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Area	Laboratory-Blood Bank
Applicability	Royal Oak

Preparing, Dispensing, and Returning Components for the Helicopter - Royal Oak Blood Bank

Document Type: Procedure

I. PURPOSE AND OBJECTIVE:

The purpose of this document is to provide policies and procedures that will be used by the Blood Bank to prepare a cooler containing blood components in advance and to dispense the cooler to LifeFlight of Michigan (the helicopter service) on a daily basis.

II. INTRODUCTION:

A. The Blood Bank will prepare a small cooler that is labeled to identify its use for the helicopter with the *Helicopter Expiration* form.

B. This cooler will contain 2 type O-negative red blood cells (RBCs) and 2 type A plasmas (liquid or thawed plasma; liquid preferred). This cooler will be prepared on a daily basis, so that the components will be available each morning to dispense to the helicopter. These steps are described in the *Procedure* section of this document.

C. The triage technologists will prepare the components, document the *Helicopter Cooler Log* and pack the components in the cooler with the data logger before the Beaumont courier driver picks up the cooler for delivery at approximately 8:00 a.m. Upon return to the Blood Bank the technologists will download the information contained on the Data Logger as described in the Procedure section of this document and process the components back into inventory.

III. DEFINITIONS:

A. **ABO plasma-compatible**: Refers to a platelet, plasma, or cryoprecipitate component that does not contain ABO antibodies corresponding to the recipient's ABO antigens.

B. **Cooler**: A Blood Bank cooler or blood box that has been validated to transport blood products and

maintain a temperature between 1° and 10°C for a determined period of time.

C. **Credo Cube**: Phase Change Material (PCM) panels that surround contents to maintain a consistent, specific, temperature range.

IV. POLICIES:

A. Wristband Number

1. A plastic pouch or bag is included in the cooler, which includes one set of multiple wristband numbers (stickers). The wristband stickers appear in the format "ABC0123." Additional sets of wristbands are located in the Triage workstation, near the emergency issue forms.

B. Components Transfused on the Helicopter

1. It is the responsibility of LifeFlight of Michigan to provide the identification of the patient to whom components from the cooler are transfused.
2. If the component was transfused en route to Beaumont Royal Oak, emergency issue the components to the patient in the computer; see the Blood Bank CDM - Emergency Issue. Use the date and issue time that was documented on F-1566, *Record of Transfusion Form*. Once a sample is received on the patient, perform compatibility testing and for RBCs, post-issue crossmatches, as described in the Blood Bank CDM - Post-Issue Crossmatch.
3. If blood components are transfused to a patient en route to a different Beaumont Hospital, the transfused components will be transferred to the receiving Beaumont location in the Blood Bank computer system. The involved paperwork will be copied and sent to the receiving Beaumont location. If RBCs were transfused, the segments from the component will be sent as well so the receiving Beaumont location can perform post-issue crossmatches. The component will be brought into the inventory of that location and the transfusion will be recouped in the Blood Bank computer.
4. If blood components are transfused to a patient en route to a non-Beaumont Hospital, recoup in the Blood Bank computer will not be possible. The involved paperwork will be submitted to the manager or a lead technologist and kept in a binder at Beaumont Royal Oak. Internal comments will be added to the transfused components to indicate the details of each transfusion. The transfused components will be transferred out of the Blood Bank computer system and the cost of the blood components will be billed to LifeFlight of Michigan.
5. For additional information, refer to the *Procedure* section of this document.

C. Reuse of Components and Expiration

1. Units of red blood cells or plasma may be used in multiple helicopter coolers as long as the data logger information has been downloaded, the units have been deemed appropriate to return to inventory and the unit expiration date and time is at least 30 hours from the time the helicopter box is packed.

D. Excess AB Plasma Inventory

1. Thawed AB plasma may be used in the helicopter cooler if there is a surplus in the Blood Bank. The helicopter cooler must contain either two A plasmas or 2 AB plasma.

