White Blood Cell Growth Factors

**Description of Procedure or Service**

White blood cell growth factors, also known as colony stimulating factors (CSF), are administered to enhance recovery of blood related functions in neutropenia (low white blood count) including febrile neutropenia (FN). CSFs are also utilized to decrease the incidence and severity of infection associated with select disease-related and drug-related myelosuppression (inhibition of bone marrow function).

Granulocyte colony stimulating factors (G-CSF) are glycoproteins which exert major control over the reproduction and maturation of certain white blood cells, which include the following U.S. Food & Drug Administration (FDA) approved products:

- Filgrastim (Neupogen®, Amgen, Thousand Oaks, CA)
- Pegfilgrastim (Neulasta®, Amgen, Thousand Oaks, CA)
- Filgrastim-sndz (Zarxio®, Sandoz, Princeton, NJ)
- Tbo-filgrastim (Granix®, Sicor Biotech UAB/Teva Pharmaceuticals North Wales, PA)

Granulocyte-macrophage colony stimulating factor (GM-CSF) is a hematopoietic growth factor which stimulates proliferation and differentiation of hematopoietic progenitor cells.

- Sargramostim (Leukine®, Bayer Healthcare Pharmaceuticals, Seattle, WA)

***Note: This Medical Policy is complex and technical. For questions concerning the technical language and/or specific clinical indications for its use, please consult your physician.***

**Policy**

BCBSNC will provide coverage for White Blood Cell Growth Factors when it is determined to be medically necessary because the medical criteria and guidelines shown below are met.

**Benefits Application**

This medical policy relates only to the services or supplies described herein. Please refer to the Member's Benefit Booklet for availability of benefits. Member's benefits may vary according to benefit design; therefore member benefit language should be reviewed before applying the terms of this medical policy.

**When White Blood Cell Growth Factors are covered**

Pegfilgrastim (Neulasta), Filgrastim (Neupogen), Filgrastim-sndz (Zarxio), Tbo-filgrastim (Granix), and Sargramostim (Leukine) are considered medically necessary for specific clinical conditions if the following criteria are met.

**Primary Prophylaxis of febrile neutropenia**
Includes all agents: Pegfilgrastim (Neulasta), Filgrastim (Neupogen), Filgrastim-sndz (Zarxio), Tbo-filgrastim (Granix), and Sargramostim (Leukine)

One white blood cell (WBC) growth factor agent is considered clinically appropriate for primary prophylaxis of chemotherapy-induced febrile neutropenia when ALL of the following (1, 2, and 3 are met:

1. The individual has a non-myeloid malignancy and is NOT receiving chemotherapy with radiation concurrently;
2. Chemotherapy intent must include ONE of the following:
   a. Curative intent, such as adjuvant treatment for early stage disease; OR
   b. Intent is survival prolongation, and the use of a different regimen or dose reduction would reduce the likelihood of reaching the treatment goal; OR
   c. Intent is symptom management, and the use of a different regimen or dose reduction would reduce the likelihood of reaching the treatment goal.
3. The individual falls into one of the following risk categories for febrile neutropenia:
   a. High risk of febrile neutropenia (> 20%) based on chemotherapy regimen; OR
   b. Intermediate risk of febrile neutropenia (> 10% but < 20 %) based on chemotherapy regimen and at least ONE of the following significant risk factors:
      • Age > 65;
      • Poor performance status (ECOG 3 or 4, but chemotherapy still indicated);
      • Preexisting neutropenia, for example resulting from bone marrow damage or tumor infiltration (ANC < 1500 mm3);
      • Previous febrile neutropenia episode;
      • Liver dysfunction, with bilirubin > 1.0 or liver enzymes > 2x upper limit of normal;
      • Presence of open wounds or active infections, when chemotherapy cannot be delayed to accommodate recovery;
      • Poor nutritional status (baseline albumin less 3.5 g/dl or BMI < 20);
      • HIV infection (active);
      • Advanced cancer

Secondary Prophylaxis of febrile neutropenia

Includes all agents: Pegfilgrastim (Neulasta), Filgrastim (Neupogen), Filgrastim-sndz (Zarxio), Tbo-filgrastim (Granix), and Sargramostim (Leukine)

Secondary prophylaxis of febrile neutropenia is considered clinically appropriate when there has been a previous neutropenic complication (in the absence of primary prophylaxis), and a change to the regimen (including dose reduction, schedule change, or change in therapy) would be expected to compromise patient outcome, particularly in the setting of curative intent.

