1) Purpose: to provide hospitals with a concise guide for identifying casualties in the aftermath of a radiation incident who may have received a clinically significant dose of radiation.

2) Regional RITN hospital contact information for specialized consultation:
   a. Hospital Name: [See list of RITN hospitals]
   b. Department
   c. Phone
   d. Email

3) Overview: Ionizing radiation affects the hematopoietic system even at very low doses; hematology and oncology medical staff treat these effects daily. Irradiated patients may develop severe organ dysfunction over time and require intense and specialized management.

4) For extensive information on the acute radiation syndrome (hematologic, gastrointestinal, cutaneous, central nervous system), types of radiation incidents, and radiation decontamination, see: [www.remm.nlm.gov](http://www.remm.nlm.gov) (Radiation Emergency Medical Management (REMM) website)

5) CONSULTATION/REFERRAL CRITERIA: Any patient suspected of having a radiation injury can be discussed with your local RITN center. The ability to accept referrals will depend on the size of the incident and the capacity of regional RITN center(s).
   a. Criteria for considering RITN center consultation/referral include:
      i. Absolute neutrophil count less than 1,000/µL
      ii. Absolute lymphocyte count less than 1,000/µL
      iii. Severe nausea, vomiting and/or anorexia
      iv. A localized cutaneous radiation injury that requiring extensive management
      v. Suspected or known internal contamination (e.g. involving a wound, the lung or GI tract)
      vi. Current facility not equipped to provide irradiated, leukoreduced blood products
   b. Manage comorbidities and possible sequelae of irradiation:
      i. See [www.ritn.net/Treatment/](http://www.ritn.net/Treatment/) for acute radiation syndrome treatment guidelines:
         1. Transfuse only irradiated and leukocyte-depleted blood products
         2. Administer myeloid cytokines (e.g. G-CSF), if indicated.
         3. Provide infection prophylaxis and/or treatment, as indicated
         4. Maintain fluid, electrolyte and nutritional balance
      ii. Also see (REMM) website for Prototype for Adult and Pediatric Medical Orders During a Radiation Incident [http://www.remm.nlm.gov/adultorderform.htm](http://www.remm.nlm.gov/adultorderform.htm)
   c. Laboratory evaluation:
      i. CBC with differential, absolute lymphocyte count (ALC) and absolute neutrophil count (ANC). If <48-72 hours since exposure, repeat q6 hours x 4, then q12 hours x 2, then daily.
      ii. Serum amylase (may be elevated at absorbed doses > 0.5 Gy)
      iii. Metabolic panel including electrolytes, renal and hepatic markers
      iv. PT/APTT
   d. Effects on Bone Marrow Function:
      i. Decreased platelet count (<100,000) - clinical presentation includes bruising, petechiae, epistaxis, blood in urine or stool
      ii. Decreased white blood cell count (ALC<1,000/µL or ANC<1,000/µL) – clinical presentation includes fever and infection
      iii. Decreased red blood cell count (Hct < 30%) – clinical presentation includes pallor, fatigue, dyspnea with exertion

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### Hematopoietic (Bone Marrow) Acute Radiation Syndrome

<table>
<thead>
<tr>
<th>Prognostic Stage</th>
<th>latent Stage</th>
<th>Manifest illness Stage</th>
<th>Recovery</th>
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</thead>
<tbody>
<tr>
<td>Onset</td>
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<td>Duration</td>
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<td>Symptom</td>
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<tr>
<td>General</td>
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*The absorbed dose quoted here are “gender-equivalent” values. Radiations in prostate generally produce the same effects as gamma rays, in 6-20 days at lower doses. If the patient has been exposed to neutrons or fast neutrons the time to recovery may be delayed.*

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****Guidelines adapted from Dana-Farber Cancer Institute and Primary Children’s Medical Center drafted documents

Submit recommendations to improve guidelines to [RITN@nmdp.org](mailto:RITN@nmdp.org)  [http://www.RITN.net](http://www.RITN.net)  rev. June 2014