E. Cool Cube™ for the Helicopter

1. The Cool Cube™ multipurpose storage and transport coolers have been validated for use in the helicopters for up to 30 hours. Any validated Cool Cube™ cooler may be prepared for the helicopter.

F. Phase Change Material Panel

1. The Credo Cubes (PCM panels) should be stored flat in the walk-in refrigerator. When removing the PCM panels for use, shake the PCM panel, you should not hear any liquid. If you hear liquid in the PCM panel, return to the walk-in refrigerator and select a PCM panel that is solid inside. If solid, the PCM panels were stored properly at 3° C ± 1° C and are ready for use.

G. Data Logger Battery - CR2016 3V Lithium Coin Cell Battery

1. If the display on the data logger appears faint or erratic, the battery may need to be changed. Remove the data logger from service and ask a lead technologist to replace the battery. The battery for each data logger will be changed yearly before being sent for calibration.

H. ABO and Rh of Blood Products Dispensed to the Helicopter

1. When the helicopter cooler is dispensed, it should contain 2 type O-negative red blood cells (RBCs) and 2 type A plasmas (liquid or thawed plasma; liquid preferred). The type A plasmas may be Rh positive or Rh negative. Note that emergency type A plasma is used for the helicopter and other limited massive transfusion situations only; patients who are transfused with plasma in the emergency center or another area of the hospital must be transfused with plasma described in Transfusion Medicine policy, Selection of Platelets, Plasma, and Cryoprecipitate for Patients Greater than 4 Months Old.

