. Above all, ensure that patients do not re-use material after decontaminating their hair. Encourage patients to repeat the entire process several times, paying particular attention to the hair, face and hands.
N	**Note** the development of any signs and symptoms. Begin triage to identify priority patients.
C	**Communicate** constantly with patients to encourage cooperation and reassurance that disrobe and decontamination will remove the vast proportion of any contamination. Confirm to the patients that advanced medical assistance is on its way.
Y	**Yards not inches**: Maintain a safe distance from patients at all times, but close enough so that they can hear instructions.

Flow chart to Determine Most Appropriate Form of Emergency Decontamination **Figure 9**

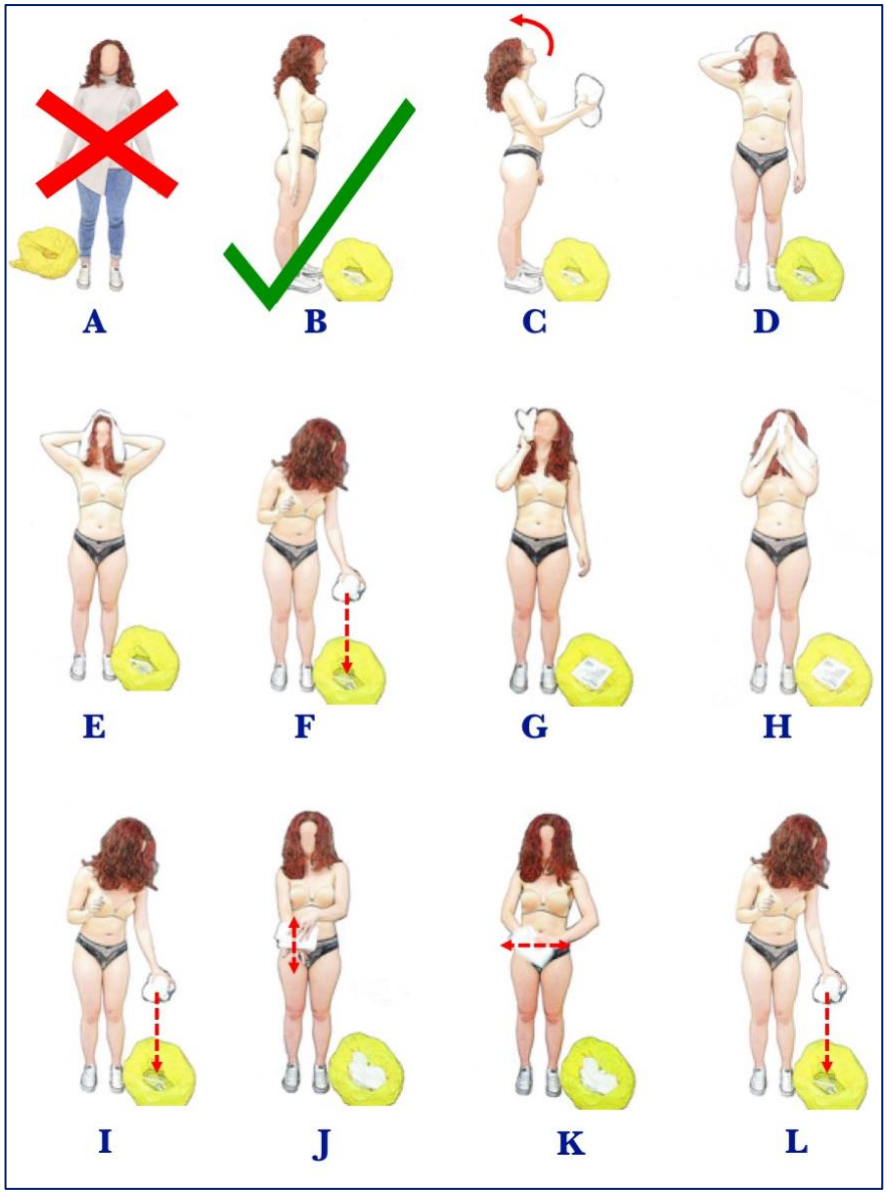


The basic rule is that the default option is dry decontamination unless the contaminant is particulate (powder) and/or overtly caustic.

