Donor Lymphocyte Infusion (DLI) and Hematopoietic Progenitor Cell (HPC) Boost

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DESCRIPTION

Donor Lymphocyte Infusion (DLI)

Donor lymphocyte infusion (DLI), also called donor leukocyte infusion, or buffy coat infusion, is a type of therapy in which lymphocytes from the blood of the donor are given to a patient who has already received allogeneic hematopoietic stem cell transplantation (HSCT) from the same donor. This therapy is based on the premise that the donor lymphocytes will recognize and kill the recipient's cancer cells in a process known as the graft-versus-leukemia (GVL) or graft-versus-tumor (GVT) effect. It is now accepted that DLI, at a time remote from the transplant conditioning regimen, can treat infections and relapse successfully after allogeneic HSCT in selected patients with hematologic malignancies; however significant complications may result including acute and chronic

graft-versus-host disease (GVHD), anemia, and infection. DLI is not used to promote engraftment or enhancement of chimerism. The intent is not to restore hematopoiesis. The recipient does not receive a preparative regimen but may require concomitant therapy for the underlying problem. Timing of DLI varies according to indication.

DLI has been researched as a treatment for a variety of hematologic malignancies, including most prominently chronic myeloid leukemia (CML), but also acute myeloid leukemia (AML), acute lymphoblastic leukemia (ALL), multiple myeloma (MM), myelodysplastic syndromes (MDS), chronic myelomonocytic leukemia (CLL), Hodgkin lymphoma (HL), and non-Hodgkin lymphoma (NHL). Studies are limited due to small numbers, but they have provided evidence that DLI can establish a graft-versus-leukemia/lymphoma effect.

Chronic Myelogenous Leukemia (CML)
Donor lymphocyte infusion (DLI) is an effective means of restoring sustained, complete cytogenetic or molecular remissions in patients with relapsed chronic myelogenous leukemia (CML), and has been shown to include complete remission (CR) in 60-80% of patients. DLI is highly effective if an appropriate number of cells are used. Factors affecting the optimal cell dose include the number of leukemic cells at the time of DLI and the alloreactive T-cell frequency contained in the donor lymphocyte preparation). Several small case series have demonstrated similar outcomes for the use of unrelated-donor DLI compared with matched sibling donor DLI.

A number of studies have examined outcomes of DLI alone compared with chemotherapy or DLI in combination with a chemotherapy agent. Authors noted that imatinib, in contrast to DLI, does not provide definite cure for relapsed CML after allogeneic HSCT. For patients with relapsing CML who received DLI after allogeneic HSCT 95% of patients achieved a complete molecular remission, while 90%, 70%, and 70% of those receiving imatinib achieved hematologic, complete molecular cytogenetic, and complete molecular genetic remission, respectively. One-, three-, and five-year probability of overall survival was 100%, 85%, and 76%-100%.

Acute Lymphoblastic Leukemia (ALL)
The existence graft-versus-leukemia (GVL) effect in the setting of clinical allogeneic transplantation has been demonstrated for patients with acute leukemia; however, the benefit of DLI for relapsed acute leukemia is limited. Overall survival (OS) rates are 15%–20% at one month to three years. In a study involving 310 consecutive patients with relapsed acute leukemia who received DLI following human leukocyte antigen (HLA)-matched-donor allogeneic HSCT, OS was 32%. Multivariate analysis indicated that longer time to relapse after HSCT, peripheral blood source for stem cells, and initial post-relapse therapy with cytokines, DLI, or second HSCT were associated with improved post-relapse survival ($p < .001$, $p < .001$, and $p < 25$, respectively). Study outcomes suggest that therapies aimed at enhancing the GVL effect of allogeneic transplantation, including the use of DLI, may be beneficial for improving post-transplantation survival. Smaller studies involving < 25 patients have demonstrated remission rates of four to thirty-eight

months with the use of donor lymphocyte infusion (DLI) after allogeneic hematopoietic stem cell transplantation (HSCT).

In 2020, Patriarca et. al. reported on a retrospective multicenter study including pediatric and adult patients with acute leukemia (AL) who received donor lymphocyte infusions (DLIs) after allogeneic hematopoietic stem cell transplantation (HCT) (n=252). Forty-six patients (18%) received a second HCT after a median of 232 days (32- 1,390) from the first DLI. With a median follow-up of 461 days after the first DLI, 1-, 3-, and 5- year overall survival (OS) of the whole group from start of DLI treatment was 55, 39, and 33%, respectively. In multivariate analysis, older recipient age, and transplants from haploidentical donors significantly reduced OS, whereas DLI for mixed chimerism or as pre-emptive/prophylactic treatment compared to DLI for AL relapse and a schedule including more than one DLI significantly prolonged OS. The authors concluded that the study confirms that DLI administration in absence of overt hematological relapse and multiple infusions are associated with a favorable outcome in AL patients and that DLI from haploidentical donors had a poor outcome and may represent an area of further investigation.