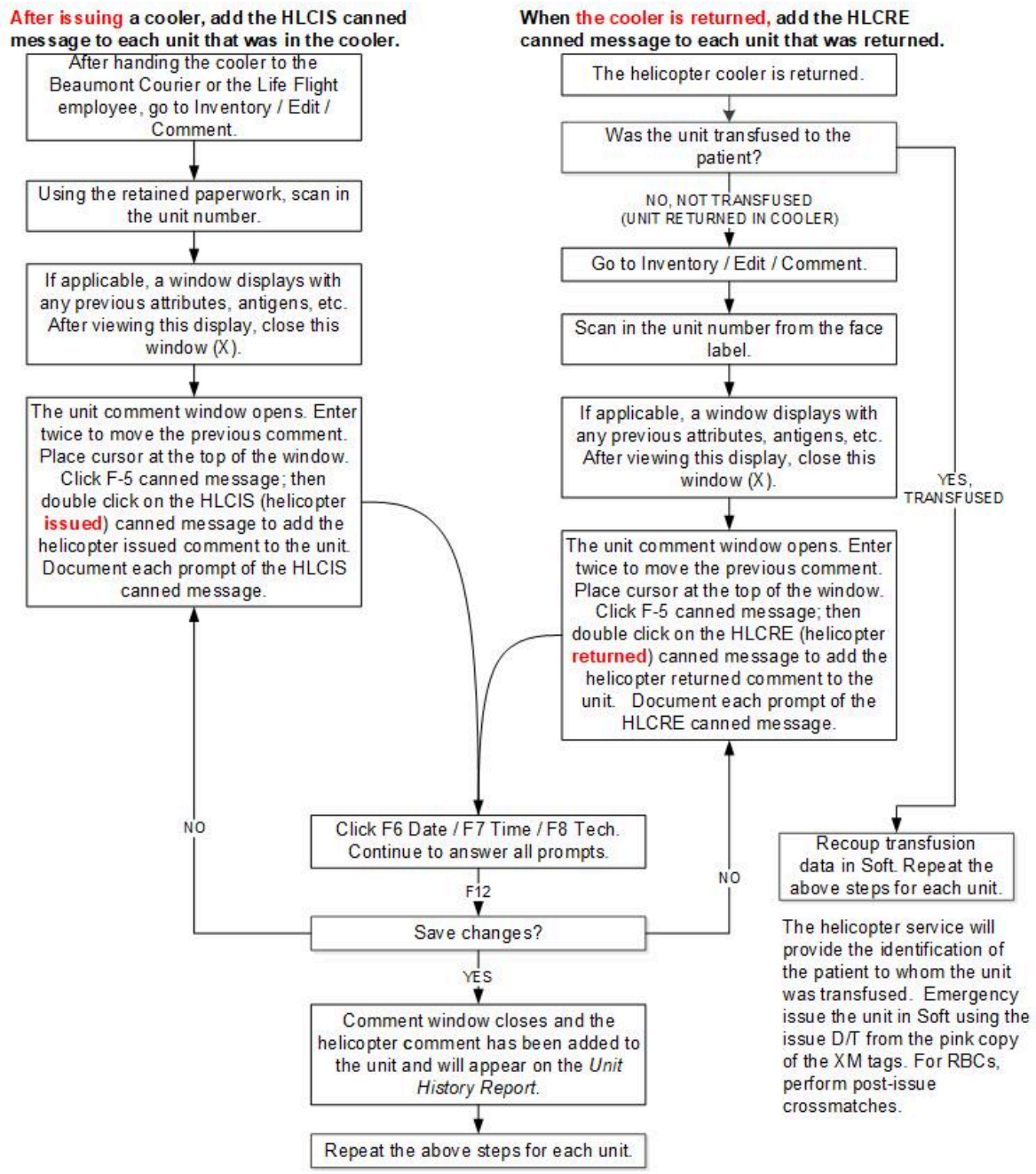
I. Use of the Helicopter Cooler Log

1. The *Helicopter Cooler Log* will be used to document the identification of the units packed in the cooler, as well as their issue and return, as described throughout this document.

J. Tracking and Traceability of Units Dispensed in the Helicopter Cooler

1. Blood Bank records must include documentation of each component from receipt/collection through processing, storage, and testing, to final disposition. The Blood Bank must be able to identify each person performing each significant step in the collection, processing, testing, storage, and distribution of blood and blood components. Therefore, the HLCIS (helicopter Cooler issued) and HLCRE (helicopter Cooler returned) canned messages are added as described throughout this document. The HLCIS and HLCRE comments will appear on a unit history report; these comments include several prompts to capture information such as the date, time, technologist, temperature of the units upon return, etc. By documenting these comments as well as the log, the Blood Bank will

have both an electronic and paper trail by which to track units issued to the helicopter.



K. Preparation of the Daily Cooler

1. Each day, the day shift will prepare a cooler with 2 RBCs and 2 plasmas. Ideally, the RBCs in the Cooler should have at least 7 days remaining until they expire, and the plasmas should have at least 3 days remaining until they expire.
2. A new log sheet will be completed to document the donor units and blood product codes.

L. Acceptable Temperatures of Units Returned in a Cooler

1. When units are returned by the helicopter service in the cooler, the temperature of the cooler is taken (using the data logger that was packed inside the cooler) and the temperature of each returned component is taken as described in Transfusion Medicine policy, *Taking the Temperature of a Blood Product*. These temperatures are documented on the *Helicopter Cooler Log*. The data logger information must be downloaded and reviewed before the units are returned to inventory, see *Procedure* section of this document. If the temperature of the cooler or any component is not within the acceptable range of 1 °C to 10 °C, then a variance should be submitted and the component(s) should be quarantined or discarded, as appropriate. For additional information, refer to Transfusion Medicine policy, Return of Blood Products from Issue.

