i. OUTLINE

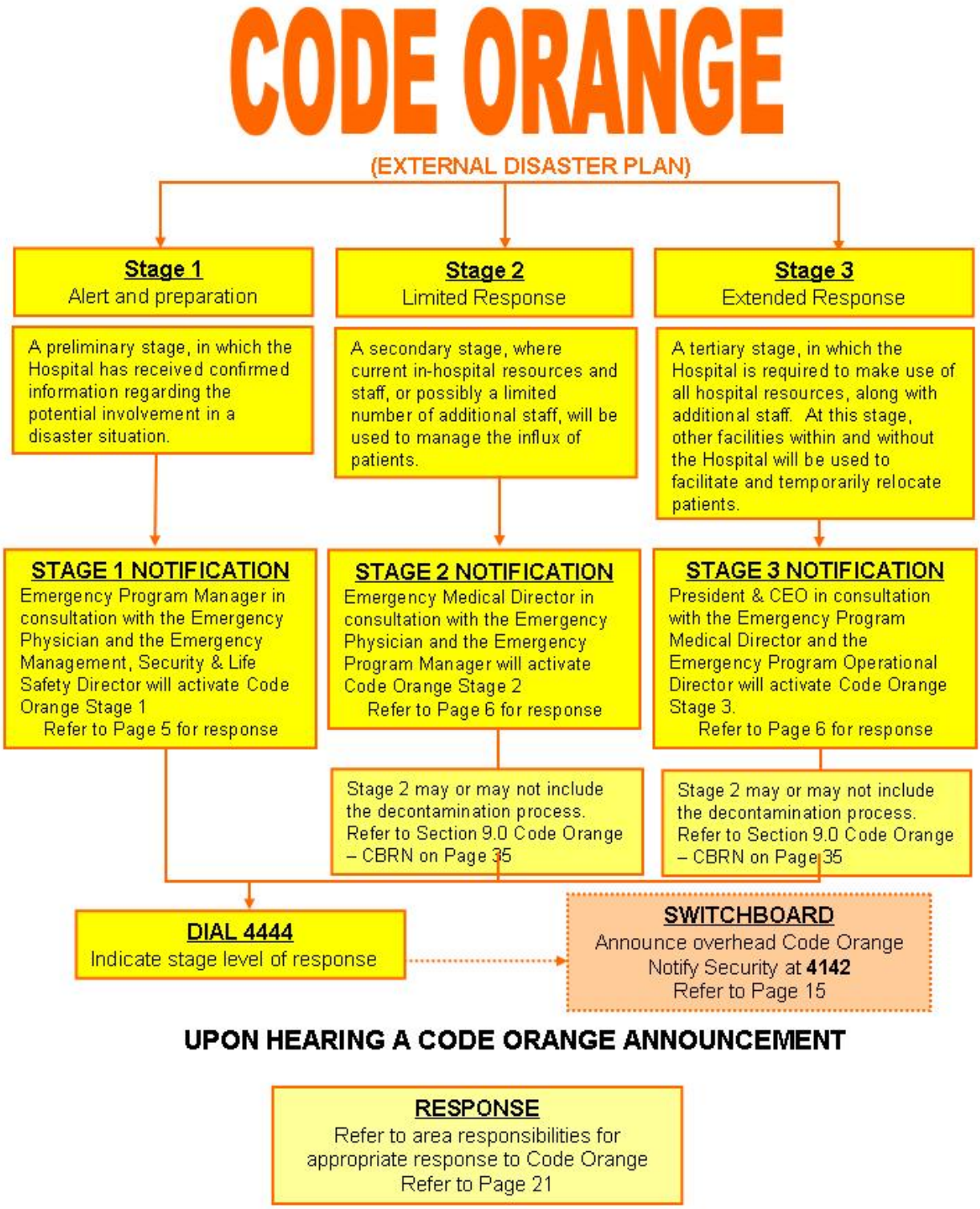
CODE ORANGE
(EXTERNAL DISASTER PLAN)
Stage 1
Alert and preparation
A preliminary stage, in which the Hospital has received confirmed information regarding the potential involvement in a disaster situation.
Stage 2
Limited Response
A secondary stage, where current in-hospital resources and staff, or possibly a limited number of additional staff, will be used to manage the influx of patients.
Stage 3
Extended Response
A tertiary stage, in which the Hospital is required to make use of all hospital resources, along with additional staff. At this stage, other facilities within and without the Hospital will be used to facilitate and temporarily relocate patients.
STAGE 1 NOTIFICATION
Emergency Program Manager in consultation with the Emergency Physician and the Emergency Management, Security & Life Safety Director will activate Code Orange Stage 1
Refer to Page 5 for response
STAGE 2 NOTIFICATION
Emergency Medical Director in consultation with the Emergency Physician and the Emergency Program Manager will activate Code Orange Stage 2
Refer to Page 6 for response
STAGE 3 NOTIFICATION
President & CEO in consultation with the Emergency Program Medical Director and the Emergency Program Operational Director will activate Code Orange Stage 3.
Refer to Page 6 for response
Stage 2 may or may not include the decontamination process.
Refer to Section 9.0 Code Orange – CBRN on Page 35
Stage 2 may or may not include the decontamination process.
Refer to Section 9.0 Code Orange – CBRN on Page 35
DIAL 4444
Indicate stage level of response
SWITCHBOARD
Announce overhead Code Orange
Notify Security at 4142
Refer to Page 15
UPON HEARING A CODE ORANGE ANNOUNCEMENT
RESPONSE
Refer to area responsibilities for appropriate response to Code Orange
Refer to Page 21

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Table of Contents

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1.0 GENERAL OVERVIEW

1.1 Code to Be Used In Case of an External Disaster

To provide a guideline for the management of casualty influx through the Emergency Department, as a result of some external disaster that exceeds the normal capacity of the Emergency Department.

1.2 Definitions

Disaster – A sudden natural or man-made event that causes widespread destruction and distress

Natural Disaster – is the effect of a natural hazard (e.g., flood, tornado, hurricane, volcanic eruption, earthquake, or landslide). It leads to financial, environmental or human losses depending on the vulnerability of the affected population

Man-Made Disaster - resulting from man-made hazards (threats having an element of human intent, negligence, or error; or involving a failure of a man-made system. May be the result of Sociological Hazard (crime, civil disorder, terrorism), Technological Hazard (Industrial, structural, fire, hazardous material), or Transportation Hazard (aviation, rail, road)

Mass Casualty – any event resulting in number of victims large enough to disrupt the normal course of emergency and health care services

Disaster Management - requires the allocation of limited resources for the greatest good of the greatest number of casualties.

CBRN – is an acronym for **Chemical, Biological, Radiological & Nuclear** event

Decontamination - is the process of cleansing the human body to remove contamination, or the possibility (or fear) of contamination, by hazardous materials including chemicals, radioactive substances, and infectious material.

1.3 Stages of External Disaster Response

Notification of an external disaster event involving mass casualties will most likely come from a confirmed public authority (police, fire, emergency medical services). Depending on the extent of the Hospitals' involvement in a disaster, a graduated system of response will be used.

Stage 1 – Alert and Preparation stage

A preliminary stage, in which the Hospital has received confirmed information regarding potential involvement in a disaster situation, however, the extent of the Hospitals' involvement, if any, is not yet clear. At this stage, personnel are assessing resources, contacting key personnel and preparing for the activation of a limited (Stage 2) or extended (Stage 3) response.

Stage 2 – Limited Response
A secondary stage; where current in-hospital resources and staff, or possibly a limited number of additional staff, will be used to manage the influx of patients.
Stage 2 may or may not be preceded by Stage 1.
Stage 2 **may or may not include the decontamination process**.

Stage 3 – Extended Response
A tertiary stage; where the hospital is required to make use of all hospital resources, along with additional staff. The number of urgent or emergent casualties exceeds the capacity of the Emergency Department. At this stage, other facilities within and without the Hospital will be used to facilitate and temporarily relocate patients.
Stage 3 may or may not be preceded by Stage 1 or Stage 2.
Stage 3 **may or may not include the decontamination process**.

1.4 Authority to Declare a Code Orange

Stage 1 will be activated by the Emergency Nursing Manager / Charge Nurse in consultation with the Emergency Physician on duty and the Emergency Management, Security & Life Safety Director / delegate[1].

Stage 2 will be activated by the Emergency Medical Director / delegate in consultation with the Emergency Physician on duty and the Emergency Nursing Manager / delegate[2]

Stage 3 will be activated by the President & CEO / delegate in consultation with the Emergency Program Operational Director / delegate and the Emergency Program Medical Director / delegate.

1.5 Incident Command Centre

Upon receiving notice of a Stage 2 or Stage 3 limited or extended response for an external disaster, the Emergency Department will immediately establish an Incident Command Centre[3] within an appropriate area in the department. The Emergency Medical Director / Delegate will assume command and coordinate the response activities.

The person acting as the Incident Commander (e.g., Emergency Program Medical Director / delegate) must be prepared to transfer command to a higher authority (Chief of Staff, CEO), or apply unified command.[4]

[1] Delegate is the next level of (appointed) authority, in this case the Manager of Emergency Planning & Life Safety
[2] Delegate is the next level of (appointed) authority
[3] "Incident Command Centre" is a centrally located space available to coordinate and manage resources. "Incident Command" reports to the Hospital Emergency Operations Centre (if active).
[4] "Unified Command" is a team effort which allows all departments / agencies with responsibility for the incident, to jointly provide management direction to an incident through a common set of incident objectives and strategies established at the command level.

1.6 Functional Areas

During Code Orange – Stage 2 or Stage 3, functional areas will be activated to assist in the isolation of the Emergency Department in order for them to deal with the casualties coming in. See **Appendix A – Functional Areas** for details.

Casualties will be triaged under the Emergency canopy prior to entering the facility. A Triage Physician and Triage Nurse will assess the casualty and identify the medical needs using the START triage method (Red, Yellow, Green, & Black). Casualties will be directed as follows:

RED	–	Emergency Sections A, B & D
YELLOW	–	Emergency Sections C & E
GREEN	–	Burr Gym
BLACK	–	Douglas Morgue

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2.0 RESPONSE & RECOVERY – EMERGENCY DEPARTMENT

RESPONSE

2.1 External Disaster Alert and Preparation – Stage 1

Emergency Charge Nurse

Upon notification from an appropriate confirmed authority (police, fire, emergency medical services) of the Hospitals' potential involvement in an external disaster situation, notify:

- ☐ Emergency Physician on duty
- ☐ Emergency Program Manager or Administrative Coordinator on call (if after hours)
- ☐ Kingston Hospitals' Security Control Centre operator (**4142**) to notify the Director of Emergency Management, Security & Life Safety / delegate
- ☐ Review responsibilities listed in "Code Orange – Stage 2" and "Code Orange – Stage 3"

Emergency Program Manager / Charge Nurse

After consultation with the Emergency Physician on duty and the Director of Emergency Management, Security & Life Safety / delegate determine whether to activate the Stage 1 external disaster alert and preparation.

NO

- ☐ Continue communications with appropriate authority and reassess response as needed
- ☐ Consider notifying Emergency Program Operational Director / delegate for information purposes

Emergency department staff shall continue with their routine duties and assist the Emergency Physician on duty to expedite patient treatment, discharges, admissions, or transfers from the department.

YES, notify:

- ☐ Emergency Program Operational Director / Delegate
  - ☐ Chief Nursing Executive / delegate
  - ☐ Duty Administrator on call during off hours
- ☐ Switchboard @ **4444** to announce overhead "Code Orange – Stage 1"
- ☐ Operating Room
- ☐ Kidd 2 Intensive Care Unit / Davies 4 Intensive Care Unit
- ☐ Trauma Coordinator
- ☐ Manager of Core Lab / delegate (for impact to the Blood Bank and available blood and blood products on hand)
- ☐ Notify Infection Control Practitioner if disaster involved biological agent

☐ Review responsibilities listed in “Code Orange – Stage 2” and “Code Orange – Stage 3”

☐ If radiation is suspected notify labs that CBC's with diffs may need to be done every 6-12 hours, which may require additional staff to come in

Emergency Physician on Duty

After consultation with the Emergency Nursing Manager / Charge Nurse and the Director of Emergency Management, Security & Life Safety / delegate determine whether to activate the Stage 1 external disaster alert and preparation.

NO

☐ Continue communications with Urgent Care Centre Nursing Manager and reassess response as needed

Emergency department staff shall continue with their routine duties and assist the Emergency Physician on duty to expedite patient treatment, discharges, admissions, or transfers from the department. Based on the Triage assessment some patients may be sent home and asked to return at a later time or to see their family physician.

YES, notify:

☐ Emergency Program Medical Director / Delegate

☐ Trauma Team Leader

☐ 0800 – 2200 hours, Hotel Dieu Hospital Urgent Care Physician on duty

☐ Notify Chief of Staff for information purposes

☐ Review responsibilities listed in “Code Orange – Stage 2” and Stage 3”

Director Emergency Management, Security& Life Safety / Delegate

☐ Notify Manager, Emergency Management, Parking & Security Control Centre / delegate

☐ Notify Manager, Security, Life Safety, Access Control & Special Projects / delegate

2.2 External Disaster Response – Stage 2 or Stage 3

Emergency Charge Nurse

Upon notification from an appropriate confirmed authority (police, fire, emergency medical services) that there is large number of casualties en-route to the Emergency department notify:

☐ Emergency Physician on duty

☐ Emergency Program Manager / delegate

☐ Assign nurse to role of triage nurse in “tarped” area under the ER canopy

Emergency Program Manager / Delegate[5]

☐ Notify the Emergency Program Operational Director / delegate

☐ Liaise with CCAC to facilitate discharge of patients into the community

Emergency Physician on Duty

☐ Notify the Emergency Medical Director / delegate

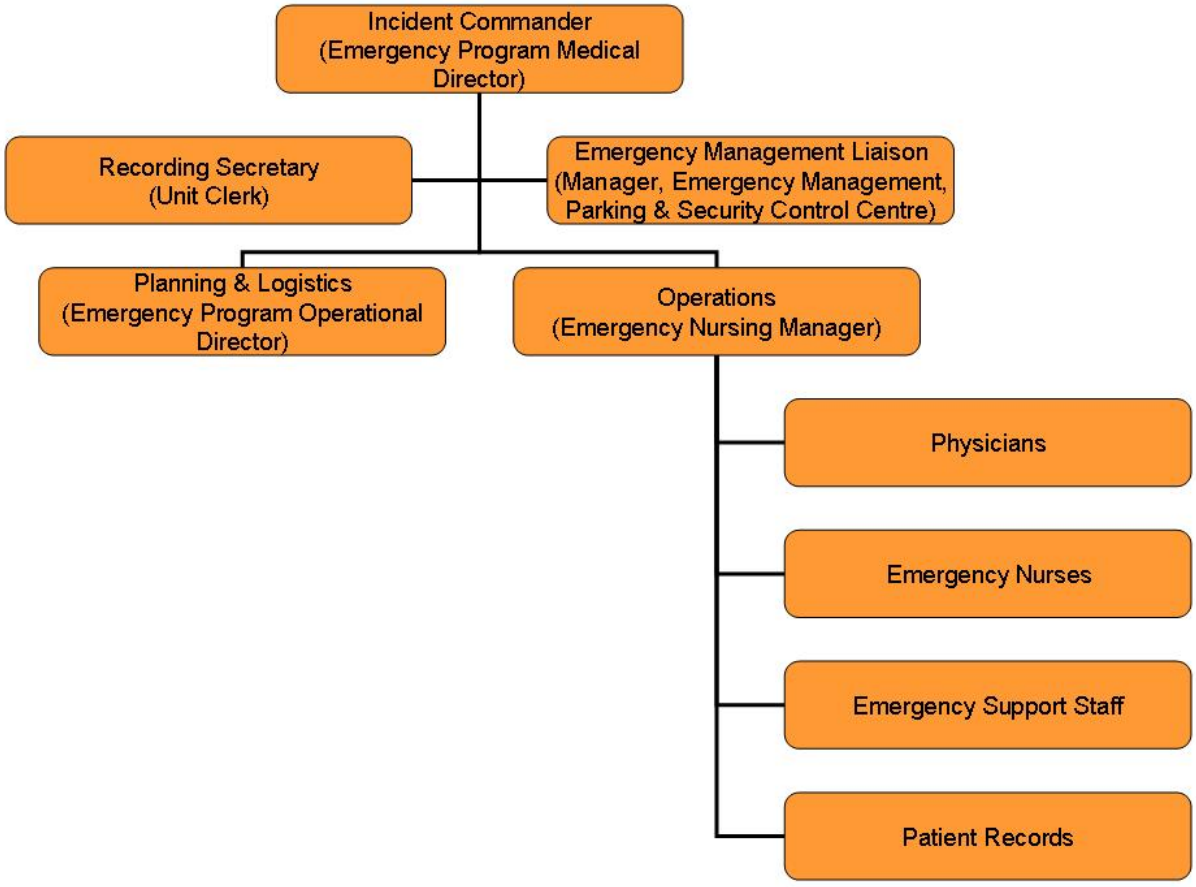
☐ Assign physician to role of triage physician in "tarped" area under the ER canopy

Emergency Program Medical Director / Delegate

☐ In consultation with the Emergency Physician on duty and the Emergency Nursing Manager / delegate, determine whether to activate the Stage 2 limited response, and authorize the Switchboard @ **4444** to announce "Code Orange – Stage 2"

2.3 Incident Command Centre (ICC)

The Incident Command Centre will be set up in an area that is away from the main reception area of the incoming casualties. (I.e. Program Operational Directors office)



[5] Delegate is the next level of (appropriate) authority, in this case it is the Charge Nurse or Manager on-call between 1600-1900 or Administrative Coordinator on call if after hours

Emergency Program Medical Director / delegate[6]

☐ Assume role of **Incident Commander**

☐ Appoint the following positions, only if the regular assigned persons are not available

- ☐ **Operations** _____
- ☐ **Planning** _____
- ☐ **Logistics** _____
- ☐ **Recording Secretary** _____

☐ Determine the incident objectives and strategy. Consider the: who, what, when, where of the emergency. (size up)

☐ Set immediate priorities

☐ Authorize Incident Action Plan

☐ Coordinate activity for all command and general staff

☐ Arrange for prompt discharge, transfer or admission of current patients

☐ Provide liaison with Nursing and other services / personnel to ensure adequate resources are available

☐ Contact Human Resources to determine the necessity of a staff resource pool

- ☐ If staff pooling area is established, have Switchboard announce location and instructions overhead. Continue announcements as required.

☐ Organize business cycle meetings to obtain and review status reports with Incident Command Centre staff

☐ Review next steps and assign tasks as required

☐ Have Kingston Hospitals' Security Control Centre initiate the Emergency department Fan-out, as required

☐ Keep the President & CEO and the Chief of Staff informed of patient and resource status.

- ☐ Ensure the Board of Directors / Ministry is made aware of the situation, if required

☐ Notify Public Affairs representative on call to determine if any communication is needed to any or all of staff, patients, visitors, public at large/media.

☐ Ensure Employee Family Assistance Program (EFAP) [7]Counselors available for staff

[6] "Delegate" refers to the next level of (appointed) authority, in this case the Administrator on Call

[7] "EFAP" is an Employee Family Assistance Program available free of charge to staff of Hotel Dieu Hospital through the Occupational Health & Safety department.