Lymphomas
For recurrent childhood non-Hodgkin lymphoma (NHL), standard treatment may include HSCT followed by donor lymphocyte infusion (DLI).

Studies in which patients received donor lymphocyte infusion (DLI) for lymphomas consist of small numbers of patients with various histologies (both Hodgkin lymphoma [HL] and high- and- low grade non-Hodgkin lymphoma [NHL]). In general, the highest response rates have been seen in indolent lymphomas.

Bloor et al. reported the results of 28 patients with low-grade lymphoid malignancies previously treated with a reduced intensity (n=26) or fully myeloablative (n=2) allogeneic HSCT. Indications for DLI were progressive disease with or without mixed chimerism and persistent mixed chimerism alone six months from the date of transplantation, without significant GVHD. Thirteen patients responded to DLI. The cumulative response rates after DLI to treat progressive disease and persistent mixed chimerism were 76.5% and 91.6%, respectively. All thirteen patients achieved complete remission which was ongoing in nine patients at a median duration of 967 days from last DLI. Of the 17 patients treated for disease progression, the projected five-year OS and progression-free survival (PFS) rates after the last treatment with DLI were 87.8% and 76.2%, respectively. A total of 25 patients received DLI for mixed chimerism. The cumulative response to DLI for mixed chimerism was 92 %. All the responding patients converted to stable full chimerism; the median time to response was 6.7 months. Results of this study demonstrate a significant response to DLI for patients treated for indolent lymphomas with disease progression post-HSCT. Cumulative complete remission rate was >75%. These results suggest that this is an effective treatment for progressive disease after allogeneic HSCT.

Multiple Myeloma (MM)
The use of donor lymphocyte infusion (DLI) has also been proposed for the treatment of relapsed multiple myeloma (MM) following allogeneic HSCT. Patients with MM have overall response rates of 40–45% after DLI with remission rates of 30% suggesting benefit in relapsed disease. Many remissions are not durable, however. The strongest prognostic factor predicting response is the occurrence of graft-versus-host disease (GVHD).

Five studies have reported on the role of donor lymphocyte infusion (DLI) in relapsed multiple myeloma consisting of patients ranging in number of 5 to 63 with the highest response to DLI being reported as 62% with approximately half of the responders attaining complete remission (CR). One confounding factor for high response rates for multiple myeloma treated with DLI following allogeneic HSCT is that corticosteroids used for treating GVHD have known antimyeloma effect which could potentially enhance response rates in these patients.

Acute Myelogenous Leukemia (AML)/Myelodysplastic Syndromes (MDS)
A graft-versus-leukemia (GVL) effect has been identified in patients with relapsed AML or MDS undergoing DLI after allogeneic HSCT. Survival is reported in several small retrospective studies as 24%-42% at a range of one year to 49 months.

In a study comparing 399 patients with acute myelogenous leukemia (AML) in first hematological relapse after HSCT whose treatment did (n=171), or who did not (n=228) include DLI, estimated survival at two years was 21% and 9%, respectively, for the cohort receiving DLI compared with the non-DLI group. Better outcome was noted for age >37 years ($p<0.04$).

An observational study comparing different treatments for relapse reported on 147 consecutive patients who relapsed after allogeneic HSCT for myelodysplastic syndrome (MDS). Sixty-two patients received HSCT or donor lymphocyte infusion (DLI), 39 received cytoreductive treatment, and 46 were managed with palliative or supportive care. Two-year rates of overall (OS) were 32%, 6%, and 2%, respectively ($p<.001$). In multivariate analysis, 4 factors adversely influenced 2-year rates of OS: history of acute graft-versus-host disease (hazard ratio [HR], 1.83; 95% CI, 1.26 to 2.67; $p=0.002$), relapse within 6 months (HR=2.69; 95% CI, 0.82 to 3.98; $p<0.001$), progression to acute myelogenous leukemia (HR=2.59; 95% CI, 1.75 to 3.83; $p<0.001$), and platelet count less than 50 g/L at relapse (HR=1.68; 95% CI, 1.15 to 2.44; $p=0.007$). HSCT or DLI was found to be an independent factor that favorably impacts OS (HR=0.40; 95% CI, 0.26 to 0.63; $p<0.001$).