M. Daily Courier Return and Pick Up

1. The Beaumont courier service will exchange the daily cooler packed for the helicopter at approximately 8:00 a.m. each morning. After delivery of the new cooler to the hangar the Beaumont courier will return the previous days cooler to the Blood Bank. This daily exchange will happen at the same time each day, even if the current cooler does not expire before 8:00 a.m. on the current day. Example follows:
    a. A cooler is packed at 0800 on Monday. The units are used at 1500 on Monday and the Beaumont courier picks up a new cooler for the helicopter at 1530 on Monday. The new cooler will have an expiration of 30 hours or 2130 on Tuesday, but must be returned to the Blood Bank after the daily exchange at 0800 Tuesday

N. Helicopter Employee Signature

I. The Beaumont courier service will be responsible for delivering the cooler to a helicopter employee and having the employee sign the *Helicopter Employee Signature* form. If a helicopter employee is unavailable, the Beaumont courier will return the current day's cooler to the Blood Bank and the helicopter service must make arrangements to retrieve the cooler.

II. If a helicopter employee exchanges the cooler with the Blood Bank themselves, they are still required to sign the *Helicopter Employee Signature* form.

O. Review of the Helicopter Cooler Log

1. A Medical Technologist Lead will review the *Helicopter Cooler Log*. This review consists of:
    a. For all coolers, verifying that a Medical Technologist has initialed and dated the log, to indicate that the Quality Control (QC) for each cooler has been reviewed.
    b. For any units that have been issued, verifying that a technologist has documented and initialed the log to indicate that the HLCIS and (if applicable) HLCRE comments have been added.
    c. For any units that have been transfused, verify the correct actions were taken as described in the *Components Transfused on the Helicopter* section of this document.
    d. For all units returned to inventory, verifying the temperature was within range during the time it was out of the Blood Bank by reviewing the data logger information.
    e. The lead technologist will initial and date the log, indicating that this review has been

performed.

V. EQUIPMENT AND SUPPLIES:

A. Cool Cube™ cooler

B. Credo Cube (PCM)

C. Blood Bank wristbands

D. Laser thermometers (to take temperature of each returned component, stored in a drawer at Triage).

E. Zip ties

F. Fischer Scientific Data Logger

G. Fischer Scientific Data Logger Cradle

VI. QUALITY CONTROL (QC):

A. The Cool Cube™ coolers (packed with 2 RBCs, 2 plasmas, and 6 PCM panels) have been validated to maintain their temperature in the range 1 °C to 10 °C for up to 30 hours.

B. Comments are added to each unit dispensed in the helicopter cooler, and to each unit that is returned in the cooler; refer to the *Tracking and Traceability of Units Dispensed in the Helicopter Cooler* section of this document.

C. The tracking of each cooler and of each unit is also tracked on paper using the *Helicopter Cooler Log*.

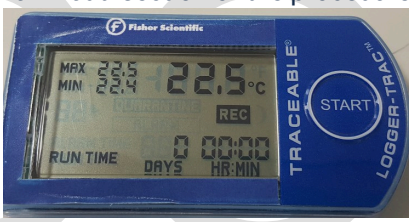
D. Each coolers temperature is also tracked using the data logger.

VII. PROCEDURE:

A. Preparation and Dispense of the Helicopter Cooler

1. Make a photocopy of the face label of each component (2 O-negative RBCs and 2 type A plasmas).
2. Remove segments from each RBC unit and label the segments with a sticker from the back of the unit (with the donor number).
3. Document and attach a crossmatch tag to each component with the patient name of “LifeFlight,” the donor unit number, the donor blood type, the component product code, the component description, and the wristband number. Do not document a medical record number (MRN) at this time. Note that templates for these crossmatch tags are located in the Triage workstation, as well as on the V:/ drive. A copy of each transfusion tag will be retained and kept with the *Helicopter Cooler Log*.
    a. The donor unit number, donor blood type, and component product code should be documented on the plastic blood product tag in addition to the paper section of the crossmatch tag.
4. Document F-1565, Request For Emergency Dispense of Uncrossmatched Blood Products with the wristband number (in the box) and the quantities for RBCs and plasma (2).
5. Attach the pink Emergency Blood tag F-191 to each component.

