Confirmation and Sources of Assistance and Support (cont.)

- For help in projecting clinical effects, contact
  - nuclear medicine physician
  - Medical Radiological Advisory Team (MRAT) at Armed Forces Radiobiology Research Institute (AFRRI) 301-295-0530
- Obtain complete blood count
  - absolute lymphocyte count <1000 mm^3 suggests moderate exposure
  - absolute lymphocyte count <500 mm^3 suggests severe exposure
  - Acute, short-term rise in neutrophil count
- Swab both nostrils
- Collect 24 hour stool if GI contamination is possible
- Collect 24 hour urine if internal contamination with radionuclides is possible
- CDC ATSDR Hotline 770-488-7100

Decontamination Considerations

- Exposure to a beam of radiation generally does not contaminate a patient. Patient contamination generally results from contact with radioactive particles.
- Treating contaminated patients before decontamination may contaminate the facility: plan for decontamination before arrival
- Exposure without contamination requires no decontamination (RSO measurement)
- Exposure with contamination requires Standard Precautions, removal of patient clothing, and decontamination with soap and water
- For internal contamination, contact the RSO and/or Nuclear Medicine Physician
- Patient with life-threatening condition: treat, then decontaminate
  Patient with non-life-threatening condition: decontaminate, then treat

Treatment Considerations

- If life-threatening conditions are present, treat them first
- If external radioactive contaminants are present, decontaminate
- If radioiodine (reactor accident) is present, consider protecting the thyroid gland with prophylactic potassium iodide if within first few hours only (ineffective later). (Table 3)
- Review http://www.afrri.usuhs.mil/www/outreach/pdf/2edmmrchandbook.pdf or http://vaww.oqp.med.va.gov/cpg

Institutional Reporting

- If reasonable suspicion of a radiation event, contact hospital leadership (Chief of Staff, Hospital Director, etc)
- Immediately discuss hospital emergency planning implications

Public Health Reporting

- Contact local public health office (city, county or state)
- If needed, contact the FBI (for location of nearest office, see http://www.fbi.gov/contact/fo/fo.htm)

TERRORISM WITH IONIZING RADIATION GENERAL GUIDANCE Pocket Guide

Diagnosis: Be Alert to the Following

- Acute radiation syndrome (table 1) follows a predictable pattern after substantial exposure or catastrophic events
- Victims may also present individually, as described in table 2, over a longer period of time after exposure to contaminated sources hidden in the community
- Specific syndromes of concern, especially with a 2-3 week prior history of nausea and vomiting, are
  - thermal burn-like skin lesions without documented heat exposure
  - immunological dysfunction with secondary infections
  - a tendency to bleed (epistaxis, gingival bleeding, petechiae)
  - marrow suppression (neutropenia, lymphonenia, and thrombocytopenia)
  - hair loss

Understanding Exposure

- Exposure may be known and recognized or clandestine as
  - large radiation exposures, such as a nuclear bomb or catastrophic damage to a nuclear power station
  - small radiation source emitting continuous gamma radiation producing chronic intermittent exposures (such as radiological sources from medical treatment or industrial devices.)
  - skin contamination with radioactive material (“external contamination”)
  - internal radiation from absorbed, inhaled, or ingested radioactive material (“internal contamination”)

Confirmation and Sources of Assistance and Support

- Contact radiation safety officer (RSO) for help

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VA access card: http://www.oqp.med.va.gov/cpg/cpg.htm
DoD access card: http://www.qmo.amedd.army.mil

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TABLE 1: ACUTE RADIATION SYNDROME

1 Gray (Gy) = 100 rads 1 centiGray (cGy) = 1 rad

	Whole body radiation from external radiation or internal absorption						
Phase of Syndrome	Feature	Subclinical range		Sublethal range		Lethal range	
		0 – 100 rad or cGy	100-200 rad 1-2 Gy	200-600 rad 2-6 Gy	600-800 rad 6-8 Gy	800-3000 rad 8-30 Gy	>3000 rad >30 Gy
Prodromal Phase	Nausea, vomiting	none	5-50%	50 - 100%	75-100%	90-100%	100%
	Time of onset		3-6 hrs	2-4 hrs	1-2 hrs	<1 hr	Minutes
	Duration		<24 hrs	<24 hrs	<48 hrs	<48 hrs	N/A
	Lymphocyte count	Unaffected	Minimally decreased	< 1000 at 24 hr	< 500 at 24hr	Decreases within hours	Decreases within hours
	CNS function	No impairment	No impairment	Cognitive impairment for 6-20 hrs	Cognitive impairment for >24 hrs	Rapid incapacitation, often after a lucid period of up to several hours	
Latent Phase (subclinical)	Absence of Symptoms	> 2 wks	7-15 days	0-7 days	0-2 days	None	
Acute Radiation Illness or "Manifest illness" phase	Signs and symptoms	none	Moderate leukopenia	Severe leukopenia, purpura, hemorrhage Pneumonia Hair loss after 300 rad/3 Gy		Diarrhea Fever Electrolyte disturbance	Convulsions, Ataxia, Tremor, Lethargy
	Time of onset		> 2 wks	2 days - 2 wks		1-3 days	
	Critical period		none	4-6 wks - Most potential for effective medical intervention		2-14 days	1-48 hrs
	Organ system	none		Hematopoietic and respiratory (mucosal) systems		GI tract Mucosal systems	CNS
Hospitali-zation	% Duration	0	<5% 45-60 days	90% 60-90 days	100% 90+ days	100% weeks to months	100% days to weeks
Mortality		None	Minimal	Low with aggressive therapy	High	Very high, significant neurological symptoms indicate lethal dose	

TABLE 2: SYMPTOM CLUSTERS AS DELAYED EFFECTS AFTER RADIATION EXPOSURES

Headache Fatigue Weakness	Partial and full thickness skin damage Hair loss Ulceration
Anorexia Nausea Vomiting Diarrhea	Lymphopenia Neutropenia Thrombopenia Purpura Opportunistic infections

TABLE 3: POTASSIUM IODIDE DOSAGES:

*The dose of potassium should be taken once a day until a risk of significant exposure to radioiodines no longer exists **

Age group	Dosage
Infants < 1 month	16 mg
Children 1 months-3 yrs	32 mg
Children 3-18 yrs	65 mg
Adults	130 mg

** For information regarding preparation of potassium iodine solution: http://www.fda.gov/cder/drugprepare/kiprep.htm*