Manager, Emergency Management, Parking & Security Control Centre / delegate[8]

- ☐ Initiate ICC set-up in the Emergency Program Operational Directors office using supplies from ICC set-up container
- ☐ Report to Incident Command in the Emergency Program Operational Directors office
- ☐ Assume role of **Emergency Management/Liaison Officer**
- ☐ Obtain a briefing from Incident Commander
- ☐ Ensure communication pathways are established with outside agencies at incident site and communicate updates. (eg. EMS, Police, Fire, Corrections etc.)
- ☐ Ensure that contact and resource information has been established with outside agencies (eg. Public Health, Ministry of Health, Local Health Integration Networks, CCAC and other hospitals etc.)
- ☐ Provide updates to the Hospital Emergency Operations Centre (EOC) Liaison Officer, if EOC activated
- ☐ Provide information to EOC Liaison Officer
  - ☐ The number of patients that can be received and treated immediately
  - ☐ Any current or anticipated shortage of personnel, supplies, etc
  - ☐ Current condition of hospital structure and utilities
  - ☐ Number and type of in-patients to be transferred by wheelchair or stretcher to another hospital
  - ☐ Any resources which may be required from other facilities
- ☐ Request assistance and information as needed through the inter-hospital emergency communication network or Municipal EOC via EOC Liaison Officer
- ☐ Prepare information for briefing with Incident Commander

Emergency Program Operational Director / Delegate

- ☐ Assume role of **Planning and Logistics Officers**

  Planning Officer
  - ☐ Evaluate incident status and make recommendations on course of action
  - ☐ Keep the Vice President Patient Care informed of patient and resource status and notify the Professional Practice Leader, if required
  - ☐ In cooperation with the Emergency Department Incident Commander, provide liaison with other services / personnel to ensure adequate resources are available
  - ☐ Prepare information for briefing with Incident Commander
  - ☐ Responsible for both short and long term planning.

[8] "Delegate" is the next level of (appointed) authority

- ☐ Ensure activation of family waiting areas, discharge area and labour pool areas for response, if required

☐ Liaise with the Director of Labs concerning morgue capacity and need for alternative arrangements if exceed capacity (ie. Refrigerated truck, release to funeral homes expedited)

Logistics Officer

☐ Obtain all pertinent information surrounding the disaster, including:
- ☐ Time of occurrence
- ☐ Number and types of casualties
- ☐ Time of arrival of casualties and potential for further casualties

☐ Assess the current resources of the Emergency Department

☐ Notify Staffing office / Human Resources for additional staff

☐ Organizes and directs those operations associated with the maintenance of the physical environment, and adequate supplies, food and shelter to support the medical objectives

☐ Liaise with other departments (eg. Portering, Environmental Services, Stores), to ensure resources and supplies are available to support the medical objectives

☐ Maintain current materials and supplies status of all areas

☐ Authorize Security Control Centre (**4142**) to activate the Emergency Department fan-out

☐ In cooperation with the Emergency Department Incident Commander, provide Liaison Officer with other services / personnel to ensure adequate resources are available

☐ Oversees the acquisition of needed supplies and services necessary for medical response, with assistance of Finance if required

☐ Prepare information for briefing with Incident Commander

Manager, Emergency Department

☐ Assume the role of **Operations Officer**

☐ Prepare the Emergency Department for anticipated casualties

☐ Oversee the operations of the physicians, nurses and support staff in the Emergency Department, “tarped” triage area and decontamination area

☐ Determine need for extra physicians, nursing and support staff and instruct Incident Commander to activate appropriate fan-out lists

☐ Determine the need for extra equipment and supplies

☐ **Notify “CritiCall” 1-800-668-HELP (4357) and give preliminary report**

☐ Assign medical resources within the Emergency Department:

- ☐ Triage
  - ☐ Physicians X 1
  - ☐ Nurses X 1
  - ☐ Unit Clerk X 1
- ☐ Red – Section A & B
  - ☐ Physicians X 3
  - ☐ Nurses X 5
  - ☐ Unit Clerk X 1
- ☐ Red Overflow – Section D
  - ☐ Physicians X 1
  - ☐ Nurses X 2
  - ☐ Unit Clerk X 1
- ☐ Yellow – Section C & E
  - ☐ Physicians X 2
  - ☐ Nurses X 3
  - ☐ Unit Clerk X 1
- ☐ Emergency Room Decanting – OPPU
  - ☐ Physicians X 1
  - ☐ Nurses X 2
  - ☐ Unit Clerk X 1
- ☐ Green – Burr Gym
  - ☐ Physicians X 1
  - ☐ Nurses X 2
  - ☐ Unit Clerk X 1

☐ Ensure **all** staff receive any updated information about the event (eg. name or antidote of chemical involved if CBRN event)

☐ Prepare information for briefing with Incident Commander

☐ Report to the Incident Commander patient and supply status

☐ Receive fan-out results of ER nursing staff from Control Centre Operator, if activated

Triage Physician & Nurse

The Triage Physician will work with the Triage Nurse and provide expertise if required in assessing casualty patients as they come on to the emergency ramp.

☐ Obtain mass casualty chart packages located in the ambulance bay office filing cabinet and take to triage entry point in tarped area

☐ Triage patients as they enter the tarped area under the ER canopy

☐ Triage physician will take the “V scan” and scan trauma patients suspected of life threatening blunt trauma injuries with internal bleeding that would require transfer to the operating room immediately

☐ Assess each patient and assign a level of care required. Using a bold marker, write large sized letter on patients right hand indicating level of care based on the **START** triage method:

- Red – Critical
- Yellow – Immediate
- Green – Minor
- Black – DOA

The **START** triage method uses **Respirations, Pulse, and Mental Status to categorize the patient** into a color code

Respirations	<10 or >30 – **RED** No respirations with patent airway – **BLACK** Respirations between 10 – 30 go to pulse
Pulse	No radial pulse – **RED** Pulse present go to mental status
Mental status	Confused or Unconscious – **RED** Alert – **YELLOW** Able to walk – **GREEN**

☐ Attach a mass casualty band from the mass casualty chart package to the wrist of patient identifying:

- ☐ Name (if known)
- ☐ Date of Birth (if known)

☐ Identify allergy (if known) and attach allergy band

☐ Ensure that all casualties are triaged, treated as necessary and transported

☐ Prioritize the need to transport casualties into the Emergency department or Operating room

☐ If patient is triaged Red then nurse or physician must escort patient and chart into section A and notify the charge nurse

☐ Direct patients triaged Yellow to take casualty chart into the Emergency waiting area where the secondary triage nurse will escort the patient to section C

☐ Direct patients triaged Green to take casualty chart to the Burr Gym

☐ Patients triaged Black will be taken to the Douglas Morgue by Transportation Services

Secondary Triage Nurse

☐ Receive patients triaged Yellow and escort to section C as beds available

☐ If no treatment bed available the secondary triage nurse is responsible for assessment and reassessment of patient using trauma flow sheet while patient waits in the waiting room until patient is taken into assigned area

☐ If the status of a patient changes to Red, escort the patient to section A and notify the Charge Nurse

Triage Unit Clerk

☐ Assist triage Physician and triage Nurse in "tarped" area to track all casualties triaged (by chart number) and location designated in the Emergency department

☐ Update EDIS with casualty location (virtual casualty beds or assigned bed)

RECOVERY

2.4 Upon Notification That the Crisis Has Concluded – Stage 1

Manager, Emergency Department

In consultation with the Emergency Physician on duty, determine whether the crisis has concluded, that it is safe to resume normal operations, and authorize the Switchboard to announce the "All Clear".

2.5 Upon Notification That the Crisis Has Concluded – Stage 2 or 3

The President & CEO / Delegate in consultation with the Incident Commander will determine whether the crisis has concluded and that it is safe to resume normal operations.

Incident Commander

☐ Once situation resolves, initiate deactivation of response

☐ Prepare for team debriefing

Emergency Management / Liaison

☐ Prepare casualty data statistics for debrief preparation

Planning & Logistics

☐ Ensure that all documentation is collected for debrief preparation

☐ Ensure equipment used has been returned and in proper storage

Operations

☐ Ensure that all required reports are filed immediately

☐ Ensure triage physician and triage nurse resume normal duties

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3.0 RESPONSE & RECOVERY – SWITCHBOARD

RESPONSE

3.1 Upon Notification of a Stage 1 – Alert and Preparation for External Disaster

☐ Announce overhead three times **"CODE ORANGE – STAGE 1"**

☐ Notify:

Monday to Friday (During normal business hours)

- ☐ Kingston Hospitals' Security Control Centre at **ext. 4142**
- ☐ President & CEO **2341**
- ☐ Program Operational Directors / Delegates

Monday – Friday (After normal business hours)

- ☐ Kingston Hospitals' Security Control Centre at **ext. 4142**
- ☐ 1700 – 0700 Duty Administrator on call
- ☐ 1700 – 0700 Administrative Coordinator at pager **178**
- ☐ 1600 – 1900 Page On call Manager

Weekends and Holidays

- ☐ Kingston Hospitals' Security Control Centre at **ext. 4142**
- ☐ Administrative Coordinator at pager **178**
- ☐ Duty Administrator on call

3.2 Upon Notification of a Stage 2 – Limited Response to External Disaster

☐ Announce overhead three times **"CODE ORANGE – STAGE 2"**

☐ Keep a record of all activities and communications pertaining to the disaster situation

☐ Notify:

Monday to Friday (During normal business hours)

- ☐ Kingston Hospitals' Security Control Centre **ext. 4142**
- ☐ President & CEO **2341**
- ☐ Program Operational Directors / Delegates (See EOC Fan-Out)

Monday – Friday (After normal business hours)

- ☐ Kingston Hospitals' Security Control Centre at **ext. 4142**
- ☐ 1700 – 0700 Duty Administrator on call
- ☐ 1700 – 0700 Administrative Coordinator at pager **178**

Weekends and Holidays

☐ Kingston Hospitals' Security Control Centre at **ext. 4142**

☐ Administrative Coordinator at pager **178**

☐ Duty Administrator

At All Times
If directed by the CEO / Delegate notify:
☐ The Emergency Operations Centre call back list

3.3 Upon Notification of a Stage 3 – Extended Response to External Disaster

☐ Announce overhead three times **"CODE ORANGE – STAGE 3"**

Notify:

Monday to Friday (During normal business hours)
☐ Kingston Hospitals' Security Control Centre at **ext. 4142**
☐ President & CEO **2341**
☐ Program Operational Directors / Delegates (See EOC Fan-Out)

Monday – Friday (After normal business hours)
☐ Kingston Hospitals' Security Control Centre at **ext. 4142**
☐ 1700 – 0700 Duty Administrator on call
☐ 1700 - 0700 Administrative Coordinator at pager **178**

Weekends and Holidays
☐ Kingston Hospitals' Security Control Centre at **ext. 4142**
☐ Administrative Coordinator at pager **178**
☐ Duty Administrator on call

RECOVERY

3.4 Upon Notification That the Crisis Has Concluded – Stage 1, 2 or 3

☐ Announce over the public address system three times, "CODE ORANGE, ALL CLEAR"
☐ Refer any media inquiries to the Public Affairs office

4.0 RESPONSE & RECOVERY – EMERGENCY MANAGEMENT, SECURITY & LIFE SAFETY

RESPONSE

4.1 Upon Receiving the Code Orange – Stage 1 Notification

Control Centre Operator

- ☐ Notify Director Emergency Management, Security & Life Safety / Delegate
- ☐ Notify Security Supervisor
- ☐ Review responsibilities listed in "Code Orange – Stage 2" and "Code Orange – Stage 3"

Security Supervisor / Delegate [9]

- ☐ Review responsibilities listed in "Code Orange – Stage 2" and "Code Orange – Stage 3"

4.2 Upon Receiving the Code Orange – Stage 2 or 3 Notification

Control Centre Operator

- ☐ Notify the Director Emergency Management, Security & Life Safety / Delegate
- ☐ Notify Security Supervisor
- ☐ Request assistance from the Police to control street traffic
- ☐ Notify Queen's Security (**613-533-6111**) that the disaster plan is in effect and that the underground parking garage will be needed to manage incoming staff and visitors
- ☐ Initiate the External Disaster Fan-Out using the electronic "Call-em-all system as instructed by the Director, Emergency Management, Security & Life Safety / delegate

Director Emergency Management, Security & Life Safety / Delegate

- ☐ Notify Manager, Emergency Management, Parking & Security Control Centre /Delegate and assign to Liaison role in the Incident Command Centre located in the Emergency Planning room
- ☐ Notify Manager Security, Life Safety, Access Control & Special Projects /Delegate to oversee the Security personnel response and assist, as required
- ☐ Notify Risk Management
- ☐ Initiate the recall of off-duty Security personnel, if necessary
- ☐ Report to the EOC if activated

[9] "Delegate" is the next level of (appointed) authority. In this case the 'Second In Command' as appointed by the Security Supervisor.

Security Supervisor / Delegate

- ☐ Ensure Security Emergency Post rolls down barrier tarps under ER canopy
- ☐ Secure all entrances to the hospital, except the main entrance and post directional signs at secured entrances
- ☐ Control access through the main entrance by checking ID for all staff and redirecting:
  - ☐ Media to the Public Affairs office through the Nickle entrance to the hospital
  - ☐ Visitors for casualties and patients being discharged will be directed to the Family Waiting Area (Etherington Hall), through the Stuart St. Etherington Hall entrance
  - ☐ Visitors for other patients not being discharged will be requested to refrain from entering the hospital for the duration of the crisis
  - ☐ Patients returning from leave to their rooms
- ☐ Set up the Emergency Operations Centre, if required
- ☐ Provide two-way radio communication, as required
- ☐ Assign an Officer to control traffic at the Discharge / Transfer point; Stuart St / Etherington entrance.
- ☐ Assign an Officer to control parking at the Steam Plant
- ☐ Allow admittance to staff members recalled to the Hospital via the Watkins old main entrance
- ☐ Ensure the continuation of Security functions in the remainder of the facility

Rounds Officer

- ☐ Obtain the functional area signs and post in appropriate locations (See APPENDIX A – Functional Area Locations)
- ☐ Report to the Security office on Dietary 1 for further direction

Emergency Post

- ☐ Control traffic flow at the emergency entrance
  - ☐ Roll down the barrier tarps under the canopy to control entrance to the Emergency Department
  - ☐ Emergency vehicles take top priority; request all non-emergency vehicle owners to move their vehicles to the Steam Plant or underground parking lots
  - ☐ Arrange for vehicles, which cannot be moved from the Emergency Department entrance to be towed
- ☐ Control access to the hospital through the Emergency Department by redirecting:
  - ☐ Staff to the Watkins old main entrance
  - ☐ Media to the Public Affairs office through the Nickle entrance to the hospital

- ☐ Visitors for casualties and patients being discharged will be directed to the Family Waiting Area (Etherington Hall), through the Stuart St. Etherington Hall entrance
- ☐ Visitors for other patients not being discharged will be requested to refrain from entering the hospital for the duration of the crisis

☐ Ensure the safety of hospital personnel, casualties, bystanders and other agencies involved in the mass casualty response

RECOVERY

4.3 Upon Notification That the Crisis Has Concluded – Stage 1

☐ Resume normal operations

4.4 Upon Notification That the Crisis Has Concluded – Stage 2 or 3

Director Emergency Management Security & Life Safety

☐ Prepare for team debriefing

Manager, Emergency Management, Parking & Security Control Centre

☐ Collect all documentation and prepare analysis of incident

Security Supervisor

☐ Unlock public entrances if required

☐ Ensure tarps rolled back up under ER canopy

☐ Ensure that all documentation is collected for debrief preparation

Security Rounds Officer

☐ Ensure equipment used has been returned and in proper storage

Control Centre Operator

☐ Notify Police that the crisis has concluded

☐ Notify Queen's Security (**613-533-6111**) that the crisis has concluded

Security Officers

☐ Await direction from the Security Supervisor

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5.0 RESPONSE & RECOVERY – ALL STAFF

RESPONSE

5.1 Procedure if You Hear a Code Orange – Stage 1 Announced Overhead

All Vice Presidents / Chief Of Staff / Director Human Resources / Delegates

☐ Notify all directors and managers within each respective portfolio required to manage a "Code Orange – Stage 2" or "Code Orange – Stage 3".

☐ Prepare to report to the Emergency Operations Centre (EOC)

Area Program Operational and Medical Directors, Department Directors & Managers / Delegates

☐ Assess current resources

☐ Review responsibilities and prepare for the activation of the "Code Orange – Stage 2" or "Code Orange – Stage 3" procedure

All Hospital Personnel

☐ Continue with normal duties unless specifically involved in the disaster response

☐ Do not leave the hospital unless authorized by immediate supervisor

☐ Staff must wear their hospital identification at all times

☐ Telephones will be restricted to necessary use only and should not be used for non-essential calls, either within the hospital or to the outside

☐ Updates regarding the Code Orange status may be given to staff by vocera, if applicable

5.2 Procedure If You Hear a Code Orange – Stage 2 or Stage 3 Announced Overhead

All Vice Presidents / Chief Of Staff / Director Human Resources / Delegates

☐ Initiate portfolio fan-out and notify all directors, managers, and department heads necessary to manage the crisis

☐ Report to the EOC if directed

Area Program Operational and Medical Directors, Department Directors & Managers / Delegates

☐ Prepare to increase staff and services as required

Direct Patient Care Personnel

☐ Update bed census and provide this information to Patient Records & Registration

☐ Triage existing patients and prepare for discharge or transfer of those patients

☐ Notify admitting of the potential discharges or transfers

- ☐ Consider the use of private transfer companies for discharged or patients being transferred to another facility
- ☐ Advise the families / friends of patients being discharged / transferred of the approximate time, and the point of pick-up, or destination of transfer
- ☐ Off duty staff reporting to work will do so to the designated pooling area and receive further instructions as to duties required
- ☐ Person reporting to work will enter through the main entrance wearing hospital identification

All Hospital Personnel

- ☐ Continue with normal duties unless specifically involved in the disaster response
- ☐ Do not leave the hospital unless authorized by your immediate supervisor
- ☐ Staff must wear their hospital identification at all times
- ☐ Telephones will be restricted to necessary use only and should not be used for non-essential calls, either within the hospital or to the outside
- ☐ Updates regarding the Code Orange status may be given to staff by vocera, if applicable
- ☐ Off duty staff reporting to work will do so to the designated pooling area and receive further instructions as to duties required
- ☐ Person reporting to work will enter through the main entrance wearing hospital identification

Operating Room

If directed by the EOC:

- ☐ Complete procedures in process
- ☐ Postpone / cancel upcoming procedures
- ☐ Assess the need for extra staff and selectively initiate fan-out to secure staff
- ☐ Assess the need for additional surgical supplies and contact Central processing to deliver sterilized equipment needed

Intensive Care Unit

- ☐ Triage existing patients and assess whether any patients can be transferred to other units in the facility
- ☐ Advise the families / friends of patients being transferred of the approximate time the patient will be transferred, and the point destination
- ☐ Update bed census and provide this information to Patient Records & Registration
- ☐ Work with “CritiCall” to transfer patients out of ICU

PAR

☐ Triage existing patients and assess whether any patients can be transferred to other units in the facility

Cancer Centre

If directed by the EOC:

☐ Complete clinic procedures in process

☐ Postpone / cancel upcoming procedures, if required on case by case basis

Clinical Laboratory Services

☐ Assess supply of blood and blood products required for Code Orange response

☐ Be prepared to access regional blood supply

☐ Consider the impact of increased demand for emergency laboratory testing due to increased number of casualties

