PROCEDURE
Corewell Health East - Handling Dry Ice for Tissue Transport to Operating Room - Farmington Hills, Grosse Pointe, Royal Oak, Troy

This Procedure is Applicable to the following Corewell Health sites:
Corewell Health Beaumont Grosse Pointe Hospital, Corewell Health Beaumont Troy Hospital, Corewell Health Farmington Hills Hospital, Corewell Health William Beaumont University Hospital (Royal Oak)

Applicability Limited to: N/A

Reference #: 33871

Version #: 2

Effective Date: 11/12/2025

Functional Area: Clinical Operations, Laboratory

Lab Department Area: Lab - Blood Bank

1. Principle

The purpose of this document is to provide the Blood Bank staff with information and procedures for safe handling of dry ice when storing and transporting tissues requiring storage temperatures less than -40°C to the operating room.

Dry ice is the solid form of carbon dioxide (chemical formula CO2), comprising two oxygen atoms bonded to a single carbon atom. It is colorless, with a sour zesty odor, non-flammable, and slightly acidic. Dry ice will sublime (vaporizes directly to a gaseous state) at a temperature of -78.5°C (-109.3°F) or higher. It sublimates at 10% or 5 to 10 pounds every 24 hours, whichever is greater.

2. Responsibility

Personnel who have completed the competency requirements will perform these tasks.

3. Definitions

A. Dry ice: A solid form of carbon dioxide, non-combustible, available in flakes, pellets, or blocks form.
B. Sublimate: The transition from the solid phase to the gas phase without passing through an intermediate liquid phase.
C. PPE: Personal protective equipment

4. Hazards of Handling Dry Ice

A. Store dry ice in an insulated container: The thicker the insulation, the slower it will sublimate.
B. Do not store dry ice in a completely airtight container. The sublimation of dry ice to carbon dioxide gas will cause any airtight container to expand or possibly explode.
C. Do not store dry ice in a refrigerator or freezer: The extremely cold temperature will cause the thermostat to turn off on the freezer.
D. Displacement of Oxygen/Asphyxiation: Dry ice is capable of causing asphyxiation by displacing breathable air. To avoid such conditions, natural ventilation should be used.

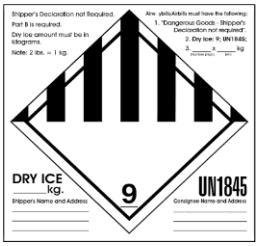
5. Reagent/Equipment Needed

A. Dry ice
B. Validated Styrofoam™ cooler
C. PPE: cryogenic protective gloves and apron, safety glasses or goggles

6. Procedure

A. **Transferring Dry Ice into a Styrofoam ™ Storage Container:** Styrofoam™ coolers filled with dry ice are used as temporary storage containers when transferring frozen tissue products to the operating room (OR). Designated coolers are available in the triage area. Due to the safety hazards that dry ice poses, the following steps must be done to promote the safety of the handler:

1. Put on a pair of cryogenic gloves, cryogenic apron or lab coat, and safety glasses or goggles.
   a. Exposed skin surfaces of the handler should be minimized.
   b. Gloves should fit loosely and the handler should be able to shake the gloves free from the hands.
2. Use a plastic or metal scoop to transfer dry ice into the designated storage container.
   a. Tissue Styrofoam™ containers are clearly marked as Human Tissue Intended for Transplant.
   b. Storage containers must have a fixed UN1845 safety label.



   c. Storage containers must also have fixed transport instructions. See attachment, *Tissue Dry Ice Cooler Instruction*.
3. Fill the container with dry ice to the designated line and place the human tissue on the dry ice so the maximum surface area of the graft is in contact with the dry ice.
4. Replace the lid.

B. Disposal of Dry Ice:

1. Dry ice should dissipate in an open storage container. This container may be a Styrofoam™ cooler or a cardboard box.
2. Do not put dry ice in the sink. Due to the extreme temperature of dry ice, it can adversely affect the plumbing.
3. Do not run water over dry ice to accelerate dissipation.
4. Place the temporary container out of the flow of work traffic.

7. Warnings

A. **First Aid:**

1. Exposure of skin or eyes:
2. If skin or eyes come in contact with dry ice, flood the exposed area with large quantities of unheated water.
3. Eye wash stations located in the blood bank may be used to irrigate the eyes.
4. Protect affected areas with loose, bulky, dry, and sterile dressings.
5. Do not rub affected areas to warm. This activity may cause further damage to tissue.

B. **Asphyxiation:**

1. If a person is overcome by loss of oxygen while working with dry ice, move that individual to a well-ventilated area immediately.
2. Artificial respiration should be immediately started if breathing has stopped.

3. In all cases, notify your direct supervisor and seek medical help immediately. Refer to Corewell Health East - Dry Ice Handling - All Beaumont Hospitals and Work Related Injury & Illness

8. Special Notes

A. MSDS for dry ice can be accessed at: SDS Vault
B. Dry ice may be ordered directly by the Blood Bank. The following is a contracted source:
   1. HAV-A-BAR INC. at (810) 234-4155 or toll free at (800) 875-2227.
   2. FAX (810) 234-7216
C. Dry ice is also available in the Royal Oak Research Building for all sites:
   1. Location: Royal Oak Basement, LL BRL Store Room
   2. If the store room is locked, call (248)551-5024.
   3. Please record the volume of dry ice removed on the log located next to the dry ice bin.

9. Resources

A. Laboratory Safety Cryogens & Dry Ice
B. UN1845 Label

10. References

A. Association for the Advancement of Blood & Biotherapies, Standards, current edition
B. American Association of Tissue Banks, Standards, current edition

11. Procedure Development and Approval

Document Owner:
Laura Judd (Operations Specialist)

Writer(s):
Wendy Frizzo (Bone and Tissue Coordinator)

Reviewer(s):
Alyssa Malone (Medical Technologist Lead), Karrie Torgerson (Medical Technologist Lead), Susan Pelley (Medical Technologist Lead)

Approver:
Ann Marie Blenc (System Med Dir, Hematopath), Brittnie Berger (Dir Sr, Lab Operations), Christopher Ferguson (Dir, Laboratory Services), Hassan Kanaan (OUWB Clinical Faculty), John Pui (Chief, Pathology), Kelly Sartor (Mgr, Division Laboratory), Kristina Davis (Staff Physician), Masood Siddiqui (Staff Pathologist), Ryan Johnson (OUWB Clinical Faculty), Sarah Britton (VP, Laboratory Svcs), Teresa Lovins (Supv, Laboratory)

12. Keywords

Not Set