Transportation of Hematopoietic Progenitor Cells and Other Cellular Products

Principle/Rationale

Hematopoietic progenitor cell (HPC) and other cellular products must be transported in such a manner as to ensure cellular viability and function. Many of these components are essential for a patient’s survival, as this type of patient undergoes high-dose marrow ablative treatment prior to transplant. If a patient has received myeloablative therapy, it is essential that only knowledgeable, trained individuals transport components from the collection center to the transplant center. These components must be packaged both to protect their integrity during transport and the health and safety of individuals in the immediate area.

Specimen

1) HPC products
2) Therapeutic cells
3) Other products

Equipment/Reagents

1) Validated thermally insulted shipping container (cooler) labeled as biohazardous
2) Plastic zip lock biohazard bags
3) Absorbent material such as Chux.
4) Frozen gel packs
5) Room temperature gel packs
6) Refrigerated gel packs
7) Temperature recording unit less than –130°C or equivalent
8) Monitoring device for –30 to 85°C
9) Liquid nitrogen (LN$_2$) dry shipper
10) Appropriate insulated container for shipping via Fed Ex either at 4°C or at room temperature (20–24°C)
11) Alcohol wipes

**Quality Control**

1) LN$_2$ dry shipper containing a temperature monitoring device.
2) The LN$_2$ dry shippers are validated twice per year to ensure that they are holding temperature less than −140°C for at least 72 h.

**Procedure**

A) **For Transportation of Products within Contiguous Facilities**
   1) Disinfect the inside and outside of a validated transport container.
   2) Place product in a plastic zip lock biohazard bag and seal to prevent leakage.
   3) Package product in cooler:
      a) For thawed products:
         1) Disinfect two refrigerated gel packs with alcohol wipes.
         2) Place product on a refrigerated gel pack.
         3) Wrap product and refrigerated gel pack in absorbent material and place in cooler.
         4) Place a second refrigerated gel pack on top of product.
      b) For fresh products:
         1) Disinfect two room temperature gel packs with alcohol wipes.
         2) Place on a room temperature gel pack.
         3) Wrap product and room temperature gel pack in absorbent material and place in the cooler.
         4) Place a second room temperature gel pack on top of the product.

B) **Transportation of Cryopreserved Products**
   1) Prior to shipping cryopreserved product charge a dry shipper. Charging a dry shipper takes a minimum of 48 h.
   2) Coordinate with receiving facility how product will be shipped (courier service, FedEx, etc.) and how the empty dry shipper will be returned.
   3) Visually inspect dry shipper for integrity and ensure that it could withstand leakage of contents, shocks, pressure changes, and other conditions incident to ordinary handling in transportation.
   4) Ensure that temperature is below −150°C.
   5) Verify product label against the patient identifiers. Place into charged dry shipper.
a) Place cassettes or vials in a plastic bag.
b) Do not remove the outer metal cassettes from products that are being shipped.
c) Place absorbent and packing material in dry shipper around product so that product is snug.
d) Ensure that product does not remain at room temperature for longer than 2 min.

6) Place product in the center of dry shipper and close the inner lid.
7) Ensure that all records required for transport are included.
   a) Close the lid and secure using zip ties, tape, or other means.
8) Upon return of dry shipper:
   a) Reinspect integrity and ensure that it could withstand leakage of contents, shocks, pressure changes, and other conditions incident to ordinary handling in transportation.
   b) Download temperature history of the container from the temperature recording unit (when applicable).

C) Transit Time
   1) For all products, the transit time must be adequate to ensure product safety.
   2) For all products, the transit time should ensure adequate time will remain upon arrival for processing and/or infusion.

Additional Information

A) If a recipient is myeloablated, HPC’s shall be hand-carried by a courier who has received instruction in transportation requirements.
B) HPC products MUST NOT BE IRRADIATED and therefore must not be passed through any type of x-ray device during transport.
C) If commercial transportation is used such as airline transportation, fresh products must be carried in a temperature and pressure-controlled compartment. These products shall be hand-carried, packaged as indicated in the aforementioned procedure by a person who is qualified by training to transport this type of product.
D) Fresh products must be transported in a rigid, puncture-proof container and NEVER left unattended.

Further Reading