Adjunctive treatment of febrile neutropenia (primary prophylaxis not given)

Includes all agents: Pegfilgrastim (Neulasta), Filgrastim (Neupogen), Filgrastim-sndz (Zarxio), Tbo-filgrastim (Granix), and Sargramostim (Leukine)

Adjunctive treatment of febrile neutropenia is considered clinically appropriate when any of the following risk factors are present:

- Age > 65
- Neutrophil recovery is expected to be delayed (greater than 10 days)
- Neutropenia is profound (less than 0.1 x 10⁹)
- Active pneumonia
- Sepsis syndrome (hypotension and/or multi-organ damage/dysfunction noted)
- Invasive fungal or opportunistic infection
• Onset of fever during inpatient stay

Note: Febrile neutropenia is defined as an oral temperature > 38.3°C (101.0°F) or 2 consecutive readings of 38.0°C (100.4°F) for 1 hour, with an absolute neutrophil count less than 500 cells/microL (0.5 x 10⁹/L) or less than 1000 cells/microL and expected to fall below 500 cells/microL over the next 48 hours.

Other oncologic uses for WBC growth factors
The following indications by growth factor type are also considered clinically appropriate when the requirements below are met:

Filgrastim/filgrastim-sndz

1. Acute lymphocytic leukemia
   a. After start of induction or first post-remission chemotherapy course; OR
   b. As an alternate or adjunct to donor leukocyte infusions (DLI) for relapsed disease after transplant.
2. Acute myeloid leukemia
   a. After induction, reinduction, or consolidation; OR
   b. As an alternate or adjunct to donor leukocyte infusions (DLI) for relapsed disease after transplant.
3. Aplastic anemia, moderate or severe
4. Hairy cell leukemia
   a. To treat severe neutropenia
5. Hematopoietic stem cell transplant
   a. To promote bone marrow myeloid recovery; OR
   b. To treat delayed or failed engraftment; OR
   c. To mobilize stem cells for collection by pheresis
6. Myelodysplastic syndrome
   a. To treat recurrent infection; OR
   b. To treat neutrophil count < 500 mm³
7. Radiation exposure
   a. Following radiation therapy in the absence of chemotherapy, if prolonged delays are expected; OR
   b. After accidental or intentional body irradiation of doses greater than 2 Gy (hematopoietic syndrome of acute radiation syndrome).
8. Support for dose dense or dose intensive chemotherapy in any of the following scenarios:
   a. Adjuvant treatment of high-risk breast cancer with combination therapy that includes anthracycline (doxorubicin or epirubicin)/cyclophosphamide followed by paclitaxel; OR
   b. High-dose intensity methotrexate, vinblastine, doxorubicin, and cisplatin (HD-M-VAC) in urothelial cancer; OR
   c. Chemotherapy intensification for newly diagnosed, localized Ewing sarcoma

Peg-filgrastim

1. Acute lymphocytic leukemia
   a. After start of induction or first post-remission chemotherapy course
2. Hematopoietic stem cell transplant
   a. To promote bone marrow myeloid recovery; OR
   b. To treat delayed or failed engraftment
3. Myelodysplastic syndrome
   a. To treat recurrent infection; OR
   b. To treat neutrophil count < 500 mm³
4. Radiation exposure
   a. After accidental or intentional body irradiation of doses greater than 2 Gy (hematopoietic syndrome of acute radiation syndrome)
5. Support for dose dense chemotherapy in any of the following scenarios:
   a. Adjuvant treatment of high-risk breast cancer with combination therapy that includes anthracycline (doxorubicin or epirubicin)/cyclophosphamide followed by paclitaxel; OR
   b. High-dose intensity methotrexate, vinblastine, doxorubicin, and cisplatin (HD-M-VAC) in urothelial cancer; OR
   c. Chemotherapy intensification for newly diagnosed, localized Ewing sarcoma.

