Cautions

- Authored by REMM and RITN physicians, this set of orders is a prototype only.
- **Orders must be customized for each patient and incident.**
- Specific drugs are suggested for function only. Patients may not need any/every category of drug listed.
- No HHS, CDC, FDA, or other US government entity endorsement of specific drugs or drug doses is intended or implied by inclusion in this order set.
- Consult the notes at the end of this document for additional, key information.

Internal contamination (decorporation treatments)

- This Pediatric Orders Prototype lists only FDA-approved medications as radioisotope countermeasures.
- Some, but not all of these drugs are currently in the Strategic National Stockpile.
- Prescribers should consult the FDA drug label for complete prescribing information.
- Decorporation drugs should be used in children with great caution.
- The online version of REMM has additional recommendations about additional countermeasure drugs that may be considered.
- This prototype does **not** address threshold levels of internal contamination that would trigger initiation, continuation, or discontinuation of decorporation treatment. See REMM Countermeasures Caution and Comment, which discusses this issue.

Drug dosages

- All drug doses in this prototype should be customized for each patient.
- All pediatric drug doses should be prescribed as appropriate for **age**, **weight**, and any **clinical issues**, including allergies.
- Appropriate dose adjustments should be made based on age, weight, drug-drug interactions, nutritional status, renal, hepatic function, and risk/benefit calculus.

After a mass casualty incident, practitioners may encounter counterfeit drugs. This FDA website will provide information on avoiding and detecting counterfeit drugs and assist with reporting of suspected counterfeit medications.

If this pediatric order set, **Version date 6/26/2018**, has been printed for use offline, consult the online version of REMM to see if updates are available. https://www.remm.nlm.gov/pediatric-order.pdf
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<td>Pediatric Vital Signs Reference Chart</td>
<td>23</td>
</tr>
</tbody>
</table>
1. Administrative information

Name: _______________________________________

Unique Identifier: ____________

Address: _______________________________________

Phone: ______________

Spoken language: ____________

Date of Birth: ______________

Age Months (if <3 years) ______   Years ______

Height (cm)/ ______   Weight (Kg) ______

Gender: ____________

Dietary Special needs: __________________________

Default Guarantor: __________________________

Relationship: ___Father   ___Mother   ___Other: specify ______________

Next of kin and contact information (home phone, cell phone, email, or address):
   _______________________________________

Primary Care Provider: __________________________

2. Admit to:

   __ Inpatient Service ____________   Area_____________

   __ Team: ______________   PICU_____________

   __ Hem/Onc: ____________   Hematopoietic Stem Cell Transplantation: ______

   __ Admitting Physician: ______________   Pager: ______________

   __ Attending Physician: ______________   Pager: ______________

   __ Other Physician: ______________   Pager: ______________
3. Diagnoses

**Acute/Chronic Non-radiation Related Admission Diagnoses:**

a. ______________________________

b. ______________________________

c. ______________________________

d. ______________________________

e. ______________________________

f. ______________________________

**Acute Radiation-related Admission Diagnoses**

a. **Radiation contamination?**  Yes_____ No_____  
   See REMM [Body Chart](#) (page 20) to record whole body radiation survey.  
   __ External contamination with Isotope (Specify or unknown) ____________  
   __ Internal contamination with Isotope (Specify or unknown) ____________  
   __ Contamination suspected, Isotope uncertain

b. **Radiation Exposure / Acute Radiation Syndrome (ARS)?**  
   Yes_____ No_____  
   • Estimated whole body dose from exposure__________(units of gray/Gy)  
   • See also Item #24 for additional radiation details and work-up

**Other potential complicating factors**

__ Mass casualty incident  

__ Other, Specify ________________
Specific populations potentially requiring more customized management?

Yes_____ No_____

__ Infant (< 1 y)
__ Child (1-18 y)
__ Pregnant/Possibly pregnant  Duration of Pregnancy (weeks): ________
__ Immunosuppressed: ________________________________
__ Other, Specify ________________________________

- See REMM page about At-Risk/Special Needs Populations

4. Precautions:

Infectious
__ Contact
__ Droplet
__ Airborne
__ Reverse Isolation/Neutropenic

Radiation precautions
- For persons with known or suspected external or internal contamination.
- Persons with exposure but NO contamination are NOT radioactive. Patients with exposure only do not need Radiation Precautions.

__ Precautions: Single room, gown, mask, cap, boots, and gloves
__ Use medical facility procedures for discarding all biological/physical/radioactive waste, including linens/towels/trash/personal protective equipment.
__ Contact Radiation Safety Officer for additional instructions.
  Phone: ______________ Pager: ____________
__ Place Radiation Safety Sign on door if patient has internal or external radioactive contamination
__ Notify pregnant staff that entry to room is prohibited if patient is/may be contaminated.
__ Everyone entering room/area of contaminated patient must wear personal radiation dosimeter assigned by Radiation Safety.
__ Use medical facility procedures for disposal of radiation waste, including linens/towels/trash/personal protective equipment.

- See guidance
5. **Urgent consultations: specify**

- Pediatric Hematology/Oncology
- Intensive Care
- Transfusion Medicine
- Hematopoietic Stem Cell Transplantation
- Radiation Oncology
- Mental Health / Psychiatry
- Endocrinology
- Ophthalmology
- Palliative Care and Pain Service
- Dermatology / Plastic Surgery
- Gastroenterology
- Radiation Safety
- Burn Therapy
- Surgery: General
- Trauma
- Thoracic
- Orthopedics
- Hepatology
- Infectious Disease
- Pulmonary
- Plastic Surgery
- Cardiology
- Nephrology
- ENT
- Other

6. **Condition:**

- Good
- Fair
- Stable
- Guarded
- Critical

7. **Vital Signs:**

- q 2 hours X 4
- Ward routine
- q 4 hours X 4

**Notify physician for:**

O₂ sat: _____ < 92%

**Pediatric SIRS Criteria (Systemic Inflammatory Response Syndrome)**

Modified SIRS Criteria: must have 2 of 4 criteria, 1 must be temperature or leukocyte abnormality

- Temperature (core) <36 °C or >38.5 °C
- Tachycardia: HR > 2 SD above normal for age or bradycardia if < 1 year old
- Respiratory: Mean RR >2 SD above normal for age or mechanical ventilation required for an acute process
- Elevated or depressed WBC for age (unrelated to chemotherapy induced leukopenia) or >10% immature neutrophils
Initiate sepsis workup for the following conditions:

<table>
<thead>
<tr>
<th>Age</th>
<th>HR (95th %ile)</th>
<th>HR (75th %ile)</th>
<th>Systolic BP (5th %ile)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 d - ≤ 1 m</td>
<td>&gt;205</td>
<td>&gt;155</td>
<td>&lt;60</td>
</tr>
<tr>
<td>&gt; 1 m – ≤ 3 m</td>
<td>&gt;205</td>
<td>&gt;155</td>
<td>&lt;70</td>
</tr>
<tr>
<td>&gt; 3 m – ≤ 1 y</td>
<td>&gt;190</td>
<td>&gt;140</td>
<td>&lt;70</td>
</tr>
<tr>
<td>&gt; 1 y – ≤ 2 y</td>
<td>&gt;190</td>
<td>&gt;130</td>
<td>&lt;70 + (age in yr x 2)</td>
</tr>
<tr>
<td>&gt; 2 y – ≤ 10 y</td>
<td>&gt;140</td>
<td>&gt;110</td>
<td>&lt;70 + (age in yr x 2)</td>
</tr>
<tr>
<td>&gt;10 y</td>
<td>&gt;100</td>
<td>&gt;100</td>
<td>&lt;90</td>
</tr>
</tbody>
</table>

8. Allergies:
   __ No Known Drug Allergies (NKDA)
   __ Allergies (drugs, foods)
   If yes, specify drug/food and reaction: ______________________

9. Activity:
   __ Bed rest   __ Bathroom privileges
   __ Out of bed/up to chair every ___ hrs.
   __ Ambulate as tolerated   __ Confine to room

10. Diet:
    __ Regular Diet   __ Liquids (full, clear)   __ NPO
    __ Advance as tolerated
    __ Neutropenic diet
    __ Special dietary needs/requests: ______________________

11. Height, weight:
    Height: ____ cm
    Weight: ____ kg
    Repeat body weight: q ____ hours    q ____ days
12. Admission studies: Labs

__ CBC w/differential __ w/ Platelet count

__ Comprehensive Metabolic Panel (CMP) / Chem 14

__ PT or INR/PTT/fibrinogen/TT

__ Urinalysis - Collection method: ________________________

__ Urine culture

__ Blood culture - Collection method: _____________________ Sets: _____________________
  Type of culture: Bacteria, fungal, aerobic, anaerobic

__ Sputum culture

__ Urine HCG (for all girls ≥10 years or post-menarche, whichever is earlier)

__ Serum HCG (for any girls ≥10 years or post-menarche, whichever is earlier)

__ Thyroid Function Tests (Specify) ________________

__ Wound cultures

Serologies:

__ Herpes Simplex Virus type 1 (HSV-1)

__ Herpes Simplex Virus type 2 (HSV-2)

__ Cytomegalovirus (CMV)

__ Varicella-zoster Virus (VZV)

__ Epstein Barr Virus (EBV)

13. Blood bank

(May set institutional transfusion parameters, e.g.: PRBC transfusion for Hgb < 7 g/dl and PLT < 20000/micL unless otherwise specified by medical staff.)

__ Type and cross match

__ Type and screen

For ____ units or ____ ml of packed red blood cells (~10-15 ml/kg)
For ____ units or ____ ml of platelets (~5-10 ml/kg)

Note:
• Use only leukoreduced AND irradiated products, if available, unless it is known with certainty that the patient was exposed to allow dose of radiation, e.g. less than 100 cGy.
• If radiation whole body dose is not known with certainty, leukoreduced AND irradiated products are preferred, if available.
• See REMM blood use page for additional information.
14. Imaging

__ Chest x-ray  Urgency:_________
__ PA/Lateral  Urgency:_________
__ Portable  Urgency:_________
__ Other imaging studies    Specify: __________________________________

15. Electrocardiogram

__ Electrocardiogram
__ STAT Electrocardiogram for chest pain, notify physician

16. Standing labs / studies

__ CBC w/diff and platelets q ___ hours, x ___ days,  
    Followed by q ___ until further orders
__ Comprehensive Metabolic Panel (CMP) / Chem 14  
    Followed by q _____ hours, x _____ days  
    Followed by q _____ until further orders
__ Other    ________ (specify test and frequency)

17. IV fluid management:

__ IV Fluids: ______ @ _____ mL/hr, with additive ______
__ IV Fluids: ______ @ _____ mL/hr, with additive ______

18. __ Foley catheter management (specify) ____________

__ Use radiation precautions for urine and feces for patients with internal radiation contamination.

19. __ Monitor I / O

Frequency ____________

__ Use radiation precautions for urine and feces for patients with internal radiation contamination.
20. Deep Venous Thrombosis (DVT) prophylaxis:

__ TED hose to Bilateral Lower-Extremities
__ Sequential Compression Devices (SCD)
__ Anticoagulation regimen _________________________________
__ Other

Note: The potential benefit of any anticoagulation regimen (e.g. heparin) should be balanced against the risk of excessive bleeding in patients with severe thrombocytopenia or significant gastrointestinal toxicity.

21. Respiratory Therapy:

__ Use radiation precautions for personnel, equipment, and waste if patient has internal radiation contamination.
__ Room air      __ Chest tube care (Specify)______________
__ Titrate oxygen supplementation for Oxygen saturation > ____%
__ Bi-PAP
__ Nebulizer treatment (Specify) ________________________________

22. Wound care:  (see also item 25)

__ Decontaminate external wounds if there is external radiation contamination. See REMM radiation contaminated wound care recommendations.
__ Sterile dressing to wounds daily/BID
__ Monitor waste

__ Use medical facility procedures for discarding biological/radioactive/physical waste and linens/towels/trash/personal protective equipment.

__ Radiation precautions (needed if patient has radiation contamination)

__ Silvadene (Silver Sulfadiazine) cream topically to burns/BID
__ Bacitracin topically to burns/BID
__ Plastic Surgery Consultation
__ Other wound management per Burn team/Dermatology/Surgery:
Pager ____________  Phone ________________________
23. Orthopedic care:

__ Splint/brace/cast/crutches

__ Other orthopedic management procedure per orthopedics:
Pager ___________ Phone ________________________

24. Radiation Dose Assessment

A. Biodosimetry and Bioassay assays (reference material)
   - Difference between Biodosimetry and Bioassay
   - Define biodosimetry
   - More about biodosimetry
   - Dicentric chromosome assay

B. Biodosimetry assays for radiation exposure

- See REMM information on
  - Dose Estimator for Exposure: 3 biodosimetry tools
  - Dose Reconstruction

- Estimated whole body dose from exposure: _____ (Gray)
  - Using which tool(s) __________________________
    e.g., vomiting, lymphocyte depletion kinetics, dicentric chromosome assay
  - Note: if different assays give different results

- METREPOL Scores: Heme___ GI___ Neuro____Cutaneous____
- Response Category (RC score) ____________
  Explain METREPOL
  Consider Response Category in clinical triage (Interactive tool for ARS)

- Date of exposure: _____________
- Time of exposure: _____________
- Location of patient at time of exposure: _____________
- Estimated whole body/partial body dose, specify ________ (dose)
- Dose unknown: _______

Dicentric Chromosome Assay Instructions:
- Draw extra green top tube and provide: date ________ time ________
- See REMM for location of approved US laboratories that perform this test.
- Send this tube ON ICE for outside lab study
  - To the attention of: __________________________
  - Name of lab: __________________________
  - Address of lab: __________________________
C. **Radiation bioassay** for evaluating/managing internal decontamination
   - Collect ≥ 70 mL Spot urine for ____________(name of radioactive isotope)
   - Directions for sample collection, labeling, packaging and shipping bioassay specimen to CDC bioassay lab:
     https://emergency.cdc.gov/radiation/labinfo.asp

   Note: Consult senior radiation event medical managers for name and location of other laboratories that may be available to perform this test in a mass casualty incident. Routine labs generally cannot perform this test, although in large incidents, senior managers may announce special arrangements.

25. General Medications:

   - Clinical Pharmacist or PharmD managed medication dosing is essential
   - Suggested dose ranges for **pediatric patients (PEDS)** are suggested but not mandated.
   - Drug names are generally listed as follows **Generic (Brand)** names
   - Some drugs with **bold blue font** have **DailyMed** hyperlinks with additional information.

**For gastric acid suppression:**

- **Lansoprazole (Prevacid)**
  PEDS: 1 to 2 mg/kg, max 30 mg/dose
  Dose: ______

**For radiation-induced nausea & vomiting:**

- **Ondansetron (Zofran)**
  PEDS: 0.15 mg/kg, max 8 mg/dose, IV/PO Q 8hrs PRN.
  Dose: ______

- **Lorazepam (Ativan)** for anxiety/insomnia/breakthrough nausea
  PEDS: 0.025 -0.05 mg/kg, max 2 mg/dose IV/PO q 6 hrs PRN.
  Dose: ______

- **Prochlorperazine** for anxiety/insomnia/breakthrough nausea
  PEDS: Children ≥2 years and weight ≥9 kg and Adolescents
  (NOTE: Administer with Diphenhydramine to mitigate risk of dystonia.)

  **Oral Prochlorperazine:**
  - 9-13 kg: 2.5 mg every 12-24 hours as needed; max daily dose: 7.5 mg/day
  - >13-18 kg: 2.5 mg every 8-12 hours as needed; max daily dose: 10 mg/day
  - >18-39 kg: 2.5 mg every 8 hours or 5 mg every 12 hours as needed;
    max daily dose: 15 mg/day
  - >39 kg: 5-10 mg every 6-8 hours; usual max daily dose: 40 mg/day

See **REMM bibliography on treatment of nausea and vomiting**
For fever:

- **Acetaminophen** q 6 – 8h PRN temperature > 38 ºC
  
PEDS: 15 mg/kg, max 650 mg PO Q 6 hrs PRN. Max 75mg/kg/day (**Tylenol**)
  
  Dose: ________

For diarrhea:

- **Loperamide hydrochloride (Imodium):**
  
  - PEDS: Oral: Children ≥2 years and Adolescents
  - 13 to <21 kg (2-5 years): Initial: 1 mg with first loose stool followed by 1 mg/dose after each subsequent loose stool; maximum daily dose: 3 mg/day
  - 21-27 kg (6-8 years): Initial: 2 mg with first loose stool followed by 1 mg/dose after each subsequent loose stool; maximum daily dose: 4 mg/day
  - 27.1-43 kg (9-11 years): Initial: 2 mg with first loose stool followed by 1 mg/dose after each subsequent loose stool; maximum daily dose: 6 mg/day
  - ≥43.1 kg (≥12 years): Initial: 4 mg with first loose stool followed by 2 mg/dose after each subsequent loose stool; maximum daily dose: 8 mg/day

For rash (itching dosing):

- **Topical sterile dressing**

- **Diphenhydramine hydrochloride (Benadryl)**
  
  PEDS: 0.5 mg/kg - 1 mg/kg, max 50 mg IV/PO Q 6 hrs PRN.
  