Summary of Evidence
For individuals who have had an allogeneic hematopoietic cell transplant (HCT) who receive donor lymphocyte infusion (DLI), the evidence includes nonrandomized comparative studies and case series. Relevant outcomes are overall survival and change in disease status. In various hematologic malignancies and for various indications such as

planned or preemptive DLI, treatment of relapse, or conversion of mixed to full donor chimerism, patients have shown evidence of responding to DLI. Response rates to DLI for relapsed hematologic malignancies following an allogeneic HCT are best in chronic myelogenous leukemia (CML), followed by the lymphomas, multiple myeloma, and acute leukemias, respectively. Other than CML, clinical responses are most effective when chemotherapy induction is used to reduce the tumor burden before DLI. The evidence is sufficient to determine qualitatively that the technology results in a meaningful improvement in the net health outcome.

The National Cancer Institute (NCI) (2020, 2021) regarding the treatment with donor lymphocytes includes the following:

- Acute myelogenous leukemia (AML): Patients who relapse following an allogeneic bone marrow transplant (BMT) may undergo an infusion of lymphocytes from the donor (donor lymphocyte infusion or DLI).
- Chronic myelogenous leukemia (CML): Treatment of relapsed chronic myelogenous leukemia (CML) may include donor lymphocyte infusion.
- Multiple Myeloma (MM): A definite graft-versus-myeloma effect has been demonstrated, including regression of myeloma relapses following the infusion of donor lymphocytes.
- Non-Hodgkin Lymphoma (NHL) in Children: Treatment of post-transplant lymphoproliferative disease may include donor lymphocyte infusion.
- Non-Hodgkin lymphoma (NHL) in adults: Anecdotal durable remissions have been reported after allogeneic HSCT and after subsequent donor lymphocyte infusion for relapses after transplantation.

Genetic Modification of Donor Lymphocytes

There is also a research interest in the genetic modification of donor lymphocytes in an effort to control graft versus host disease (GVHD). For example, it has been proposed that donor lymphocytes can be modified by insertion of a thymidine kinase gene, rendering the cells susceptible to ganciclovir therapy. If the infusion of the genetically modified donor lymphocytes results in severe graft versus. host disease (GVHD), the transplant recipient can then be treated with ganciclovir to selectively destroy the donor lymphocytes. However, further investigation and data regarding the safety and efficacy of genetic modifications of DLI on GVHD and/or graft-versus-leukemia (GVL) are needed. The evidence is insufficient to determine the effects of the technology on net health outcomes.

Donor Lymphocyte Infusion (DLI) for Nonmalignant Disease

Donor lymphocyte infusion (DLI) is used in hematologic malignancies as a means of increasing graft versus tumor effect, however, experience with DLI to improve engraftment in nonmalignant disease is extremely limited. The evidence is insufficient to determine the effects of the technology on net health outcomes.

Hematopoietic Progenitor Cell (HPC) Boost
A boost of hematopoietic progenitor cell (HPC) (also known as stem cells) from the original HCST donor is intended to restore hematopoiesis or augment poor graft function after hematopoietic stem cell transplantation (HSCT). Poor graft function is a severe complication of HSCT which is defined as persistent cytopenias and/or transfusion dependence. The cell product used for a HPC boost may be a previously cryopreserved cell product, or alternatively, the donor may need to undergo additional evaluation, stem cell mobilization, and cell harvest. A boost is not preceded by a preparative regimen. A potential source of confusion is that a boost is often required when additional conventional chemotherapy is given to treat relapse and reestablish remission after transplantation. Prolonged cytopenias and immunosuppression may result, requiring additional HPC boost, which is typically given days to weeks after reinduction chemotherapy.

Although data are not robust, several prospective and retrospective clinical trials demonstrate beneficial effects of HPC boost after HSCT.