6. Document the *Helicopter Cooler Log* with each of the donor numbers, blood product codes, expiration date, the data logger serial number, the helicopter cooler number, the date and time packed, and the technologist's initials.
7. Based on the validation of the coolers to maintain their temperature, the coolers are packed in a very specific manner. Pack the 2 plasmas and the 2 RBCs in the cooler in the following manner.
    a. Pack the Cool Cube™ cooler in the walk-in refrigerator.
    b. Place one PCM panel into the base of the Cool Cube™, embossed side up.
    c. Add four PCM panels to form walls, embossed side facing inward.
    d. Assure that the walls of the Cool Cube™ do not have punctures or tears; remove from service and use a new Cool Cube™ if punctures or tears are present.
    e. Visually inspect each unit and record on the *Helicopter Cooler Log* as you are packing the cooler.
    f. Pack the components on their side in the following order, plasma, red blood cells, red blood cells, plasma in a biohazard bag with absorbent material.
    g. Obtain a pre-programmed data logger and press the start button for approximately 10 seconds, until the data logger screen is blinking REC. If there isn't a pre-programmed data logger with the helicopter cooler already, obtain another data logger from the walk in refrigerator. Verify it is programed correctly before use as described in the *Data Logger Download* section of the procedure.



    h. Place the data logger in a biohazard bag and place in-between the two red blood cell units.
    i. Push the units together and close the biohazard bag.
    j. Place one PCM panel on the top of the bag.
    k. Close the Cool Cube™ cooler lid.
    l. Velcro the straps shut on top of the cooler lid.
    m. Place the plastic pouch or bag containing the wristband and the copy of F-1565, Request For Emergency Dispense of Uncrossmatched Blood Products inside the Cool Cube™ cooler, between the hard part of the cooler and the fabric exterior.
    n. Zip the Cool Cube™ cooler closed and loosely secure with a zip tie.
    o. Place a plastic biohazard bag at the helicopter computer area in the plastic filing stand in the slot labeled "Issued Today". This bag should contain a photocopy of each component's face label, labeled segments for the 2 RBC units, copies of the crossmatch tags and the helicopter log.
    p. Place the sealed cooler at the triage area until the Beaumont courier arrives for pick up.
    q. Immediately **after** the cooler has been dispensed, document the log with the date and time of dispense, the technologist's initials, and the ID number of the Beaumont courier

employee to whom the cooler was issued. If a helicopter employee picks up the cooler themselves, document their first and last name in place of the Beaumont courier ID number.

r. Document the HLCIS canned message. Refer to the *Tracking and Traceability of Units Dispensed in the Helicopter Cooler* section of this document.

B. Return of the Cooler from the Helicopter to Blood Bank

1. For **any components that have been transfused**, the helicopter service should write the name and MRN of the applicable patient on the attached crossmatch tags and on the emergency issue form. Perform the following:
    a. On the *Helicopter Cooler Log*, document "T" (transfused) for the return temperature, visual inspection, and return unit status. Document "NI" (not indicated) for the HLCRE added section. Document the Transfusion section of the log with the patient's MRN, B# and circle YES, indicating that a unit was transfused. Note that there may not be a Beaumont MRN for the patient if they were transfused en route to a non-Beaumont hospital.
    b. Discard any wristband numbers that remain inside of the cooler, and place a new set of wristbands in the pouch or bag.
    c. Remove and return the PCM panels to the walk-in refrigerator.
    d. Return the cooler to the walk-in refrigerator with the lip propped open for proper air flow and cooling.
    e. Recoup or document the component transfusion as follows:
        i. If the component was transfused en route to Beaumont Royal Oak, emergency issue the components to the patient in the computer; see the Blood Bank CDM - Emergency Issue. Use the date and issue time that was documented on F-1566, *Record of Transfusion Form*. Once a sample is received on the patient, perform compatibility testing and for RBCs, post-issue crossmatches, as described in the Blood Bank CDM - Post Issue Crossmatch.
    f. Prepare a new cooler as described above.
2. For **any components that have NOT been transfused**, perform the following:
    a. Do not open the box or cut the zip tie until there is time to immediately place the data logger on the cradle and stop the data logger from further recording any temperatures.
    b. Download the data logger information to verify that the units were within their acceptable temperature (1°C - 10°C) for the duration of their time in the helicopter cooler.
    c. Take the temperature of each component that was returned and document on the *Helicopter Cooler Log*.
    d. Visually inspect each unit as described in Transfusion Medicine policy, Visual Inspection of Blood Products and document the *Helicopter Cooler Log*.
    e. Determine whether each unit is acceptable for re-issue as described in Transfusion Medicine policy, Return of Blood Products from Issue.
        i. If all returned units are acceptable for re-issue, return the units to the Helicopter cooler for future use or return to inventory.

