ADVOCATE HEALTH		
Title: Liquid Nitrogen Use, Precautions, and Exposure Policy (NCBH)		**Document Number: 54926**
Document Type: ☒ **Policy** ☐ **Procedure** ☐ **Guideline** ☐ **Other**		**Last Review/Revision Date: 02/21/2023**
Content Applies to Patient Care: (Select all that apply) ☒ **Adults** ☐ **Pediatrics (Under 18)**	**Content Applies to: (Select One)** ☒ **Clinical** ☐ **Administrative**	**Effective Date: 02/21/2023**
Scope: ☐ **Enterprise** ☐ **MW Region** ☐ **SE Region** ☐ **WI** ☐ **IL** ☐ **Greater Charlotte Market** ☐ **Navicent Market** ☐ **Wake Market** ☐ **Floyd Market** ☒ **Entity Only (Entity Name): NCBH** ☒ **Department Only (Department Name): SCTCT**		

I. PURPOSE

Liquid Nitrogen (LN_2) is used in the Stem Cell Transplant and Cellular Therapy (SCTCT) Lab to cryopreserve stem cells. LN_2 is a cryogenic liquid, or a liquefied gas that has a boiling point of less than -73°C. LN_2 therefore has hazardous properties, and specific instructions for its handling and dealing with exposures.

II. SCOPE

This document applies to NCBH SCTCT staff and management

III. DEFINITIONS/ABBREVIATIONS

LN2: Liquid Nitrogen
SCTCT: Stem Cell Transplant and Cellular Therapy
PPE: Personal Protective Equipment

IV. POLICY

SECTION I: HANDLING LN_2

- Access to LN_2 sources shall be limited to authorized personnel.
- Employees of the SCTCT lab must be trained in the use of LN_2 equipment. Refer to ***Microbulk Liquid Nitrogen Supply*** and ***Changing Liquid Nitrogen Tanks.***
- Never store cryovials in the liquid phase of nitrogen as they might explode
- Store products in the vapor phase of liquid nitrogen when possible to avoid splashing and possible exposure.
- Always use a lab coat, cryogloves, and a face shield when handling products stored in liquid nitrogen, or when changing liquid nitrogen hoses on dewars.
- Maintain LN_2 supplied equipment in well-ventilated areas.
- An oxygen monitor should be employed in a space containing LN_2 supplied equipment.

- Equipment containing cryogenic fluid should be stored in specific, validated containers which are not above eye level.
- Never touch uninsulated pipes or vessels without PPE.
- Never remove product identification labels from LN^2 dewars.
- LN_2 containers and equipment should be stored away from corrosives and combustible materials.
- LN_2 dewars are **NEVER** to be transported in an elevator with persons on the elevator.
- In case of breach of LN_2 vacuum-jacketed piping, immediately shut down the bulk system and evacuate area; Notify engineering, management, and medical director immediately.
- There are 2 emergency shutoff buttons for the bulk LN_2 system; One is next to the door in the Cryo Room and one is in the Blood Bank on the wall on the way from the Blood Bank to the Blood Bank Conference Room.
- If you must evacuate the SCTCT Lab prior to shutting down the bulk system during a large LN2 breach, utilize the Blood Bank shutoff valve to disable the system.
- The LN2 system can be reenabled by pulling out on the emergency stop button.

SECTION II: PPE AND CLOTHING CONSIDERATIONS TO BE USED WITH NITROGEN

- Do not wear open or canvas shoes while handling LN_2.
- Do not wear pants with cuffs while handling LN_2.
- Always wear cryogloves, a lab coat and a face shield when handling LN_2.
- Cryogloves should be loose fitting so they can be easily removed in case of exposure.
- Shoulder-length cryogloves are available for some tasks.
- Never touch uninsulated pipes or vessels without PPE.

SECTION III. EXPOSURE TO LN_2

- Treatment for LN_2 exposure should be given pending the care of a physician ONLY if there is no immediate risk to the caregiver.
- For skin contact, remove any clothing that may restrict circulation to the area.
- Do not rub frozen parts, as tissue damage may result.
- Do not walk on frostbitten feet.
- As soon as possible, place affected area in warm (NOT HOT) water.
- Never use dry heat to treat LN_2 exposure.
- If part of body is frozen, thaw with warm (NOT HOT) water, and cover with a dry sterile dressing pending medical care.
- In case of massive exposure, shower the victim with warm water while removing clothing.
- Victims suffering from lack of oxygen should be moved immediately to fresh air.
- If the victim is not breathing, administer artificial respiration.

- If breathing is difficult, administer oxygen.

V. CROSS REFERENCES

- Microbulk Liquid Nitrogen Supply Procedure
- Changing Liquid Nitrogen Tanks Procedure
- Material Safety Data Sheet, LN2 Form
- Airgas Safe Handling and Use of Specialty Gases Appendix Form (NCBH)
- Airgas Cryogenic Liquid Containers Appendix Form (NCBH)
- Pathology Laboratory Safety Manual
- Precautions for Mechanical and Thermal Hazards

VI. RESOURCES AND REFERENCES

- Safe Handling and Use of Specialty Gases and Cryogenic Liquid Containers, Appendix, Airgas.com

VII. ATTACHMENTS

Not Applicable