Filgrastim

Brand names

Neupogen, Granulocyte Colony-Stimulating Factor, GCSF

Medication error potential

Look-alike, sound-alike drug names
USP reports that filgrastim has been confused with sargramostim.\(^1\) USP reports that Neupogen has been confused with Epogen, Neulasta, and Neurontin.\(^1\) ISMP reports that Neupogen has been confused with Neumega.\(^2\)

Contraindications and warnings

**Contraindications:** Individuals with known hypersensitivity to *Escherichia coli*-derived proteins, filgrastim, or any product components.\(^3\)

**Warnings:** Rare cases of splenic rupture have been reported; some were fatal. Abdominal pain or shoulder tip pain that occurs during infusion should be evaluated.\(^3\)

Infusion-related cautions

Allergic reactions occur more frequently with IV infusion and usually within 30 minutes of infusion.\(^3\) Epinephrine, antihistamines, corticosteroids, and/or bronchodilators are usually effective in alleviating symptoms.\(^3\)

Dosage

Consult individual protocols for complete dosing information.

**Aplastic anemia:** 400 mcg/m\(^2\)/day IV for 2 weeks\(^4\) or 90 days\(^5\)

**Bone marrow transplantation:** 5–10 mcg/kg/day administered ≥24 hours after chemotherapy and ≥24 hours after bone marrow infusion until neutrophil recovery.\(^3\) The table depicts dosing based on neutrophil response.\(^3\)

<table>
<thead>
<tr>
<th>Absolute Neutrophil Count (ANC)</th>
<th>Filgrastim Adjustment</th>
</tr>
</thead>
<tbody>
<tr>
<td>If ANC &gt;1000/mm(^3) × 3 day</td>
<td>Reduce dose to 5 mcg/kg/day</td>
</tr>
<tr>
<td>If ANC remains &gt;1000/mm(^3) for 3 more days</td>
<td>Discontinue filgrastim</td>
</tr>
<tr>
<td>If ANC decreases to &lt;1000/mm(^3)</td>
<td>Resume 5 mcg/kg/day</td>
</tr>
<tr>
<td>If ANC decreases to &lt;1000/mm(^3) while receiving 5 mcg/kg/day</td>
<td>Increase dose to 10 mcg/kg/day</td>
</tr>
</tbody>
</table>

**Neutropenia following chemotherapy:** 5–10 mcg/kg/day sub-Q or IV for up to 14 days until neutrophil recovery\(^6-10\)

**Congenital neutropenia or agranulocytosis:** 5–15 mcg/kg/day sub-Q as a single dose or divided and given BID\(^12\) or 10–30 mcg/kg/day as an intermittent infusion up to 60 mcg/kg/day as a continuous infusion\(^13\)

**Neutropenia and sepsis in neonates:** 10 mcg/kg sub-Q or IV once\(^13-16\) or 5 mcg/kg sub-Q or IV twice\(^14,17\) a day for 3–14 days

**Neutropenia/neutrophil dysfunction due to glycogen storage disease type 1b:** 3–8 mcg/kg/day for up to 290 days\(^18\) or 3–7.5 mcg/kg/day (sub-Q) for 6–12 months\(^19\)

**Mobilization of peripheral blood progenitor cells (PBPCs):** 10–24 mcg/kg/day sub-Q for 3–5 days before PBPC apheresis\(^20-22\)

**Idiopathic or cyclic neutropenia:** 1–5 mcg/kg sub-Q once daily\(^11\)

Dosage adjustment in organ dysfunction

None noted

Maximum dosage

Not established. Children with severe chronic neutropenia (19 months–14 years) have received 3–8 mcg/kg/day for up to 290 days.\(^19\) Five of 20 children with severe aplastic anemia who failed to respond to 400 mcg/m\(^2\)/day were given 800 mcg/m\(^2\)/day or 1200 mcg/m\(^2\)/day for up to 2 weeks.\(^14\)
Filgrastim

### Additives

<table>
<thead>
<tr>
<th>Additive</th>
<th>300 mcg/1 mL Vial</th>
<th>480 mcg/1.6 mL Vial</th>
<th>300 mcg/0.5 mL Syringe</th>
<th>480 mcg/0.8 mL Syringe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetate</td>
<td>0.59 mg</td>
<td>0.94 mg</td>
<td>0.295 mg</td>
<td>0.472 mg</td>
</tr>
<tr>
<td>Sorbitol</td>
<td>50 mg</td>
<td>80 mg</td>
<td>25 mg</td>
<td>40 mg</td>
</tr>
<tr>
<td>Polysorbate 80</td>
<td>0.04 mg</td>
<td>0.064 mg</td>
<td>0.02 mg</td>
<td>0.032 mg</td>
</tr>
<tr>
<td>Sodium</td>
<td>0.035 mg</td>
<td>0.056 mg</td>
<td>0.0175 mg</td>
<td>0.028 mg</td>
</tr>
</tbody>
</table>

### Suitable diluents

- D5W\(^{(3)}\)

### Maximum concentration

- 600 mcg/mL\(^{(3)}\)

### Preparation and delivery

Concentrations ≤ 5 mcg/mL may precipitate and are not recommended.\(^{(3)}\) If concentration is 5–15 mcg/mL, normal human serum albumin should be added at a final concentration of 0.2% (2 mg/mL) to prevent adsorption of filgrastim to glass or plastic administration sets.\(^{(24)}\)

**Compatibility:** Dilution in NS may cause precipitation.\(^{(3)}\)

### IV push

- Not indicated

### Intermittent infusion

- Over 15–60 minutes\(^{(3,5,12-15)}\)

### Continuous infusion

The total daily dose may be diluted in 10–50 mL D5W and infused continuously over 24 hours by sub-Q infusion at a rate not to exceed 10 mL/24 hr.\(^{(3,13,23)}\) (See the Comments section.)

### Other routes of administration

- Sub-Q as a bolus injection or continuous infusion IV.\(^{(3)}\) Not administered IM.\(^{(3)}\)

### Comments

The use of colony-stimulating factors decreased febrile neutropenia, length of hospitalization, and number of infectious episodes but did not shorten the duration of neutropenia nor lessen treatment delays in children with acute lymphoblastic leukemia.\(^{(24)}\)

Pediatric patients with severe congenital neutropenia maintained on G-CSF long-term are at a higher risk for development of myelodysplastic syndrome and acute myeloid leukemia.\(^{(25)}\)

**Monitoring:** A CBC including a platelet count should be obtained before initiation therapy with filgrastim and should be repeated at least twice a week during treatment.\(^{(3)}\) Monitor hematocrit, temperature, urinalysis, and liver function tests. When the ANC is > 10,000/mm\(^3\) after the expected neutrophil nadir following chemotherapy filgrastim should be discontinued.\(^{(3)}\)

### REFERENCES