**Peg-filgrastim**

1. Acute lymphocytic leukemia
   a. After start of induction or first post-remission chemotherapy course
2. Hematopoietic stem cell transplant
   a. To promote bone marrow myeloid recovery; OR
   b. To treat delayed or failed engraftment
3. Myelodysplastic syndrome
   a. To treat recurrent infection; OR
   b. To treat neutrophil count < 500 mm$^3$
4. Radiation exposure
   a. After accidental or intentional body irradiation of doses greater than 2 Gy (hematopoietic syndrome of acute radiation syndrome)
5. Support for dose dense chemotherapy in any of the following scenarios:
   a. Adjuvant treatment of high-risk breast cancer with combination therapy that includes anthracycline (doxorubicin or epirubicin)/cyclophosphamide followed by paclitaxel; OR
   b. High-dose intensity methotrexate, vinblastine, doxorubicin, and cisplatin (HD-M-VAC) in urothelial cancer; OR
   c. Chemotherapy intensification for newly diagnosed, localized Ewing sarcoma

**Sargramostim**

1. Acute lymphocytic leukemia
   a. After start of induction or first post-remission chemotherapy course
2. Acute myeloid leukemia
   a. After induction, reinduction, for individuals over 55 years of age
3. Hematopoietic stem cell transplant
   a. To promote bone marrow myeloid recovery; OR
   b. To treat delayed or failed engraftment; OR
   c. To mobilize stem cells for collection by pheresis
4. Myelodysplastic syndrome (MDS)
   a. To treat recurrent infection; OR
   b. To treat neutrophil count < 500 mm$^3$
5. Radiation exposure
   a. After radiation therapy in the absence of chemotherapy, if prolonged delays are expected; OR
   b. After accidental or intentional body irradiation of doses greater than 2 Gy (hematopoietic syndrome of acute radiation syndrome)
6. Support for dose dense chemotherapy in any of the following scenarios:
   a. Adjuvant treatment of high-risk breast cancer with combination therapy that includes anthracycline (doxorubicin or epirubicin)/cyclophosphamide followed by paclitaxel; OR
   b. High-dose intensity methotrexate, vinblastine, doxorubicin, and cisplatin (HD-M-VAC) in urothelial cancer; OR
   c. Chemotherapy intensification for newly diagnosed, localized Ewing sarcoma.

**Tbo-filgrastim**
1. Hematopoietic stem cell transplant
   a. To promote bone marrow myeloid recovery; OR
   b. To treat delayed or failed engraftment; OR
   c. To mobilize stem cells for collection by pheresis

Use of White Blood Cell Growth Factors may be considered medically necessary for clinical indications not listed above when the drug is prescribed for the treatment of cancer either:

- In accordance with FDA label (when clinical benefit has been established, see Policy Guidelines); OR
- In accordance with specific strong endorsement or support by nationally recognized compendia, when such recommendation is based on strong/high levels of evidence, and/or uniform consensus of clinical appropriateness has been reached.

**When White Blood Cell Growth Factors are not covered**

Pegfilgrastim (Neulasta), Filgrastim (Neupogen), Pegfilgrastim (Filgrastim-sndz (Zarxio), Tbo-filgrastim (Granix) and Sargramostim (Leukine) are considered not medically necessary and therefore not covered when above criteria are not met.

Pegfilgrastim (Neulasta) is not medically necessary for the mobilization of peripheral blood progenitor cells for hematopoietic stem cell transplantation.

Indications outside of FDA labeling will be subject to medical necessity review against nationally recognized compendia (National Comprehensive Cancer Network, NCCN) for the highest level of evidence (Level 1, 2A).

White Blood Cell Growth Factors are considered investigational when used for:

1. Non-cancer indications; OR
2. When criteria are not met regarding FDA labeling OR strong endorsement/support by nationally recognized compendia, as stated under “When White Blood Cell Growth Factors are covered.”

**Policy Guidelines**

Indications outside of FDA labeling will be subject to medical necessity review against nationally recognized compendia (National Comprehensive Cancer Network, NCCN) for the highest level of evidence (Level 1, 2A).

Drugs prescribed for treatment of cancer in accordance with FDA label may be considered medically necessary when clinical benefit has been established, and should not be determined to be investigational as defined in Corporate Medical Policy (CMP), “Investigational (Experimental) Services.”

Please refer to CMP “Investigational (Experimental) Services” for a summary of evidence standards from nationally recognized compendia.

**Billing/Coding/Physician Documentation Information**

This policy may apply to the following codes. Inclusion of a code in this section does not guarantee that it will be reimbursed. For further information on reimbursement guidelines, please see Administrative Policies on the Blue Cross Blue Shield of North Carolina web site at www.bcbsnc.com. They are listed in the Category Search on the Medical Policy search page.