ii. If any of the returned units are unacceptable for re-issue, dispose of the unit(s).

iii. If there is any concern as to whether any of the units are acceptable, place the unit(s) in quarantine.

f. Document the log with the date and time of return, technologist's initials, and for each of the returned units document the temperature (°C), the visual inspection (VIS) as satisfactory (S) or unsatisfactory (U), and the return unit status as available (A), quarantine (Q), or discard (D).

g. Document the HLCRE canned message.

h. Remove and return the PCM panels to the walk-in refrigerator.

i. Return the cooler to the walk-in refrigerator with the lid propped open for proper air flow and cooling.

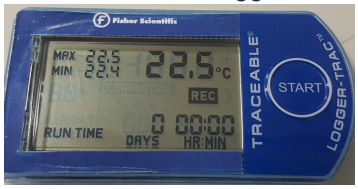
j. Prepare a new cooler, if applicable, as described above.

C. Data Logger Download

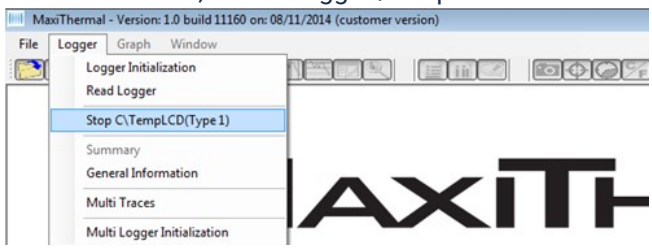
Upon return to the Blood Bank, the data logger will be removed from the cooler and all data will be downloaded in the following manner. Do not remove the data logger from the cooler until it can be immediately put into the docking cradle.

1. Sign into a Triage computer containing the Maxi Thermal program.
2. Open the Maxi Thermal program on the desktop.

3. Remove the data logger from the cooler. The data logger should say REC.



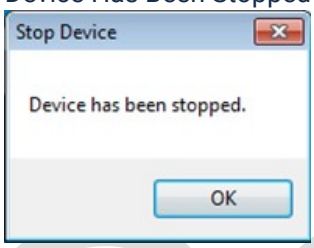
4. Slide the data logger into the USB connected port cradle.
5. Once connected, select Logger / Stop.



6. Select Yes when asked if you want to Stop the Device.

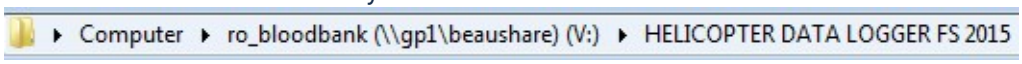
7. Data logger display will read END.

