

BIOSPECIMEN PROCESSING

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1. Background and rationale

This year of the Health ABC study involves the collection of approximately 28.5 mL of blood from participants. The blood is collected in three types of tubes for specialized processing of different blood components. Specimens will be sent to LCBR, Fisher BioServices, and Dr. Bernd Meibohm's laboratory at the University of Tennessee, Memphis for storage and analysis. One tube will be picked up by each field center's local laboratory and analyzed.

2. Equipment and supplies

Necessary processing supplies include:

- Centrifuges capable of spinning at 3000 g-minutes
- -20° Freezer space is required
- -80° Freezer space is required
- Refrigerator space
- Dry Ice
- Pipets and tips: 1.0 mL volumes and 0.5 mL volume
- Lab coat and gloves
- Biohazardous waste disposal container
- Balance tubes for the centrifuge
- Lab mat
- 10% bleach solution
- Freezer racks
- Rubber bands

2.1 Sample ID Labels

You will be supplied with sheets of sample ID barcode labels to use for labeling forms, draw tubes, and cryovials. A sample sheet of barcode labels can be found in Appendix 1. All labels on each sheet have the same 6-digit sample ID number (the first digit identifies the clinic: Memphis = 1, Pittsburgh = 2).

Each cryovial label also has a 2-digit extension (01 to 11) that serves as a unique identifier for each cryovial within a sample ID. The labels for two of the collection tubes also have bar codes; one goes to Dr. Meibohm and one goes to LCBR. See Appendix 2 for proper orientation of the barcode label.

Beneath the human-readable ID number, cryovial labels also have one to three lines of text. The first line consists of a letter, a word, and a number. This line of text is intended to increase accuracy in labeling and filling the cryovials. Abbreviation codes can be found at the bottom of the Laboratory Processing form. The letter refers to the color of the cryovial cap, e.g., R= red, W= white, C= clear. The word corresponds to the type of sample to be stored in the cryovial,

e.g., Serum for serum). **The number refers to the cryovial volume (.5 mL), not the volume aliquoted.**

There are also 8 labels containing the ID number with no extension. Four are to be used for pre-labeling the 4 draw tubes, with 2 extra. Of these labels, the Draw Tubes #2 and #4 labels have a barcode. They all have 1-3 lines of text indicating which specimen container they are intended for, including the stopper color and volume, if applicable. The EDTA tube (#3a) will have a label from the field center's local laboratory.

There are 2 barcoded labels with the ID number, one with the words "Phlebotomy Form," which is placed on the Phlebotomy Form (see Blood Collection chapter), and the other with the words "Laboratory Processing Form," which is placed on the Laboratory Processing Form (Appendix 3). *This process of matching the participant-specific Health ABC Enrollment ID# (**already on the form brought to the lab by the participant**) to the sample-specific ID barcode is crucial to being able to use the data collected from laboratory tests.*

3. Safety issues and exclusions

3.1 Precautions for handling blood specimens

In accordance with the OSHA regulations on blood borne pathogens (see copy on file in laboratory), the study recommends the following laboratory safety protocol for the field center laboratories:

- Non-permeable lab coats, latex gloves, and face shields should be used when handling any blood in any situation where splashes, spray, spatter, or droplets of blood may be generated and eye, nose, or mouth contamination can be reasonably anticipated.
- 'Universal Precautions' should be followed when handling any blood products.
- Contaminated needles and sharps shall be immediately placed in a puncture-resistant, leakproof container. Never recap or break needles.
- Hepatitis B vaccine should be offered to all unvaccinated technicians handling blood and documentation of vaccination or technician's declining to be vaccinated should be kept.

4. Participant and exam room preparation

4.1 Preparation for processing

All items on the Sample Processing Checklist (Appendix 4) should be on hand before beginning processing.

Aliquot racks will be set up to correspond to each blood collection tube rack. Rack setup is completed the previous day. All tubes and vials are labeled with sample ID bar codes (see Label Orientation diagram in Appendix 2) and arranged in appropriate working order. After labeling draw tubes and cryovials, there will be 4 labels left: 2 “Backup” labels, 1 “Phlebotomy Form,” and 1 “Laboratory Processing Form” label. These can be separated into 2 mini-sheets: The “Backup Vacutainers,” “Phlebotomy Form” and “Laboratory Processing Form” labels should be clipped to the corresponding blood collection tray.

