



## Nursing Service Guideline General

**Title:** **DRY ICE CRYOAMPUTATION OF AN EXTREMITY**

**Responsibility:** Registered Nurse (RN)

**Equipment:** Obtain dry ice application box from MICU Storage Room

**INCLUDED IN SUPPLY BOX:**

- 1. Instructions for obtaining dry ice\***
2. Insulated bags
3. Insulated work gloves
4. Goggles

**Obtain from Unit/Central supply:**

1. Kling gauze/kerlix
2. Tape – silk, elastoplast, refrigerator
3. Permanent marker
4. Bath towels/washcloths
5. Heating pad with pillowcase cover
6. Blanket rolls

Optional from Central: Abductor pillow

Note: Call to obtain dry ice as soon as possible after being ordered. Delivery times vary.\*

**Procedure**

1. Check two patient identifiers to determine the correct patient is being treated. **Check for physician's order and that a signed consent for freezing and amputation has been obtained.**
2. Remove all clothing from extremity and position all IV tubing's and catheters away from involved extremity.
3. Perform time out procedure as per Hospital Administration policy 3364-100-53-05; Universal Protocol policy- Procedural verification/time out.
4. The physician will :
  - A. Mark the upper level to which the dry ice is to be applied with a permanent marker or with adhesive tape around the extremity at the desired level.
  - B. Mark the remainder of the extremity above the iced area to indicate the upper limits beyond which the frost line should not be permitted to extend.
5. Wrap the extremity with Kling or Kerlix bandage to the first mark.

**Point of Emphasis**

Dry ice refrigeration of an extremity is **irreversible** and is always followed by an amputation.

Do not want dry ice contact with anything except intended extremity. Healthcare professionals should be sure to use insulated work gloves and safety glasses. Arms should be covered when handling dry ice.

Due to irreversible damage to the extremity, a time out should be performed.

<u>Procedure</u>	<u>Point of Emphasis</u>
6. Place the appropriate extremity in the insulated bag through the open end of the bag.	Obtain an insulated bag from the Dry Ice Application Supply Box -choose the appropriate size pouch for the extremity receiving the dry ice application based on the actual patient extremity size. Rough guidelines: Small - Hand/Foot Medium – Arm/lower extremity below knee Large – Leg/generally above the knee *note the bags can be trimmed for proper fit.
7. Place the dry ice from the insulated delivery box/cooler in the insulated bag around the extremity to the desired mark.	Obtain dry ice in the form and the size, in which it will be used, pellets are best for this application. Never saw or break the dry ice with a hammer. Use insulated glove/safety glasses and preferably long sleeves when handling dry ice.
8. Pad and insulate the opening in the end of the bag with a washcloth/towel and then seal with adhesive tape (i.e.: silk, refrigerator or elastoplast)	If the area around the slot is not properly insulated and sealed, the carbon dioxide gas may leak out and cause the frost line to extend up the extremity.
9. Cover a heating pad with a pillowcase and then wrap the heating pad around the part of the extremity outside of the insulated bag- then tape heating pad securely to extremity.	Make certain that the heating pad does not touch the insulated bag or the refrigerated extremity. Allow for <u>at least one inch</u> of clearance between the insulated bag and the heating pad.
10. Check the level of the frost line <b>every hour</b> . The frost line will usually <u>extend 2-3cm above the highest level of dry ice placement</u> .	Observe the extremity closely because if the frost line begins to extend up beyond the desired level this may necessitate a higher amputation than was originally planned. <b>Notify the physician immediately of frost line extension.</b>
11. Check the dry ice in the insulated bag around extremity every eight hours. Replace as needed.	CAUTION! Avoid contact with with skin and eyes for dry ice can cause severe frostbite. Dry ice is - 109°F (-79°C).
12. Maintain patient on bed rest. Sedation may be necessary. Blanket rolls on each side of the leg may provide additional insulation for the dry ice and may also inhibit movement of the patient's extremity.	Do not allow the patient to move excessively for the patient may break the seal where the extremity enters the insulated bag or may accidentally move the extremity further down into the dry ice, thus extending the frost line.
13. Keep other parts of the body away from the insulated bag and involved extremity. The blanket rolls and an abductor pillow can be helpful in isolating an extremity.	To avoid frostbite to other areas of the body.

Procedure

Point of Emphasis

14. Documentation: Include observations and conditions of the affected extremity and the frost line on the Special Report Sheet. Documentation will always include the date and time cryoamputation started as well as the time any additional dry ice is applied. Every 1-hour checks will document ice line check, frost line check, protection of other extremities from cold using pillows, blankets, abductor pillows, use of heating pad covered with pillow case, etc.

Initially the skin will become red, cold and firm. Later the extremity will appear cold, hard and be covered with frost. Note: **If freezing extends beyond the upper marked line notify physician immediately.**

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Approved: 4/2009  
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References: Pascual, J., Cannon, J., Rodgers, H., Rogalski, A., & Kaplan, L. (2017). Cryoamputation: A paradigm for safe emergency medical amputation and immediate local infection control without antimicrobial resistance induction. *Surgical Infections Case Reports*, 2(1), 109-112. [www.praxair.com](http://www.praxair.com), Safe Handling and Storage of Dry Ice, Accessed September 2, 2020.