In 2017, Ghobadi et. al. performed single institution study at the Washington University School of Medicine. A pilot trial was conducted to study three different sources of CD34+ cells for treatment of poor graft function (PGF): (1) fresh mobilized product using G-CSF only, (2) fresh mobilized products using G-CSF and plerixafor, and (3) cryopreserved cells mobilized with G-CSF. Seventeen donor-recipient pairs were enrolled onto this prospective study. A retrospective review of similar patients treated off protocol with the same regimen was conducted. From June 2010 through June 2015, 17 donor-recipient pairs were enrolled in the prospective study and 9 donor-recipient pairs were treated off protocol. Together 26 donor-patient pair were analyzed and reported in this manuscript. The primary objective was the hematologic response rate. Secondary objectives included: (1) CD34+ yields; (2) incidence and severity of acute and chronic GVHD; (3) Overall survival (OS) and relapse free survival (RFS). The Washington University Institutional Review Board (IRB) approved the study. The prospective trial was registered at ClinicalTrials.gov as NCT01026987. PGF was defined as having cytopenia (ANC < 0.5k/μL, platelets < 30k/μL or platelet transfusion dependence, or red blood cell transfusion dependence) for two consecutive weeks in the absence of relapse/persistent hematologic disorder, incomplete (< 90%) donor chimerism, active infectious diseases, or drug related myelosuppression. Primary PGF was defined as PGF in the absence of full engraftment. Secondary PGF was defined as PGF after full engraftment. Complete response was defined as improvement of all involved cells lineages; partial response was defined as improvement of platelets and/or neutrophils with continuing RBC transfusion dependence. Neutrophil improvement was defined as an absolute neutrophil count > 500/μl without growth factor support for >7 days; platelet improvement was defined as platelet count ≥ 50,000/μl without platelet transfusion support for > 7 days; and RBC improvement was defined as hemoglobin > 9 g/dL and transfusion independence. CD34+ yield was defined as the number of CD34+ cells after selection/CD34+ cells in the mobilized product prior to CD34+ selection. Overall survival (OS) was defined as time from SCB to death. Relapse-free survival (RFS) was

defined as time from stem cell boost (SCB) to relapse or death. Eligible patients were those who were at least 18 years old, had an ECOG performance status of 2 or below, and had poor graft function (PGF) following allo-HSCT (more than 60 days post allo-HSCT). Patients with poor graft function secondary to relapse/persistent disease, incomplete (< 90%) donor chimerism, or active infectious diseases were excluded, as were patients with significant medical, psychiatric, or social conditions that contraindicated the procedure. Previous allo-HSCT may have been performed using a related or unrelated donor; however, the original donor was required to undergo additional PBSC collection or authorize that cryopreserved cells from a previous PBSC collection be used. Blood counts were performed at least weekly through Day +14 then at least every other week through Day +100, monthly thereafter for patients on the prospective trial; patients reviewed retrospectively were followed per institutional guidelines. Incidence and severity of acute GVHD was defined according to Glucksberg criteria, chronic GVHD as limited or extensive. Patients were monitored for acute GVHD through Day +100 and for chronic GVHD through Day +365 following SCB. The median age at SCB was 52.5 years (range 25–68) and 16 of 26 were male. Twelve patients underwent allo-HSCT for acute myelogenous leukemia, 6 for myelodysplastic syndrome, 4 for acute lymphoblastic leukemia, 2 for aplastic anemia, and 1 for Hodgkin's lymphoma, and 1 for Diamond-Blackfan Anemia. Sixteen patients had related donors (11 HLA-matched siblings, 5 haplo-identical donors). Ten had unrelated donors (9 HLA-matched and 1 HLA-mismatch). All received peripheral blood stem cell products. Sixteen patients had primary PGF, 10 secondary. The median time from allo-HSCT to SCB was 4.6 months (range 2.1–23.6). At time of SCB 6 had PGF involving neutrophils, 25 platelets, and 23 red blood cells. Twenty-six recipients of SCB for the treatment of PGF following allo-HSCT. The complete response rate was 62% and overall response rate was 81%. Six of the 10 patients who failed to achieve a complete response suffered from disease relapse while only one of 17 patients with complete hematologic response suffered from disease relapse within 3 months of SCB; Treatment was well tolerated; there was no TRM and no grade III–IV acute GVHD. The authors concluded our data suggests that cryopreserved products can be an effective and viable source of cells for SCB (stem cell boost).

In 2018, Mainardi et. al. reported retrospective study results involving 50 children with acute lymphatic leukemia, acute myeloid leukemia and severe aplastic anemia who received 61 boosts with CD34+ selected peripheral blood stem cells after transplantation from matched unrelated (n = 25) or mismatched related (n = 25) donors. No conditioning was performed prior, and no immunosuppressive therapy was administered post the allogeneic HSCT. Within 8 weeks, a significant increase in median neutrophil counts ($p < 0.05$) and a decrease in red blood cell and platelet transfusion requirement ($p < 0.0001$ and <0.001) respectively, were observed. 78.8% of patients resolved one or two of their cytopenias and 36.5% had a complete hematological response. The rate of de novo acute graft-versus-host disease (GVHD) grade I–III was only 6% and resolved completely. No GVHD grade IV or chronic GVHD occurred. Patients who responded to hematopoietic progenitor cell (HPC) displayed a trend toward better overall survival (OS) ($P = 0.07$). Data suggest improved graft function with HPC boost in this cohort of patients.