5. Detailed procedures

5.1 Processing

5.1.1 General

Tube #1 should be held at room temperature for up to 90 minutes. Tubes #2 and #3 should be mixed (for about 30 seconds) and immediately placed on ice. Tube #3a should be mixed (for about 30 seconds) and immediately placed on ice; and should be placed in the refrigerator (**do not freeze**) immediately following venipuncture – within 15 minutes of collection of the last tube. Tube #4 should be inverted 10 times and placed in a -20°C freezer. Personal protective equipment (non-permeable lab coats, double-gloves with at least one latex pair, splatter shields) **MUST BE** worn for processing.

It is possible that not all tubes will be collected due to problems with phlebotomy. During processing, work in the order specified and make as many aliquots as possible while meeting the volume requirement of each cryovial. On the Laboratory Processing form, fill the bubble next to each cryovial that is filled, whether partially or totally. If the sample is hemolyzed, fill the bubble marked H. If the tube is only partially filled, fill the bubble marked P. If the tube is both hemolyzed and partially filled, fill the bubble marked B. If the tube is not filled at all, only fill the last bubble (marked not filled).

5.1.2 Description of blood collection tubes

Each draw tube is color coded to aid in handling.

Tube #1 is a 10 ml red stoppered tube used to collect serum. This tube contains no anticoagulant so that the blood clots to form serum. After drawing, the blood is allowed to clot at room temperature for 40-45 minutes (Maximum = 90 minutes). Cryovial caps are coded red. The serum is used for analysis of fasting glucose, fasting insulin, cystatin C, and archiving.

Tube #2 is a 4 mL lavender stoppered tube containing EDTA as the anticoagulant. After drawing, the tube should be mixed and immediately placed on ice. This tube will not be processed; it will be kept refrigerated (not frozen) and sent to LCBR for analysis of HgA1c.

Tube #3 is a 7 mL lavender stoppered tube containing EDTA as the anticoagulant. After drawing, the tube should be mixed and immediately placed on ice. Immediately after the blood draw is complete, this tube will be spun. The plasma supernatant will be aliquoted into cryovials with white caps. The plasma will be used for archival purposes. After the plasma is aliquoted, the buffy coat will be removed from on top of the layer of red cells. The buffy coat is stored in a cryovial with a clear cap.

Tube #3a is a 4 mL (Memphis) or 5 mL (Pittsburgh) lavender stoppered tube containing EDTA as the anticoagulant. After drawing, the tube should be mixed and immediately placed on ice. This tube will not be processed; it will be kept refrigerated (not frozen) and picked up by the field center's local laboratory for complete blood count (CBC) analysis.

Tube #4 is a special PAXgene blood RNA collection tube with a red stopper. This tube does not need to be processed and will be used to isolate messenger RNA in an ancillary study. Even though the tube is a 10 mL tube, only 2.5 mL of blood are collected in this tube. The tube contains already approximately 5 mL of a chemical additive that stabilizes the RNA in the collected blood.

5.1.3 Immediate processing

Upon reaching the blood processing station, remove the blood drawing rack and ice bath containing tubes from the blood collection tray. The rack should contain tubes #1 and #4. The ice bath should contain tubes #2, #3, and #3a.

5.1.4 Aliquots per sample type:

The following is a summary of how to handle each collection tube. Detailed instructions follow (volume indicates sample size, not cryovial size).

EDTA plasma: Tube #2 is a 4 mL lavender stoppered tube containing EDTA as the anticoagulant. After drawing, the tube should be mixed and immediately placed on ice. This tube will not be processed; it will be kept refrigerated (not frozen) and sent to LCBR for analysis of HgA1c.

EDTA plasma: Tube #3a is a 4 mL (Memphis) or 5 mL (Pittsburgh) lavender stoppered tube containing EDTA as the anticoagulant. After drawing, the tube should be mixed and immediately placed on ice. This tube will not be processed; it will be kept refrigerated (not frozen) and picked up by the field center's local laboratory for complete blood count (CBC) analysis.

EDTA plasma: Immediately after the draw, these tubes are spun. The plasma from tube #3 is aliquoted into four 0.5-mL cryovials
The total number of aliquots is 4 (Color code = white caps)

4 x 0.5 mL sample volume

EDTA buffy coat: The buffy coat is removed from tube #3 and placed into one 2-mL cryovial (Color code = clear caps)
1 cryovial, volume varies

PAXgene: The 10 ml drawtube (#4) needs no further processing. After inverting the sample 10 times, the tube can be placed into a regular freezer (-20°C).