8. Device Has Been Stopped will appear, click OK.

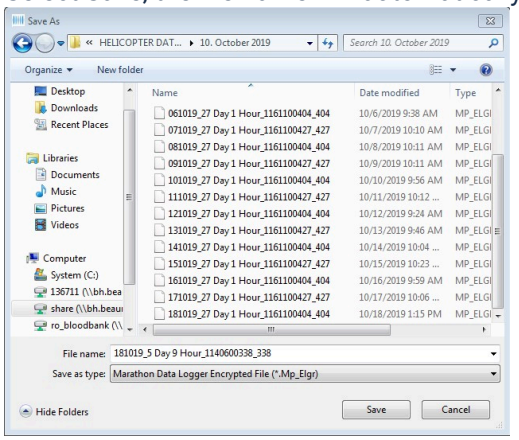


9. Select the download button to Read Logger (Read Logger will appear when you hover over the purple download button).

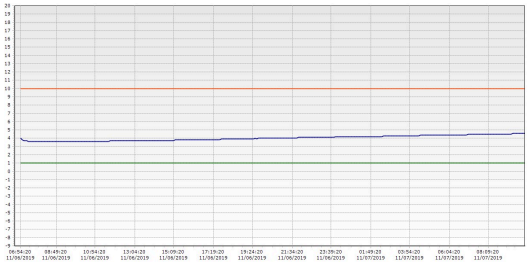
10. Select the folder designated for the current month under the V:/ drive HELICOPTER DATA LOGGER FS YYYY folder for the current year.



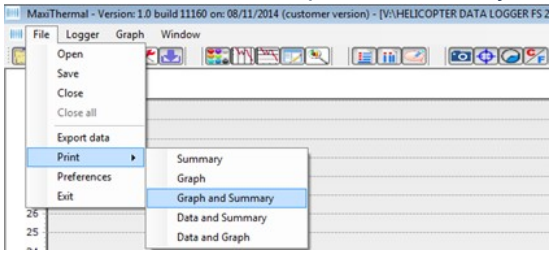
11. Select Save, the file name will automatically populate.



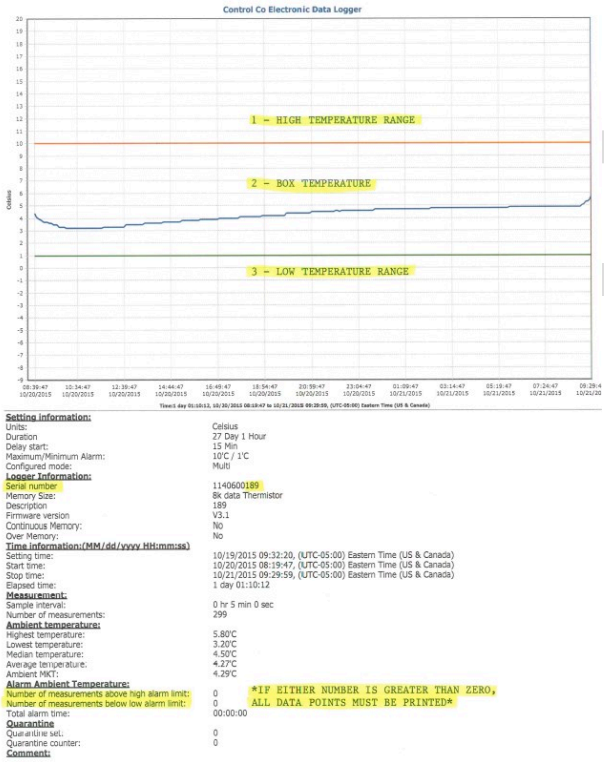
12. The points will download and the graph populates.



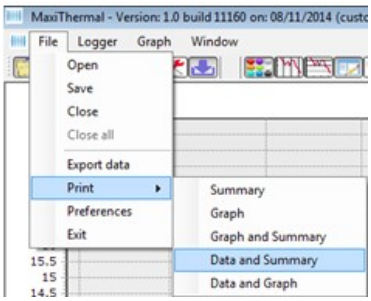
13. Select File / Print and Graph and Summary and attach it to the *Helicopter Cooler Log*.