Relative Effectiveness of Absorbent Materials — Figure 10

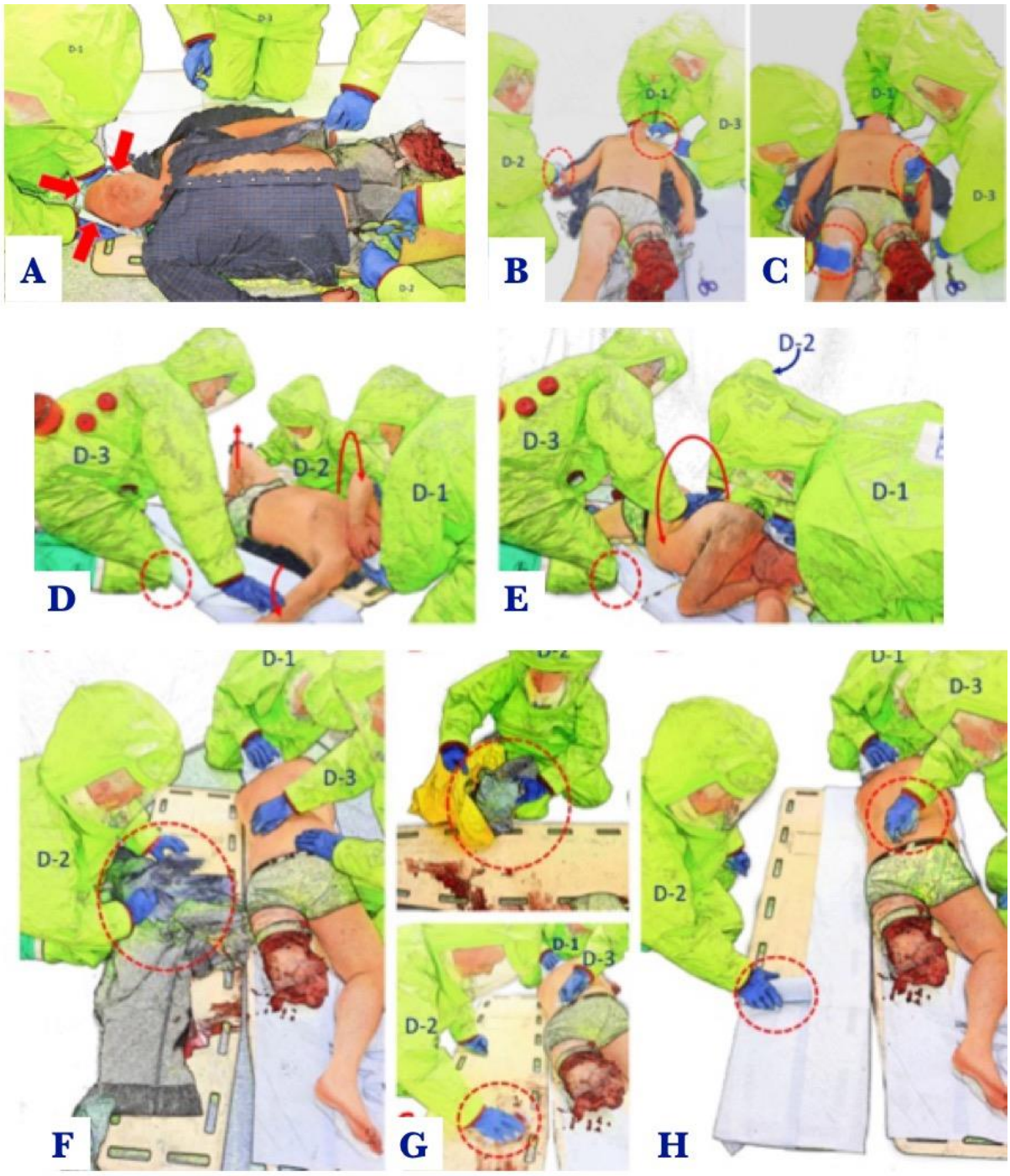


Absorbency of a selection of materials found within domestic or medical environments, expressed as weight of contaminant absorbed per gram of material. For example, an material absorbency value of 10 would indicate that one gram of material can absorb 10 g of a liquid contaminant.



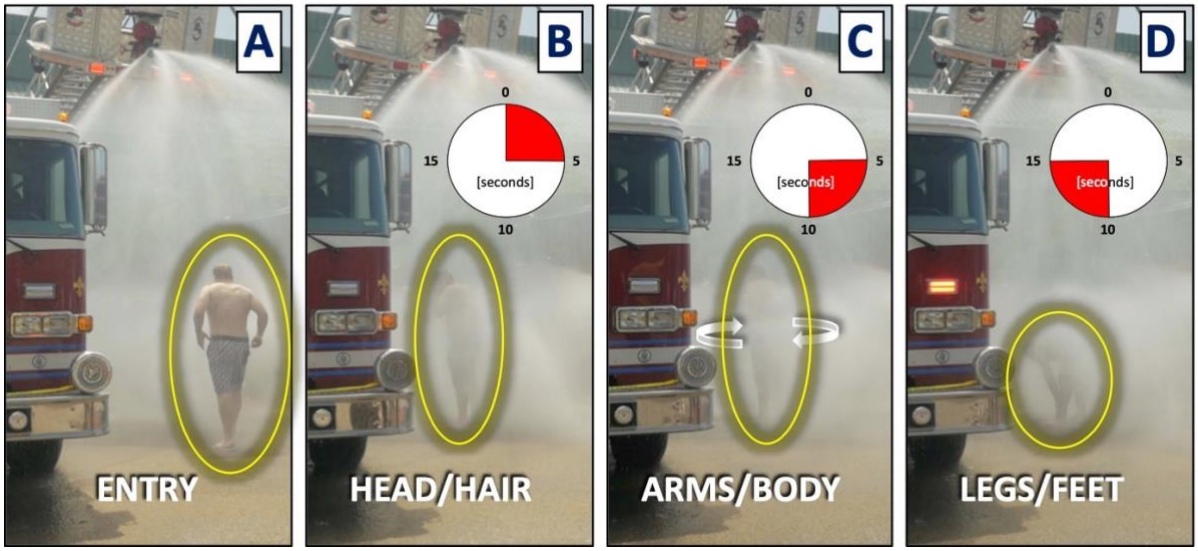
Ensure that patients have undertaken disrobe [A, B]. Start dry decontamination with the hair, tilting the head back to reduce contamination of the face. If sufficient decontamination material is available, place used material into an appropriate waste receptacle [C]. Blot then rub the hair/head, using the 10:10 approach [D, E], disposing of used absorbent material if sufficient material is available [F]. decontaminate the face next, using the same 10:10 approach [G, H], ideally using a fresh piece of decontamination material, which should be placed into an appropriate waste receptacle [I]. Use the 10:10 approach to clean both surfaces of the hands [J, K], ideally with fresh decontamination material, which should then be placed into a waste receptacle [L]. Using clean decontamination material (if available), proceed to decontaminate any other areas of potentially exposed skin.