Serum: The serum from tube #1 is aliquoted into one 5.0 mL polypropylene tube with a red push cap (only 0.5 mL should be aliquoted into this tube) and five 0.5 mL cryovials (Two cryovials (cryo#01 (the polypropylene tube) and cryo #02 are sent to LCBR, one for fasting glucose and insulin and one for cystatin C. The remaining aliquots (cryos #03-#06) are designated for storage.)
The total number of aliquots is: 6 (Color code = red caps)
6 x 0.5 mL

The total number of aliquots per participant is 11 plus three unaliquotted specimen collection tubes. A detailed listing of aliquots can be found on the Laboratory Processing form (Appendix 3).

5.1.5 Centrifugation of Serum Samples

Tube #1 should be left at room temperature for at least 40-45 minutes (maximum 90 minutes; longer duration gives higher serum yield) after it is drawn. It should be displaying a clot by this time. It is centrifuged at 4° C for 10 minutes at 3000 G.

5.1.6 Making Serum Aliquots

Allow the centrifuge to come to a complete stop. Carefully remove the tube from the centrifuge, being careful not to shake the tube, and place it on ice.

Serum (Tube #1) Color coded Red

Aliquots:	2 x 0.5 mL serum	use one 5.0 mL tube and one 0.5-mL cryovial	LCBR
	4 x 0.5 mL serum	use 0.5-mL cryovial	Fisher BioServices (previously called McKesson)

Note: The 5.0 tube uses a red push/plug type cap and the 0.5 mL cryovials are capped with red screw caps.

- Follow the outline on the Laboratory Processing form for aliquoting the serum samples. Fill in the bubble next to each cryovial that is filled, whether partially or totally. If the tube is only partially filled, also fill the bubble marked P. If a sample is hemolyzed, fill in the bubble marked H. To determine whether a sample is hemolyzed, compare its color to the chart provided by LCBR. If the tube is both hemolyzed and partially filled, fill the bubble marked B (only one P, H, or B bubble should be filled for each cryovial, if applicable). If the tube is not filled at all, fill the bubble in the last column (“Not filled”).
- Pipet the serum with the *proper volume pipet*. Do not use the cryovial to estimate volume.
- Recap aliquots after each sample tube has been pipetted.

5.1.7 Centrifugation of EDTA Plasma Samples

Tube #3 is centrifuged at 4° C for 10 minutes at 3000 G. (A total of 30,000 g-minutes). Be sure to balance the centrifuge either with another plasma tube from another participant or with a balance tube filled with an equal volume of water.

While these tubes are spinning:

- Restock the blood collection tray with tube rack and blood collection tubes, ice, and forms for the next participant.
- Recheck labels on the aliquot racks to ensure that they match the sample ID# on the draw tubes.
- Perform any necessary clean up.

5.1.8 Making EDTA Plasma Aliquots

Once centrifuged, the maximum time allowed before aliquoting the EDTA plasma tube (#3) is 15 minutes. If aliquoting is not immediate (within 15 minutes from removal of tubes from the centrifuge), please note the delay on the comment section of Laboratory Processing Form. Keep the collection tube (#3) on ice until aliquoting can occur.

Aliquots:	4 x 0.5 mL plasma	use 0.5-mL cryovials	Fisher Bioservices
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EDTA 0.5 mL cryovials are capped with white screw caps

- Allow the centrifuge(s) to come to a complete stop. Remove tube from the 4° C centrifuge, being careful not to shake the tubes, and put them on ice.
- Follow the outline on the Laboratory Processing form for aliquoting the plasma samples. Fill in the bubble next to each cryovial that is filled, whether the cryovial is filled partially or totally. If the tube is not filled at all, fill the bubble in the last column (“Not filled”). If the tube is only partially filled, also fill the bubble marked P. If a sample is hemolyzed, fill the bubble marked H. To determine whether a sample is hemolyzed, compare its color to the chart provided by LCBR. If the tube is both hemolyzed and partially filled, fill the bubble marked B (only one P, H, or B bubble should be filled for each cryovial, if applicable).
- Pipet the plasma with the *proper volume pipet*. Do not use the cryovial to estimate volume.
- Recap aliquots after each sample tube has been pipetted.

5.1.9 Making buffy coat aliquot from EDTA tubes

The buffy coat aliquot is obtained from tube #3 after the plasma is removed. Use a Pasteur pipet to suction off the white cell layers. It is okay to include red cells in this cryovial. The main focus should be to obtain a large enough volume of white cells. The volume will vary (approximately 400-800 µL). The white cells are placed into one clear-coded 2.0-mL cryovial.

