# Radiological / Nuclear

Note: Does not address nuclear power plant incident or nuclear detonations.

## General

- Liaison with Incident Command.
- Perform patient assessment and critical care FIRST, deal with contamination as time permits (different than chemical).
- Contaminated patients (radiation emitting particles on body surface) MAY pose a threat but exposure is usually small.
- No provider has ever been injured by patient contamination.
- "Dirty Bombs" are not expected to yield life-threatening levels of radiation due to contamination.
- Assure hospital is aware of situation, contact supervisor to determine if you need a medical assessment.

## Safety/Exposure

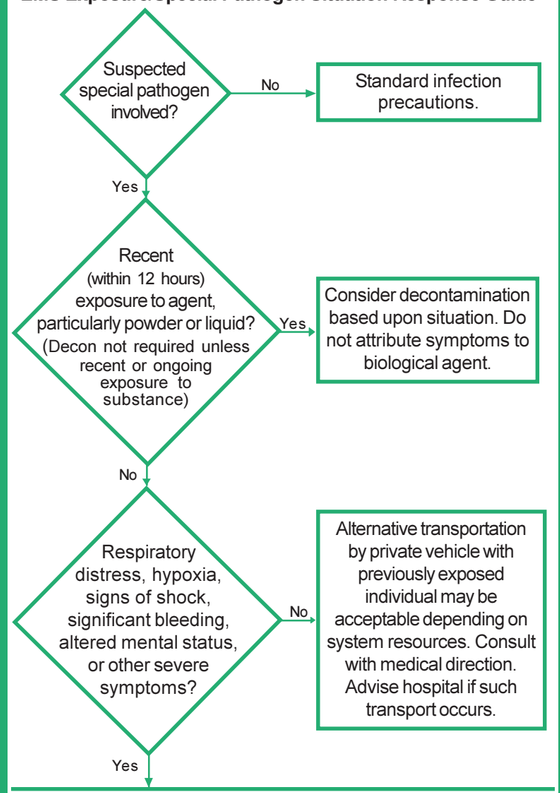
- Time duration, distance, source strength and shielding determine exposure.
- Double glove so that if the outer pair becomes contaminated you can change gloves without exposing bare hands to potential contamination.
- Use N-95 mask and full barriers during a suspected event.
- PAPR may be used in very heavy dust/particle environment. Tyvek suit protects against alpha and moderately against beta; not against gamma radiation.
- Potassium iodide (KI) can be taken to protect the thyroid gland against future cancer but is only helpful if radioactive iodine is part of the release AND when KI is taken within 4 hours after exposure.
- DISTANCE = SAFETY - Do not directly touch contaminated surfaces; use McGill forceps or other tools when possible to avoid directly touching contamination on patients.
- Area >5mR/h considered restricted area for personnel operations (will need personal monitoring and restricted time in area); up to 25rem exposure is allowed for rescues.

## Assessment and Decontamination

- Survey with G-M counter 0.5-1 inch from skin at 1 inch/second.
- Contamination = 2-3x background radiation or greater than 0.1mR/h exposure.
- Alpha stopped by paper (travels only a few inches in air), beta penetrates skin but not deeply, gamma passes through all but thick lead or other dense material.
- Cover open wounds with gauze.
- "Mummy wrap"/"cocoon" patient to contain contamination in breathable (e.g. sheet) wrap when possible.
- Decontamination usually is clothing removal, soap and water.
- Contain contaminated clothing, dressings, etc. in bags, ensure they are secured and labeled.
- Irradiated patients (exposed to radiation but no residual contamination) do not pose a threat to others and do not require decontamination.

# Biological

## EMS Exposure/Special Pathogen Situation Response Guide




**Personal protective equipment:**

1. Respiratory symptoms–place surgical (NOT N95) mask on patient. Providers wear surgical mask unless virulent influenza, plague, smallpox, SARS, or hemorrhagic fever suspected (then N95 or PAPR) unless directed otherwise by your service protocols.
2. Hemorrhagic symptoms–mask as above, strict contact precautions (gown, gloves, eye protection, hand hygiene).
3. Rash– strict contact precautions; if consistent with smallpox, use N95; if not, surgical mask
4. Vomiting and/or diarrhea–contact precautions.

