TRAINING UPDATE

Lab Location:	SGAH and WAH	**Date Implemented:**	3.28.2014
Department:	Blood Bank	**Due Date:**	4.15.2014

DESCRIPTION OF PROCEDURE REVISION

Name of procedure:
Thermometer Verification and Installation
Description of change(s):
Updated procedure to reflect new CAP wording.... "Calibrate/calibration" was changed to "verify/verification" throughout the document.

Electronic Document Control System

Quest Diagnostics

Document No.: WAH.BB89[1]
Title: THERMOMETER VERIFICATION AND INSTALLATION
Owner: LESLIE.X.BARRETT LESLIE BARRETT
Status INWORKS
Effective Date: 26-Apr-2014 **Next Review Date:**

Non-Technical SOP

Title	**Thermometer Verification and Installation**	
Prepared by	Stephanie Codina	Date: 3/26/2011
Owner	Stephanie Codina	Date: 3/26/2011

Laboratory Approval		
Print Name and Title	**Signature**	**Date**
Refer to the electronic signature page for approval and approval dates.		
Local Issue Date:	Local Effective Date:	

Review:		
Print Name	**Signature**	**Date**

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1. PURPOSE

All thermometers used in the blood bank, including those used in blood product storage devices, are verified before initial use and annually thereafter to ensure accurate temperature readings. The thermometer is re-verified anytime there is reason to suspect change or damage.

When possible, thermometers that have a certificate of accuracy documenting comparison with a NIST standard will be used.

2. SCOPE

This procedure applies to any thermometer used in the blood bank.

3. RESPONSIBILITY

All blood bank staff members must understand and follow this procedure for thermometer installation, verification, and tracking.

4. DEFINITIONS

- NIST standard: The National Institute of Standards and Technology is a physical science research laboratory that supplies reference materials of the highest quality. Verification of thermometers against and NIST standard ensures accurate temperature readings.
- NIST-Certified Thermometer: A thermometer certified by the NIST.
- NIST-Traceable Thermometer: A thermometer guaranteed by the manufacturer to meet NIST standards or be traceable to a NIST thermometer.

5. PROCEDURE

Verifying Thermometers

Step	Action
1	All new thermometers will arrive with a certificate documenting comparison with an NIST-certified or NIST-traceable thermometer. A. Write the date the thermometer was received on the certificate. B. File the certificate in the "Thermometers" folder of the equipment file. The certificate must be maintained for the life of the thermometer.
2	Thermometers will be identified by their serial number. The serial number is traceable to the NIST certificate. The thermometer will be assigned a unique identifier if it does not contain an engraved serial number.
3	Inspect the thermometer carefully for cracks and separations in the liquid column and reunite columns that have been separated. A. Heating Method a. Heat the thermometer in the upright position away from your face in warm water. b. Allow the liquid to rise slowly until the separated portion of the column enters the expansion chamber at the top of the thermometer. Note: Overfilling the expansion chamber will break the thermometer. c. Tap the thermometer gently in an upright position allowing the gas separating the column to rise above the column. d. Allow the thermometer to cool slowly in an upright position. B. Cooling Method a. Prepare a solution of crushed ice and salt. Place the thermometer bulb only in the solution. b. Keep the thermometer upright. c. Allow the liquid column to retreat into the bulb. d. Swing the thermometer bulb down in an arc to force the entrapped gas above the column. e. Allow the thermometer to warm slowly in an upright position. C. Discard any thermometer whose fluid cannot be reunited.
4	Divide the thermometers by temperature range. Each thermometer will be verified at the temperature range that it will be used. Blood bank routinely uses the following: A. Freezer temperature ≤ -18°C B. Refrigerator temperature 1-6°C C. Room temperature 20-24°C D. Body temperature 36-38°C

Step	Action
5	Heat or cool a solution at the temperature the thermometers will be verified until a stable temperature has been reached. For some, the bottle in which the refrigerator/freezer probes are stored can be used. A. For freezer thermometers, place ethylene glycol, propylene glycol, or mineral oil in a cup and store in the freezer. B. For refrigerator thermometers, place saline or water in a cup and store in a refrigerator. C. For room temperature thermometers, place saline or water in a cup and store in the platelet incubator or at room temperature. D. For 37°C thermometers, use a waterbath or place saline or water in a container in the heating block. a. For watherbath, place the thermometer in a test tube rack and place the test tube rack in the waterbath. b. For heat block, place a test tube in the heat block and add the thermometer. Add water to the top of the heat block. Allow to warm sufficiently before reading.
6	Once the temperature of the solution has equilibrated, place the thermometer to be verified and the NIST-traceable thermometer in the solution together. A. Ensure their bulbs are at uniform depth. Rubber-banding the thermometers together can help with this. B. Allow the thermometers to remain in solution for a minimum of 5 minutes until the temperature equilibrates.
7	Document the serial numbers of the test and NIST-traceable thermometers on the "Thermometer verification Log" form.
8	Observe and record the temperature of each thermometer. Document the temperatures on the "Thermometer Accuracy Verification Log." A. The thermometer reading must agree with the NIST-traceable thermometer within 1°C. B. If the difference between the two readings is greater than 1°C, the thermometer should be returned to the vendor (if new) or discarded. C. Document the acceptability of the verification on the QC form. D. Document corrective action on the form, if applicable. E. Date and document tech identification.
9	Attach a tag to the top of the thermometer and label with the verification date, temperature at which it was verified, any variation from the reference thermometer, and tech initials.