5.1.10 Freezing

Upon completion of the processing steps, the serum, EDTA plasma, and buffy coat cryovials, must be frozen at -70° or on dry ice within a maximum of 30 minutes.

After aliquoting is complete, the rack containing the serum, plasma, and buffy coat cryovials is removed from the ice bath and placed upright in the freezer at -70° C for at least half an hour (preferably until the end of the day). Make sure the aliquots are not wet when placed in the freezer to avoid ice formation on the outside of the cryovials which can interfere with scanning of the barcode labels. If a freezer is not immediately available, place the rack of samples on dry ice.

5.1.11 Return visit aliquots

Occasionally, participants return to the clinic after their Year 10 clinic visit just to have a fasting blood draw or because they were unable to give a sample at the regular clinic visit. The same types of forms are used for the first sample collection and lab processing as for the second. The only difference is that for the first sample collection the “first sample collection” bubble on the first page is filled; for a repeat collection the “repeat sample collection” bubble is filled. Be sure to fill out all three forms with the header information including the Health ABC Enrollment ID #, Acrostic, Date Form Completed, and Staff ID #.

5.1.12 Completed forms

The completed Phlebotomy and Laboratory Processing forms can be set aside in a daily work folder. These forms are copied (two copies of the Phlebotomy Form [one for LCBR and one for B. Meibohm] and three of the Laboratory Processing Form [for three of the labs – not the local lab]), and then the originals are scanned into the data system and filed in the participants’ charts. The copies are enclosed with each shipment of samples to LCBR, Fisher BioServices, and Dr. Meibohm.

End of the Day Procedures

- For the frozen cryo# 01 (5 mL tube) there is a choice on how it can be packaged. Use which method works best for your lab. Keep samples frozen.

Method 1: The cryo# 01 tubes can be packaged in the screw top, wide mouth plastic jar (supplied by LCBR) ready for shipping. The tubes are rubber-banded together, wrapped in absorbent material then sealed in a zip-lock bag. The zip-lock bag containing the tubes is placed in the screw top plastic jar ready for shipping.

Method 2: The cryo# 01 tubes can be loaded into a 3” freezer box (9x9 dividers) ready for shipping.

- Frozen cryo# 02 (0.5 mL cryovial) can be packaged into the 2” freezer boxes (9x9 dividers) ready for shipping. Keep frozen.
- Frozen cryovials (cryos# 03-11) in racks are packaged into freezer boxes by numeric order of cryovials per participant. Do not leave spaces in the boxes when the total number of cryovials is less than expected. Samples from one participant may overlap into two boxes. (See freezer box diagrams in Appendix 5).
- Collection tube #02 is being sent to LCBR for immediate analysis, and is packaged in the screw top, wide mouth plastic jars ready for shipping. The draw tubes are rubber-banded together, wrapped in absorbent material then sealed in a zip-lock plastic bag. The zip-lock bag containing the tubes is placed in the screw top plastic jar ready for shipping.

Keep refrigerated. **These tubes are not frozen. See procedure below for storage and shipment instructions.**

- Tube #01 and cryovial #02 are earmarked for later assays of glucose, insulin and cystatin C. The 3” freezer box (or plastic jar) containing tubes# 01 and the 2” freezer box containing cryos# 02 are shipped together in the weekly frozen shipment to LCBR. *Note that the labels on these cryovials include the words “To LCBR” to make them easy to identify.* These boxes and jars should be numbered consecutively (1, 2, 3, etc.) and should also be labeled with the name of the site (see Appendix 5).
- Cryovials #3 through #11 should also be stored in freezer boxes, which should be included in a semi-monthly shipment to Fisher BioServices (see Appendix 5).
- Drawtube #4 should be stored in a ziplock bag in the regular freezer (-20°C), which should be included in the weekly shipment to Dr. Meibohm.
- Re-stock blood collection trays with supplies.
- Label the next day's draw tubes and cryovials.
- Arrange draw tubes and aliquots in their proper racks.
- Wipe down all work areas with 10% Clorox solution.

5.2 Summary of processing time limitations

From end of venipuncture to start of processing:

- | | | |
|----|-------------|------------|
| 1. | EDTA 7 mL | 15 minutes |
| 2. | Serum 10 mL | 90 minutes |

Once centrifuged, maximum time before aliquoting: 15 minutes. After aliquoting samples, freeze within 30 minutes.