Material Management Personnel

☐ Ensure the delivery of supplies and equipment to Emergency and other areas

Outpatient Procedures Unit

If directed by the EOC:

☐ Complete clinic procedures in process

☐ Postpone / cancel upcoming procedures

Spiritual Care

☐ Report to the Family Waiting area (Etherington Hall) and assume command

☐ Have additional staff report to the Operations Officer in the Emergency Department

☐ Arrange for spiritual support for family members and critically injured patients

Patient Records & Registration

☐ Prepare a list of all available beds

☐ Determine the need to call in additional staff

☐ Register incoming casualties in the Emergency Department

☐ Collate all patient movement information

☐ Document the discharge / transfer of patients and ensure that individual charts accompany the patients

☐ To the extent possible, keep physicians informed of movement information relative to their patients

☐ Advise inquiring families / friends of patients not to enter the hospital for the duration of the crisis

☐ Prepare to provide a bed allocation report for the EOC

Pharmacy Services
☐ Supply required medications to Emergency

Public Affairs
☐ Provide communication as needed to any or all staff, patients, visitors, public at large/media. Information vetted through the Incident Commander
☐ Assist with calls from general public regarding the disaster response
☐ Arrange for media to enter through Nickel entrance and to remain in designated area

Radiology (X-Ray)
If directed by the EOC:
☐ Complete procedures in process
☐ Postpone / cancel upcoming procedures
☐ Advise patients that they may need to be sent home and rescheduled at a later date
☐ If patients are cancelled, advise the patients to exit the building immediately

Respiratory Therapy Services
☐ Provide required medical gases to Emergency and other functional areas, and to the destinations of patients being relocated

Same Day Admission Centre
If directed by the EOC:
☐ Complete clinic procedures in process
☐ Postpone / cancel upcoming procedures

Social Work / CCAC
☐ Report to the Discharge Staging area (FAPC 1) and assume command
☐ Have additional staff report to the Operations Officer in the Emergency Department
☐ Arrange for support for family members and critically injured patients

Transportation Services
☐ Assist as requested by the staff in charge and in accordance with departmental guidelines
☐ Must be available to move Emergency patients and inpatients from the Emergency Department to other locations
☐ Must be available to move supplies as necessary

Volunteer Services
☐ Send Volunteers to the Discharge Staging area (FAPC 1) and Family Waiting area (Etherington Hall) to assist where required to comfort patients and visitors
☐ Send Volunteers to the Emergency Department and report to the Operations Officer

RECOVERY

5.3 Upon Notification That the Crisis Has Concluded – Stage 1

All Hospital Personnel

☐ Resume normal operations

5.4 Upon Notification That the Crisis Has Concluded – Stage 2 or 3

All Vice Presidents / Chief of Staff / Director Human Resources / Delegates

☐ Prepare for debriefing with President & CEO and Incident Command

All Hospital Personnel

☐ Assess the impact of the crisis on current resources and report to EOC

☐ Resume normal operations

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6.0 RESPONSE & RECOVERY – PRESIDENT & CEO / DELEGATE

RESPONSE

6.1 Upon Receiving the Code Orange – Stage 1 Notification

☐ Review responsibilities and prepare for the activation of the "Code Orange – Stage 2" or "Code Orange – Stage 3" procedure

6.2 Upon Receiving the Code Orange – Stage 2 Notification

☐ Determine the need to activate the Emergency Operations Centre and / or proceed to the Stage 3 response

☐ Assume overall responsibility for the response to the crisis

☐ Consider the need to contact the Emergency Management Unit (EMU) if additional resources are required (i.e. the need for **Emergency Medical Assistance Team)**

6.3 Activation of Code Orange – Stage 3

☐ In consultation with the Emergency Program Medical Director/Delegate and the Emergency Program Operational Director / Delegate, determine whether to activate the Stage 3 Extended response, and authorize Switchboard @ **4444** to announce the "Code Orange – Stage 3".

☐ Activate the Emergency Operations Centre if not already activated

☐ Assume overall responsibility for the response to the crisis

☐ Ensure Employee Family Assistance Program (EFAP) [10]Counselors available for staff

RECOVERY

6.4 Upon Notification That the Crisis Has Concluded – Stage 1

☐ Resume normal operations

6.5 All Clear – Stage 2 or 3 Declaring Return to Normal Operations

In consultation with Emergency Medical Director, determine whether the crisis has concluded, that it is safe to resume normal operations, and authorize the Switchboard to announce the "All Clear"

☐ Implement a course of action to manage a major disruption of hospital routine, if necessary

[10] "EFAP" is an Employee Family Assistance Program available free of charge to staff of Hotel Dieu Hospital through the Occupational Health & Safety department.

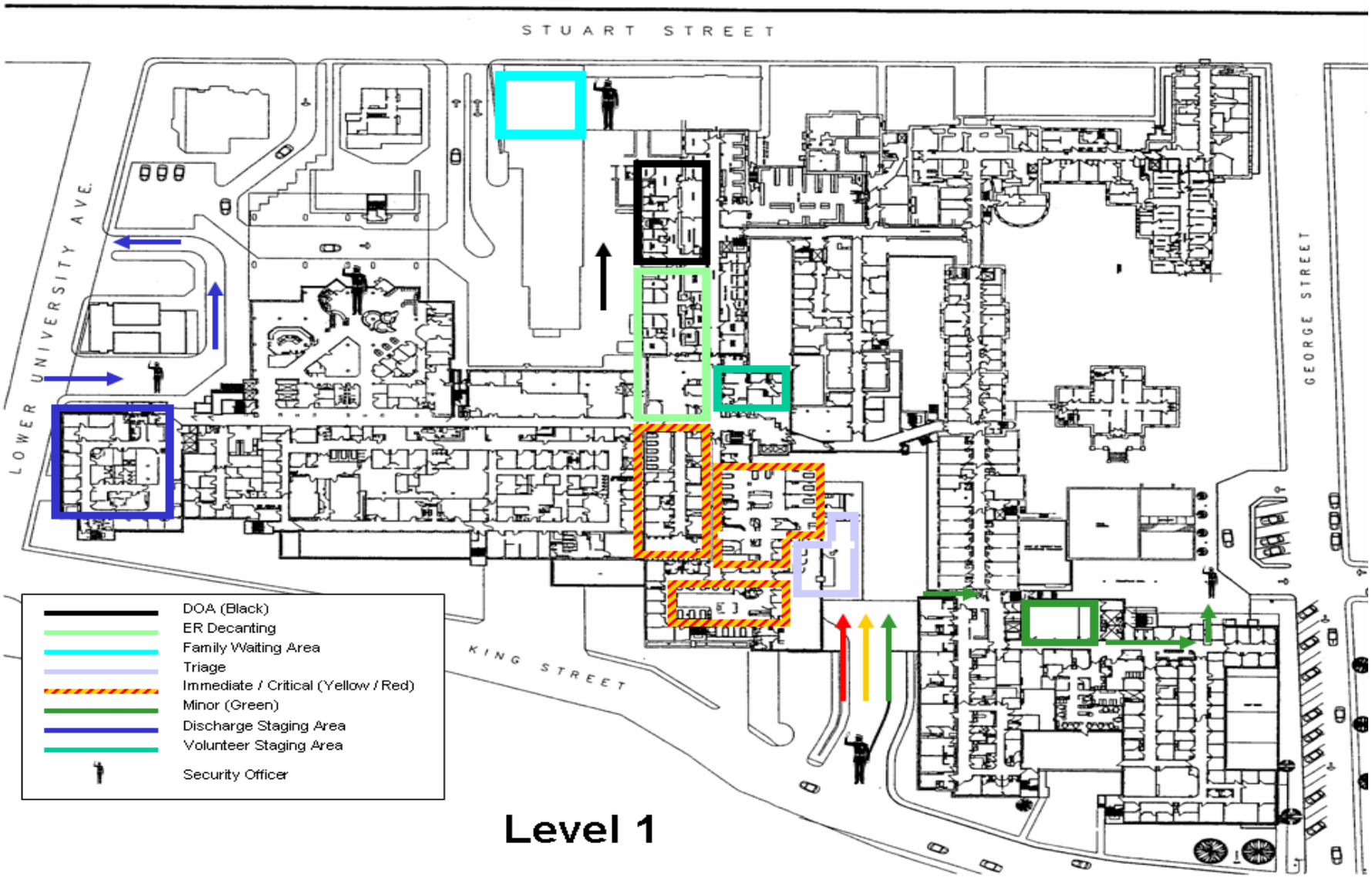
- ☐ Arrange for a debrief session between Incident Command and the Emergency Operations Centre
- ☐ Arrange for a debrief session with involved staff
- ☐ **Arrange a Critical Incident Stress Debriefing (EFAP[11]) for involved staff**

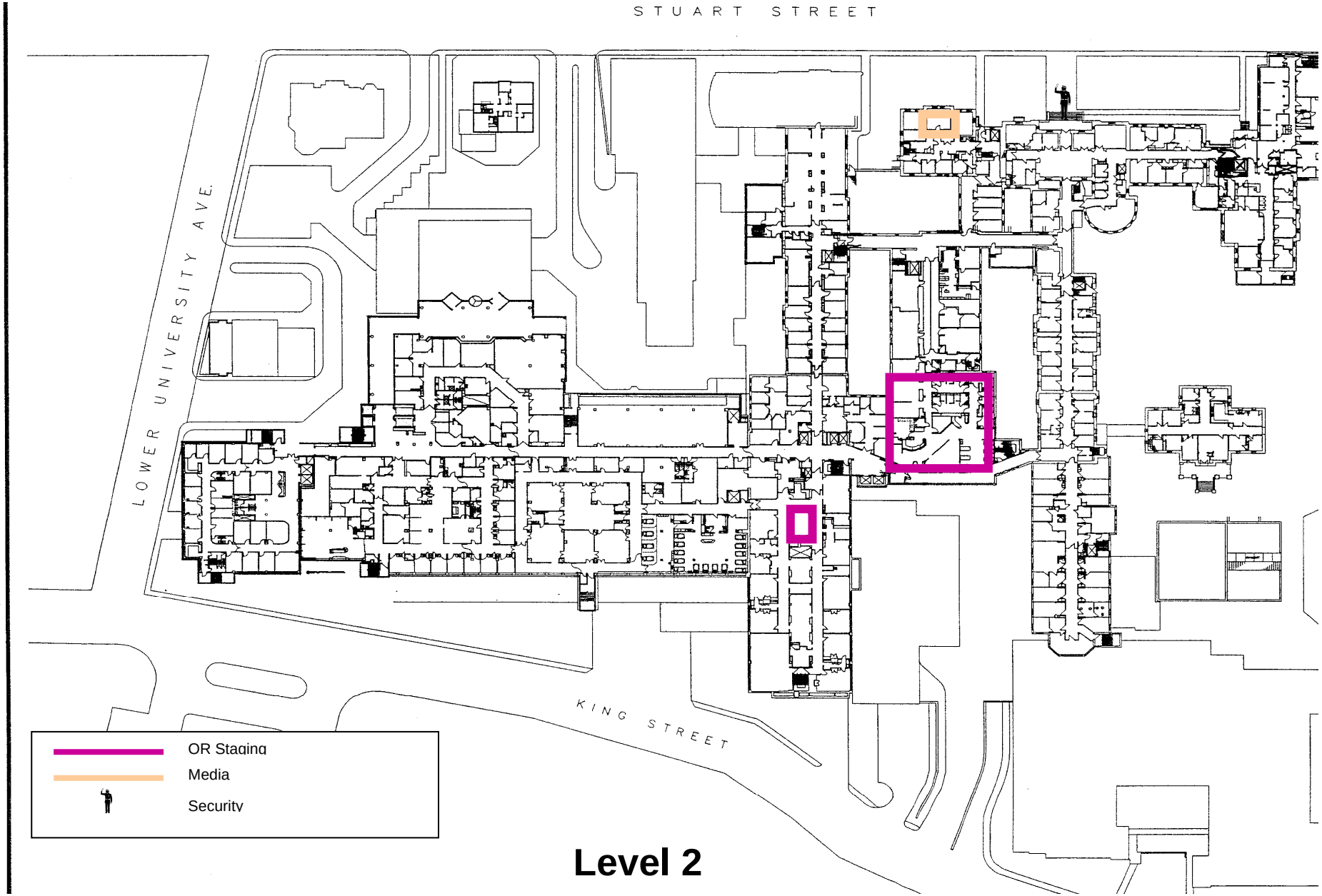
[11] "EFAP" is an Employee Assistance Program available free of charge to staff of Kingston General Hospital through the Occupational Health & Safety department.

7.0 APPENDIX A – FUNCTIONAL AREAS

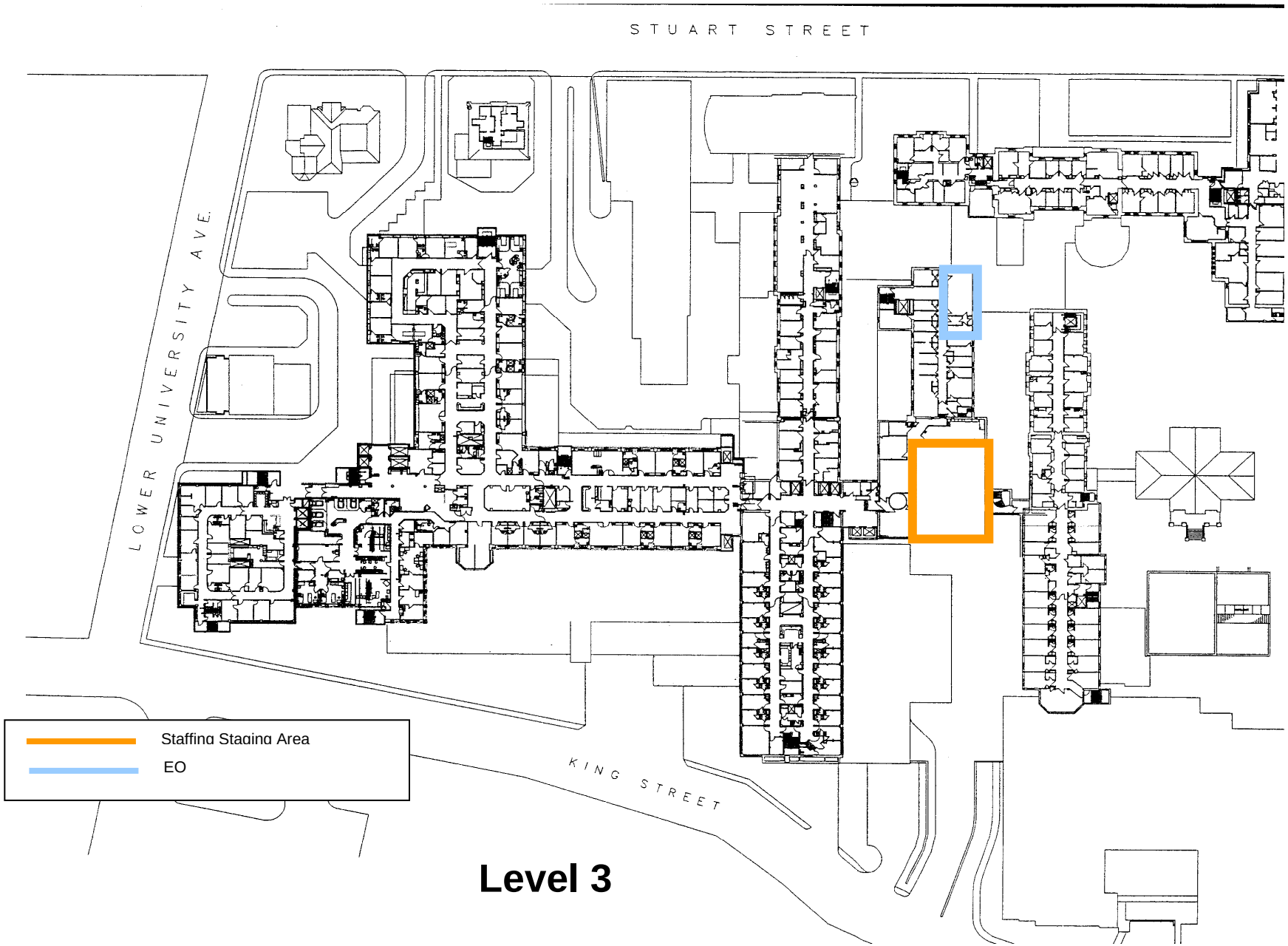
Functional Area	Location	Phone #	Staffed By	Controlled By	Call Back List
Emergency Operations Centre	Dietary 3 Boardroom	2500	• EOC Members	President & CEO / Delegate	Switchboard
Media Centre	Public Affairs & Development Conference Room – Nickle 2 (9-225)	1247	• Public Affairs Specialists	Chief Communication & Marketing Officer / Delegate	Switchboard
Discharge Staging Area	FAPC Level 1		• Social Work • Patient Records & Registration • Nursing • CCAC • Volunteers	Director Social Work / Delegate	Switchboard
Family Waiting Area	Etherington Amphitheatre		• Pastoral Care • Social Work • Volunteers	Director Pastoral Care / Delegate	Switchboard
Discharge / Transfer Point	FAPC Entrance off Lower University St.	N/A	• Security	Director Security & Life Safety / Delegate	N/A
Pre-Op Staging Area	Same Day Admission Centre – Dietary 2 (7-213)	3451	• Nursing Personnel	Surgery Department Head / Delegate	N/A
ER Decanting	Outpatient Procedures Unit – Connell 1 (2-183)	4285	• Nursing Personnel	Medicine Department Head / Delegate	N/A
Nursing Personnel Pool	Nursing Conference Room – Empire 2 (3-237C)	4669	• Nursing Personnel	Director Nursing Staffing / Delegate	Nursing Staffing Office
Medical Personnel Pool	Watkins 3 Conference Room		• Physicians	Medical Director / Delegate	Switchboard
Support Personnel Pool	Old Cafeteria – Dietary 3 (7-328H)	3179	• Support Staff (i.e. Maintenance, Transportation, Environmental Services, etc.)	Chief Human Resources Officer / Delegate	Departmental Call Back Lists
Volunteer Personnel Pool	Volunteer Conference Room – Connell 1 (2-192)	2359	• Volunteers	Director Volunteer Services / Delegate	Volunteer Office
Parking Areas	**Staff** • Steam Plant Lot • Underground Parking Lot **Visitors** • Underground Parking Lot	N/A	• Security • Queen's Parking • Queen's Parking	Director Emergency Management, Security & Life Safety / Delegate	N/A

Points of Entry	**Staff**
	• Card Reader Access Points
	  • Watkins Old Main
	  • Connell 0
	  • Burr 0
	  • FAPC 1
	  • Douglas 1
	Visitors
	• George St. Entrance
	Media
	• Nickle Main
	Patients:
	Returning from Leave
	• Davies Main
	Casualties
	• Emergency Entrance
		N/A	• N/A
			• Security
			• Public Affairs
			• Security
			• Security
				Director Emergency Management, Security & Life Safety / Delegate	N/A


STUART STREET
LOWER UNIVERSITY AVE.
GEORGE STREET
KING STREET
DOA (Black)
ER Decanting
Family Waiting Area
Triage
Immediate / Critical (Yellow / Red)
Minor (Green)
Discharge Staging Area
Volunteer Staging Area
Security Officer
Level 1

