I. **Purpose:** To safely and efficiently administer lymphocytes from a donor who previously donated stem cells to a particular recipient.

II. **Principle:** It is generally accepted that allogeneic hematopoietic stem cell transplantation (HSCT) is associated with an important graft versus tumor (GVT) reaction, mediated in part by donor T cells. This graft versus tumor activity can be harnessed by withdrawing immunosuppression and/or administering donor lymphocytes to some patients with recurrent or persistent disease following transplant.

III. **Scope:** Allogeneic HSCT patients with hematological malignancies who relapse post transplant.

IV. **Procedure:** Potential cases will be discussed at the HSCT Patient Care Conference. After the decision is made to pursue lymphocyte collection and insurance coverage is secured, the original stem cell donor will be contacted. The transplant coordinator will schedule laboratory work, history & physical, and consent for collection. Refer to BMT Collections SOP B2.001 Donor Evaluation and B2.002 Consent Procedures.

A. Recipient Conditions resulting in donor lymphocyte infusion (DLI):

The recipient should have hematopoietic chimerism analysis at intervals following allogeneic transplant to determine donor/recipient contribution. DLI could be potentially used if chimerism analysis indicate there is low level of engraftment by donor cells or if there is progressive loss of donor hematopoietic cells.

For example, DLI could be used alone or in combination with other treatment for relapsed CML after allogeneic HSCT. For CML cytogenetic and molecular markers such as PCR for BCR-ABL clone can be used to determine disease status. Recipients with CML may continue on a tyrosine kinase inhibitor depending on HSCT physician’s discretion.
For HSCT recipients with lymphomas, CT results can indicate the potential need for DLI.

The recipient should not have active GVHD, should not be taking immunosuppressive medications, and should be free of active infections.

B. Collection of the donor

Lymphocytes are collected from the donor once eligibility is determined according to SOP B2.001. Lymphocytes are collected according to SOP B5.001 and usually divided into at least three aliquots of: 1 x 10^7, 3 x 10^7, and 1 x 10^8 CD3+ cells/kg (recipient’s weight) according to HSCT lab SOP 2.28.

The first aliquot can be given fresh and the subsequent aliquots will be frozen for future use.

The donor is generally collected in steady state without the use of growth factors. If the recipient will receive cytoreductive therapy for recurrence, the physician may consider growth factor for stem cells along with lymphocyte collection.

C. Infusion of lymphocytes

Once patient laboratory results are reviewed, the HSCT physician infusing the lymphocytes will contact the HSCT Laboratory to arrange for a time for thawing or for when the first fresh aliquot will be available for infusion. Most patients will be outpatients and infusion can be done in the Infusion Center or the Therapy Room in the Oncology Clinic. The Donor Lymphocyte Infusion Consent is reviewed with the recipient and signed before the infusion begins.

The nurse assisting in the infusion will review the infusion orders and send laboratory work as indicated.
The recipient will have an identification armband and the lymphocytes will be verified and documented on the Product Verification Form.

A HSCT physician will infuse the lymphocytes according to SOP # B3.711

Vital signs will be taken before the infusion and every 15 minutes during the infusion. The first aliquot is usually less than 20 mls and can be given over a few minutes. Vital signs will be again taken 30 minutes after infusion. If the aliquot was frozen, the preservative DMSO will be depleted. Follow the SOP for DMSO depleted cell products SOP # B3.711.

Once the patient is clinically stable and has been assessed by the HSCT physician, the patient may leave. Printed information such as “Donor Leukocyte Infusion” and “Graft –versus-Host Disease” will be given.

D. Subsequent Infusions and follow-up

Literature suggests approximately 3- month intervals between escalating lymphocyte doses for those patients with CML. However, the physician may want to decrease the interval to as short as one month depending on the recipient’s disease process.

If the DLI interval is about three months, the recipient should be scheduled for laboratory work including: complete blood count, chemistry panel, and BCR-ABL, if appropriate, between intervals.

Once the lymphocyte doses are complete, the physician should consider sorted chimerism analysis and/or CT scans.

Consider prophylactic medications after first lymphocyte dose, if not already taking such as fluconazole, acyclovir, and TMP-sulfa.
### References:
