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](https://www.cdc.gov/nhsnd/snds/strategicnationalstockpile/).
- Prescribers should consult the FDA drug label for complete prescribing information.
- Decorporation drugs should be used in children and pregnant women with great caution.
- The online version of REMM has additional recommendations about [additional countermeasure drugs that may be considered](https://www.remm.nlm.gov/adultorderform.htm).
- 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.

Mass Casualty Emergency

- After a mass casualty incident, practitioners may encounter counterfeit drugs. This [FDA website](https://www.fda.gov/Counterfeiting) will provide information on avoiding and detecting counterfeit drugs and assist with reporting of suspected counterfeit medications.
- This is [Version date January 25, 2019 of the Pediatric Order set template](https://www.remm.nlm.gov/adultorderform.htm). Before using an order set that has been previously printed for use offline, consult the online version of REMM to see if updates are available. This REMM web page has the most recent version of both the adult and pediatric templates.

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</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 #25 in order set** 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
- Hematopoietic Stem Cell Transplantation
- Mental Health / Psychiatry
- Ophthalmology
- Dermatology / Plastic Surgery
- Radiation Safety
- Surgery: General
- Hepatology
- Pulmonary
- Cardiology
- ENT
- Other

- Intensive Care
- Transfusion Medicine
- Radiation Oncology
- Endocrinology
- Palliative Care and Pain Service
- Gastroenterology
- Burn Team
- Trauma
- Thoracic
- Orthopedics
- Infectious Disease
- Plastic Surgery
- Nephrology
- Social Services

6. Condition:

- Good
- Fair
- Stable
- Guarded
- Critical

7. Vital Signs: Temp, BP, Pulse, [Pulse Ox if needed]

- q 2 hours X 4
- 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
___ Ambulate in room only
___ Ambulate ad lib

10. Diet:

___ Regular Diet   ___ Liquids (full, clear)   ___NPO
___ Advance as tolerated
___ Low microbial diet (for neutropenia)
___ 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

___ See #13 in order set for blood bank labs including Type & Screen or Cross Match

Serologies:
___ Herpes Simplex Virus type 1 (HSV-1) [unless acyclovir prophylaxis planned]
___ Herpes Simplex Virus type 2 (HSV-2) [unless acyclovir prophylaxis planned]
___ Cytomegalovirus (CMV)
___ Varicella-zoster Virus (VZV)
___ Epstein Barr Virus (EBV)

Standing labs / studies, if needed

___ 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)
13. Blood bank
(May set institutional transfusion parameters, e.g.: PRBC transfusion for Hgb < 7 g/dl and PLT < 20000/microL 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 whole body dose of radiation 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. IV fluid management: (including requirements for burns, if present)
   __ IV Fluids: ______@______ mL/hr, with additive ______
   __ IV Fluids: ______@______ mL/hr, with additive ______

   See REMM burn page for details of fluid replacement

17. __ Foley catheter management (specify) _____________

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

18. __ Monitor I / O
    Frequency ____________

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

19. 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.
20. **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) __________________________

21. **Wound care:** *(see also order set item #24 and REMM burn page)*
   - __ 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 (but not face)
       Specify location, frequency:_______________
     - __ Other topical silver impregnated burn treatment (e.g. Acticoat, Restore)
       Specify medication, location, frequency:_______________
     - __ Other burn treatment: (e.g., ReCell) Specify:_______________
     - __ Bacitracin topically to burns/BID
     - __ Plastic Surgery Consultation
     - __ Other wound management per Burn Team/Dermatology/Surgery:
       Pager_____________ Phone _________________________
   - __ Consider referral to American Burn Association Burn Center

22. **Orthopedic care:**
   - __ Splint/brace/cast/crutches
   - __ Other orthopedic management procedure per orthopedics:
     Pager___________Phone ____________________________
23. 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.
24. 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 web site 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: ______

__Hydroxyzine__

__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: ______

__Hydroxyzine (Vistaril)___ capsules and oral suspension
PEDS: children under 6 years: 50 mg daily in divided doses
children over 6 years: 50-100 mg daily in divided doses

__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.
Some prefer not to use this medication in children to avoid extrapyramidal symptoms.)

