PROCEDURE

Title: Freezer Alarm Policy

Procedure #: 2015BLOODBANK70

Institution: Highlands Regional Medical Center

Address: 3600 Highlands Avenue, Sebring Florida 33870

Prepared by: Anita Smith Date: 6/12/2015

Title: Laboratory Administrative Director

Accepted by: _____ Date: 6/12/15

Title: Laboratory Medical Director

Date Patient Testing Implemented: 6/12/2015

Review of procedure every two years

Reviewed by: _____ Date: _____

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Reviewed by: _____ Date: _____

Discontinued testing date: _____

Policy Title: Freezer Alarm Monitoring Policy

Audience: Laboratory Staff

References and Citations: AABB Technical Manual CURRENT Edition, Standards CURRENT Edition

I. POLICY

The quality of blood products is ensured by keeping them stored at the proper temperature.

A. There must be a system to continuously monitor the temperature of the freezer.

B. The thermometer and alarm should be checked periodically to ensure they are functioning properly.

C. In the event of an emergency (power failure, freezer failure, etc.) an approved plan for the storage of the products in an alternate freezer will be initiated.

D. Daily checks
1. Read and record temperature of internal thermometer
2. Read and record temperature of LCD display
3. Comparing the temperature in #1 and #2 with the "automatic recorder" on exterior of the freezer
4. Check audible alarm

E. Quarterly checks
1. Check high/low activation temperatures

II. PROCEDURE

A. **EMERGENCY ACTIONS**
1. When the alarm sounds
   a. Press the "□" button to silence the audible alarm
   b. Check temperature of freezer
   c. Check if door is ajar
      1) If door is ajar
         a) Close door
         b) Monitor temperature, is it returning to normal?
            i. Yes, proceed to step g
            ii. No, proceed to step d
      2) If door is not ajar
         a) Proceed to step d
   d. Call Maintenance Department for a "STAT" evaluation and/or repair
   e. Move contents of freezer to the chemistry freezer (-18°C) if the temperature can not be returned to -18°C or lower quickly
   f. Monitor and record the temperature of Chemistry Freezer every 4 hours while components are stored there (See example log following procedure)
   g. Press "Δ" and "∇" buttons simultaneously, hold for 5 seconds to reset alarm
   i. Document all temperature fluctuations
      1) Record on freezer log
      2) Record on chart

NOTE: If temperature of freezer is within limits and the problem is with the internal thermometer/probe, components may remain in the freezer but the temperature must be monitored/recorded every 4 hours until problem is resolved

2. Alarm Malfunctions
   a. Check units in freezer
      1) Have the units started to thaw
   b. Move units immediately to Chemistry's freezer
      1) Monitor Chemistry freezer every 4 hours
   c. Contact the Pathologist and Supervisor immediately
      1) Medical Director will decide final disposition of the units
      2) Medical Director/Supervisor will decide if and when One Blood needs to be contacted
   d. Contact Maintenance department for a "STAT" evaluation and/or repair

B. **PERIODIC TESTING**
   1. Daily
      a. Read and record temperature using the thermometer
         1) Acceptable range < -18°C
         2) Notify supervisor if temperature is out of range
      b. Read and record temperature of the LCD display
      c. Read and record temperature of the chart recorder
         1) Readings must compare +/- 1°C
            a) If not compare both the thermometer and the recording thermometer against a NIST thermometer
            b) Contact Maintenance if the recording thermometer is the problem
            c) Discard the thermometer if it is the source of the problem
         2) Document any adjustments on log
         3) Notify supervisor
      d. Check audible alarm
         1) Press "Δ" and "□" buttons simultaneously, hold for 5 seconds
            a) Alarm will sound
            b) If alarm does not sound notify Maintenance Department for a "STAT" evaluation and/or repair
            c) Notify supervisor
            d) Chart recorded chart is changed every Monday morning
         1) Remove old chart - date and initial
         2) Stamp new chart with "Brandywine Hospital and Trauma Center" stamp
         3) Date and initial new chart
         4) Place new chart on recorder, lining up pen on correct day and time
   2. Quarterly
      a. Reagents and special supplies
         1) Reagents
            a) Ethylene glycol (anti freeze)
         2) Thermometer that will read between -30°C to -14°C
         3) Container for anti-freeze
      b. Procedure
         1) Record on maintenance log
            a) Initial temperature of the internal thermometer

b) Temperature displayed on the chart recorder
2) Fill the container ½ way full with anti-freeze
a) Keep a small amount of anti-freeze at room temperature
3) Place the half full container into the freezer
4) Allow temperature of anti-freeze to equilibrate to the freezer temperature
5) Use an NIST certified or traceable thermometer for testing
6) Place the thermocoupler and the thermometer (from step 5) into the anti- freeze container
7) Slowly add small amounts of the room temperature anti- freeze to the "cold" container
8) Gently agitate container, this will warm the cold anti-freeze slowly
9) Continue to add small amounts of the room temperature anti-freeze until the alarm sounds
10) Record the temperature at which the alarm sounds on the log - Acceptable $\leq$-18^{0}C
11) Complete log, include:
a) Date
b) Initials of person doing the test
12) Return the freezer and alarm system to their normal conditions
13) Take appropriate corrective actions if:
a) Alarm sounds to high (>-18°C)
1) Call Maintenance
2) Record any corrections made
3) Notify supervisor

c. Clean exterior with a mild disinfectant
d. Record on Maintenance Log

3. Yearly
a. Clean condenser
1) Maintenance department schedules and performs this preventive maintenance

C. PROCEDURE NOTES

1. Freezer malfunctions - common causes
a. Freezer door not properly shut
b. Low level of refrigerant
c. Compressor failure
d. Dirty heat exchanger
e. Loss of electrical power
2. When using an alternate freezer for back up, the temperature of this freezer MUST be recorded every 3-4 hours. **Monitoring times may NOT EXCEED 4 hours between readings!**
3. Use of and all maintenance performed is in compliance with the manufacturer's specifications.
4. Equipment will need to be revalidated after any repair.
5. Follow-up review of any evaluation and/or repair is done by the supervisor and is reported to the Pathologist and at the QA meetings.