Protocol for Emergency Dry Decontamination (Non-Ambulatory) **Figure 12**



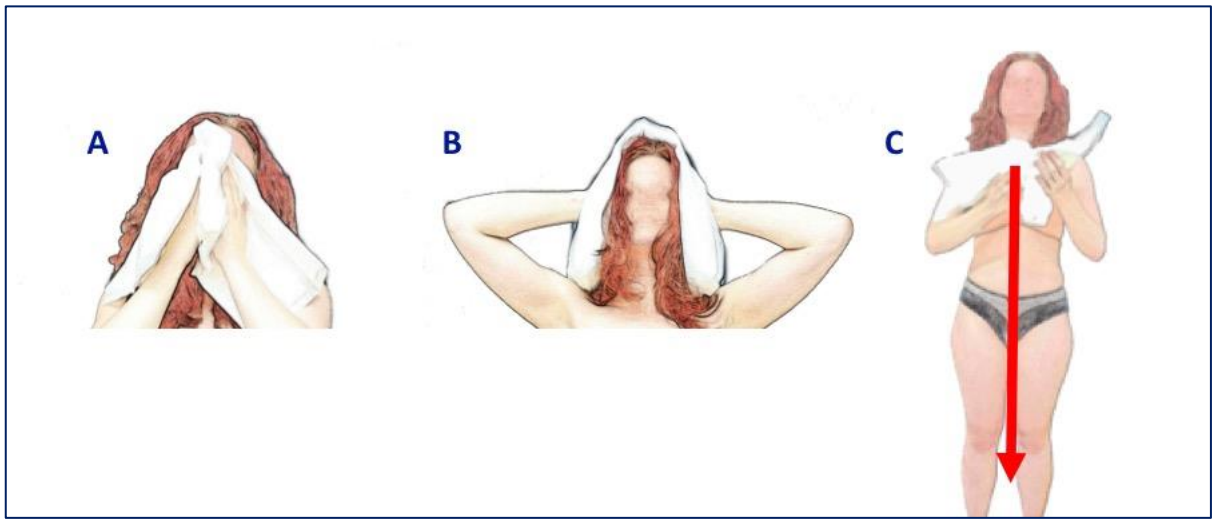
The first responder at the top of the spine board ("D-1") supports the patient's head/neck and ensures a patent airway. The two other officers ("D-1" and "D-2") initially perform disrobe [A]. Using the 10:10 method, decontaminate areas not originally protected by clothing such as the head/hair, face, neck, hands [B, C]. Next, the patient is moved onto an adjacent spine board (covered with fresh absorbent material) by placing into the recovery position [D, E]. After removing clothes, the original spine board is cleaned [F,G] and clean absorbent material applied [H]. The patient is then moved back onto the original spine board by reversing the recovery position.

Protocol for LPS Decontamination (Standard) Figure 13



Times indicated represent the <u>minimum allowable durations</u>. After entering the corridor [A], instruct the patient to use their hands to wash their head, face and neck [B], followed by shoulders, body and arms [C]). If possible, ask patient to turn through 360° with arms outstretched before rubbing legs and feet [D]. Instruct patient to rub hands together before leaving the corridor.

