PROCEDURE

Title: Blood Bank Refrigerator Policy

Procedure #: 2015BLOODBANK65

Institution: Highlands Regional Medical Center

Address: 3600 Highlands Avenue, Sebring Florida 33870

Prepared by: Anita Smith Date: 6/5/2015

Title: Laboratory Administrative Director

Accepted by: _____, MD Date: 6-5-15

Title: Laboratory Medical Director

Date Patient Testing Implemented: 6/5/2015

Review of procedure every two years

Reviewed by: _____ Date: _____

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Reviewed by: _____ Date: _____

Discontinued testing date: _____

Policy Title: Refrigerator Alarms_Maintenance Policy

Audience: Laboratory Staff

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

I. POLICY

The quality of blood is ensured by keeping the units stored at the proper temperature in the Blood Bank's refrigerator.

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

B. The thermometers and alarms should be checked periodically to ensure they are functioning properly.

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

D. Daily checks
1. Reading and recording the temperatures from the thermometers in all locatioins in the refrigerators
2. Comparing the readings from #1 with the "automatic recording chart" on exterior of the refrigerators
3. Check audible alarms

E. Quarterly checks
1. Checking high/low temperature activation of the refrigerator alarms

II. PROCEDURE

A. EMERGENCY ACTIONS

1. Refrigerator - when the alarm sounds
   a. Press the "Start" push button switch one time to silence the alarm
   b. Check closure of doors
   c. Check temperature of both upper and lower solutions
   d. Wait 5 minutes (the alarm will sound again)
   e. Contact Maintenance for a "STAT" evaluation and/or repair if temperature has not returned to a safe level
   f. Move blood to the hematology refrigerator if problem cannot be fixed immediately
      1) The temperature must be monitored every 3-4 hours until the problem is resolved.
   g. Notify Supervisor
   h. Document all temperature fluctuations
      1) Record on the refrigerator log
      2) Record on the chart

2. Alarm Malfunction of Double door refrigerator
   a. Take the temperature of different units in several locations in the bank
   b. Contact the Pathologist and Supervisor IMMEDIATELY if unit temperatures are >10°C or <1°C
   c. Medical Director will decide final disposition of blood
   d. Medical Director/Supervisor will decide if and when ARC needs to be contacted

e. Move blood immediately to the single door refrigerator regardless of what temperature readings of the units were
f. Contact Maintenance for a "STAT" evaluation and/or repair

B. PERIODIC TESTING
1. Daily
a. Read and record the temperature from both thermometers in the refrigerators
1) Acceptable range = 1° to 6°C for PC and 2°C to 8°C for reagents.
2) Record upper and lower solutions using display
b. Compare readings from step "a" with the "Automatic Recording Chart" on the exterior of refrigerators
1) Readings must compare with in ± 1°C
a) If not, compare the thermometer and the recording thermometer against the NIST thermometer
b) Contact Maintenance if the recording thermometer is the problem
c) Discard the thermometer(s) if they are the source of the problem
d) Notify supervisor
2) Document any adjustments
3) Notify Supervisor
c. Check audible alarm
1) Press "Low alarm" push button to activate low alarm
2) Record on the log, the display temperature when alarm sounds
3) Press "High alarm" push button to activate high alarm
4) Record on the log, the display temperature when the alarm sounds
5) If alarms do not sound, contact Maintenance Department to make adjustments
6) Document any adjustments
7) Notify Supervisor
d. Automatic temperature recording chart is to be changed weekly
1) Remove old chart
a) Press the number "3", located above the chart, for one second
b) Pen will move off chart
2) Stamp new chart with "Brandywine Hospital and Trauma Center" stamp
3) Date and initial new chart
4) Indicate which refrigerator chart is being placed on:
a) Write "Single", or
b) Write "Double"
5) Place new chart on recorder
a) Press the number "3" again for one second
b) Pen will move back on the chart
6) Date and Initial old chart
7) Place old chart on supervisor's desk for review
2. Quarterly
a. Low Alarm activation (this one should always be done first)
1) Fill a 250ml beaker half full with chilled water (4°C)
2) Fill another beaker with crushed ice (get ice from the Emergency room or Recovery room)

3) Remove the sensor from the upper solution bottle (it is labeled as "upper probe")
4) Tape sensor to the test thermometer (NIST certified or traceable)
5) Place sensor and thermometer into the beaker half filled with water
6) Slowly, add the crushed ice (approximately 1 teaspoon every 15 to 25 seconds) to the water filled beaker
7) Stir the test thermometer/monitor sensor constantly in a circular motion, keeping the sensor ends in the lower liquid, NOT in the upper ice slurry
8) Log the low alarm activation on the log
Expected = 2.5°C Acceptable = >2.0°C

NOTE: Any deviation from "Expected" result, notify Supervisor.

b. High Alarm activation (perform immediately after the low alarm activation testing)
1) Slowly, add warm water to beaker of ice slurry
2) Constantly stir the test thermometer/monitor sensor in a circular motion, keeping the sensor ends in the lower liquid, NOT in the upper ice slurry
3) Log the high alarm activation
Expected = 4.5°C Acceptable = <6.0°C

NOTE: Any deviation from "Expected" result, notify supervisor.

c. Clean outside cabinet with disinfectant

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

C. PROCEDURE NOTES

1. When using an alternate refrigerator for back-up the temperature MUST be recorded every 3-4 hours. **Monitoring times may NOT EXCEED 4 hours between readings!**
2. **When the temperatures of activation are checked, the change in temperature should be allowed to occur slowly enough that the slowly responding thermocouple can respond. Too rapid a change in temperature may give the false impression that the alarm does not sound until a higher or lower temperature is registered.**
3. The low temperature of activation should be no lower than 2°C; the high temperature of activation no higher than 6°C. Low activation above 2°C and high activation below 6°C are acceptable and within the AABB Standards.
4. The amount of fluid in which the thermocouple is immersed must be no larger than the volume of the smallest component stored in the refrigerator. The thermocouple may be immersed in a smaller volume, but this makes the alarm go off with small temperature changes than those registered in a larger volume of fluid.
5. Use of and all maintenance performed is in compliance with the manufacturer's specifications.
6. Equipment will need to be revalidated after any repair.
7. 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.