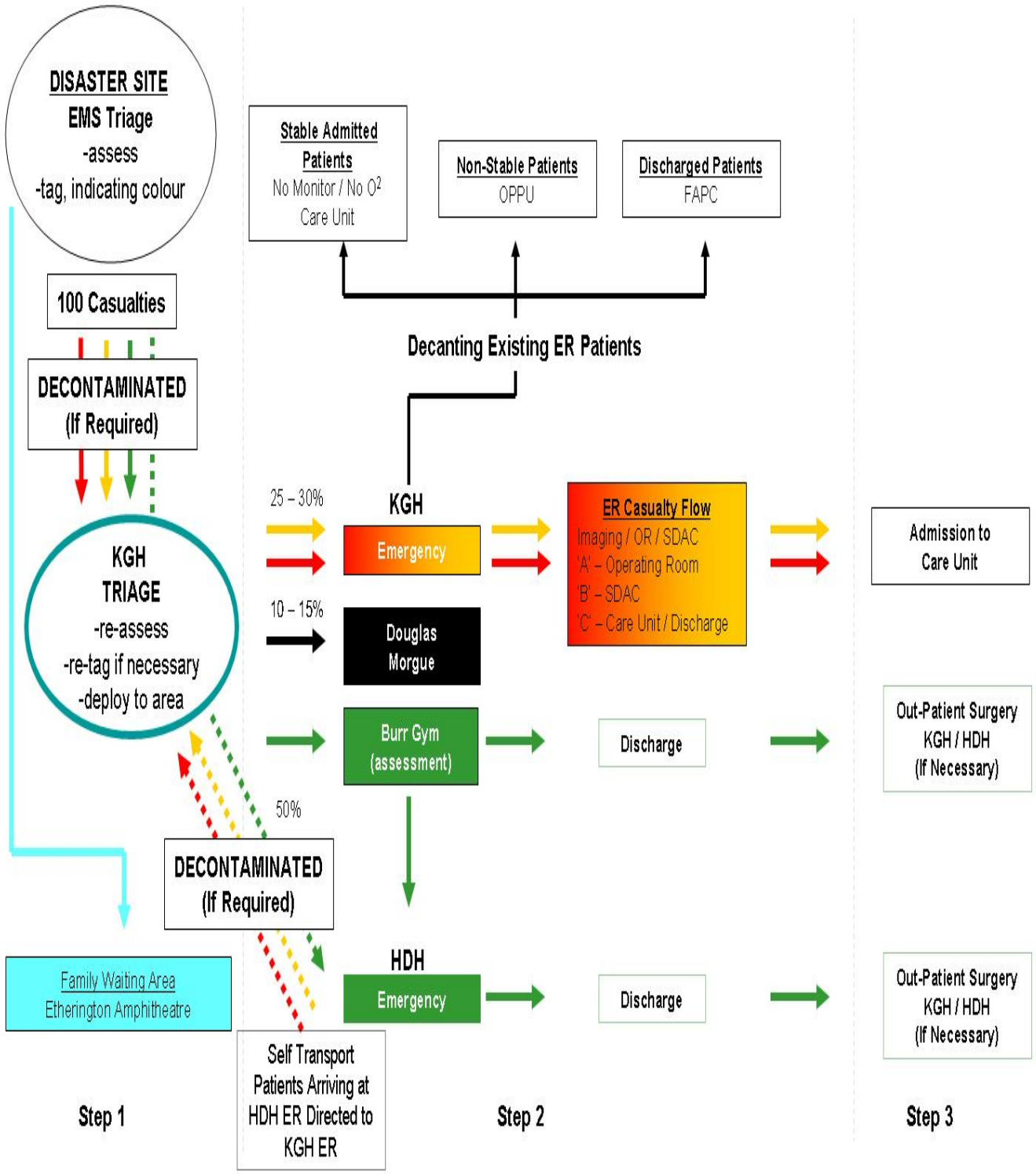

STUART STREET
LOWER UNIVERSITY AVE.
KING STREET
OR Staging
Media
Security

Level 2


STUART STREET
LOWER UNIVERSITY AVE.
KING STREET
Staffing Staging Area
EO

Level 3

8.0 APPENDIX B – BASIC ASSUMPTIONS



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9.0 CODE ORANGE - CHEMICAL, BIOLOGICAL, RADIOLOGICAL, NUCLEAR (CBRN) GENERAL OVERVIEW

9.1 Code to Be Used In Case of a CBRN Event

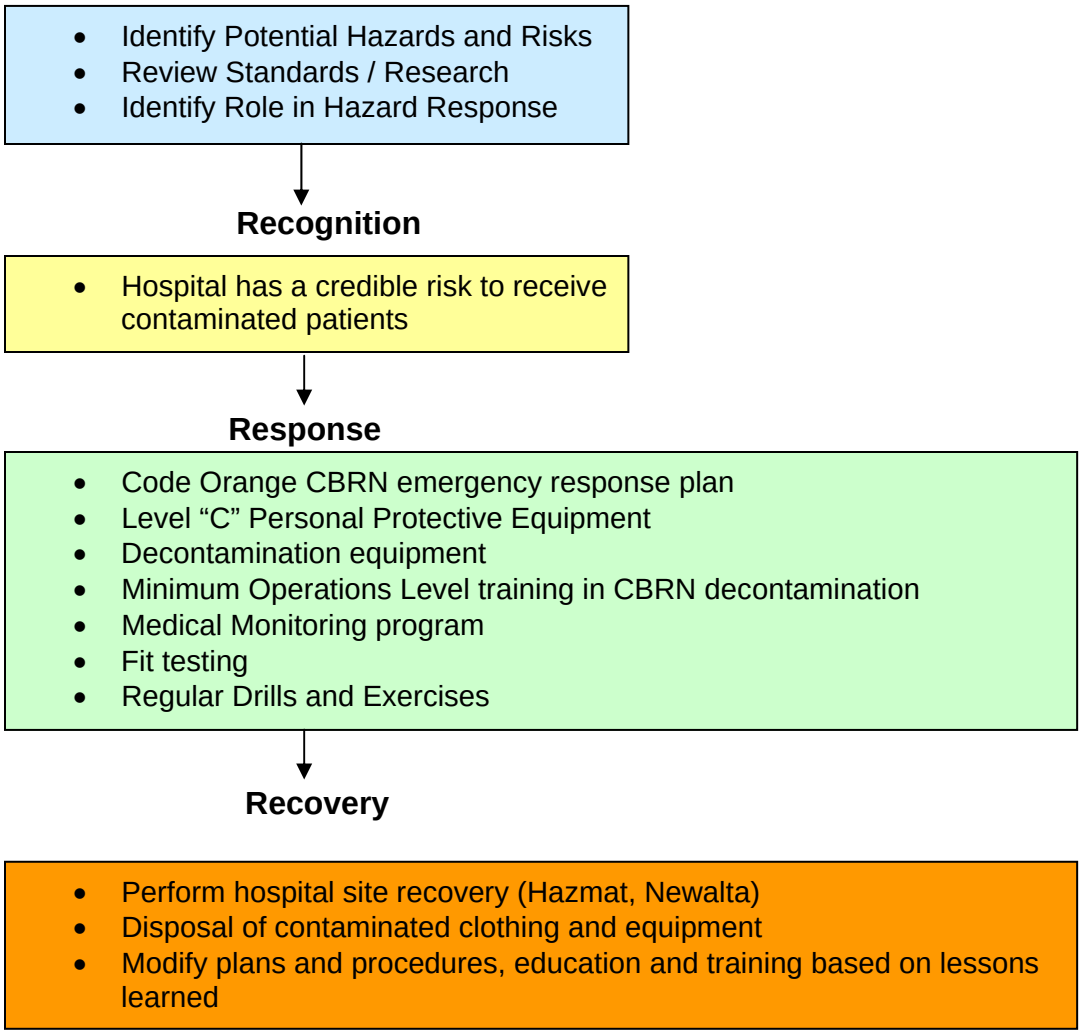
This response plan identifies the hospital response to an event involving chemical, biological, radiological, or nuclear hazardous materials. The plan provides algorithms, identifies personal protective equipment needs, donning and doffing procedures.

The primary goal of the hospital in a hazardous materials event is to:

- Protect the facility and its personnel from being contaminated and thus further casualties
- Facilitate the triage, decontamination and medical treatment as rapidly as possible

9.2 Model for Hospital Decontamination Planning

Conduct Hazard Vulnerability Analysis



9.3 Authority to Declare a Code Orange CBRN

The need for decontamination may be apparent from notification of the type of emergency or it may be identified during the reception of patients. Once it is identified that there is a need for decontamination, the following will occur:

- The Emergency Charge Nurse in consultation with the Emergency Physician and Director, Emergency Management, Security & Life Safety/Delegate is authorized to activate Code Orange – CBRN response.

- Emergency Charge Nurse will notify the Control Centre Operator **(4142)** to request the Security Shift Supervisor provide access for the decontamination equipment.

- The Security Supervisor will immediately notify the Manger of Emergency Planning & Life Safety to activate the Decontamination Team.

9.4 Definitions

CBRN

CBRN is an acronym for **Chemical, Biological, Radiological & Nuclear** event.

PPE

Personal Protective Equipment, worn by the responding staff to decontaminate incoming casualties that have been exposed to a Chemical, Biological, (Radiological) contaminant.

Decontamination Equipment

Equipment identified to assist responding staff to decontaminate incoming casualties in a safe environment. Decontamination equipment will be stored and maintained by the Emergency Management, Security & Life Safety Department.

Decontamination Set-up Team

The Decontamination Set-up Team consists of CBRN trained staff including Physicians, Nurses, Security and Maintenance. They will set up the roll down tarps, tent, connect the power and water supply, and ensure everything is in good working condition. Once the tent is up and functioning they will be relieved by the Decontamination Response Team and assigned other duties. There will be two divisions for the decontamination set-up team, Internal & External.

- **Internal Set-Up**
  The Internal Decontamination Set-Up Team will be responsible to ensure all components on the inside of the decontamination tent are functional prior to the first patient being sent through.
- **External Set-Up**
  The External Decontamination Set-Up Team will be responsible to ensure all components on the outside of the decontamination tent are functional prior to the first patient being sent through.

Decontamination Response Team
The Decontamination Response Team will consist of 15 CBRN trained staff, including Physicians, Nurses, Security and Maintenance.

Hospital Hot Zone
The Hospital Hot Zone is the area outside of the decontamination set-up area that casualties will gather in prior to decontamination.

Warm Zone
The Warm Zone is the decontamination set-up area where patients will be decontaminated prior to entry into the Emergency Department.

Cold Zone
The Cold Zone is the inside of the Emergency Department. It is imperative that the Emergency Department remain the Cold Zone and **no contaminates enter.**

Distribution Safety Officer
The Distribution Safety Officer will be in overall command of the Decontamination area and is responsible for the safety of the staff responding to the decontamination site. The Decontamination Safety Officer will determine who can and cannot respond as well as determine the length of response for each person. The Distribution Safety Officer will report to the Incident Commander.

Decontamination Safety Officer
The Decontamination Safety Officer will be in command of the Decontamination warm zone area. Working with the Distribution Safety Officer the Decontamination Safety Officer is responsible for the safety of the staff responding in the decontamination site.

Decontamination Triage Nurse
The Decontamination Triage Nurse working with the Decontamination Triage Physician is responsible for the Warm Zone area, and will be assessing and tagging all patients based on triage acuity before they enter the Decontamination Area.

Decontamination Triage Physician The Decontamination Triage Physician is responsible for the Warm Zone area, and will be assessing and tagging all patients before they enter the Decontamination Area

Decontamination Access Nurse
The Decontamination Access Nurse will be responsible for the Warm Zone area, ensuring all patients entering the decontamination area, in order of triage classification, are directed through the proper showering procedures and are safe to enter the Cold Zone.

Decontamination Physician
The expectation is that **decontamination is the immediate priority** and medical treatment should be initiated **after** the decontamination process in the Emergency

department. If the decontamination physician **elects** to intubate the victim prior to decontamination, that physician must assist the victim through the decontamination process, ensuring no water enters the exposed airway and transfer care to the physician in the cold zone.

Decontamination Nurses for Non-ambulatory Casualties
The Decontamination Nurses are responsible for decontaminating non-ambulatory patients in the center lane of the decontamination shower system. They must always work in groups of 4 to ensure the decontamination process is completed safely using the roller system. The Decontamination Nurses are responsible for the removal of the victims clothing and log-rolling the victim to ensure all surfaces of the victim are decontaminated using soap and water for a minimum of 12 minutes. They are also responsible for decontaminating the board under the patient.

Decontamination Nurse for Ambulatory Casualties
The Decontamination Nurse is responsible for assisting and ensuring the decontamination of ambulatory patients using soap and water for a minimum of 5 minutes.

Post Decontamination Triage Nurse
The Post Decontamination Triage Nurse is responsible for the Warm/Clean Zone area, and will be assessing all patients to ensure decontamination completed and possible re-triage classification if warranted before they enter the Cold Zone.

Maintenance
A maintenance person will be available during the incident and be prepared to dress in PPE and enter the warm zone to troubleshoot any mechanical, electrical or plumbing needs that might occur during the decontamination phase.

Security Crowd Control
Security Crowd control will be responsible for crowd control in the Warm Zone and assist the Triage Physician and Nurse in that respect.

Security Traffic Control
Security will be responsible for controlling traffic coming onto the emergency ramp. Security Traffic control will direct non-contaminated patients and ambulances to the Burr Entrance for alternate access into the Emergency Department.

9.5 If Emergency Exceeds Available Resources
In the event that the CBRN emergency exceeds the resources available for staff at Kingston General Hospital, the following will occur:

- The Emergency Program Medical Director (Incident Commander) shall notify the Hospital Emergency Operations Centre that additional support is required.

- The Hospital Emergency Operations Centre Incident Commander will contact the provincial Emergency Management Unit and request support.

- The Emergency Management Unit will determine within 2-3 hrs whether or not to activate the Emergency Medical Assistance Team (EMAT)

9.6 Potential Hazards to Health-Care Workers

The hazard to healthcare workers is strictly from secondary exposure and "depends largely on the toxicity of the substance on the victims' hair, skin, and clothing; the concentration of the substance; and the duration of contact with the victim." The quantity of contaminant that healthcare workers might encounter can be dramatically less than the amount to which the victim was exposed. Gas or vapor releases can expose victims to toxic concentrations, but tend to evaporate and dissipate quickly.

Respiratory protective equipment, if correctly selected, fitted, used, and maintained, reduces significantly the effective exposure level that an employee experiences. An employee wearing a respirator that offers a protection factor of 1,000 will breathe air that contains no more than 1/1,000 (or 0.1 percent) of the contaminant level outside the respirator.

9.7 Communications From Potential / Actual CBRN Incident Scene

Upon receiving notification of alert stage from public authority (police, fire, ambulance) the Incident Command Centre will be established in the Emergency Planning room to provide central communication for information sharing in a timely manner. The Paramedic Supervisor/Manager in charge at the scene will have a dedicated Cell Phone or Satellite phone for direct communication to the hospital Emergency Charge nurse and will notify the ER Charge nurse of the dedicated number.

The communications from the scene will be direct from the Paramedic Supervisor/Manager and the Emergency Charge Nurse (The ER Charge nurse may delegate the Program Manager, Director, or Emergency Management Personnel to communicate with the EMS Supervisor.) The Emergency Charge Nurse will be notified by the scene Paramedic Supervisor of all patient movement from the scene, indicating complaints, involvement in the incident and decontamination.

If the incident is in a poor communication area, Central Ambulance communication centre will be requested to set up a reverse patch with the Emergency Charge nurse and the scene Paramedic Supervisor.

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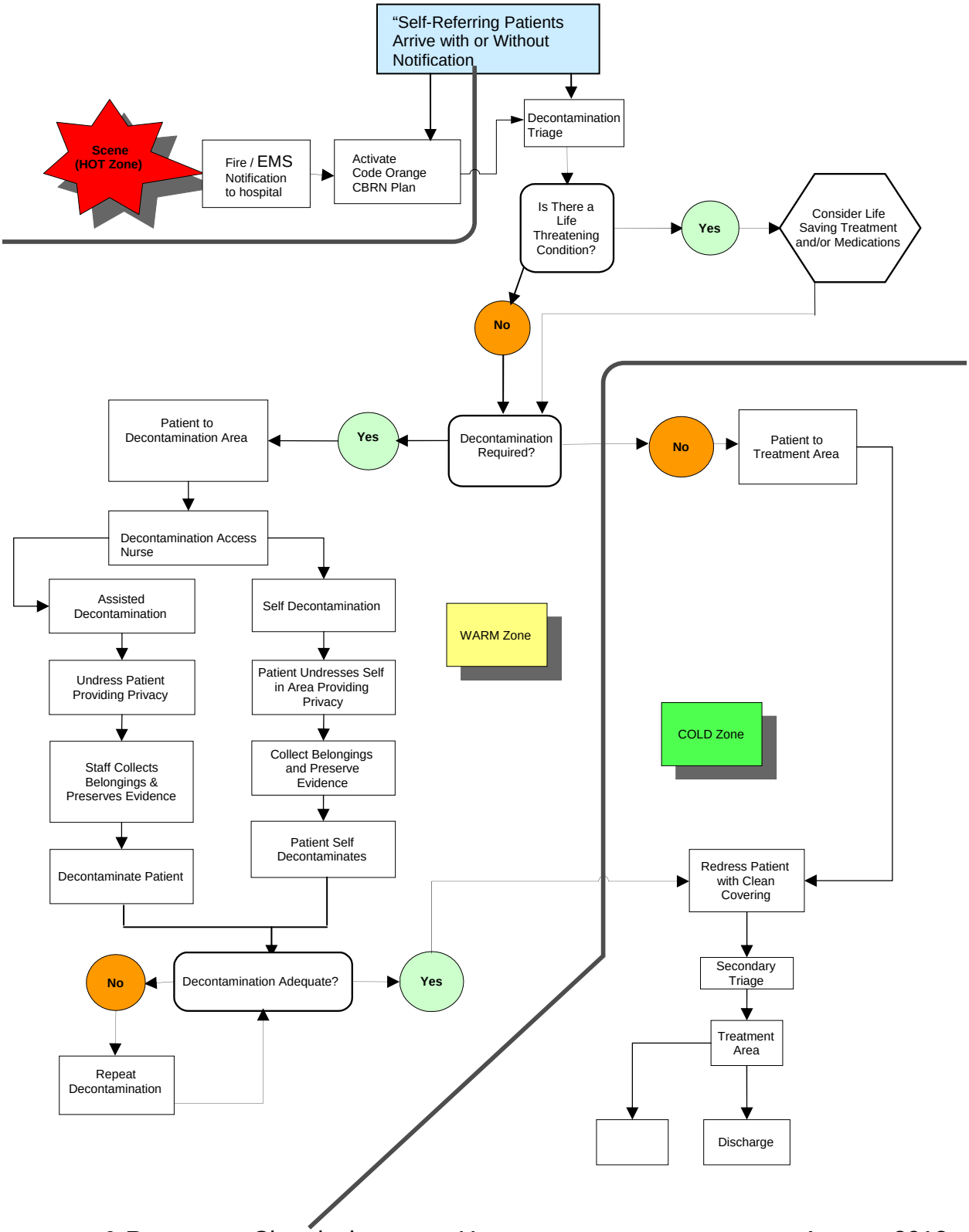
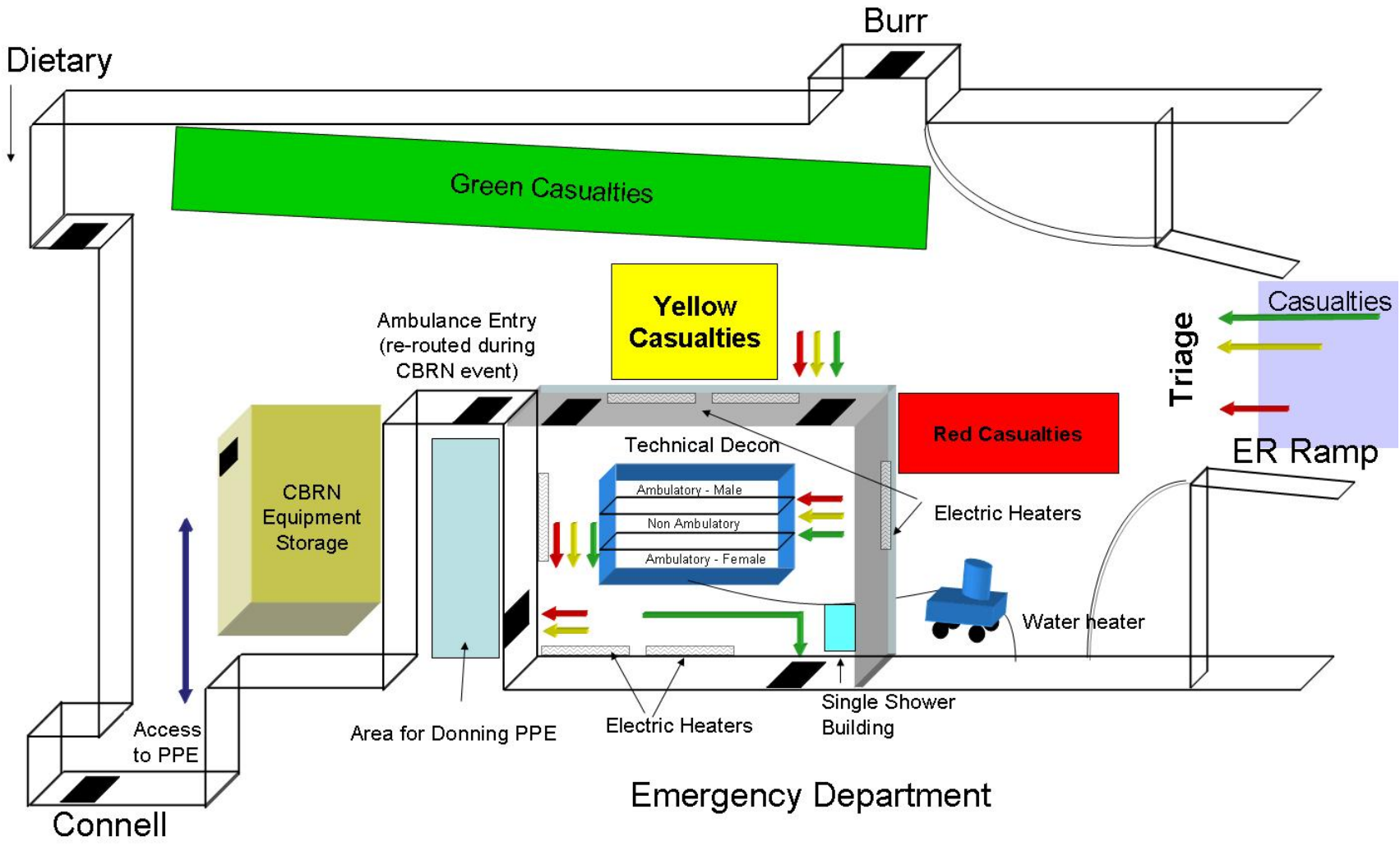
10.0 RESPONSE & RECOVERY - CHEMICAL DECONTAMINATION