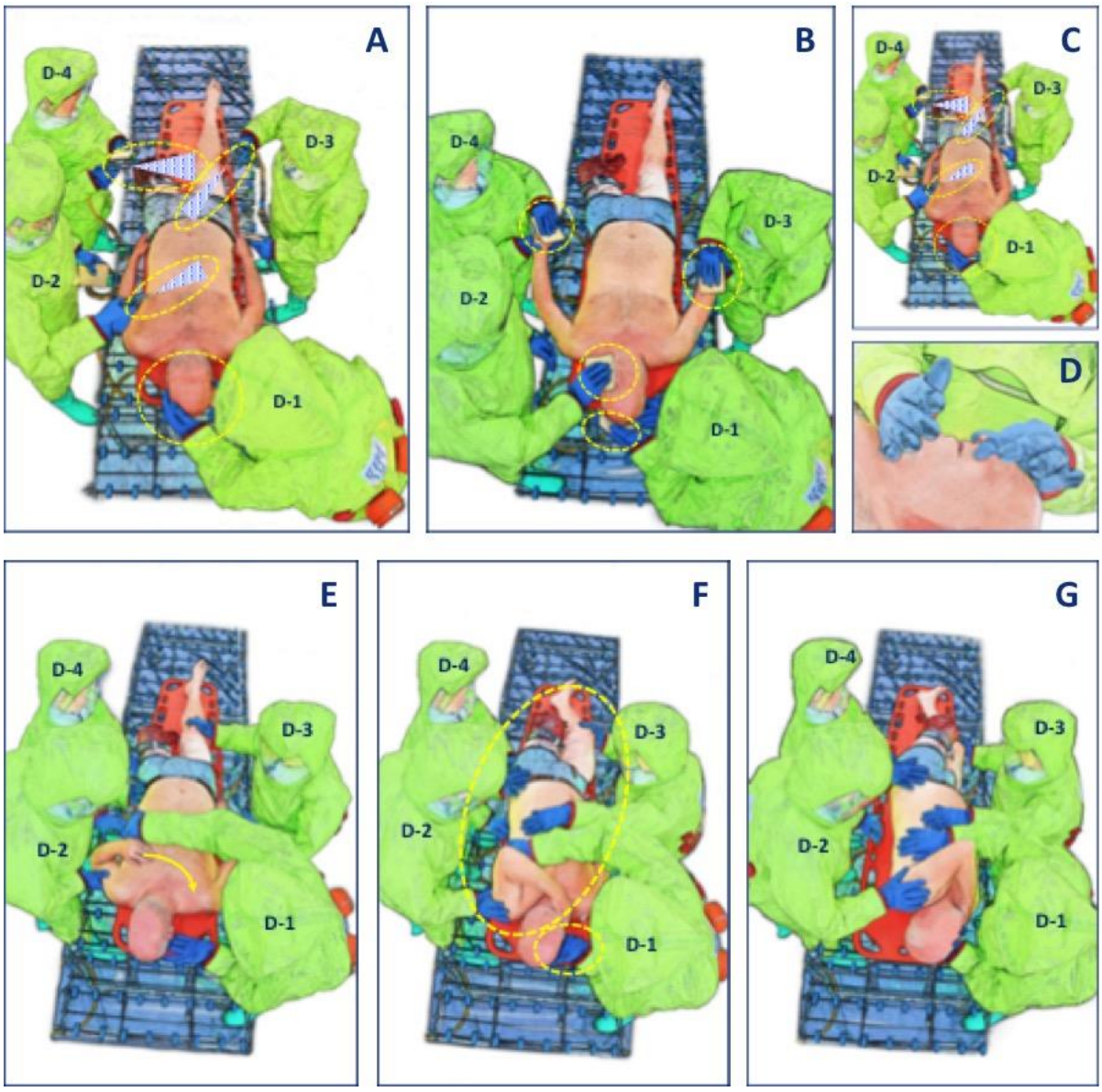
Protocol for Active Drying Figure 14



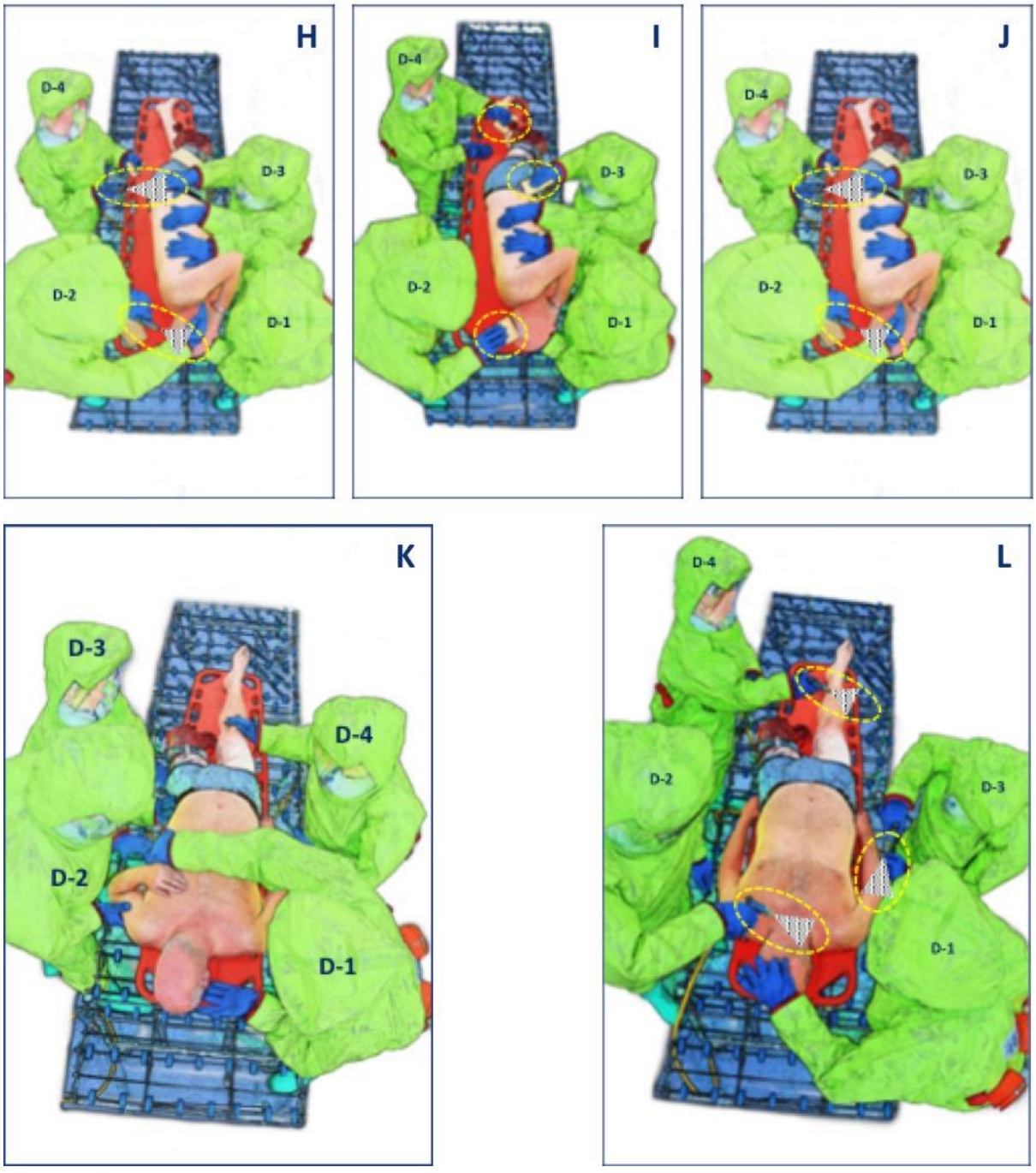
Starting with the face [A], tilt head back to dry the hair/head [B], then progressively move down the body [C].