Summary of Evidence
A boost of hematopoietic progenitor cell (HPC) (also known as stem cells) from the original HCST donor is intended to restore hematopoiesis or augment poor graft function after hematopoietic stem cell transplantation (HSCT). Poor graft function is a severe complication of HSCT which is defined as persistent cytopenias and/or transfusion dependence. The cell product used for a HPC boost may be a previously cryopreserved cell product, or alternatively, the donor may need to undergo additional evaluation, stem cell mobilization, and cell harvest. A boost is not preceded by a preparative regimen. A potential source of confusion is that a boost is often required when additional conventional chemotherapy is given to treat relapse and reestablish remission after transplantation. Prolonged cytopenias and immunosuppression may result, requiring additional HPC boost, which is typically given days to weeks after reinduction chemotherapy. Based on review of the peer reviewed medical literature, although the evidence is not robust, several prospective and retrospective clinical trials demonstrate beneficial effects of HPC boost after HSCT. The evidence is sufficient to determine the effects of the technology on net health outcomes.

Practice Guideline and Position Statements

National Comprehensive Cancer Network (NCCN)

Acute Lymphoblastic Leukemia Version 1.2022
For patients with relapsed disease after allogeneic HCT, a second allogeneic HCT and/or donor lymphocyte infusion (DLI) can be considered.

Pediatric Acute Lymphoblastic Leukemia Version 1.2022

CAR-T Cells
One of the early treatments for patients with advanced ALL included adoptive cell therapy to induce a graft-versus leukemia effect through allogeneic HSCT or donor lymphocyte infusions. However, this method resulted in significant risk of graft-versus-host disease (GVHD). To circumvent this issue, current advances are focused on the use of the patient's own T-cells to target the B-ALL cells.

Acute Myeloid Leukemia Version 2.2022
A study suggests that azacitidine followed by donor lymphocyte infusions (DLIs) may be a treatment option for therapy in patients with AML that relapses after allogeneic HCT.

B-Cell Lymphoma Version 5.2022
The current NCCN guideline does not mention the use of donor lymphocyte infusions.

Pediatric Aggressive Mature B-Cell Lymphomas Version 3.2022
The current NCCN guideline does not mention the use of donor lymphocyte infusions.

Chronic Myeloid Leukemia Version 1.2023
Management of Post-Transplant Relapse
Donor lymphocyte infusion (DLI) is effective in inducing durable molecular remissions in the majority patients with relapsed CML following allogeneic HCT, though it is more effective in patients with chronic phase relapse then advanced phase relapse. However, DLI is associated with complications such as graft-versus host disease (GVHD) susceptibility to infections and immunosuppression. Improvements in the methods of detecting BCR-ABKL1 transcripts to predict relapse, the development of reduced intensity conditioning regimens, modified delivery of lymphocytes with the depletion of CD8+ cells and the use of escalating cell dosage regimens have reduced the incidence of GVHD associated with DLI.

TKI with or without DLI or omacetaxine can be considered for patients who are not in remission or in cytogenetic relapse or those with an increasing level of molecular relapse. The selection of TKI depends on prior TKI, the side effect profile of the TKI, the presence of comorbidities, and BCR-ABL 1 mutational status. Pre-existing mutations in the BCR-ABL 1 kinase domain, frequently associated with resistance to TKIs, are detectable in the majority of patients who relapse after allogeneic HCT. BCR-ABL 1 mutational analysis is therefore essential prior to the selection of TKI for the treatment of post-transplant relapse.

Multiple Myeloma Version 1.2023

Multiple Myeloma (Symptomatic)

Relapse or Progressive Disease
Additional Treatment
- Allogeneic HCT [dd, ff, gg]

[dd]Allogeneic HCT should preferentially be done in the context of a trial when possible
[ff]Assess for HCT candidacy
[gg]Donor lymphocyte infusion can be considered in patients relapsing after allogeneic HCT

Myelodysplastic Syndromes Version 1.2023
Relapse after allo-HCT or no response:
- Consider allo-HCT or donor lymphocyte infusion; or
- Clinical trial; or
- HMA Azacitidine or Decitabine; or Oral decitabine and cedazuridine

Consider second transplant or donor lymphocyte infusion immune-based therapy for appropriate patients who had a prolonged remission after first transplant.