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

For diarrhea:

__Loperamide hydrochloride (Imodium):__
PEDS: Oral: Children ≥2 years and Adolescents
  o 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
  o 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
  o 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
  o ≥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 and itching (unrelated to radiation exposure):

__Topical steroid:__
_______ Medication Name
______Cream/lotion/ointment  ____Strength  ____ Frequency____

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: IV 0.05 mg/kg Q 2-4 hrs PRN
**Usual initial max dose:**
Infants: 2 mg/dose
1 to 6 years: 4 mg/dose
7 to 12 years: 8 mg/dose
>12 years: 10 mg/dose

PO 0.2-0.5 mg/kg, Q 4 hrs PRN
**Usual initial max dose:** 15 – 20 mg

**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 # 21 in order set: wound care)
See also: REMM burn page for more details

Record burn area(s) on body diagram and % Body Surface Area affected
(See body chart on page 22)

Burn topical regimen ________________________________

Replace body fluid ________________________________

Other burn therapy ________________________________

Consider referral to American Burn Association Burn Center: ____________

For oral mucositis:

Mouth care regimen ________________________________
25. 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$^{1,3}$ Zn-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>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></td>
<td>Californium (Cf-252)$^2$</td>
<td></td>
<td>Nebulized inhalation: 1 g in 1:1 dilution with sterile water or NS over 15-20 min</td>
<td>Give Zn-DTPA for any follow-up doses (i.e., maintenance as indicated)</td>
</tr>
<tr>
<td></td>
<td>Cobalt (Co-60)$^2$</td>
<td></td>
<td>PEDS: nebulized dosing same as adults</td>
<td>Duration of therapy depends on total body burden and response to treatment</td>
</tr>
<tr>
<td></td>
<td>Curium (Cm-244)$^1$</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Plutonium (Pu-238 and Pu-239)$^1$</td>
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<tr>
<td></td>
<td>Yttrium (Y-90)$^2$</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Medical Countermeasure</td>
<td>Administered for</td>
<td>Route of Administration</td>
<td>Dosage</td>
<td>Duration</td>
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<tr>
<td>------------------------</td>
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<td>----------</td>
</tr>
<tr>
<td>Potassium iodide¹</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></td>
<td></td>
<td>Adolescents, 12 through 18 years: 65 mg/d</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Over 3 years through 12 years: 65 mg/d</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>1 month through 3 years: 32 mg/d [Use KI oral solution with 65 mg/mL.]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Birth through 1 month: 16 mg/d [Use KI oral solution with 65 mg/mL.]</td>
<td></td>
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<tr>
<td></td>
<td>[For projected thyroid gland exposure ≥ 5cGy]</td>
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<tr>
<td></td>
<td>See REMM’s KI summary information.</td>
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</tr>
<tr>
<td></td>
<td>See FDA’s KI information.</td>
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</tbody>
</table>

¹Some incidents will require only a single dose of KI. Incident managers may recommend additional doses if ongoing radioactive iodine ingestion or inhalation represents a continuing threat. See also: Potassium Iodide (KI): Duration of Therapy. See FDA information on duration of therapy.
<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>PEDS:</td>
<td>Minimum 30 days course per FDA</td>
</tr>
<tr>
<td></td>
<td>Thallium (TI-201)</td>
<td></td>
<td>&gt;12 yrs: 3 g po TID</td>
<td>Obtain bioassay and whole body counting to assess treatment of efficacy</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2-12 yrs: 1 gm TID</td>
<td>Duration of therapy depends on total body burden and response to treatment</td>
</tr>
</tbody>
</table>

¹ See REMM’s Prussian Blue summary information.  
See FDA Prussian Blue information page.  
See FDA’s Prussian Blue drug label.
26. **Neutropenia therapy** and **antimicrobials Neutropenia therapy, if indicated:**

**Neutropenia definition:**
Total count of neutrophils + bands in the peripheral blood <1,000 /microL
- The 3 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**