  Dose ____________

For pain:

- **Morphine Sulfate**
  
  PEDS: 0.05 mg/kg, max 2 mg/dose IV Q 2-4 hrs PRN
  
  0.2-0.5 mg/kg, max 15 mg/dose PO Q 4 hrs PRN

  **PCA starting dose recommendation 0.015-0.02 mg/kg/dose, lockout 8-10 minutes, or continuous 0-0.02 mg/kg/hr and hourly max 0.1-0.12 mg/kg/hr.**
  
  Dose ____________

- **Other pain medication (specify):** name, dose, route, frequency

  ___________________________________________________
For skin burns: (see also item 22: wound care)

Burn topical regimen __________________________________________

Replace body fluid ___________________________________________

Other burn therapy __________________________________________

For oral mucositis:

Mouth care regimen __________________________________________

26. Radioisotope decorporation or blocking agents:
   • Note: Only FDA approved radiation countermeasures are listed in table below.
   • See REMM table longer list of countermeasures which have been recommended by
     some experts but are not FDA approved as radiation countermeasures.
   • Pediatric administration of these should be discussed with toxicology experts in
     order to optimize risk/benefit.
   • Adult and pediatric doses are noted below.

<table>
<thead>
<tr>
<th>Medical Countermeasure</th>
<th>Administered for</th>
<th>Route of Administration</th>
<th>Dosage</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ca-DTPA (^1,^3)</td>
<td>Americium (Am-241) (^1)</td>
<td>IV (^1): Give once daily as a bolus or as a single infusion, i.e., do not fractionate the dose.</td>
<td>IV: 1 g in 5 cc 5% dextrose in PEDS: &lt;12 years old: 14 mg/kg IV qd, no more than 1g/day</td>
<td>Ca-DTPA for the first dose</td>
</tr>
<tr>
<td>Zn-DTPA (^1,^3)</td>
<td>Californium (Cf–252) (^2)</td>
<td>DTPA is FDA-approved for intravenous Rx of known or suspected internal contamination with Am, Cm, and Pu only.</td>
<td>Nebulized inhalation: 1 g in 1:1 dilution with sterile water or NS over 15-20 min PEDS: nebulized dosing same as adults</td>
<td>Give Zn-DTPA for any follow-up doses (i.e., maintenance as indicated)</td>
</tr>
<tr>
<td>See REMM’s DTPA information.</td>
<td>Cobalt (Co-60) (^2)</td>
<td>Nebulized inhalation (^1): DTPA is FDA-approved for nebulized inhalation in adults only, and if the route of contamination is through inhalation.</td>
<td></td>
<td>Duration of therapy depends on total body burden and response to treatment</td>
</tr>
<tr>
<td>See FDA’s Zn-DTPA drug label.</td>
<td>Curium (Cm-244) (^1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>See FDA’s Ca-DTPA drug label.</td>
<td>Plutonium (Pu-238 and Pu-239) (^1)</td>
<td></td>
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<tr>
<td></td>
<td>Yttrium (Y-90) (^2)</td>
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</tbody>
</table>
### Medical Countermeasure

<table>
<thead>
<tr>
<th>Medical Countermeasure</th>
<th>Administered for</th>
<th>Route of Administration</th>
<th>Dosage</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potassium iodide&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Iodine (I-131)</td>
<td>PO</td>
<td>(Adolescents ≥ 150 lbs. should receive the full adult daily dose (130 mg/d)</td>
<td>• See FDA pediatric dosing recommendations, including liquid vs. tablet options</td>
</tr>
<tr>
<td></td>
<td>[For projected thyroid gland exposure ≥ 5cGy]</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>See REMM’s KI summary information.</td>
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<tr>
<td></td>
<td>See FDA’s KI information.</td>
<td></td>
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<tr>
<td></td>
<td>See FDA pediatric dosing recommendations, including liquid vs. tablet options</td>
<td></td>
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<tr>
<td></td>
<td>Some incidents will require only a single dose of KI.</td>
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<tr>
<td></td>
<td>Incident managers may recommend additional doses if ongoing radioactive iodine ingestion or inhalation represents a continuing threat.</td>
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<tr>
<td></td>
<td>See also: Potassium Iodide (KI): Duration of Therapy.</td>
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<tr>
<td></td>
<td>See FDA information on duration of therapy.</td>
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</tbody>
</table>

<sup>1</sup> See FDA pediatric dosing recommendations, including liquid vs. tablet options.
<table>
<thead>
<tr>
<th>Medical Countermeasure</th>
<th>Administered for</th>
<th>Route of Administration</th>
<th>Dosage</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prussian blue, insoluble¹</td>
<td>Cesium (Cs-137)</td>
<td>PO</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Thallium (TI-201)</td>
<td></td>
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</tr>
<tr>
<td>See REMM’s Prussian Blue summary information.</td>
<td></td>
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<tr>
<td>See FDA Prussian Blue information page.</td>
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<tr>
<td>See FDA’s Prussian Blue drug label.</td>
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</tr>
</tbody>
</table>

- **Prussian blue, insoluble**:  
  - See REMM’s Prussian Blue summary information.  
  - See FDA Prussian Blue information page.  
  - See FDA’s Prussian Blue drug label.