T-Cell Lymphomas Version 1.2021

Donor lymphocyte infusion (DLI) has been shown to induce long-term remissions in a few patients with PD (progressive disease) or disease relapse after allogeneic HCT. An analysis showed that induction of GVL effect via DLI may provide long-lasting remission in selected patients with relapsed ATLL.

Regulatory Status

The U.S. Food and Drug Administration regulates certain human cells, tissues, and cellular and tissue-based products under the legal authority of section 361 of the Public Health Service Act (42 USC 264). This section authorizes the Surgeon General, with the approval of the Secretary of the U.S. Department of Health and Human Services, to make and enforce such regulations as judged necessary to prevent the introduction, transmission, or spread of communicable diseases from foreign countries into the United States or from state to state. According to Addendum 7342.007—Imported Human Cells, Tissues, and Cellular and Tissue-based Products (HCT/Ps), umbilical cord blood stem cells, peripheral blood stem cells, lymphocytes (donor lymphocytes for infusion, T cells) are identified by product code 57M.P.

PRIOR APPROVAL

Not applicable.

POLICY

See Related Medical Policy

- 07.03.11 Hematopoietic Stem Cell Transplantation (Bone Marrow Transplant) Autologous and Allogeneic*

Donor Lymphocyte Infusion (DLI)

Donor lymphocyte infusion (DLI) is considered **medically necessary** following an allogeneic (myeloablative or non-myeloablative) hematopoietic stem cell transplant that was originally considered medically necessary for the treatment of hematologic malignancy that has relapsed or is refractory (disease that does not respond), or to prevent relapse in the setting of a high risk of relapse (T-cell depleted grafts or non-myeloablative [reduced intensity conditioning] allogeneic transplant) or to convert an individual from a mixed to full donor chimerism.

***Note**: The donor for the lymphocytes is the same individual whose stem cells (hematopoietic progenitor cells) were used for the transplant procedure.*

Collection and Cryopreservation of donor lymphocytes is considered **medically necessary** prior to, at the time of, or after a medically necessary allogeneic (myeloablative or non-myeloablative) hematopoietic stem cell transplant.

Donor lymphocyte infusion (DLI) is considered **investigational** including but not limited to the following as there is insufficient scientific evidence to permit conclusions concerning the health outcomes or benefits associated with this procedure:

- Donor lymphocyte infusion (DLI) as a treatment of nonhematologic malignancies.
- Donor lymphocyte infusion (DLI) following allogeneic (myeloablative or non-myeloablative) hematopoietic stem cell transplant that was originally considered investigational for the treatment of hematologic malignancy.
- Genetic modification of donor lymphocytes (donor lymphocytes can be modified by insertion of a thymidine kinase gene).

Hematopoietic Progenitor Cell (HPC) Boost

Hematopoietic progenitor cell (HPC) boost is considered **medically necessary** following autologous or an allogeneic (myeloablative or non-myeloablative) hematopoietic stem cell transplant that was originally considered medically necessary for the treatment of hematologic malignancy for either of the following indications:

- Promote engraftment
- Enhancement of chimerism when studies reveal <100% donor cells

Hematopoietic progenitor cell (HPC) boost is considered **investigational** for all other indications as there is insufficient scientific evidence to permit conclusions concerning the health outcomes or benefits associated with this procedure.

PROCEDURE CODES AND BILLING GUIDELINES

To report provider services, use appropriate CPT* codes, Alpha Numeric (HCPCS level 2) codes, Revenue codes, and/or ICD diagnosis codes.

- 38242 Allogeneic lymphocyte infusions
- 38243 Hematopoietic progenitor cell (HPC); HPC boost

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- National Comprehensive Cancer Network (NCCN) Myelodysplastic Syndromes Version 1.2023. Also available at https://www.nccn.org
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POLICY HISTORY

Date	Reason	Action
November 2022	Annual Review	Policy Renewed
November 2021	Annual Review	Policy Renewed
November 2020		New Policy

New information or technology that would be relevant for Wellmark to consider when this policy is next reviewed may be submitted to:

Wellmark Blue Cross and Blue Shield
Medical Policy Analyst
PO Box 9232
Des Moines, IA 50306-9232

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