WASHED Mnemonic for Evacuation, Disrobe and Emergency Dry Decontamination **Figure 15**

W	**Warm Water:** shower water temperature should be between 35ºC (95ºF) and 40ºC (104ºF) to ensure optimal removal of contaminants.
A	**Aid:** the use of a washing aid (e.g., washcloth or sponge) will improve the removal of contamination by 20% during the showering process. Washing aids should be single-use and considered as hazardous waste after use.
S	**Soap:** The use of a detergent has been shown to assist decontamination of lipophilic (oily) substances. Where available, use a metered dosing system to add liquid detergent to shower water at a concentration of 0.1–0.5% (v/v). Alternatively, place ~10 mL of liquid soap or detergent directly onto the washing aid immediately prior to use.
H	**Head to toe:** Instruct patients to wash from the top of the head down to their feet. The head should be tilted back during hair washing to avoid transfer of contamination onto the face.
E	**Expedite:** In order to avoid the "wash-in" effect (which can enhance dermal absorption of certain contaminants), shower for **no longer than 90 seconds**. Ideally, 1 minute with soapy water followed by ½ minute of rinsing with water only.
D	**Drying:** active drying with a towel or other appropriate material is a critical step for removing many chemical contaminants. As with washing aids, used towels must be treated as hazardous and disposed of in accordance with local regulations.



The process requires four decontamination team members (D1 – D4). A "rinse-wipe-rinse" approach is adopted to clean the front surfaces of the patient [A – C, respectively]. Note that officer D-4 protects the airways from water spray [D]. The patient is then carefully rotated by partially utilizing the recovery position method, stopping when the patient is perpendicular to the stretcher [E – G].



A "rinse-wipe-rinse" approach is used to clean the rear surfaces of the patient [H - J, respectively]. After washing the stretcher, the patient is carefully returned to the supine position [K], and a final rinse is performed [L]. Full details of this procedure are provided in PRISM Volume I.

Important Advice on Patients' Hair Following Decontamination

Hair which has been contaminated with certain chemicals (including chemical warfare agents) cannot be thoroughly decontaminated and may continue to pose a contact and/or inhalation hazard for several days following exposure. Therefore, it is recommended that consideration be given to the removal of hair in circumstances where the following criteria are met:

1. Chemical contamination of the patient has been confirmed.
2. The contaminant is known to be toxic.
3. Residual hair contamination has been confirmed using available DIM equipment.

Methods for safely removing contaminated hair include cutting and clipping, but not shaving. The removal of hair is likely to be a highly emotive issue: the residual risk of contamination must be fully communicated to patients prior to requesting their consent.

Summary

The guidance presented in this document is predominantly based on technical evidence and require two operational changes from traditional practices:

- An understanding that the response is time critical. Evacuation, disrobe, and emergency decontamination must be completed as rapidly as possible in the likely absence of any specialist resources (such as an LPS decontamination corridor and technical decontamination units).
- In order to reduce the complexity of dealing with a range of potential issues, patients should initially be categorized for one of two responses: Standard or Non-Ambulatory. The former accommodates individuals who are able to understand and perform instructions (C1 patients) or those who are either unable to understand instructions or unable to perform activities without limited accommodations or assistance (C2 patients). The non-ambulatory pathway is for patients who are unresponsive, have life-threatening injuries or require extensive accommodations or assistance (C3 patients), but can also accommodate C2 patients if or when sufficient resources become available.

The main features of the PRISM response processes are summarized on page 4. A comprehensive description of the response processes and the underpinning scientific and technical evidence can be found in PRISM Volume 1.

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Annex A: ΔH_{evap} values for a range of common chemicals

The following values are provided for use in conjunction with the ASPIRE Ready-Reckoner (Figure 5).