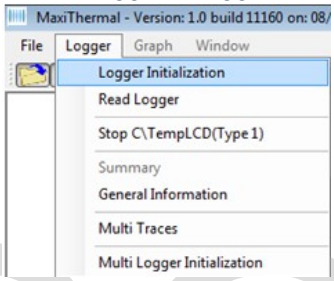
14. Select Print and OK.



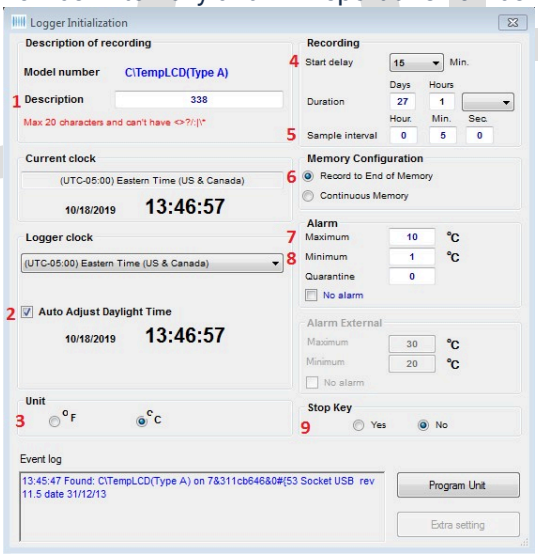
15. Review the data logger information to assure that the temperature was within range the entire time the cooler was out of the Blood Bank. If the number of high or low alarms is greater than zero, print the entire set of data points and attach to the log. The component(s) should be quarantined or discarded, as appropriate.
16. Select File / Print and Data and Summary and attach to the *Helicopter Cooler Log*.



17. Attach the printed data logger information to the *Helicopter Cooler Log*.
18. Return units to inventory and document the *Helicopter Cooler Log*.
19. To reset the data logger after download:
    a. Select Logger / Logger Initialization



    b. The description of both data loggers will remain the same, the system tracks the serial number internally and will report this number on each summary and graph.

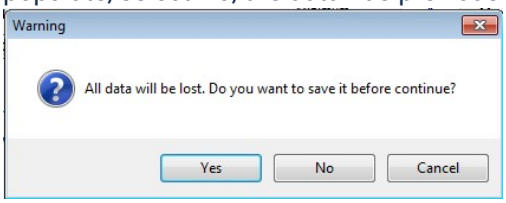


        i. 1 - Enter the last three digits of the data logger serial number.
        ii. 2 - Verify that the Auto Adjust Daylight Time box is checked.
        iii. 3 - Verify °C is selected.
        iv. 4 - Set the delay time for 15 minutes.
        v. 5 - Set the Sample Interval time for 0 Hour, 5 Min, 0 Sec.
        vi. 6 - Verify that Record to End of Memory is selected.
        vii. 7 - Set the Maximum alarm to 10°C.

viii. 8 - Set the Minimum alarm to 1°C.

ix. 9 - Verify that No is selected.

c. Verify all of the information matches the above and select Program Unit. A warning will populate, select No, the data has previously been saved.



d. Logger screen will clear.

e. Event log will display "End Setting: Successfully".

f. The data logger can now be removed from the USB connected port cradle.

VIII. REFERENCES:

1. CAP, *Transfusion Medicine Checklist*, current edition.
2. Insert from Fischer Scientific.
3. Pelican BioThermal, LLC. *Pelican Crēdo Cube Series 4 User Guide – Rev D*.

Attachments

Helicopter Cooler Log

Helicopter Employee Signature

Helicopter Expiration

Approval Signatures

Step Description	Approver	Date

	Ann Marie Blenc: System Med Dir, Hematopath	6/21/2023
	Kristina Davis: Staff Physician	6/21/2023
Policy and Forms Steering Committe (if needed)	Brooke Klapatch: Medical Technologist Lead	3/23/2023
	Kelly Sartor: Mgr Laboratory	3/23/2023
	Brooke Klapatch: Medical Technologist Lead	3/22/2023