Quest Diagnostics Nichols Institute
Site: Washington Adventist Hospital
Title: Thermometer Verification and Installation

Step	Action
10	Utilize the "Thermometer Inventory Log" to track the placement of each thermometer. A. Indicate "storage" as the location if the thermometer is currently not in use. B. Update the information each time a thermometer is discarded or placed into service. C. Thermometers must always be stored in an upright position.
11	Some thermometers are stored in a plastic sleeve. The plastic sleeve is treated with an anti-fogging material, but it loses effectiveness over time. Ordinary eyeglass defogger can be applied to the plastic sleeve if needed to ensure accurate reading of the thermometer.

6. RELATED DOCUMENTS

Certified Thermometer Verification Record (Documentation that the NIST-traceable reference thermometer meets specifications)
Form: Thermometer Accuracy Verification Log (AG.F93)
Form: Thermometer Inventory Log (AG.F280)

7. REFERENCES

1. Roback, J.D., Combs, M.R., Grossman, B.J., Hillyer, C.D. 2008. Technical Manual of the AABB, 16th ed. AABB Publishing, Bethesda, Maryland.
2. Standards for Blood Banks and Transfusion Services, 2014. AABB, 29th ed. AABB Publishing, Bethesda, Maryland.
3. Temp-Chex Instruction Information and Certificate of Accuracy, Streck Laboratories, LaVista, NE.

8. REVISION HISTORY

Version	Date	Reason for Revision	Revised By	Approved By
		Supersedes WAH-SGAH B503.001		
000	3.26.14	All sections: Changed terminology from "calibrated" to "verified." Footer: version # leading zero's dropped due to new EDCS in use as of 10/7/13.	SCodina	NCacciabeve

9. ADDENDA AND APPENDICES

N/A

Electronic Document Control System

Quest Diagnostics

Document No.: AG.F93[1]
Title: THERMOMETER ACCURACY VERIFICATION LOG
Owner: LESLIE.X.BARRETT LESLIE BARRETT
Status RELEASED
Effective Date: 17-Feb-2014 **Next Review Date:** 17-Feb-2016
Implementation Date: 2/17/14 6:28 am

Review

Review: DEFAULT DOCUMENT

Approver	Status	Sign-off Date
G.S.CATHERINE ROGERS	APPROVED	12/19/13 8:25 am
CYNTHIA BOWMAN-GHOLSTON	APPROVED	12/26/13 10:52 am
NICOLAS CACCIABEVE	APPROVED	1/2/14 12:57 pm

☐ Germantown Emergency Center
☐ Shady Grove Adventist Hospital
☐ Washington Adventist Hospital

THERMOMETER ACCURACY VERIFICATION LOG

Test Thermometer Serial # or Unique ID	NIST-Traceable Thermometer Serial #	Thermometer Temperature Reading	NIST-Traceable Thermometer Temp Reading	Variance	Acceptable? Y/N	Corrective Action	Tech	Date

Tolerance Limits = +/- 1 degree
Reviewed by:_____ Date: _____

AG.F93.1 Rev 1/2014

Electronic Document Control System

Quest Diagnostics

Document No.: AG.F.280[0]
Title: Thermometer Inventory Log, Blood Bank
Owner: LESLIE.X.BARRETT LESLIE BARRETT
Status PRERELEASED
Effective Date: 01-Jan-2099 **Next Review Date:**

Review

Review: **DEFAULT DOCUMENT**

Approver	Status	Sign-off Date
STEPHANIE L CODINA	APPROVED	3/27/14 11:07 am
NICOLAS CACCIABEVE	APPROVED	3/27/14 2:18 pm

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- ☐ Germantown Emergency Center
- ☐ Shady Grove Adventist Hospital
- ☐ Washington Adventist Hospital

THERMOMETER INVENTORY LOG, BLOOD BANK

Thermometer Serial #	Thermometer Lot #	Certified Y/N	Range	Placed in Service			Broken & Discarded	
				Date	Tech	Location	Date	Tech

All non-certified thermometers must be verified before being placed into service