Substance Name	CAS Number	Heat of Vaporization (ΔH_{evap}; kJ mol^{-1})
1-Butyl Mercaptan	109-79-5	32
1-Hexanol	111-27-3	32
1-Methylnaphthalene	90-12-0	46
1-Octanethiol	111-88-6	42
1,1-Dichloroethane	75-34-3	31
1,1-Dichloroethylene	75-35-4	27
1,1-Difluoroethane	75-37-6	19
1,1-Difluoroethene	75-38-7	10
1,1-Dimethylhydrazine	57-14-7	34
1,1,1-Trichloroethane	71-55-6	33
1,1,2,2-Tetrachloroethane	79-34-5	46
1,2-Dibromo-3-chloropropane	96-12-8	42
1,2-Dichloroethane	107-06-2	35
1,2-Dichloroethylene	540-59-0	32
1,2-Dichloropropane	78-87-5	36
1,2-Diphenylhydrazine	122-66-7	47
1,2-Propanediol Dinitrate	6423-43-4	64
1,2-Propylene Oxide	75-56-9	28
1,2,4,5-Tetrachlorobenzene	95-94-3	61
1,2:3,4-Diepoxybutane	1464-53-5	36
1,3-Butadiene	106-99-0	21
1,3-Dichloropropene	542-75-6	33
1,3-Dinitrobenzene	99-65-0	97
1,3-Dioxolane	646-06-0	34
1,3-Pentadiene	504-60-9	28
1,3,5-Trinitrobenzene	99-35-4	70
1,4-Dioxane	123-91-1	39
1,6-Hexanediol Diacrylate	13048-33-4	54
2-Chloroethanol	107-07-3	46
2-Ethyl-1-hexanol	104-76-7	49
2-Hexanone	591-78-6	43
2-Mercaptoethanol	60-24-2	46
2-Methoxyethanol	109-86-4	38
2-Nitroaniline	88-74-4	65
2-Nitropropane	79-46-9	41
2-Pentanone	107-87-9	38
2-Pentyl Acetate	626-38-0	37
2-Pyrrolidinone,1-ethenyl-	88-12-0	45
2-Xylene	95-47-6	43
2,2-Dimethylbutane	75-83-2	28
2,2-Dimethylpropane	463-82-1	22
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6	65
2,4-Dichlorophenoxyacetic acid	94-75-7	62
2,4-Dinitrophenol	51-28-5	58

2,4-Dinitrotoluene	121-14-2	77
2,4-Lutidine	108-47-4	39
2,4-Toluene Diisocyanate	584-84-9	60
2,4,6-Trinitrotoluene	118-96-7	87
2,6-Toluene Diisocyanate	91-08-7	60
3-Bromo-1-propyne	106-96-7	27
3-Chloro-1,2-dihydroxypropane	96-24-2	52
3-Nitroaniline	99-09-2	65
3-Xylene	108-38-3	43
3,3'-Dichlorobenzidine	91-94-1	63
4-Methyl-2-pentyl Acetate	108-84-9	38
4-Nitroaniline	100-01-6	70
4,4'-Methylenebis(2-chloroaniline)	101-14-4	67
4,6-Dinitro-o-cresol	534-52-1	60
Acetaldehyde	75-07-0	26
Acetic Acid	64-19-7	23
Acetone	67-64-1	31
Acetone Cyanohydrin	75-86-5	107
Acetonitrile	75-05-8	33
Acetyl Acetone	123-54-6	43
Acetylene	74-86-2	16
Acrolein	107-02-8	30
Acrylamide	79-06-1	62
Acrylic acid	79-10-7	53
Acrylonitrile	107-13-1	33
Adiponitrile	111-69-3	59
Aldrin	309-00-2	75
Allyl Alcohol	107-18-6	47
Allyl Chloroformate	2937-50-0	35
Ammonia	7664-41-7	23
Aniline	62-53-3	52
Arsenic Trichloride	7784-34-1	35
Arsenic Trioxide	1327-53-3	77
Arsine	7784-42-1	17
Azinphosmethyl	86-50-0	68
Benzene	71-43-2	34
Benzidine	92-87-5	60
Benzyl Chloride	100-44-7	50
Benzyl Chloroformate	501-53-1	46
beta-Hexachlorocyclohexane	319-85-7	51
Bis(2-Chloroethyl) Ether	111-44-4	50
Bis(2-Chloroethyl)sulfide	505-60-2	60
Bis(2-Ethylhexyl) Phthalate	117-81-7	103
Bis(chloromethyl) Ether	542-88-1	33
Boron Trifluoride	7637-07-2	19
Bromine	7726-95-6	30
Bromoform	75-25-2	46
Butanenitrile	109-74-0	39
Cadmium, Elemental	7440-43-9	100
Carbon Dioxide	124-38-9	17

Carbon Disulfide	75-15-0	28
Carbon Monoxide	630-08-0	6
Carbon Tetrachloride	56-23-5	32
Carbonyl Sulfide	463-58-1	18
Chlordane	57-74-9	65
Chlorine	7782-50-5	18
Chlorine Trifluoride	7790-91-2	28
Chloroacetic Acid	79-11-8	61
Chloroacetyl Chloride	79-04-9	45
Chlorobenzene	108-90-7	41
Chlorodiethylaluminum	96-10-6	51
Chlorofenvinphos	470-90-6	62
Chloroform	67-66-3	31
Chloromethyl Methyl Ether	107-30-2	32
Chloropicrin	76-06-2	35
Chlorosulfonic Acid	7790-94-5	44
Chlorotrifluoromethane	75-72-9	16
Chlorpyrifos	2921-88-2	60
Cis-1,2-dichloroethylene	156-59-2	32
Cis-1,3-dichloropropene	10061-01-5	33
Cresol	1319-77-3	45
Crotonaldehyde	4170-30-3	37
Cumene Hydroperoxide	80-15-9	70
Cyanamide	420-04-2	50
Cyanogen	460-19-5	24
Cyanogen Bromide	506-68-3	46
Cyanogen Iodide	506-78-5	58
Cyanuric Fluoride	675-14-9	39
Cyclobutane	287-23-0	25
Cycloheptane	291-64-5	39
Cyclohexanone Peroxide	78-18-2	72
Cyclohexene	110-83-8	33
Cyclohexylamine	108-91-8	43
Cyclonite	121-82-4	84
Cyclopentane	287-92-3	29
Cyclopropane	75-19-4	17
DDD	72-54-8	89
DDT	50-29-3	84
delta-Hexachlorocyclohexane	319-86-8	51
Diallyl Phthalate	131-17-9	57
Diazinon	333-41-5	87
Diborane	19287-45-7	7
Dibromomethane	74-95-3	37
Dibutyl Phthalate	84-74-2	79
Dichlorodifluoromethane	75-71-8	20
Dichloromethane	75-09-2	29
Dichlorvos	62-73-7	68
Dicrotophos	141-66-2	55
Dicyclopentadiene	77-73-6	39
Dieldrin	60-57-1	83