**Patient care:**

1. Minimize use of nebs, suction, or assisted ventilation as possible.
2. Advise hospital immediately of situation.
3. Keep PPE on until finished with rig decontamination.
4. Following transfer at hospital, wipe down patient care compartment with standard disinfectants.
5. Carefully remove PPE and wash hands.
6. Provide names of crew and call details to EMS supervisor.
7. Supervisor should contact hospital and MDH for follow up.

**Family members:**

Unless symptomatic, they pose no risk to public or providers. They should be encouraged to contact MDH Infectious Disease Reporting at 1-877-676-5414.

# Patient Decontamination Procedure

*Please note: In HAZMAT incidents, EMS should be working closely with Incident Command, determining patient care needs. Below is a quick reference of the types of decontamination that a HAZMAT and/or CAT team would be facilitating. EMS should be aware of the process of where to receive the patients and the health/ safety considerations.*

**Solid Particulate Contamination**

1. Wet patient's clothing just prior to removal to keep hazard from becoming airborne.
2. Follow procedure for Liquid Contamination.

**Liquid Contamination**

1. Have patient remove clothing and place in plastic bag (Mark plastic bag with patient's name).
2. Rinse patient with water.
3. Wash patient with soap and water.
4. Rinse patient.
5. Cover patient with blankets/cocooning/patient coveralls.
6. Evaluate for patient transport.
7. Advise receiving hospital of patient decontamination status.

**Gas Contamination**

1. Move patient to fresh air.
2. Removal of clothing may not be or may be the only step necessary for decontamination, consult with Incident Command/HAZMAT team.
3. If patient complains of/or shows signs of injuries sustained from direct contact with hazard, follow liquid decontamination procedure.

* If organophosphate/nerve agents are suspected, follow procedure for Liquid Contamination.

**Hospital Notification**

1. Advise receiving facility of contaminated patients as soon as possible.
2. Advise receiving facility of patient decontamination status.
3. EMS should assure that the receiving facility has resources to provide BOTH decontamination and appropriate patient care for the patient's injuries/ exposure (ie: critical trauma with contamination to Level 1 trauma center).

**Hospital Arrival**

The receiving facility reserves the right to have patients repeat the decontamination process prior to entering the emergency room for evaluation.


MDH, Office of Emergency Preparedness
P.O. Box 64975
St. Paul, MN 55164-0975
651-201-5700, TTY 651-201-5797
www.health.state.mn.us

9/06 IC# 141-1644

If you require this document in another format, such as large print, Braille or cassette tape, call 651-201-5797.


# Emergency Medical Services Guide

## Chemical Biological Radiological Nuclear Explosive

### Basic Points for CBRNE

**First Arriving Crew Safety**

- Are YOU safe? What PPE is needed?
- Protect yourself (uphill/upwind), communicate safe routes/areas to incoming crews.
- Is Decontamination needed?
- Notify Dispatch of situation ( See below: Basic HAZMAT Information to Gather)
- Refer to EMS Incident Response Plan as needed.

**2nd In or Late Arriving Ambulances**

- Report to staging, receive update.

**Basic HAZMAT Information to Gather**

- Report all observations to dispatch.
- Substance name, MSDS, ID numbers.
- Concentration of substance.
- Route of exposure (inhalation, contact, ingestion).
- Environment (closed space, outside, etc.).
- Time and duration of exposure.
- Decon or other first aid provided/needed.
- Current symptoms and signs.
- Chronic illnesses/health of patient.

**Treatment**

- Direct walking wounded to safe refuge and contain them.
- Calm victims by saying! "HELP is on the way."
- Do not touch patient until decontaminated or proper PPE is donned.
- Supportive treatment (ABCs) first.
- Specific treatment second (if substance is known).

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|---|---|
| Poison Control Nationwide | 1-800-222-1222 |
| MN Duty Officer | 1-800-422-0798 |
| MDH Infectious Disease Reporting | 1-877-676-5414 |

**This document is meant to be a quick resource if a suspected CBRNE event has occurred. This document should not take the place of Medical Direction Protocols.**


Thanks to the EMS Emergency Preparedness Workgroup of the Metropolitan Emergency Services Board for developing this reference guide.