RESPONSE

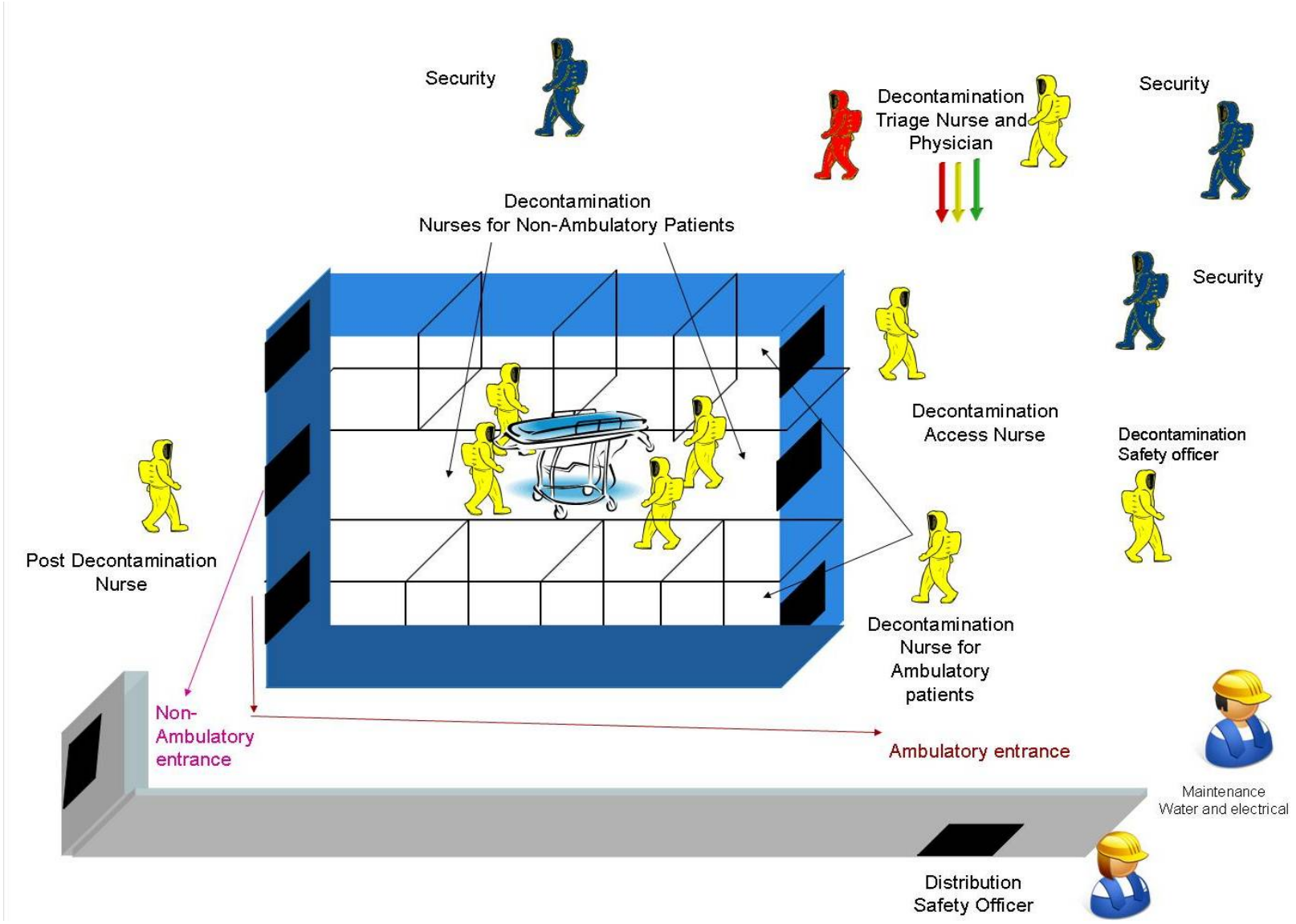
10.1 Algorithm For Chemical Decontamination



10.2 Emergency Ramp Equipment Lay-Out



10.3 Staff Deployment / Decontamination Lay-Out



10.4 Donning and Doffing PPE Procedure

Donning PPE for chemical decontamination

Using Proper Technique and Size of equipment the decontamination responder is able to follow the proper Donning Sequence.

Donning and taping will be done using a "buddy" system

- ☐ Visit washroom before applying PPE
- ☐ Layout PPE and confirm articles are the right size and in working order. (Mask, Canister, Coverall, Cooling Vest, Boots, Nitrile Gloves X 2, Butyl Gloves, Chem Tape)
- ☐ Insert cooling packs into vest
- ☐ Install canister onto mask but do not over tighten
- ☐ Remove Jewelry. Secure long hair
- ☐ Hydrate with 8-16 oz. of fluid
- ☐ Remove shoes. Don Tychem F coverall to waist.
- ☐ Put on HazProof boots. Pull coverall cuff **over** top of boot
- ☐ Tape over coverall-boot interface with Chem tape. Ensure to leave a tab on tape
- ☐ Put on Ergodyne Cooling Vest
- ☐ Don 2 pair nitrile gloves
- ☐ Don butyl chemical protective gloves
- ☐ Pull Coveralls up over shoulders. Ensure sleeves **over** butyl gloves
- ☐ Tape over suit-glove interface with Chem tape. Ensure to leave a tab on Chem tape
- ☐ Don CBRN Mask and Canister:
  1. Loosen head straps
  2. Grasp the temple and neck straps in each hand. Place chin and forehead into face piece, and pull harness over back of head
  3. Tighten temple straps evenly, then lower straps, ensure face piece and back pad remain centered
  4. Tighten top straps
- ☐ **Perform negative pressure test** by blocking canister inlet using palm of hand, mask should suck into face, if not, readjust and test again
- ☐ Don hood of coverall over head, ensure face elastic snug to mask
- ☐ Zip up front of coverall completely to chin. Remove protective strip from two way tape and seal front of coverall with both flaps
- ☐ Place Chem-Tape over front flap to create a seal. Ensure to leave tab on tape
- ☐ Apply Chem tape around mask and neck area, taping mask-coverall interface. May use several pieces of tape with tabs to seal
- ☐ Label on the hood exterior with marker the **time mask applied**
- ☐ Label chest and back with the **name and type of personnel** (e.g. Dr., Nurse, Security)
- ☐ Donning of equipment verified by Distribution Officer before proceeding

Technical Decontamination Instructions (Doffing chemical PPE)

The Safety officer or another person in PPE will assist you

- ☐ Both participants rinse gloves in bucket with 10% Javex solution
- ☐ Step into 1st catch basin with 10% Javex solution and shuffle boots
- ☐ Then step into 2nd basin with 10% Javex solution and swirl boots in solution
- ☐ Stretch arms outward with palms facing upward. Staff member in PPE will spray you with a 10% Javex solution. Do quarter turns and repeat spray top to bottom. Spray until all sides covered
- ☐ Brush all surfaces. Repeat quarter turns while brushing. Make sure you get into all folds, neck, axilla, groin and seat
- ☐ Assistant to perform 2nd spray from top to bottom with 10% Javex solution. Do quarter turns and repeat spray top to bottom until all sides covered. Step out of second catch basin
- ☐ Assistant in PPE will pull your glove taped to your sleeve. Keeping nitrile gloves on, slide your hand back into your sleeve and across your chest
- ☐ Repeat with second arm folding both arms across your chest inside your suit
- ☐ Assistant will remove tape around mask and chest. Look up to the ceiling and keep looking up
- ☐ Assistant will unzip coveralls to waist
- ☐ The assistant from behind will grasp hood and slide upper part of coveralls to below knees while only touching the outside of the suit
- ☐ Instruct personnel to “slowly back up until you feel the bench behind you and sit” Continuously look up
- ☐ Assistant to pull boot and coverall off as you pull leg out of suit and swing leg over bench to face clean zone. Repeat for remaining leg in the same manner
- ☐ Assistant disposes of suit, outer gloves and boots
- ☐ Continue looking up. Stand up. Reach behind head and pull strap of mask over head in forward motion. Loosen straps on one side, if required
- ☐ Remove outer pair of nitrile gloves and drop in dirty bin
- ☐ Remove Cooling Vest by undoing straps at waist and one shoulder. Slide off remaining shoulder
- ☐ Remove nitrile gloves and discard in dirty bin
- ☐ Obtain post vital signs including weight. Personnel should shower and redress in normal working attire.
- ☐ If post vital signs stable, re-hydrate with 8-16 oz of fluid. Report for further duties.

10.5 Chemical Decontamination Response:

Emergency Charge Nurse

Notify:

- ☐ Kingston Hospitals' Security Control Centre Operator **(4142)** that there is a need for Decontamination
- ☐ Ambulance Dispatch and advise them of the CBRN event and to use alternate entrance (Douglas)
- ☐ Consider and advise the triage nurse of the potential for using the single shower system for 1-3 victims
- ☐ Assign a nurse to the role of Distribution Safety Officer until Distribution Safety Officer arrives
- ☐ Inform the Emergency Physician of the CBRN event
- ☐ Assign Patient Care Assistant to obtain 2 large basins of ice cubes from kitchen and deliver to Distribution Safety Officer in CBRN building for cooling vests. If after hours, notify security control center (4142) to gain entrance into kitchen
- ☐ The communications from the scene will be direct between the Paramedic Supervisor/Manager and the Emergency Charge Nurse (The ER Charge nurse may delegate the Program Manager, Director or Emergency Management Personnel to communicate with the EMS Supervisor.)
- ☐ ER Charge Nurse will be notified by the scene EMS Supervisor of all patient movement from the scene, indicating complaints, involvement in the incident and decontamination

Security Shift Supervisor

- ☐ Notify Manager, Emergency Management, Parking & Security Control Centre / Delegate
- ☐ Unlock CBRN building for distribution safety officer
- ☐ Ensure Security lock down the facility and proceed to the Security Command Centre
- ☐ Have Rounds Officer cover Emergency Post

Manager, Emergency Management, Parking & Security Control Centre / Delegate

- ☐ Notify the decontamination set-up team
- ☐ Report to Incident Command in Emergency Planning Room
- ☐ Contact Hazmat contract company and advise of emergency

Distribution Safety Officer

- ☐ Assume overall command of the Decontamination Area and staff
- ☐ Report to decontamination storage area and distribute decontamination PPE

- ☐ Assess the vitals and weight of the decontamination response team prior to donning PPE
- ☐ Document time staff applied PPE in a log
- ☐ Verify that each member of the response team is wearing PPE correctly
- ☐ Ensure each member of the response team is given a brief overview of the roles and aware of their responsibilities. Remind them to give a report to their relief
- ☐ Ensure no staff stay in the PPE for more than one-hour
- ☐ Document times staff have removed PPE as per Decontamination Safety Officer in log

Security – Emergency Post

- ☐ Report to decontamination storage area and obtain decontamination PPE
- ☐ Don decontamination PPE
- ☐ Roll down barrier tarps under Emergency entrance canopy
- ☐ Ensure everyone is kept outside of the Emergency entrance canopy
- ☐ Take on the role of Security Crowd Control
- ☐ Be aware that a contaminated victim may try to enter the Emergency Department from the scene. This may be the first notification that a CBRN event has occurred. The Security Officer would need to keep the victim out of the Emergency Dept., notify by radio the Security Supervisor of the need for CBRN decontamination of the victim and the Security Officer that was exposed, and immediate coverage of the Security Officers duties
- ☐ Notify the triage nurse of the need to decontaminate the victim and potential for more victims (use the single shower system if 1 – 3 individuals require decontamination)

Security Crowd Control X 2 Personnel

- ☐ Remain in PPE and report to hospital warm zone outside entry zipper tarp in Decontamination Setup area
- ☐ Responsible for crowd control of victims waiting to be triaged for Decontamination
- ☐ Ensure everyone remains outside the tarp area until triaged by either the Decontamination Triage Physician or Nurse.
- ☐ Maintain orderly fashion of entry into Decontamination area after triage classification
- ☐ Handle any security issues in the Hospital Warm Zone
- ☐ Ongoing communication with Security Traffic Control
- ☐ Be aware of signs of on-site toxic exposure or adverse reactions from wearing PPE. If any signs are observed, notify Decontamination Safety Officer immediately and prepare for Doffing PPE as per page 11

- ☐ When instructed by Distribution Safety Officer, or if symptomatic, doff decontamination PPE
- ☐ Report to your immediate supervisor for assigned duties

Decontamination Set-Up Team – Minimum 4 persons required

- ☐ The first 4 persons responding from the response team will become the set-up team
- ☐ Report to decontamination storage area and obtain decontamination PPE
- ☐ Don decontamination PPE
- ☐ Set-up the decontamination equipment
- ☐ Be aware of signs of on-site toxic exposure or adverse reactions from wearing PPE. If any signs are observed, notify Decontamination Safety Officer immediately and prepare for Doffing PPE
- ☐ May provide temporary role until Decontamination Response team arrives
- ☐ When set-up complete, doff decontamination PPE as per page 9
- ☐ Report to your immediate supervisor for assigned duties

Decontamination Response Team – Minimum 15 persons required

- ☐ Report to decontamination storage area and obtain decontamination PPE
- ☐ Don decontamination PPE
- ☐ Report to assigned area of responsibility per Decontamination Safety Officer for Decontamination Report
- ☐ Be aware of signs of on-site toxic exposure or adverse reactions from wearing PPE. Notify Decontamination Safety Officer immediately and prepare for doffing PPE as per page 11
- ☐ When instructed by Distribution Safety Officer, or if symptomatic, doff decontamination PPE
- ☐ Report to your immediate supervisor for assigned duties

Security Traffic Control

- ☐ Report to decontamination storage area and obtain decontamination PPE
- ☐ Don decontamination PPE
- ☐ Control traffic at the Emergency Department
- ☐ Emergency vehicles take top priority; request all non-emergency vehicle owners to move their vehicles to the Steam Plant or underground parking lot
- ☐ Arrange for vehicles, which cannot be moved from the Emergency Department to be towed
- ☐ Proceed to the bottom of Emergency ramp and prevent all vehicle access
- ☐ Ongoing communication with Security Crowd control

☐ When instructed by Distribution Safety Officer, or if symptomatic, Doff decontamination PPE

☐ Report to your immediate supervisor for assigned duties

Decontamination Triage Physician & Nurse

The Triage Physician will work with the Triage Nurse and provide expertise if required in assessing casualty patients as they come on to the Emergency ramp.

☐ Report to decontamination storage area and obtain decontamination PPE

☐ Don decontamination PPE

☐ Report to hospital warm zone outside entry zipper tarp in Decontamination Setup area

☐ Assess each patient in the hospital warm zone and assign a level of decontamination priority and using a bold marker write large sized letter on patients right hand:

- Red – Critical
- Yellow – Immediate
- Green – Minor
- Black – DOA (They may be temporarily moved away from the decontamination area to an isolated location on the E.R. ramp by PPE protected staff. Decontamination will occur after all living casualties have completed the decontamination process. Once they are decontaminated they can be transported by transportation services, autopsy or funeral home staff without any concern for cross-contamination.)