- **Dosage**  
  PEPS:  
  >12 yrs: 3 g po TID  
  2-12 yrs: 1 gm TID

- **Duration**  
  - Minimum 30 days course per FDA  
  - Obtain bioassay and whole body counting to assess treatment of efficacy  
  - Duration of therapy depends on total body burden and response to treatment
27. Neutropenia therapy ± antimicrobials

Neutropenia therapy, if indicated:

**Neutropenia definition:**
Total count of neutrophils + bands in the peripheral blood <1,000 /microL
- The 2 drugs listed below have been approved by the FDA for the indication of acute exposure to myelosuppressive doses of radiation
- See [REMM cytokines page](#) for more detailed information, especially potential need for *dose alterations during large mass casualty incidents when medical countermeasures may be scarce.*

---

Myeloid cytokines approved by the FDA for the indication of acute exposure to myelosuppressive doses of radiation (may consider biosimilar if available)

<table>
<thead>
<tr>
<th>Cytokine</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>G-CSF or filgrastim <em>(Neupogen® drug label)</em></td>
<td>10 mcg/kg/day as a single daily subcutaneous injection in adults and children (IV optional based on availability)&lt;br&gt;Continue administration daily until absolute neutrophil count remains greater than 1,000/mm³ (= 1.0 x 10⁹ cells/L) for 3 consecutive (daily) CBCs or exceeds 10,000/mm³ (= 10 x 10⁹ cells/L) after a radiation-induced nadir.&lt;br&gt;See <a href="#">REMM cytokines page</a> for more information about potential dose alterations during large mass casualty incidents when medical countermeasures may be scarce.</td>
</tr>
<tr>
<td>Pegylated G-CSF or pegfilgrastim <em>(Neulasta® drug label)</em></td>
<td><strong>Pediatric patients weighing less than 45 kg:</strong> refer to <a href="#">table in Neulasta drug label</a> (on page 20 of this document) for dose calculated by weight. Administer two doses of drug subcutaneously one week apart, if second dose is needed&lt;br&gt;A CBC should be obtained prior to administration of the second dose of Neulasta®. Subject matter experts recommend not administering the second dose if absolute neutrophil count is greater than 5,000/mm³ (= 5.0 x 10⁹ cells/L).&lt;br&gt;See <a href="#">REMM cytokines page</a> for more information about potential dose alterations during large mass casualty incidents when medical countermeasures may be scarce.</td>
</tr>
<tr>
<td>GM-CSF or sargramostim <em>(Leukine® drug label)</em></td>
<td>A subcutaneous injection administered once daily as follows:&lt;br&gt;7 mcg/kg in adult and pediatric patients weighing greater than 40 kg&lt;br&gt;10 mcg/kg in pediatric patients weighing 15 kg to 40 kg&lt;br&gt;12 mcg/kg in pediatric patients weighing less than 15 kg&lt;br&gt;Continue administration of Leukine until absolute neutrophil count remains greater than 1,000/mm³ (= 1.0 x 10⁹ cells/L) for 3 consecutive CBCs or exceeds 10,000/mm³ (= 10 x 10⁹ cells/L) after a radiation-induced nadir.&lt;br&gt;See drug label for prescribing information, especially <em>warning related to diluent</em> use in infants and premature infants.</td>
</tr>
</tbody>
</table>
See Clinical Practice Guidelines for Myeloid Cytokines (for Adults)


- NCCN Clinical Practice Guidelines in Oncology, Myeloid Growth Factors, Version 1.2015. See section entitled "NCCN Guidelines for Supportive Care" > "Myeloid Growth Factors". (Registration required.)


For Antimicrobial therapy with neutropenia:

**Neutropenia definition:**
Total count of neutrophils + bands in the peripheral blood <1,000 /microL

- For patients with neutropenia who have NOT HAD NEUTROPENIC FEVER.
- Use as appropriate for each patient.
- Drugs listed are examples only.