*Applicable service codes: J1442, J2505, J2820, S0353, S0354*
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ICD-10 Codes: C00.0-C49.9, C4A.0-C4A.9, C50.01-C79.9, C7A.00-C7A.8, C7B.00-C7B.8, C80.0-C86.6, C88.2-C96.Z, D00.00-D09.9, Z51.11, Z51.12

BCBSNC may request medical records for determination of medical necessity. When medical records are requested, letters of support and/or explanation are often useful, but are not sufficient documentation unless all specific information needed to make a medical necessity determination is included.

Scientific Background and Reference Sources

U.S. Food and Drug Administration (FDA). Neulasta® (Pegfilgrastim). Available at: http://www.accessdata.fda.gov/drugsatfda_docs/label/2015/125031s170s179s181lbl.pdf

U.S. Food and Drug Administration (FDA). Neupogen (Filgrastim). Available at: http://www.accessdata.fda.gov

U.S. Food and Drug Administration (FDA). Leukine (Sargramostim). Available at: http://www.accessdata.fda.gov

Leukine (sargramostim) product information. Sanofi-aventis. Bridgewater, NJ. April 2013


Medical Director review 9/2016

Medical Director review 12/2016

Medical Director review 3/2017

Specialty Matched Consultant Advisory Panel 4/2017


U.S. Food and Drug Administration (FDA).
Neupogen [Product Information]. Thousand Oaks, CA. Amgen; July 30, 2015. Available at:
http://www.accessdata.fda.gov/drugsatfda_docs/label/2015/103353s5186lbl.pdf. Accessed on June 19,
2017.

U.S. Food and Drug Administration (FDA).
http://www.accessdata.fda.gov/drugsatfda_docs/label/2016/125553s001lbl.pdf. Accessed on June 19,
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Accessed August 9, 2017.

Policy Implementation/Update Information

12/30/16 New policy developed. Pegfilgrastim (Neulasta), Filgrastim (Neupogen), Sargramostim
(Leukine), Tbo-filgrastim (Granix) and Filgrastim-sndz (Zarxio) are considered medically necessary to enhance recovery of blood related functions in neutropenia. References added. Added HCPCS codes S0353, S0354 and ICD-10 diagnoses codes to “Billing/Coding” section. Medical Director review 12/2016. Notification 12/30/16 for effective date 4/1/17. (lpr)

5/26/17 Added the following statement to “When Covered” section: “Use of White Blood Cell Growth Factors may be considered medically necessary for clinical indications not listed above when the drug is prescribed for the treatment of cancer either: In accordance with FDA label (when clinical benefit has been established, see Policy Guidelines); OR In accordance with specific strong endorsement or support by nationally recognized compendia, when such recommendation is based on strong/high levels of evidence, and/or uniform consensus of clinical appropriateness has been reached”. Under “When Not Covered” section, added the statement “White Blood Cell Growth Factors are considered investigational when used for: 1)Non-cancer indications; OR 2) When criteria are not met regarding FDA labeling OR strong endorsement/ support by nationally recognized compendia, as stated under “When White Blood Cell Growth Factors are covered.” Added the following statements under “Policy Guidelines” section: 1)Drugs prescribed for treatment of cancer in accordance with FDA label may be considered medically necessary when clinical benefit has been established, and should not be determined to be investigational as defined in Corporate Medical Policy, Investigational (Experimental) Services.” 2) Please refer to CMP “Investigational (Experimental) Services” for a summary of evidence standards from nationally recognized compendia. Medical director review 3/2017. Specialty Matched Consultant Advisory Panel review 4/26/2017. No change to policy statement. (lpr)

6/30/17 Revised “When Covered” and When Not Covered” sections to reflect coverage by clinical condition rather than by individual agent, but no change to intent. References added. (lpr)

8/25/17 Added NCCN reference. No change to policy statement. (lpr)

Medical policy is not an authorization, certification, explanation of benefits or a contract. Benefits and eligibility are determined before medical guidelines and payment guidelines are applied. Benefits are determined by the group contract and subscriber certificate that is in effect at the time services are rendered. This document is solely provided for informational purposes only and is based on research of current medical literature and review of common medical practices in the treatment and diagnosis of disease. Medical practices and knowledge are constantly changing and BCBSNC reserves the right to review and revise its medical policies periodically.