The **START** triage method uses **Respirations, Pulse, and Mental Status to categorize the patient** into a colour code

Respirations	<10 or >30 – **RED** No respirations with patent airway – **BLACK** Respirations between 10 – 30 go to pulse
Pulse	No radial pulse – **RED** Pulse present go to mental status
Mental status	Confused or Unconscious – **RED** Alert – **YELLOW** Able to walk – **GREEN**

☐ Provide controlled access through the zipper entry tarp into the Decontamination area as per triage status

☐ Be aware of signs of on-site toxic exposure or adverse reactions from wearing PPE. If any signs are observed, notify Decontamination Safety Officer immediately and prepare for Doffing PPE

- ☐ When instructed by Distribution Safety Officer, or if symptomatic, doff decontamination PPE as per page 11
- ☐ Report to your immediate supervisor for assigned duties

Decontamination Safety Officer

- ☐ Completes “acting role” of Distribution Safety Officer by giving report to the Distribution Safety Officer when arrives on scene
- ☐ Takes on the role of Decontamination Safety Officer
- ☐ Obtains PPE and Dons PPE as per Page 10 – Donning Personal Protective Equipment
- ☐ Reports to Decontamination Warm Zone Area
- ☐ Working with the Decontamination Distribution Officer, is responsible for command in the Decontamination Warm Zone and to identify any safety hazards
- ☐ Responsible for medical monitoring and safety of responding personnel in PPE
- ☐ Regularly observe all responders in PPE for signs of on-site toxic exposure or adverse reactions from wearing PPE
- ☐ Provide communication link for Hospital Warm Zone to Decontamination Distribution Safety Officer

Decontamination Access Nurse

- ☐ Report to decontamination storage area and obtain decontamination PPE
- ☐ Don decontamination PPE
- ☐ Provides direction into the Decontamination Shower System.
  - ☐ First lane ambulatory females
  - ☐ Second lane for non-ambulatory patients
  - ☐ Third lane for ambulatory males
- ☐ Ensures each individual understands decontamination procedure before entering shower system. Ensure patient belongings are put in numbered plastic bag and corresponding number applied to patients left hand
- ☐ Coordinates entry into shower system based on triage classification
- ☐ Be aware of signs of on-site toxic exposure or adverse reactions from wearing PPE and prepare for immediate doffing
- ☐ When instructed by Distribution Safety Officer, or if symptomatic, doff decontamination PPE
- ☐ Report to your immediate supervisor for assigned duties

Decontamination Physician

- ☐ Report to decontamination storage area and obtain decontamination PPE
- ☐ Don decontamination PPE

- ☐ Responsible for any immediate life-saving act, such as intubation, prior to decontamination
- ☐ Assist intubated patient through the decontamination non-ambulatory shower system immediately, so further treatment can be provided in the Emergency Department.
- ☐ Defer all care of casualties until decontamination completed. Treatment to be provided in the Emergency Department after decontamination process complete
- ☐ Be aware of signs of on-site toxic exposure or adverse reactions from wearing PPE and prepare for immediate doffing
- ☐ When instructed by Distribution Safety Officer, or if symptomatic, doff decontamination PPE
- ☐ Report to your immediate supervisor for assigned duties

Decontamination Nurses for Non-ambulatory Casualties

- ☐ Report to decontamination storage area and obtain decontamination PPE
- ☐ Don decontamination PPE
- ☐ Responsible for decontaminating non-ambulatory casualties in the center lane of shower system for a minimum of 12 minutes per patient with soap and water
- ☐ Use roller system to move contaminated casualties through shower system always using 4 personnel. Ensure transfer board decontaminated
- ☐ Be aware of signs of on-site toxic exposure or adverse reactions from wearing PPE and prepare for immediate doffing as per page
- ☐ When instructed by Distribution Safety Officer, or if symptomatic, doff decontamination PPE
- ☐ Report to your immediate supervisor for assigned duties

Decontamination Nurse for Ambulatory Casualties

- ☐ Report to decontamination storage area and obtain decontamination PPE
- ☐ Don decontamination PPE
- ☐ Responsible for assisting and ensuring the decontamination of ambulatory casualties in the outer lanes of the shower system for a minimum of 5 minutes per patient with soap and water
- ☐ Be aware of signs of on-site toxic exposure or adverse reactions from wearing PPE and prepare for immediate doffing
- ☐ When instructed by Distribution Safety Officer, or if symptomatic, doff decontamination PPE
- ☐ Report to your immediate supervisor for assigned duties

Post Decontamination Triage Nurse

- ☐ Report to decontamination storage area and obtain decontamination PPE
- ☐ Don decontamination PPE
- ☐ Ensure casualties have been decontaminated. If still contaminated re-direct back into the shower system
- ☐ Re-triage if needed post decontamination
- ☐ Apply warm blankets
- ☐ Direct casualties into the Emergency Department
  - ☐ If patient is triaged Red then escort patient and chart into section A and notify the charge nurse
  - ☐ Patients triaged Yellow will be directed to take casualty chart into the Emergency waiting area where the secondary triage nurse will escort the patient to section C
  - ☐ Patients triaged Green will be directed to take casualty chart to the Burr Gymnasium
  - ☐ Patients triaged Black will be taken to the Douglas Morgue by Transportation Services
- ☐ Be aware of signs of on-site toxic exposure or adverse reactions from wearing PPE and prepare for immediate doffing
- ☐ When instructed by Distribution Safety Officer, or if symptomatic, doff decontamination PPE
- ☐ Report to your immediate supervisor for assigned duties

Maintenance (Trained in PPE and Decon set-up)

- ☐ Report to KGH as part of the response team
- ☐ Report to decontamination storage area and obtain decontamination PPE
- ☐ If required, Don decontamination PPE
- ☐ Troubleshoot any electrical or water issues that may arise
- ☐ Ensure patent water and electrical hook up for the decontamination tent
- ☐ Be aware of signs of on-site toxic exposure or adverse reactions from wearing PPE and prepare for immediate Doffing
- ☐ Be prepared to Don PPE each time entry into warm zone needed for any electrical or water issues.

10.6 Decontamination Tent Equipment Set-Up

Minimum 4 persons required

- ☐ Place tent on side with thick corner down
- ☐ Tilt the tent onto its thick corner (which will become the floor)
- ☐ Using the handles at each end, pull apart and out from the back and the front so that the tunnel grows both longer and wider

Internal Set-up team (2 persons)

- ☐ Walk down center lane of the tent to set floor completely flat
- ☐ Check fold on tent roof and sides
- ☐ Install support poles x 2 at each end and strap lane divider curtains around wall poles
- ☐ Ensure all curtains are draped inside the basin
- ☐ Clip 6 outer clips of basin to the side walls and 4 inner clips to shower walls
- ☐ Insert light fixture into loops on interior roof
- ☐ Place elevated grids x 3 each in outer two lanes of tent
- ☐ Check and aim all spray nozzles toward the center of each shower stall and ensure valves off (up and down)
- ☐ Place the waste transfer pump in the shelter next to the basin outlet and connect the quick connect drain hose to it
- ☐ Place non-ambulatory roller systems x 3 inside center lane of tent and attach bungee cords to roller system to secure together
- ☐ Place 4 pails and brushes with soap in non-ambulatory centre lane of tent
- ☐ Place 2 pails and brushes with soap in each of the outside shower lanes below each shower nozzle

External Set-up team (2 persons)

- ☐ Roll down tarps and secure to bottom
- ☐ Attach ratchet straps to secure tarps
- ☐ Turn on outside wall heaters
- ☐ Move water heater to water outlet and connect hoses
- ☐ Connect water heater hose outlets to shelter connections
- ☐ Plug the water heater into a GFI protected 110V AC power outlet
- ☐ Connect lighting connector to DC Transformer Power Supply
- ☐ Plug the DC Power Supply into GFI protected outlet
- ☐ Turn on the DC Power Supply to illuminate lighting system
- ☐ Connect waste-water transfer pump to GFI outlet
- ☐ Open the water supply
- ☐ Start the water heater
- ☐ Ensure the waste water transfer pump is operating freely once there is about 3” of water in the basin at the pump
- ☐ Ensure that the pump outlet drain hose has no kinks in it that would block water outlet flow

10.7 Technical Decontamination Equipment Set-up

☐ Obtain technical decontamination equipment from the CBRN building and set up:

1. Green bucket with 10% Javex solution
2. Catch basin to shuffle boots in
3. Red container for spraying with 10% Javex solution
4. Black catch basin for spray, scrub and spray
5. Containers for contaminated boots
6. Bench
7. Containers for masks, gloves and cooling vests

10.8 Decontamination Instructions for Casualties

AMBULATORY PATIENTS

1. Remove valuables and put in numbered sealable bag

2. Place valuable bag in numbered clothing bag

3. Remove clothing and put in numbered plastic bag

4. **Wash for 5 minutes continuously with soap and water** using scrub brush

- ☐ Focus on non-clothed / exposed areas and all body openings, folds or creases in skin
- ☐ Shower from the head down, leaning head back to reduce the chance of any residue contacting the eyes, nose and mouth. Then scrub from feet back up to head. Repeat
- ☐ Skin must be cleaned / scrubbed thoroughly. Remove any bandages
- ☐ Wrap in warm blanket

NON-AMBULATORY PATIENTS

- ☐ Use roller system with “red transfer board” to move contaminated casualties through shower system always using 4 personnel.
- ☐ Remove patients clothing
- ☐ **Wash for 12 minutes continuously with soap and water** using scrub brush
- ☐ Each person is responsible for washing an assigned quadrant of the casualty with overlapping areas. The process should start at the midline, and spray/wipe the casualty toward the side and back of the body

- ☐ Once the front surfaces of the casualty have been decontaminated, the victim should be carefully rolled onto one side, and the back should be decontaminated with a brush from highest to lowest point
- ☐ Ensure transfer board decontaminated by brushing with soap and water while casualty is on their side
- ☐ Turn the casualty onto the opposite side and continue washing

10.9 Water Containment and Run Off

The U.S. Environmental Protection Agency has issued guidance to the effect that: "contaminated runoff should be avoided whenever possible, but should not impede necessary and appropriate actions to protect human life and health. In a mass casualty emergency, staff should dispose of the water used to decontaminate patients via the sewer system. Once the victims are removed and safe from further harm and the site is secured and stable, the first responders should be doing everything reasonable to prevent further migration of contamination into the environment"

Authorities[12] suggest that 75% to 90% of the hazardous agent may be removed by disrobing. The remaining skin contaminant may be minuscule and can be diluted further during the decontamination washing and passing into public wastewater systems. Appropriate water authorities should be notified at the time of the event.

[12] JAMA Dec. 30, 2005

10.10 Summary of Chemical Agent Specifics[13]

CHEMICAL AGENTS					
AGENT	CHARACTERISTICS	ONSET	SIGNS & SYMPTOMS	DECONTAMINATION	TREATMENT/FIRST-AID (Speed is vital in treatment)
Nerve Agents Tabun (GA) Sarin (GB) Soman (GD) V Agents (VX)	▪ Colourless gas ▪ Colourless/pale yellow liquid	Vapour: seconds Liquid: minutes/hours	**S**alivation **L**acrimation (tearing) **D**efecation **G**astric disturbances **E**mptying (vomiting) **M**iosis (pinpoint pupils)	▪ Remove contaminated clothing ▪ Wash skin with liberal amounts of water and if available soap or 0.5% bleach solution (staying away from eyes)	▪ Atrophine* ▪ Pralidoxime* ▪ Obidoxime* ▪ Diazepam (Anticonvulsant) ▪ Reactice Skint Decontamination Lotion (RSDL) * May be used as auto injectors
Blood Agents (Cyanide) Hydrogen Cyanide (AC) Cyanogen Chloride (CK) Arsine (SA)	▪ Colourless gas or volatile liquid ▪ Smells of bitter almonds	Seconds	▪ Loss of consciousness ▪ Convulsions ▪ Temporary cessation of respiration	▪ Remove contaminated clothing ▪ Wash skin with liberal amounts of soap and water	▪ *Hydroxocobalamin (2 Cyanokitkits available at Belleville General))* ▪ Amyl Nitrite *(N/A)* ▪ Sodium Nitrite *(N/A)* ▪ Sodium Thiosulphate
Blister Agents (Vesicants) Sulfur Mustard (H) Distilled Sulfur Mustard (HD) Lewisite (L) Phosgene Oxime (CX)	▪ Colourless to amber oily liquid ▪ Colourless gas ▪ Smell of garlic or geraniums	Hours	▪ Redness of the skin ▪ Blisters ▪ Irritation of eyes ▪ Coughing or shortness of breath	▪ Remove contaminated clothing ▪ Wash skin with 0.5% bleach solution **within 5 minutes** followed by liberal amounts of soap and water	▪ Use antibiotics and local anesthetics ▪ Treat skin blisters for thermal burns ▪ Oxygen ▪ Ventilation ▪ Morphone ▪ Use a steroid inhaler, Salbutamol
Choking Agents (Pulmonary) Phosgene Sulfur dioxide Chlorine Diphosgene Oxides of nitrogen Chloropicrin	▪ Colourless gas can form white cloud	Hours	▪ Shortness of breath ▪ Coughing ▪ Tearing of eyes ▪ Runny nose	▪ Remove contaminated clothing ▪ Wash skin with liberal amounts of water and if available soap	▪ Ventilation ▪ Oxygen ▪ Salbutamol ▪ Furosemide ▪ IV Therapy ▪ Strict rest and warmth
Riot Agents	▪ Solid which can be dispersed as a liquid spray or heated/burned to produce smoke	Seconds	▪ Burning, stinging of the eyes, nose, air ways, skin	▪ Remove contaminated clothing ▪ Wash skin with liberal amounts of water and if available soap or 0.5% baking soda solution	▪ Rinse eyes with water ▪ Oxygen ▪ Salbutamol

Italics - Amendments to table specific for KGH Nov. 2010

[13] Government of Canada

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RECOVERY

10.11 Upon Notification That the Crisis Has Concluded

Distribution Safety Officer

- ☐ Document times staff have removed PPE
- ☐ Assess the decontamination response team vitals and authorize team to return to work
- ☐ Be prepared to provide update at incident debriefing

Decontamination Team

- ☐ Doff decontamination PPE
- ☐ Be prepared to participate in incident debriefing
- ☐ Resume normal duties

Manager, Emergency Planning, Security & Life Safety

- ☐ Contact Hazmat contract agency to respond to Emergency Ramp to clean area of decontamination (as per Code Brown Procedures)
- ☐ Redirect incoming emergency traffic from alternate entrance once ER entrance has been decontaminated

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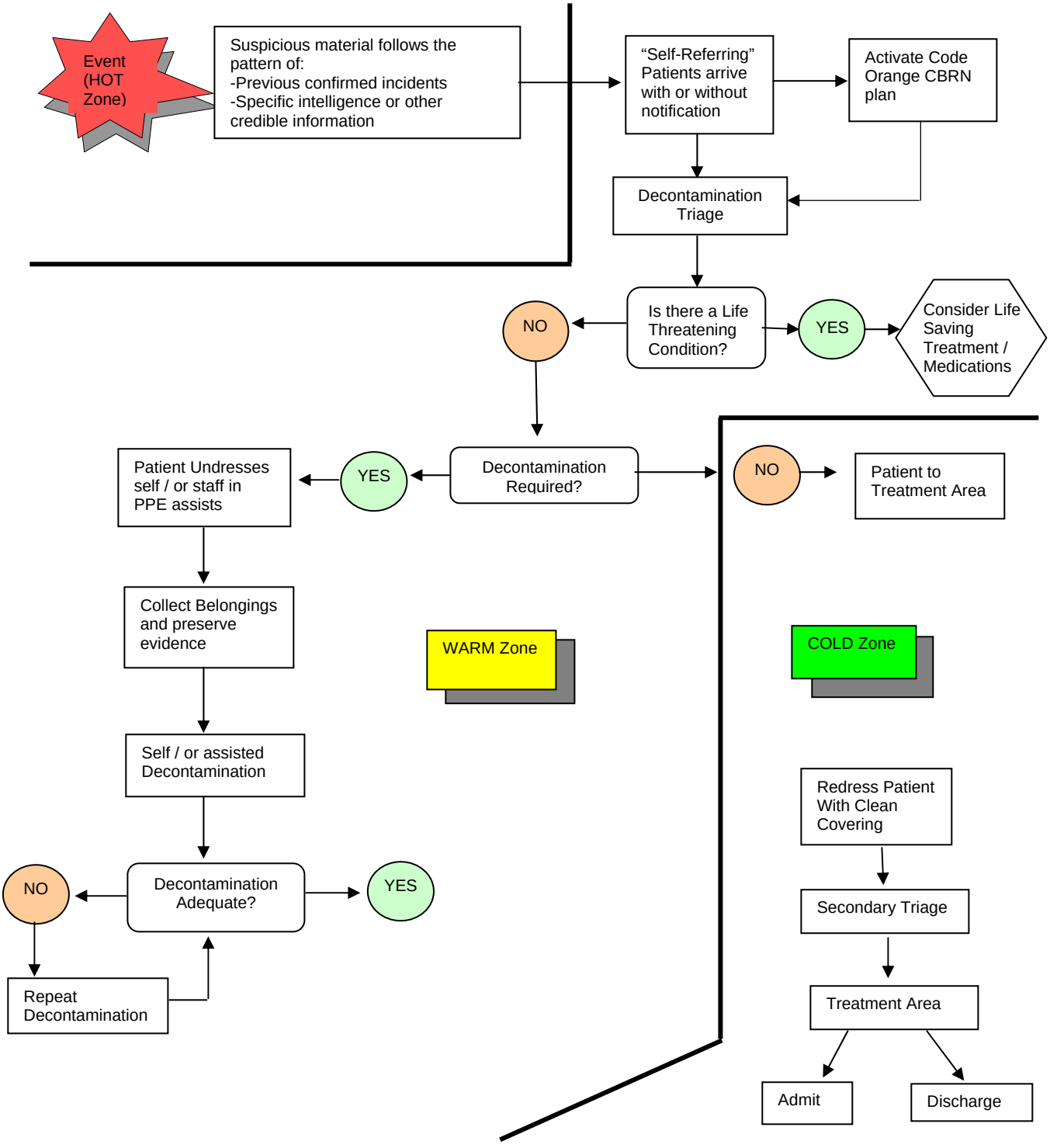
11.0 RESPONSE & RECOVERY - BIOLOGICAL DECONTAMINATION

RESPONSE

11.1 Algorithm For Biological Decontamination



11.2 Decontamination of Patients and Environment

The need for decontamination depends on the suspected exposure and in most cases will not be necessary. The goal of decontamination after a potential exposure to a biological agent is to reduce the extent of external contamination of the patient and contain the contamination in order to prevent further spread. Decontamination should only be considered in instances of gross contamination. Decisions regarding the need for decontamination should be made in consultation with provincial and local health departments. Decontamination of exposed individuals prior to receiving them in the healthcare facility may be necessary to ensure the safety of patients and staff while providing care. When developing Bioterrorism Readiness Plans, facilities should consider available locations and procedure for patient decontamination prior to facility entry.

Depending on the agent, the likelihood for re-aerosolization or the risk associated with cutaneous exposure, clothing of exposed persons may need to be removed. After removal of contaminated clothing, patients should be instructed (or assisted if necessary) to immediately shower with soap and water. **Potentially harmful practices, such as bathing patients with bleach solutions, are unnecessary and should be avoided.** Clean water, saline solution, or commercial ophthalmic solutions are recommended for rinsing eyes. If indicated, after removal at the decontamination site, patient clothing should be handled only by personnel wearing appropriate personal protective equipment, and placed in an impermeable bag to prevent further environmental contamination.

Development of Bioterrorism Readiness Plans should include coordination with law enforcement agencies. They may require collection of exposed clothing and other potential evidence for submission to the Department of Defense laboratories to assist in exposure investigations.