Diethyl Ether	60-29-7	27
Diethyl Malonate	105-53-3	44
Diethyl Zinc	557-20-0	38
Diethylamine	109-89-7	31
Diglycidyl Ether	2238-07-5	44
Diisopropylamine	108-18-9	35
Dimethoate	60-51-5	95
Dimethyl Ether	115-10-6	19
Dimethyl Sulfate	77-78-1	47
Dimethyl Sulfoxide	67-68-5	52
Dimethylamine	124-40-3	25
Dipentylamine	2050-92-2	44
Diphosgene	503-38-8	37
Dipropyl Ether	111-43-3	36
Dipropylamine	142-84-7	44
Disulfoton	298-04-4	77
Endosulfan	115-29-7	68
Endrin	72-20-8	64
Epichlorohydrin	106-89-8	43
Ethane	74-84-0	5
Ethanol	64-17-5	42
Ethion	563-12-2	63
Ethyl Acetate	141-78-6	36
Ethyl Chloride	75-00-3	25
Ethyl Chloroacetate	105-39-5	40
Ethyl Mercaptan	75-08-1	27
Ethyl Methyl Ether	540-67-0	30
Ethyl Nitrate	625-58-1	37
Ethyl Nitrite	109-95-5	26
Ethylamine	75-04-7	29
Ethylbenzene	100-41-4	42
Ethylene	74-85-1	14
Ethylene Dibromide	106-93-4	42
Ethylene Glycol	107-21-1	66
Ethylene Glycol Diethyl Ether	629-14-1	43
Ethylene Glycol Mono-N-butyl Ether	111-76-2	57
Ethylene Oxide	75-21-8	25
Ethylenediamine	107-15-3	45
Ethyleneimine	151-56-4	30
Ethylphenyldichlorosilane	1125-27-5	51
Fluorine	7782-41-4	7
Formaldehyde	50-00-0	23
Furan	110-00-9	28
Furfuryl Alcohol	98-00-0	54
Glutaraldehyde	111-30-8	56
Glycolonitrile	107-16-4	51
Heptachlor	76-44-8	77
Hexachloro-1,3-butadiene	87-68-3	59
Hexachlorobenzene	118-74-1	74
Hexachlorocyclopentadiene	77-47-4	54

Hexachloroethane	67-72-1	54
Hexamethylene Diamine	124-09-4	51
Hydrazine	302-01-2	45
Hydrogen	1333-74-0	1
Hydrogen Bromide	10035-10-6	18
Hydrogen Chloride	7647-01-0	16
Hydrogen Cyanide	74-90-8	28
Hydrogen Fluoride	7664-39-3	25
Hydrogen Peroxide	7722-84-1	49
Hydrogen Sulfide	7783-06-4	14
Iodine, Elemental	7553-56-2	42
Iron Pentacarbonyl	13463-40-6	38
Isobutane	75-28-5	21
Isopentane	78-78-4	26
Isoprene	78-79-5	26
Isopropanol	67-63-0	45
Isopropylamine	75-31-0	28
Isopropylbenzene	98-82-8	45
Kepone	143-50-0	71
Lewisite	541-25-3	53
Lindane	58-89-9	51
Malathion	121-75-5	71
Mechlorethamine	51-75-2	55
Mesityl Oxide	141-79-7	43
Methacrolein	78-85-3	31
Methacrylic Acid	79-41-4	48
Methane	74-82-8	9
Methanesulfonyl Chloride	124-63-0	38
Methanol	67-56-1	37
Methoxychlor	72-43-5	67
Methyl Acrylate	96-33-3	38
Methyl Bromide	74-83-9	23
Methyl Chloride	74-87-3	19
Methyl Ethyl Ketone	78-93-3	35
Methyl Formate	107-31-3	28
Methyl Isobutyl Ketone	108-10-1	43
Methyl Isocyanate	624-83-9	27
Methyl Isothiocyanate	556-61-6	37
Methyl Mercaptan	74-93-1	24
Methyl Methacrylate	80-62-6	36
Methyl N-Butyrate	623-42-7	40
Methyl Parathion	298-00-0	89
Methyl Salicylate	119-36-8	48
Methyl Vinyl Ketone	78-94-4	33
Methylacrylonitrile	126-98-7	37
Methylamine	74-89-5	23
Methylhydrazine	60-34-4	36
Methylpyridines	1333-41-1	35
Methyltrichlorosilane	75-79-6	31
Morpholine	110-91-8	45