<table>
<thead>
<tr>
<th>Cytokine</th>
<th>Dose</th>
</tr>
</thead>
</table>
| G-CSF or filgrastim *(Neupogen drug label)* | - 10 mcg/kg/day as a single daily subcutaneous injection in adults and children (IV optional based on availability)  
- 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.  
- See REMM cytokines page for more information about potential dose alterations during large mass casualty incidents when medical countermeasures may be scarce. |
| Pegylated G-CSF or pegfilgrastim *(Neulasta drug label)* | - Pediatric patients weighing less than 45 kg: refer to *table in Neulasta drug label*⁴ (on page 21 of this orders document) for dose calculated by weight. Administer two doses of drug subcutaneously one week apart, if second dose is needed  
- 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).  
- See REMM cytokines page for more information about potential dose alterations during large mass casualty incidents when medical countermeasures may be scarce. |
<table>
<thead>
<tr>
<th>GM-CSF or sargramostim (Leukine drug label)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• A subcutaneous injection administered once daily as follows--</td>
</tr>
<tr>
<td>• 7 mcg/kg in adult and pediatric patients weighing greater than 40 kg</td>
</tr>
<tr>
<td>• 10 mcg/kg in pediatric patients weighing 15 kg to 40 kg</td>
</tr>
<tr>
<td>• 12 mcg/kg in pediatric patients weighing less than 15 kg</td>
</tr>
<tr>
<td>• 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.</td>
</tr>
<tr>
<td>• See drug label for prescribing information, especially warning related to diluent use in infants and premature infants.</td>
</tr>
<tr>
<td>• See REMM cytokines page for more information about potential dose alterations during large mass casualty incidents when medical countermeasures may be scarce.</td>
</tr>
</tbody>
</table>
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 diagnosis of VZV or HSV; see drug label for details  
Peds:  
Weight ≤ 40 kg: 60-80 mg/kg/day PO in 2-3 divided doses, with max 200 mg PO q8h  
Weight > 40kg: 400 mg PO q 12 h  
Dose: __________

**Anti-fungal prophylaxis** *(neutropenia without fever)*

[Note: Consider prophylaxis for Pneumocystis pneumonia in immunocompromised patients.]

__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.

*Oral suspension:* < 12 years: 4 mg/kg PO TID; >12 years: 200 mg PO TID  
*DR tablets:* Adolescents: 300 mg PO twice daily on day 1, then 300 mg PO daily  
Note: IV formulation is not FDA approved in children < 18 years of age because of “non-clinical safety concerns”.  
*Note: FDA drug label cautions for this drug in pediatric patients, especially those < 13 years of age.* Drug label includes various dosing options.

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

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

__Blood cultures__  
__Sputum culture + sensitivity__  
__Urinalysis w/culture__  
__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**

[Note: Consider prophylaxis for Pneumocystis pneumonia in immunocompromised patients.]

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: ________

__Posaconazole (Noxafil)__ with food – beginning when absolute neutrophil count (ANC) becomes < 1000.

*Oral suspension:* < 12 years: 4 mg/kg PO TID; >12 years: 200 mg PO TID

*DR tablets:* Adolescents: 300 mg PO twice daily on day 1, then 300 mg PO daily

IV is not FDA approved in children < 18 years of age because of “non-clinical safety concerns”.

*Note:* See FDA drug label cautions for this drug in pediatric patients, especially those < 13 years of age. Drug label includes various dosing options.

__Liposomal amphotericin B (AmBisome)__ See drug label for cautions.

Peds dose: 3-5 mg/kg/day IV over 2h

Dose: ________

__Amphotericin B lipid complex (Abelcet)__ See drug label for cautions.

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 and/or Burns
# 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>58-140</td>
<td>80-120</td>
</tr>
<tr>
<td>Preschool (3-5 y)</td>
<td>60-120</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>Normal Respiratory Rate (breaths/minute)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infants (&lt;1 y)</td>
<td>30-53</td>
</tr>
<tr>
<td>Toddler (1-2 y)</td>
<td>22-37</td>
</tr>
<tr>
<td>Preschool (3-5 y)</td>
<td>20-28</td>
</tr>
<tr>
<td>School-age (6-11 y)</td>
<td>18-25</td>
</tr>
<tr>
<td>Adolescent (12-15 y)</td>
<td>12-20</td>
</tr>
</tbody>
</table>

## Blood Pressure

<table>
<thead>
<tr>
<th>Age</th>
<th>Systolic Pressure (mm Hg)</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>81-80</td>
<td>&lt;90</td>
</tr>
<tr>
<td>Adolescent (12-15 y)</td>
<td>110-131</td>
<td>84-83</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>35.8-38</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
About: PedsCases