11.3 Donning & Doffing PPE Procedure

Donning PPE for a biological emergency

- ☐ Layout PPE pieces. Confirm PPE is the right size and in working order
- ☐ Remove Jewelry. Secure long hair
- ☐ Hydrate with 8 oz. of fluid
- ☐ Visit washroom before applying PPE
- ☐ Don Proshield 2 Coverall and zip up to waist area
- ☐ Pull on Poly boot covers over shoes and cover-alls.
- ☐ Place N100 mask over nose and mouth. Perform negative pressure test
- ☐ If air leaks, reposition it and adjust the nose clip for a more secure seal
- ☐ Apply goggles over mask straps onto ears
- ☐ Don inner gloves (2 Pair)
- ☐ Pull up Proshield 2 coveralls and hood; ensure elastic snug to face.
- ☐ Don outer protective gloves (Neoprene) over suit sleeves

☐ Apply tape over back of hood area with staff name and time PPE applied

Doffing PPE for a biological emergency

☐ Remove outer gloves, turning them inside out as they are removed
☐ Remove suit, turning it inside out and folding downward to boot covers
☐ Remove boot cover from one foot, pulling leg out of suit and step over the clean line. Remove other boot cover and leg of suit and step over clean line.
☐ Remove outer set of inner gloves and discard in dirty area
☐ Gloves, suit and boot covers must be recognized as “contaminated” and remain on the dirty side of the decontamination line
☐ Remove goggles and discard in dirty area
☐ Remove N100 mask and discard in dirty area
☐ Remove inner gloves and discard in dirty area
☐ Obtain Post vital signs Temperature, Blood Pressure, Heart Rate, Oxygen Level
☐ If post vital signs stable, re-hydrate with 8-16 oz of fluid
☐ Report for further duties

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11.4 Summary of Biological Agent Specifics[14]

BIOLOGICAL AGENTS					
Agents	**Contagious**	**Incubation**	**Signs and Symptoms**	**Decontamination**	**Treatment/First-aid**
BACTERIA					
Anthrax	**Not contagious** and can not be spread person-to-person Use standard precautions	1-60 days (2-60 days following inhalation; 1-7 days following ingestion or cutaneous exposure)	**Inhalation:** flu-like symptoms **2-4 days later:** respiratory failure, fever, shock, death **Cutaneous:** Sores/blisters on skin Sores develop black centres 2-6 days later **Gastrointestinal (upper and lower):** Upper: oral ulcers, swollen lymph glands Lower: vomiting, sever stomach pain, dehydration, bloody diarrhea, fever	**Victims:** remove contaminated clothing and wash skin with soap and water **Equipment:** should be disinfected with a sporicidal agent (chlorine) and/or 0.5% hypochlorite (bleach) solution	**Antibiotic:** ▪ Ciprofloxacin ▪ Doxycycline **Prophylaxis:** Ciprofloxacin, Doxycycline **Vaccine:** Limited availability in Canada (not for general public)
Plague	**Contagious:** Use standard precautions for bubonic plague Droplet and standard precautions for pneumonic plague. Avoid close contact	2-10 days (bubonic) 1-6 days (inhalational)	**Initial** (inhalational): Flu-like symptoms Fever, cough, shortness of breath, respiratory failure, death	**Victims:** Remove contaminated clothing and wash with soap water **Equipment:** Heat, disinfectant solution (0.5% hypochlorite – bleach) and exposure to sunlight	**Antibiotic:** ▪ Streptomycin, Gentamicin, Doxycycline, Ciprofloxacin **Prophylaxis:** Doxycycline, Ciprofloxacin **Vaccine:** Not licensed in Canada (ineffective against the aerosolized form of the disease)
Tularemia	**Not contagious** and can not be spread person-to-person Use standard precautions	1-14 days, usually 3-5 days (inhalational) Route and dose Dependant	**Initial** (inhalational): abrupt onset of fever, chills, general muscle pain, headaches, cough, chest pain **Ingestion:** tonsillitis, pharyngitis	**Victims:** Remove contaminated clothing and wash skin with soap and water **Equipment:** Use mild heat and 10% hypochlorite (bleach) solution	**Antibiotic:** ▪ Streptomycin, Gentamicin, Doxycycline, Ciprofloxacin **Vaccine:** Limited availability in Canada (not for general public)

[14] Government of Canada

Agents	Contagious	Incubation	Signs and Symptoms	Decontamination	Treatment/First-aid
VIRUSES					
Smallpox	**Contagious** from rash onset until all scabs are gone Use contact and airborne precautions until no longer infectious Isolation Measures	Average 12 day incubation period (range 7-17 days)	**Initial:** fever, malaise, headache **2-3 days later:** Rash inside mouth, on face, forearms, palms, spreading to the trunk and legs. Eruptions develop at the same rate.	Victims: **Remove contaminated clothing and wash skin with soap and water. Handle clothing with gloves.** **Equipment:** Use dedicated patient equipment when possible. Use Hypochlorite and quarternary ammonia for surfaces. Autoclave.	**Antivirals:** none **Vaccine:** ▪ Will be available for the general public in the event of an emergency ▪ Vaccination within 4 days of exposure offers protection
Viral Hemorrhagic Fever (VHF)	**Contagious** (most) throughout the illness. Use contact precautions, airborne precautions & barrier nursing procedures.	2-21 days depending on the individual organism/disease	Fever, chest/back pain, sore throat, cough, vomiting, diarrhea, rash, weakness, delirium, Unexplained bruising/bleeding from eyes, nose or mouth	**Victims:** Remove contaminated clothing and wash skin with soap and water **Equipment:** Hypochlorite (bleach) or phenolic disinfectants	**Antivirals:** Ribavirin for some VHF **Vaccine:** For yellow fever only
Botulism	**Not contagious and can not be spread person-to-person** **Use standard precautions**	2 hours to 8 days (mean 12-72 hours)-foodborne, route and dose dependent	Foodborne: vomiting, diarrhea followed by CNS signs Symptons manifested by cranial nerves: Blurred vision, dry mouth, difficulty swallowing, slurred speech, diarrhea, symmetric descending paralysis, respiratory dysfunction	**Victims: Remove contaminated clothing and wash skin with soap and water** **Equipment: Hypochlorite (bleach) 0.1%**	**Antibiotic:** ▪ **Not effective against botulism, can be used to treat secondary infections + antitoxin** **Prophylaxis:** ▪ **Antitoxin within 48 hours** **Vaccine: Not for general public**
Ricin	**Not contagious and can not be spread person-to-person** **Use standard precautions**	Inhaled: 1 to 12 hours Ingested: 5 min to 1 hours	Inhalation: Coughing, tightness of chest, difficulty breathing, muscle aches Ingestion: Nausea, vomiting, irritation of GI tract, internal bleeding of stomach/intestines, liver failure, spleen/kidneys and death	**Victims: Remove contaminated clothing and wash skin with soap and water** **Equipment: Hypochlorite (bleach)**	**Antibiotic: None** **Prophylaxis: None** **Vaccine: None**

RECOVERY

11.5 Upon Notification That the Crisis Has Concluded
Manager, Emergency Planning, Security & Life Safety

- ☐ Contact Hazmat contract agency (if applicable) to respond to area of decontamination (as per Code Brown Procedures)
- ☐ Redirect incoming emergency traffic from alternate entrance once ER entrance has been decontaminated
- ☐ Resume normal operations

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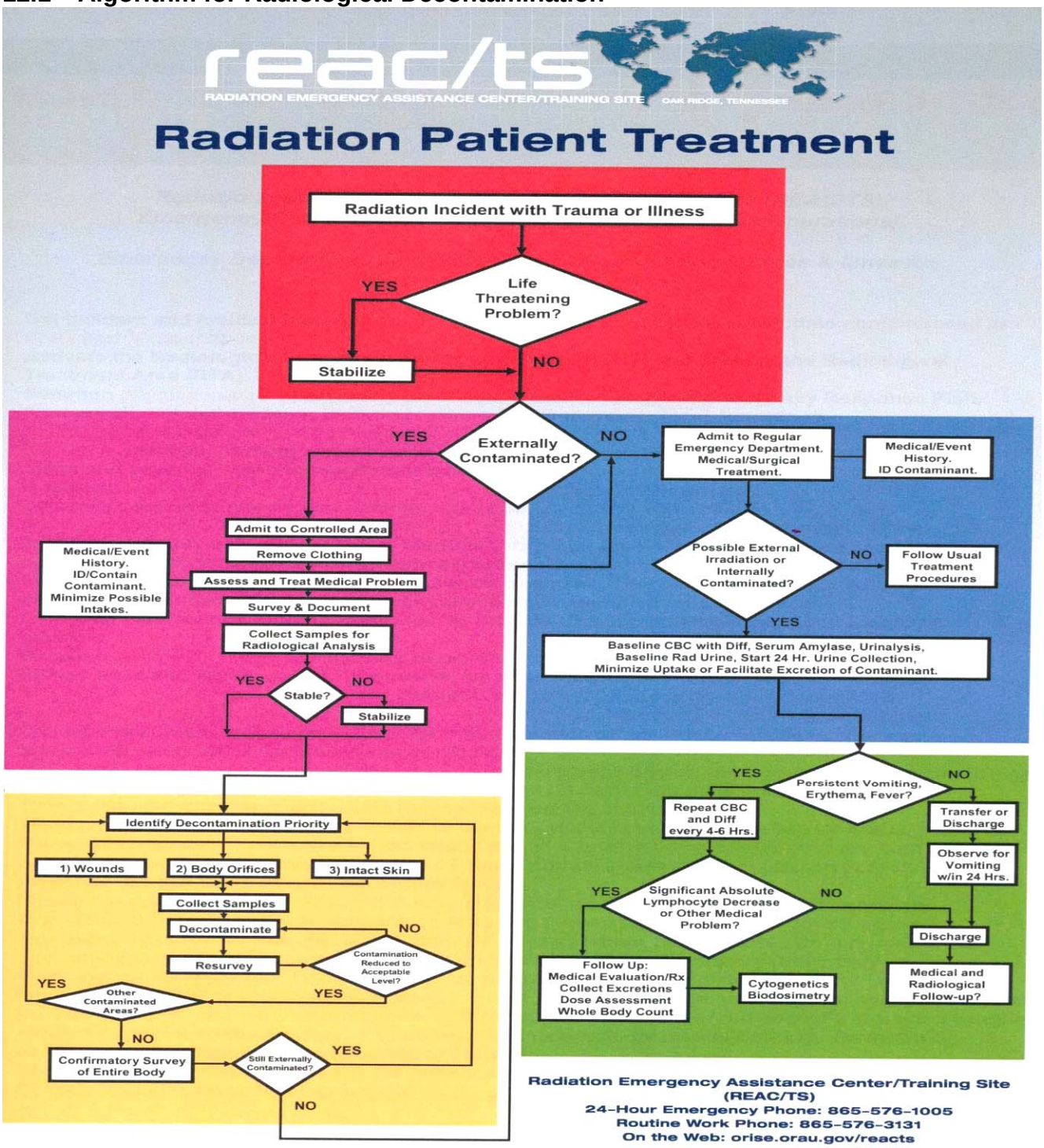
12.0 RESPONSE & RECOVERY - RADIOLOGICAL / NUCLEAR DECONTAMINATION

RESPONSE

12.1 Algorithm for Radiological Decontamination



12.2 Radiation Protection Regulations

The Government agency which is responsible for radiation safety is the Canadian Nuclear Safety Commission (CNSC). One of their mandates is to set standards and limit people from exposure from ionizing radiation. They have implemented the ALARA principle which limits the DOSE that a person is exposed to with regards to ionizing radiation safety. ALARA stands for: As Low As Reasonably Achievable and is the main principle used in any radiation protection program. The ALARA principle uses TIME-DISTANCE-SHIELDING.

The CNSC has set limits called radiation protection regulations for emergency responders to a radiation event. The maximum dose a first responder may receive in an emergency is 500 Sv. (Sv is the measure of the risk of damage to living tissue). This is a whole body dose. This dose may be exceeded if the person voluntarily acts to save a human life.

12.3 Treatment of Radiological Contamination

Radioactive contamination (whether internal or external) is generally not life threatening and therefore, a radiological assessment or decontamination should never take precedence over life-threatening acute medical conditions. **Medical stabilization of the patient is the top priority of the health care provider, even though the patient is contaminated.** Medical and nursing personnel have never received a medically significant acute radiation dose when providing patient care to radiation casualties.

Radiologically contaminated patients with life-threatening acute medical conditions should be transported to treatment areas without delay (e.g. Emergency Department, Radiology Department, and Surgery Suite) despite the presence of contamination. Cover stretcher with two clean sheets wrapping one around the patient to minimize the spread of contamination.

To minimize staff risks from exposure to ionizing radiation, all healthcare providers should carry out their responsibilities keeping in mind these principles:

- **Not all patients need decontamination**. Unless the patient is contaminated with material, they do not need to be decontaminated if they were only exposed. Remove from source
- Some types of systemic radiation therapy may temporarily make a patient's bodily fluids (such as saliva, urine, sweat, or stool) emit a low level of radiation. Over time (usually days or weeks), the radioactive material retained within the body will break down so that no radiation can be measured outside the patient's body
- **Computed X-ray tomography (CT) scans and nuclear medicine contribute 36% of the total radiation exposure and 75% of the medical exposure to the US population**, according to a US National Council on Radiation Protection & Measurements report in 2009. **(Industrial radiation exposure, including that from nuclear power plants, is less than 0.1% of overall public radiation exposure.)**
- **Radiation material CANNOT be destroyed or neutralized.** It can only be removed. Limit spread of radioactive material
- Removing patients' clothing generally removes up to 90-95% of the contamination

- All personnel responding to the care of a radiologically contaminated patient should be given a personal dosimeter (film badge or TLD) and a self-reading dosimeter, if available. Medical personnel who will be handling potentially contaminated patients should use PPE
- Minimize time spent in a radiological environment and maintain the maximum distance from sources of radiation consistent with appropriate patient care
- If available, have a radiological health specialist (e.g. health physicist, radiation safety officer, medical physicist, nuclear medicine personnel) assist with detecting the sources of radioactive contamination and the effectiveness of decontamination efforts

12.4 Initial Response Steps:

☐ Ascertain from scene the type of radiological incident, number of victims and types of injuries

☐ Obtain and test radiation survey meters

☐ Obtain radiation decontamination supplies. Provide personal dosimeters (film badge or TLD) and PPE to staff. Decontamination tent – may be required, if large numbers of victims expected with external contamination)

☐ Request assistance of radiological health specialist, if available to perform role of Radiation Safety Officer

☐ Ensure designated controlled area in ER ready to receive victims (B2, B3 rooms)

☐ Cover stretcher with two clean sheets

☐ A step-off-pad or boundary line should be established to distinguish clean areas from potentially contaminated areas

☐ Cover floor of treatment room with non-skid plastic covering to aid in facility decontamination following the event *(if sufficient time and external contamination is expected)*

☐ Label waste containers for radioactive waste

☐ Don PPE (refer to 4.0 personal protective equipment - Don PPE sequence)

☐ **Upon arrival of the patient** (as early as possible without delaying appropriate medical care) **perform a very quick head-to-toe survey to ascertain presence of radioactivity** and exposure rate

☐ Patients without life-threatening conditions should receive effective decontamination prior to receiving medical care

12.5 Personal Protective Equipment

The purpose of protective clothing is to keep bare skin and personal clothing free of contaminants. Members of the radiological emergency response teams should dress in scrub suit/uniform, Proshield 2 Coverall, N100 mask, face shield, Poly Boot covers and gloves (“Biological Kit”). All open seams and cuffs should be taped using chem-tape. Fold-over tabs at the end of each taped area will aid removal.

Two **different colored** pairs of surgical gloves (ease of determining outer and inner gloves) should be worn. The first pair of gloves (blue nitrile) should be under the arm cuff and secured by tape. The second pair of gloves (another color) should be easily removable and replaced if they become contaminated.

A radiation dosimeter should be assigned to each team member and attached to the outside of the coverall at the neck where it can be easily removed and read. A waterproof apron can also be worn by any member of the team using liquids for decontamination purposes.

This protective clothing is effective in stopping alpha and some beta particles but not gamma rays. Lead aprons, are not recommended since they will not stop most gamma rays.

12.6 Don PPE in Sequence (Biological Kit with a Face Shield):

1. Scrubs
2. Boot covers
3. First pair of gloves (colored nitrile)
4. Proshield coverall. Tape at wrists, ankles and zipper
5. Attach dosimeter to outside of coverall near neck
6. Second pair of gloves over cuffs of coverall (different color)
7. Mask (N100 or N95) and Face shield
8. Pull up hood when patient arrives

12.7 Decontamination Measures:

☐ Remove and bag clothing carefully to prevent spread of contamination

- If the patient is amenable, a splash shield may be applied
- Cut clothing and fold away from the cut to the side so that the outside of the fabric with the contamination is rolled away from exposed skin
- Log-roll the patient so the sheet can be removed
- Roll the sheet under the patient towards the patient trapping the radioactive contamination
- Isolate clothing and sheet in linen container designated for radioactive materials

☐ Locate the contamination by surveying the patient with a beta/gamma probe

☐ Record the location of contamination, including the counts per minute (CPM) on the survey meter at one inch above the location.

☐ Collect samples as appropriate:

- Nasal (each nostril separately), oral

- Skin wipes of contaminated areas
- Foreign objects
- Blood (baseline CBC with diff, Serum amylase)
- Urine and/or feces (suspected internal contamination)
- Contaminated wound exudates
- Vomitus

☐ Cover uncontaminated wounds with waterproof dressings

☐ Decontaminate skin by cleaning carefully with soap and tepid water, wiping toward the highest contaminated area to limit spread. Do not abrade skin

☐ Gently rinse contaminated burns (do not scrub)

☐ If radioactive fragments are discovered on the patient, use long-handled tongs or forceps to remove the fragment(s). Place the fragment in a shielded container, if available

☐ Irrigate contaminated wounds with room temperature sterile saline and gently wash with surgical sponges. Collect run-off in plastic bowls or absorb using gauze or sponges to minimize the spread of contamination

☐ Control contamination by placing all potentially contaminated material in waste containers labeled with a “caution radioactive materials” sign

☐ While it is desirable to obtain samples during the decontamination effort that can be used for analysis to determine the radionuclitides present, it is not necessary to attempt to contain all the fluids generated during decontamination. The amount of radioactive material released to the sanitary sewer will likely be below the levels that are of regulatory concern

☐ Stop decontamination of skin and wounds when either:

- The contamination is less than 2 to 3 times the normal background levels, ***or;***

☐ Attempts to decontaminate are not significantly reducing contamination levels

12.8 Determine Patient Contamination

☐ The Radiation Safety Specialist / delegate will survey the patient for contamination

- The beta/gamma probe is moved slowly at a rate of 1” per second approximately one inch from the surface
- The probe is checked frequently to ensure that the probe cover has not been contaminated. If contaminated, probe covering is changed
- If alpha contamination is suspected, use alpha monitor. Do not cover this probe
- Record all readings on the anatomical body chart form

☐ After gross decontamination, re-survey the patient with the beta/gamma probe. Record readings on a second anatomical body chart

☐ Re-survey areas as required and record readings

☐ Radiation Safety Specialist / delegate will advise when additional decontamination is required and when activity is sufficiently reduced to acceptable limits

12.9 Techniques to Decontaminate a Wound

Decontamination is intended to remove as much radioactive material as practical.

Decontamination priorities are:

1. Wounds
2. Body orifices around the face
3. intact skin

☐ Proceed from areas of highest to lowest contamination. Individually expose each area of the patient that is contaminated with radioactive material

☐ Perform radioactive sampling

Wounds

☐ Intact skin immediately adjacent to the wound should be quickly decontaminated using a baby wipe (wipe away from the wound)

☐ Drapes should be applied and taped around the wound to prevent the spread of contamination to uncontaminated area

☐ Gently irrigate the wound to prevent splashing with sterile saline using an Irrijet. Collect the run-off at the wound site via the use of absorbent pads. Run-off could be directed into a lined garbage receptacle

☐ When decon efforts have likely significantly reduced the wound contamination levels, the wound should be covered, the drapes removed, a clean pad placed under the area

☐ Re-survey with beta/gamma probe

☐ If the wound is still contaminated, the process should be repeated until no further progress is made.