n-Butane	106-97-8	22
n-Butyl Acetate	123-86-4	44
n-Butyl Acrylate	141-32-2	45
n-Butyl Alcohol	71-36-3	52
n-Butyl Isocyanate	111-36-4	35
n-Butylamine	109-73-9	36
n-Butyric Acid	107-92-6	40
n-Dodecane	112-40-3	43
n-Ethylaniline	103-69-5	58
n-Heptane	142-82-5	37
n-Hexane	110-54-3	32
n-Nitrosodi-n-propylamine	621-64-7	42
n-Nitrosodimethylamine	62-75-9	37
n-Nitrosodiphenylamine	86-30-6	59
n-Nonane	111-84-2	47
n-Octane	111-65-9	41
n-Pentane	109-66-0	26
n-Propylbenzene	103-65-1	46
n-Tridecane	629-50-5	45
n-Undecane	1120-21-4	57
N,N-Dimethylformamide	68-12-2	48
Naphthalene	91-20-3	53
Nickel Carbonyl	13463-39-3	27
Nitric Acid	7697-37-2	39
Nitrobenzene	98-95-3	55
Nitrogen tetroxide	10544-72-6	38
Nitrogen, Elemental	7727-37-9	6
Nitroglycerin	55-63-0	105
Nitromethane	75-52-5	38
Nitrous Oxide	10024-97-2	17
o-Cresol	95-48-7	45
Oleic Acid	112-80-1	67
p-Cresol	106-44-5	62
Parathion	56-38-2	60
Pentachlorophenol	87-86-5	69
Peracetic acid	79-21-0	44
Phenol	108-95-2	58
Phenyl chloroformate	1885-14-9	42
Phenyl Isocyanate	103-71-9	40
Phenylacetonitrile	140-29-4	47
Phenylhydrazine	100-63-0	59
Phorate	298-02-2	51
Phosgene	75-44-5	25
Phosphine	7803-51-2	186
Phosphorus Oxychloride	10025-87-3	34
Phosphorus Trichloride	7719-12-2	31
Phosphorus, Elemental	7723-14-0	17
Phthalic Anhydride	85-44-9	65
Phthaloyl Chloride	88-95-9	52
Picric Acid	88-89-1	106

Pinacolyl Alcohol	464-07-3	54
Piperidine	110-89-4	38
Propadiene	463-49-0	23
Propane	74-98-6	15
Propargyl Alcohol	107-19-7	42
Propionaldehyde	123-38-6	30
Propionic Acid	79-09-4	55
Propionic Anhydride	123-62-6	48
Propionitrile	107-12-0	36
Propyl Mercaptan	107-03-9	32
Propylamine	107-10-8	31
Propylene	115-07-1	19
Pyridine	110-86-1	40
Pyrrolidine	123-75-1	38
Radon, Radioactive	10043-92-2	0
Salicylaldehyde	90-02-8	45
Sarin	107-44-8	37
sec-Butyl Acetate	105-46-4	35
sec-Butyl Alcohol	78-92-2	50
Selenium, Elemental	7782-49-2	60
Silicon Tetrafluoride	7783-61-1	17
Sodium Hydroxide	1310-73-2	175
Soman	96-64-0	42
Styrene	100-42-5	44
Sulfur Dioxide	7446-09-5	25
Sulfur Hexafluoride	2551-62-4	10
Sulfur Trioxide	7446-11-9	43
Sulfuric Acid	7664-93-9	63
Sulfuryl Chloride	7791-25-5	31
Tabun	77-81-6	48
Terpinolene	586-62-9	51
tert-Butyl Hydroperoxide	75-91-2	42
tert-Butylamine	75-64-9	30
Tetrachloroethylene	127-18-4	40
Tetraethyl Pyrophosphate	107-49-3	48
Tetrafluoroethylene	116-14-3	17
Tetrahydrofuran	109-99-9	32
Tetrahydrothiophene	110-01-0	39
Tetramethyl Lead	75-74-1	36
Tetranitromethane	509-14-8	47
Thiodiglycol	111-48-8	28
Thionyl Chloride	7719-09-7	32
Thiophene	110-02-1	35
Thiophenol	108-98-5	40
Titanium Tetrachloride	7550-45-0	38
Toluene	108-88-3	38
Toluene Diisocyanate	26471-62-5	49
Trans-1,2-dichloroethylene	156-60-5	30
Trans-1,3-dichloropropene	10061-02-6	33
Triallylamine	102-70-5	39

Tributylamine	102-82-9	45
Trichloroacetyl Chloride	76-02-8	36
Trichloroethylene	79-01-6	35
Trichlorosilane	10025-78-2	25
Triethyl Phosphite	122-52-1	38
Triethylamine	121-44-8	35
Trifluoromethane	75-46-7	17
Triisobutylaluminum	100-99-2	38
Trimethyl Borate	121-43-7	34
Trimethyl Phosphite	121-45-9	43
Trimethylamine	75-50-3	22
Trimethylchlorosilane	75-77-4	30
Tripropylamine	102-69-2	46
Tris(2-Chloroethyl)amine	555-77-1	65
Turpentine	8006-64-2	50
Uranium, Elemental	7440-61-1	447
Vanadium, Elemental	7440-62-2	459
Vinyl Acetate	108-05-4	34
Vinyl Bromide	593-60-2	23
Vinyl Chloride	75-01-4	23
Vinyl Fluoride	75-02-5	17
Vinyl Methyl Ether	107-25-5	23
VX	50782-69-9	101
Xylenes	1330-20-7	36