**Anti-bacterial prophylaxis:**

__Levofloxacin (Levaquin) (neutropenia without fever)__

**6 months to 4 years old:**
Oral, IV: 8 to 10 mg/kg/dose twice daily;
Maximum dose: 250 mg
Dose: __________

**≥5 years:**
Oral, IV: 10 mg/kg/dose once daily; maximum dose: 500 mg/day
(Increase max to 750 mg/day if treating pneumonia)
Dose: __________
Anti-viral prophylaxis *(neutropenia without fever)*

__ Acyclovir *(Zovirax)*
Dosing varies based on VZV and HSV  
Weight ≤ 40 kg: 60-90mg/kg/day divided in 2-3 divided doses  
(Max 800mg PO BID) Weight > 40kg: 800mg PO BID  
Dose: _________

Anti-fungal prophylaxis *(neutropenia without fever)*

__ Fluconazole *(Diflucan)* dose considered beginning when  
absolute neutrophil count (ANC) becomes < 1000  
6 mg/kg PO/IV daily, max 400 mg daily  
Dose: _________  

or

__ Posaconazole *(Noxafil)* with food – beginning when absolute neutrophil count  
(ANC) becomes < 1000  
≥13 years –  
**Suspension** is 4 mg/kg 3 times a day with fatty food.  
**Tablets** (delayed release) or **IV** – d1 300 mg twice a day, then 300 mg daily  
Dose: ____________

For treatment of neutropenia AND fever *(defined as T>38 °C while neutropenic)*

**Anti-microbial work-up and therapy**

__ Blood cultures  __ Urinalysis w/culture  
__ Sputum culture + sensitivity  __ Chest x-ray  

__ Cefepime *(Maxipime)*
PEDS: 50 mg/kg, max 2000 mg IV Q8h  
Dose: _______

__ Vancomycin *(Vancocin)*
Consider if: suspected catheter-related infection, skin or soft tissue infection,  
pneumonia or hemodynamic instability.  
Consider trough level before 4th dose  
**PEDS:** 15 mg/kg IV Q6-8h  
**Dose:** ______
Antifungal therapy
Consider one of the following if: fever >72 hours on antibacterial therapy, evidence of fungal infection or hemodynamic instability.

**Voriconazole (Vfend)**
PEDS: 2 to 11 years: 9 mg/kg Q12H for two doses then 8 mg/kg IV Q12h
≥12 yr or ≥ 50 kg: 6 mg/kg IV q12h for two doses, then 4 mg/kg IV q12h
Dose: _____

**Caspofungin (Cancidas)**
PEDS: 70 mg/m2 IV once, then 50 mg/m2 IV daily
(max dose 70 mg once then 50 mg daily)
Dose: ____________

**Liposomal amphotericin B (AmBisome)**
PEDS dose: 3-5 mg/kg/day IV over 2h
Dose: ____________

**Amphotericin B lipid complex (Abelcet)**
PEDS dose: 5 mg/kg/day IV over 2h (2.5 mg/kg/hr)
Dose: __

See [Fever and Neutropenia Guidelines for children with cancer](#)

NOTES

1. FDA approved for this indication

2. This drug is not approved by the FDA for this indication. If used, this would be an "off label use", and physician discretion is strongly advised.

3. Ca-DTPA and Zn-DTPA have not been approved by FDA for treating internal contamination with californium, thorium, and yttrium. For initial treatment, Ca-DTPA is recommended, if available, within the first 24 hours after internal contamination. Zn-DTPA is preferred for maintenance after the first 24 hours, if available, due to safety concerns associated with prolonged use of Ca-DTPA.

4. **Pegfilgrastim (Neulasta): Weight-based Dosing for Pediatric Patients Weighing Less than 45 kg (from drug label dated 11/2015)**

<table>
<thead>
<tr>
<th>Body Weight</th>
<th>Pegfilgrastim Dose</th>
<th>Volume to Administer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 10 kg*</td>
<td>See below*</td>
<td>See below*</td>
</tr>
<tr>
<td>10 - 12 kg</td>
<td>1.5 mg</td>
<td>0.15 mL</td>
</tr>
<tr>
<td>21 - 30 kg</td>
<td>2.5 mg</td>
<td>0.25 mL</td>
</tr>
<tr>
<td>31 - 44 kg</td>
<td>4 mg</td>
<td>0.40 mL</td>
</tr>
</tbody>
</table>

* For pediatric patients weighing less than 10 kg, administer 0.1 mg/kg (0.01 mL/kg) of Neulasta.