☐ Consider the use of Betadine or tide/cornmeal emulsion irrigation fluids

☐ Should the contamination levels continue to be elevated and decontamination progress nonexistent, the wound should be explored for foreign bodies by the treating physician

☐ Small amounts of contamination in a wound do not override the concerns for proper infection control and cosmetic effect

Body orifices around the face

☐ Many times the nose can be decontaminated simply by having the patient blow their nose

☐ If the patient is able to cooperate, irrigation is an option as long as care is taken not to force more contamination into the body

☐ Routine methods to irrigate the eyes are acceptable, but care should be taken to ensure run-off is directed away from the nose/mouth and to prevent it from entering the ears

Skin

☐ Care should be taken to avoid visible irritation. Abrading skin may allow an entry point for radioactive materials deposited on its surface

☐ The use of "baby wipes" is a simple method of performing skin decontamination. The cleaning motion should go from the outside in. (minimize the area of contamination, not to spread it outward)

☐ Gentle scrubbing with a soft cloth and tepid water and soap is another option

☐ If hair is contaminated it can be washed taking care not to allow the wash/rinse water to run to the face.

☐ On areas such as hairy chests it's best not to shave the area since this may lead to skin abrasions. Clip the hair only if necessary.

☐ Bare skin and hair should be thoroughly washed, and if practical the effluent should be sequestered and disposed of appropriately.

Burns

☐ Partial thickness burns should be thoroughly irrigated and cleaned with mild solutions to minimize irritation of the burned skin.

☐ Blisters should be left closed; open blisters should be irrigated and treated in accordance with appropriate burn protocols

☐ In full thickness burns, radioactive contaminants will slough in the eschar. As there is no circulation in the burned tissues, contaminants will remain in the layers of dead tissue

12.10 Internal Contamination

Internal contamination occurs when unprotected personnel ingest, inhale, or have wounds contaminated with radioactive material. Externally contaminated casualties who did not have respiratory protection should be evaluated for internal contamination. Internal contamination is more likely if significant contamination is found on the face, in/around the nostrils or mouth, or in/around open wounds.

Internal doses are assessed differently than external doses. The two primary differences are:

1. Internal doses are calculated, not measured
2. The doses are committed doses. Internal doses are based on the intake - or the amount of radioactive material that initially enters the body. Once the radioactive

material deposits into the target organ it is there until it decays or the body removes it through normal biokinetic processes.

☐ Radiation dose can not only be estimated early post-event by health physics calculations, but from evaluation of serial blood counts and the medical history (i.e., the timing and severity of symptom complexes, the time to emesis, etc.) A medically significant dose may be subsequently confirmed/discounted with chromosome-aberration bioassay, the current gold standard in radiation biodosimetry.

☐ Obtain an initial **baseline CBC** with differential, if possible and repeat every 6-12 hours.

- Lymphocyte depletion follows dose-dependent, first-order kinetics after high-level gamma and criticality incidents
- Neutrophil/lymphocyte ratio increases over the first few days post-exposure.
- Both lymphocyte depletion and neutrophil/lymphocyte ratio are sensitive indicators of radiation dose

☐ For **time to emesis** (TE)

- If **TE < 2 hours**, the effective **whole-body dose** is likely to be at **least 3 Gy**.
- If **TE < 1 hour**, the **whole-body dose** most probably **exceeds 4-6 Gy**.
- Conversely, if the patient has **not vomited within 8-10 hours** post-event, the **whole-body dose is likely < 1 Gy**.
- Note: vomiting due to radiation dose tends to be persistent while psychosomatic vomiting will likely cease once the patient is reassured the radiation dose is of minimal medical concern

☐ Medical management of patients with acute, moderate to severe radiation exposure (effective whole-body dose > 3 Gy) should emphasize the rapid administration of colony-stimulating factors to enhance hematopoietic recovery. These compounds decrease the duration of radiation-induced neutropenia and stimulate neutrophil recovery

Nasal swab estimation of dose inhalation

A quick way to estimate the potential dose due to inhalation is through the evaluation of nasal swabs.

☐ Samples should be collected by swabbing the anterior nares (separately, with separate swabs) with a cotton swab.

☐ They should be taken as soon after the suspected intake as possible, preferably within the first hour or so. Delays in obtaining nasal swabs will affect intake estimation since the nose clears fairly quickly.

☐ Each swab should be counted with a hand-held detector and the results summed.

☐ It is important to count each swab individually since most people breathe fairly evenly across the nose. A significant difference in the count rates may indicate cross-contamination (a contaminated finger?)

12.11 Acute Radiation Syndrome

Acute Radiation Syndrome (ARS) results from external exposure to radiation doses greater than 1 Gy delivered to the whole body, or a major portion of it, over a short time period (high-dose rate).

☐ Dose reconstruction, time to emesis, lymphocyte and neutrophil kinetics, clinical history noting the timing and sequence of signs/symptoms, and several biochemical markers can be used for early dose estimation.

☐ Radiation damage to cells occurs within microseconds of exposure

☐ Cellular damage is generally most severe in rapidly reproducing cell types,(intestinal crypt cells, stem cells, cells with a large nucleus such as lymphocytes)

☐ ARS is an acute illness that varies in onset from a few hours to weeks.

☐ The illness typically follows a pattern of prodromal signs/symptoms, a latent period, and a period of manifest illness, followed by recovery or death. Each phase varies in length relative to the radiation dose received.

☐ Prodromal signs and symptoms of high-level radiation exposure include anorexia, nausea and vomiting, diarrhea and mild fever. Conjunctivitis, if the radiation is near the eyes, and possible skin erythema due to the skin entrance dose that often accompanies large acute whole-body exposures.

☐ The clinical thresholds that result from radiation exposure occur within a predictable range of doses after whole-body or significant partial-body exposure. Based on the **patient's signs/symptoms, general thresholds** associated with various radiation dose thresholds can be used to **approximate the radiation dose.**

- **Hematopoietic syndrome - > 1 Gy**
- **GI syndrome - > 6-8 Gy**
- **Cardiovascular / CNS syndrome - > 20Gy**

Medical Management of Acute Radiation Syndrome

☐ Management of ARS is focused on support and recovery of the hematologic system

☐ Two major aims of medical management are efforts to prevent neutropenia and sepsis

☐ Radiation-induced vomiting tends to be more persistent than psychogenic vomiting.

- Radiation-induced vomiting is best treated by ondansetron or granisetron
- Early oral feeding is preferable to IV feeding in order to maintain the physiologic integrity of the gut

☐ Consultation with a hematologist, radiation oncologist and other specialties should be considered as they would be able to provide valuable insight into the treatment of radiation-induced illness/injury.

Hospital Management Issues for ARS

- Antibiotic, antiviral and antifungal agents
- Early cytokine therapy
- Early wound closure
- GI decontamination
- Minimization of invasive procedures
- Barrier isolation, Strict environmental control
- Reverse isolation for patients with whole-body doses greater than 2-3 Gy
- Avoid antacids and H2 blockers to maintain gastric acidity, sucralfate to avoid stress ulcers
- Oral feeding is preferable to IV, if possible (only cooked foods, no root crops)
- Meticulous oral and nail hygiene
- Povidone-iodine or chlorhexidine for skin and hair

12.12 Medical Management of Local Injury

Acute local irradiation events may occur separately or co-exist with ARS.

☐ Deterministic thresholds exist as follows for certain clinical signs:

- **3 Gy:** Epilation, typically beginning 14-21 days post-event
- **6 Gy:** Erythema is often transient soon post-incident, with secondary erythema 14-21 days thereafter. It may occur in a few hours post-accident or come and go in waves
- **10 – 15 Gy:** Dry desquamation of the skin secondary to radiation to the germinal layer is usually seen approximately 20 days post-incident. There is diminished mitiotic activity in the cells of the basal and parabasal layers with thinning of the epidermis and desquamation of large macroscopic flakes of skin
- **20 – 50 Gy:** For wet desquamation (partial thickness injury) at least 2-3 weeks post-exposure, depending on dose. Microscopically, one usually finds intracellular edema,
  coalescence of vesicles to form macroscopic bullae, and a wet dermal surface, coated by film.
- **For skin dose > 50 Gy:** Overt radionecrosis and ulceration secondary to endothelial cell damage and fibrinoid necrosis of the arterioles and venules in the affected area.

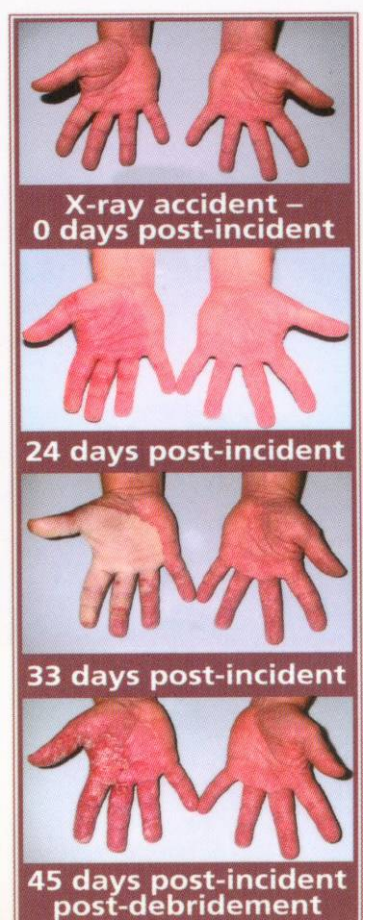
☐ The U.S. CDC has recently published physician guidelines for grading cutaneous radiation injury:

- **Grade I: > 2 Gy**
- **Grade II: > 15 Gy**
- **Grade III: > 40 Gy**

Clinical Signs of Local Injury

☐ The medical history is particularly important in diagnosis of the extent of partial-body injury since signs and symptoms generally take days to weeks to manifest.

☐ Serial color digital photographs are crucial, possible along with drawings of the lesion. These allow more precise documentation of the evolution of cutaneous necrosis.



☐ Clinically, within the first week post-accident (depending on the dose), the patient is asymptomatic, with possibly an early wave of transient erythema

☐ Around week 2, true erythema develops along with progressive epilation, suppression of sweating and diminished sebaceous gland secretion.

☐ In week 3, the patient often presents with warm skin that is edematous, painful to touch, with occasional severe pruritis and symptoms that are generally limited to the radiation field.

☐ By week 4, overt dry or wet desquamation has evolved in a dose dependent manner in skin exposed to the radiation field.

Managing Local Radiation Injury

On the basis of etiology, local radiation injury can be managed by:

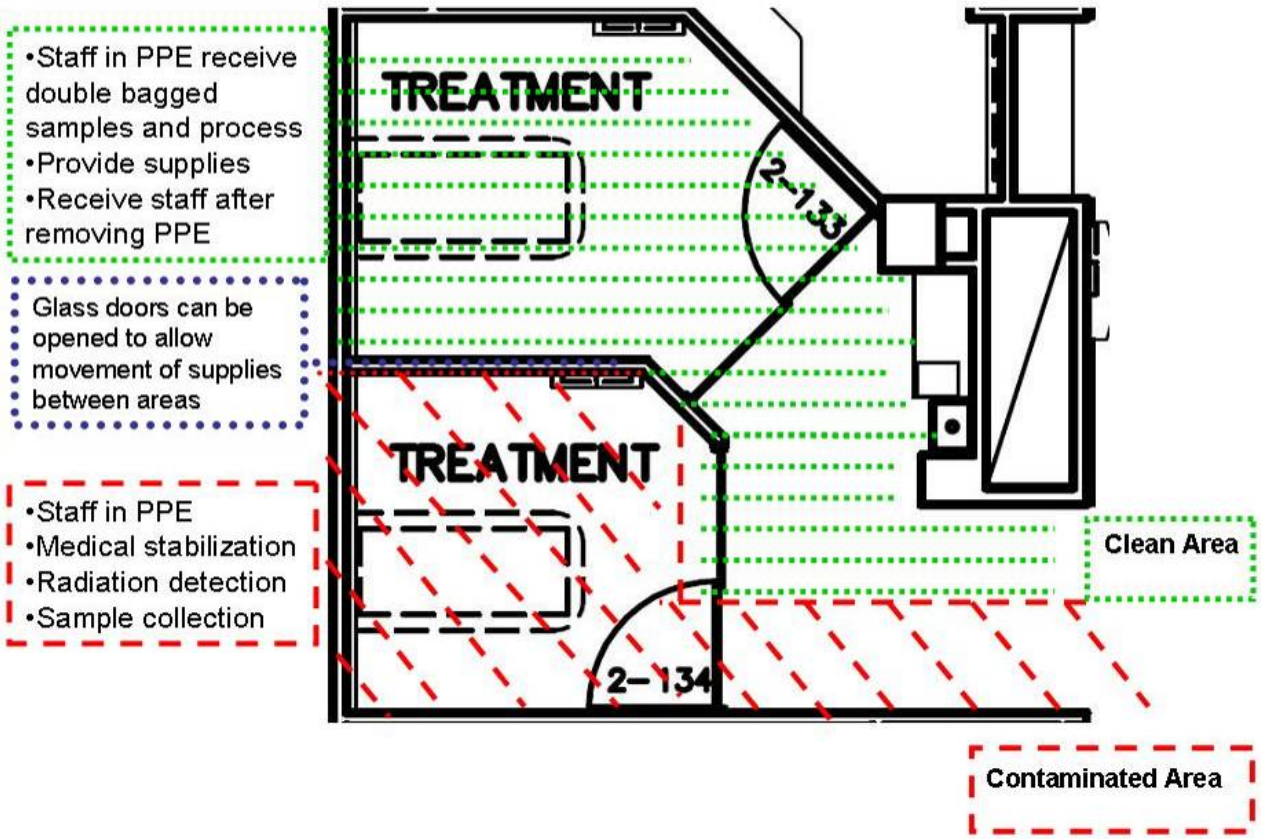
1. Anti-inflammatory treatment with topical corticosteroids, and non-steroidal anti-inflammatory drugs
2. Vascular therapy with hyperbaric oxygen and pentoxifylline or PTX-vitamin E combination
3. Wound management and surgical guidance by physicians experienced in the management of chronic vascular injury

12.13 Doffing PPE Sequence – Leaving the Controlled Area

At exit line:

1. Hand dosimeter to Radiation Safety Officer (RSO)
2. Remove tape down front zipper, at cuffs and ankles
3. Remove outer gloves, turning out – put in radiation waste container
4. Remove face shield and mask and put in radiation waste container
5. Open front zipper
6. Remove hood. Roll proshield coveralls down below seat to level of knees and sit on stool at exit line
7. Remove coverall leg and boot cover. Move foot over the clean line
8. Repeat with other leg and put coverall and boot covers in radiation waste container. Move other foot over line into clean control area
9. Stand-up. Remove inner gloves and put in radiation waste container
10. Radiation Safety Officer to monitor complete body using MCB2 or Pancake meter. If contamination is found, Radiation Safety Officer will advise on decontamination

12.14 Layout of B2, B3 Rooms for Radiation Contaminated Patient



12.15 Summary of Radiological Agent Specifics

RADIATION					
Agents	**Characteristics**	**Onset**	**Signs and Symptoms**	**Decontamination**	**Treatment/First-aid**
Ionizing Radiation Alpha particles Beta particles Gamma Radiation & X-Rays Neutrons	▪ Detectable by specialized equipment	**Acute Radiation Syndrome:** seconds to hours	**Acute Radiation Syndrome:** ▪ Nausea, vomiting, fatigue, disorientation, seizures, coma, death ▪ Skin reddening (localized)	▪ Removal of contaminated clothing ▪ Gently flush skin with liberal amounts of water and if available soap ▪ Specialized treatment for internal contamination	▪ Initial treatment for radiation burns is the same as for other burns ▪ First aid treatment for associated injuries ▪ Specialized treatment for Acute Radiation Syndrome

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RECOVERY

12.16 Upon Notification That the Crisis Has Concluded

Manager, Emergency Planning, Security & Life Safety

- ☐ Contact Hazmat contract agency to respond to area of decontamination (as per Code Brown Procedures)
- ☐ Redirect incoming emergency traffic from alternate entrance once ER entrance has been decontaminate

Radiation Safety Specialist

- ☐ Document times staff have removed PPE
- ☐ Assess the response staff and authorize team to return to work
- ☐ Be prepared to provide update at incident debriefing

Urgent Care Staff in PPE

- ☐ Doff PPE
- ☐ Be prepared to participate in incident debriefing
- ☐ Resume normal duties

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13.0 RESPONSE & RECOVERY – EVIDENCE COLLECTION; ALL HAZARDS

RESPONSE

13.1 Recommended Procedures for Evidence Collection

The following recommended procedures serve as a foundation in order to collect and maintain the chain of evidence. In the event of a suspected or actual criminal event including a CBRN event, a variety of responders, ranging from health care providers to law enforcement, will play a role in the coordinated response. The identification of victims as well as the collection of evidence will be a critical step in these efforts.

- The health care provider's first duty is to the patient; however interoperability with other response agencies is strongly encouraged.

- The performance of evidence collection while providing required patient decontamination, triage and treatment should be reasonable for the situation.

- Information gathered from the victims and first responders may aid in the epidemiological investigation and ongoing surveillance

13.2 Collection of Patient Belongings

Valuables:

☐ Ambulatory and non-ambulatory patients who are able to undress without assistance will be directed to place their valuables (wallets, jewelry, cell phones, etc.) in a labeled re-sealable envelope

☐ Assistive devices such as glasses, canes, hearing aids, etc. and car/house keys should be kept by the patient and decontaminated along with him/her.

Clothing:

☐ Ambulatory and non-ambulatory patients who are able to undress without assistance will be directed to place their clothing in a pre-numbered plastic bag.

☐ Place the labeled patient's valuables bag in the clothing bag.

☐ Label the bag with patient identification and event information.

- ✓ **Patient name**
- ✓ **DOB**
- ✓ **Medical record number**

Time permitting and person able:

- ✓ Date and time
- ✓ Valuables list (if known and time allows)

- ✓ Geographical site where contamination occurred. (This information is critical to the epidemiological surveillance of the event and causative agent. Information may include proximity to the release site, location at time of the event, etc,)

☐ Patient to write corresponding number on clothing bag onto their LEFT hand using marker (assistance may be required if the patient is left handed)

Other considerations in evidence collection:

☐ If **time and staffing allow**, a picture of the patient taken with an instant developing camera prior to clothing removal should be taken and attached to or inserted into the labeled bag. This will enhance identification of belongings with patients post event. The use of digital cameras is not recommended due to the ability to modify the pictures.

☐ A hospital security officer or police officer should oversee the collection of clothing and valuables. Efforts should be made to store each bag separately (i.e., not touching each other) in order to maintain the chain of evidence.

☐ Release of patient belongings and valuables to law enforcement authorities should be according to local law enforcement and hospital policy.

13.3 Decontamination of Belongings

☐ The designated decontamination safety officer will determine the need for decontamination of the clothing and valuables. If valuables and/or belongings are released to law enforcement, it will be their responsibility to decontaminate the articles.

☐ In the event that law enforcement determines that the patient valuables and belongings are not needed as evidence, the property should be released to the patient upon discharge in accordance with hospital policy