See [drug label information](#) regarding how to administer drug for pediatric patients receiving doses less than 6 mg.
Body Chart for Recording Results of Radiation Survey
## Pediatric Vital Signs Reference Chart

This table, along with our detailed references can be found online at [http://www.pedscases.com/pediatric-vital-signs-reference-chart](http://www.pedscases.com/pediatric-vital-signs-reference-chart). For a more detailed approach to this topic, see our podcast on "Pediatric Vital Signs."

### Heart Rate

<table>
<thead>
<tr>
<th>Age</th>
<th>Awake Rate</th>
<th>Sleeping Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neonate (&lt;28 d)</td>
<td>100-205</td>
<td>90-160</td>
</tr>
<tr>
<td>Infant (1 mo-1 y)</td>
<td>100-190</td>
<td>90-160</td>
</tr>
<tr>
<td>Toddler (1-2 y)</td>
<td>80-140</td>
<td>80-120</td>
</tr>
<tr>
<td>Preschool (3-5 y)</td>
<td>80-120</td>
<td>65-100</td>
</tr>
<tr>
<td>School-age (6-11 y)</td>
<td>75-118</td>
<td>58-90</td>
</tr>
<tr>
<td>Adolescent (12-15 y)</td>
<td>60-100</td>
<td>50-90</td>
</tr>
</tbody>
</table>

### Respiratory Rate

<table>
<thead>
<tr>
<th>Age</th>
<th>Infants (&lt;1 y)</th>
<th>Toddler (1-2 y)</th>
<th>Preschool (3-5 y)</th>
<th>School-age (6-11 y)</th>
<th>Adolescent (12-15 y)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal Respiratory Rate</td>
<td>30-53</td>
<td>22-37</td>
<td>20-28</td>
<td>18-25</td>
<td>12-20</td>
</tr>
</tbody>
</table>

### Blood Pressure

<table>
<thead>
<tr>
<th>Age</th>
<th>Systolic Pressure</th>
<th>Diastolic Pressure</th>
<th>Systolic Hypotension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth (12 h, &lt;1000 g)</td>
<td>39-59</td>
<td>16-36</td>
<td>&lt;40-50</td>
</tr>
<tr>
<td>Birth (12 h, 3 kg)</td>
<td>60-76</td>
<td>31-45</td>
<td>&lt;50</td>
</tr>
<tr>
<td>Neonate (96 h)</td>
<td>67-84</td>
<td>35-53</td>
<td>&lt;60</td>
</tr>
<tr>
<td>Infant (1-12 mo)</td>
<td>72-104</td>
<td>37-56</td>
<td>&lt;70</td>
</tr>
<tr>
<td>Toddler (1-2 y)</td>
<td>86-106</td>
<td>42-63</td>
<td>&lt;70 + (age in years x 2)</td>
</tr>
<tr>
<td>Preschooler (3-5 y)</td>
<td>89-112</td>
<td>46-72</td>
<td>&lt;70 + (age in years x 2)</td>
</tr>
<tr>
<td>School-age (6-9 y)</td>
<td>97-115</td>
<td>57-76</td>
<td>&lt;70 + (age in years x 2)</td>
</tr>
<tr>
<td>Preadolescent (10-11 y)</td>
<td>102-120</td>
<td>61-80</td>
<td>&lt;90</td>
</tr>
<tr>
<td>Adolescent (12-15 y)</td>
<td>110-131</td>
<td>64-83</td>
<td>&lt;90</td>
</tr>
</tbody>
</table>


### Temperature

<table>
<thead>
<tr>
<th>Method</th>
<th>Temperature (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rectal</td>
<td>36.6-38</td>
</tr>
<tr>
<td>Ear</td>
<td>35.6-38</td>
</tr>
<tr>
<td>Oral</td>
<td>35.5-37.5</td>
</tr>
<tr>
<td>Axillary</td>
<td>36.5-37.5</td>
</tr>
</tbody>
</table>

Temperature ranges do not vary with age. Axillary, tympanic and temporal temps for screening (less accurate). Rectal and oral temps for definitive measurement (unless contraindication).

### Oxygen Saturation

Normal pediatric pulse oximetry (SPO2) values have not yet been firmly established. SPO2 is lower in the immediate newborn period. Beyond this period, a SPO2 of <92% should be a cause of concern and may suggest a respiratory disease or cyanotic heart disease.

Developed by Chris Novak and Peter Gill for PedsCases.com.
April 21, 2016.

Source: [PedsCases.com](http://www.pedscases.com)
About: [PedsCases](http://www.pedscases.com)