5.3 Shipping the whole blood, EDTA plasma, and serum samples

5.3.1 General

Frozen blood samples are shipped *weekly* to both Fisher BioServices and LCBR by Federal Express overnight delivery. The schedule will be as follows:

Monday	Memphis
Tuesday	Pittsburgh

This allows the laboratory and repository to stagger the arrival of samples on Tuesdays and Wednesdays for easier processing. When Monday is a holiday, the Monday shipment may be shipped on Tuesday.

Shipments to Fisher are charged to your local Federal Express account number. All shipments to LCBR are charged to the University of Vermont (recipient) Federal Express account.

This shipping protocol follows the procedures mandated by the International Air Transport Association's Dangerous Goods Regulations-Packaging Instructions 650 and 904. All items from the shipping checklist (Appendix 6) should be kept in stock at all times.

Whole blood samples (draw tube #2) must be shipped separately twice weekly by Federal Express overnight delivery to LCBR. This must be done on Monday and Wednesday to allow LCBR to process the tubes within 7 days of collection. Again, when Monday is a holiday, that shipment may be delayed until Tuesday.

5.3.2 Methods for shipping frozen samples of serum, EDTA plasma, and buffy coat

The frozen samples of serum, EDTA plasma, and buffy coat to be shipped are those from the previous week. There will be two separate shipments made: one to Fisher BioServices and one to the University of Vermont (LCBR).

Make complete copies (all pages) of corresponding Phlebotomy and Laboratory Processing forms for the LCBR shipment. Copies of the Laboratory Processing forms only are made for the Fisher shipment.

Samples should be prepared for shipping as follows:

For samples in freezer boxes:

- Wrap each freezer box in paper towels to absorb possible leakage. Put a rubber band around the towel-wrapped box or bag.
- Put the individual freezer boxes containing the samples into a leakproof zip-lock plastic bag. Seal the zip-lock bags.

For the 5.0 mL tubes packaged in plastic jars:

The plastic jar with the tubes already packaged in it is ready to be placed on the absorbent material in the shipping container.

- Line the styrofoam mailer with absorbent material (e.g., paper towels).
- Place approximately one third of the dry ice on the bottom of the mailer. Add another layer of absorbent material.
- Carefully place the freezer boxes (and screw cap plastic jar) into the styrofoam mailer. Place no more than a total of 4 L of sample into the styrofoam shipping container. Use two or more styrofoam mailers for the Fisher shipment when necessary. (In this case, label the mailers "1 of 2" and "2 of 2").
Again place a little absorbent material around the zip-lock bags and plastic jars.
- Place the remaining dry ice (approximately 7 - 14 lbs total) on top and around the samples to fill the styrofoam container.

- Seal the top of the styrofoam container with tape.
- Enclose the styrofoam container in the outer cardboard sleeve.
- Place the copies of the Phlebotomy and Laboratory Processing forms (LCBR) or Laboratory Processing form (Fisher) on top of the styrofoam container before closing up the outer sleeve with tape.

Fill out the FedEx Airbill as follows (Appendix 7):

- Type in your FedEx account number (for both Fisher and LCBR shipments)
- Type the date of the shipment
- Type the name of the person sending the shipment under Section one, where it says ‘From’
- Type in your address and telephone number in Section one.
- Type the recipient’s name, address, and telephone number in Section two. *The telephone number is mandatory.*
- Type an ‘X’ in the Bill Sender box for the Fisher shipment
- Type an ‘X’ in the Bill Recipient box for the LCBR shipment. Fill in the University of Vermont account number: 318-807-442 and internal reference "number:" HABC below the account number.
- Type an ‘X’ in Priority Overnight under Section 4a
- Type an ‘X’ in the Other Packaging box in Section 5
- Type an ‘X’ in the Deliver Weekday box (Box 2).
- Place an ‘X’ in the “Dry Ice” box in Section five (Box 6). Enter the weight of the dry ice in kilograms as specified and the number of boxes shipped.
- In section 6, place an ‘X’ in the ‘Yes (Shipper’s declaration not required)’ box

Affix the completed airbill to the front side of the package in the plastic pouch (see Appendix 9).

The following additional labels are to be attached to each shipping box. (A diagram showing the placement of these labels on the shipping container is shown in Appendix 9):

- | | |
|---|---|
| • Return Address Label: | placed on top in upper left corner. |
| • Consignee Address Label: | placed on top in bottom right corner. |
| • Black and White Class 9 Label:
(UN1845, see Appendix 10) | placed on top in upper right hand corner. |
| • Diagnostic Specimen Label: | placed on top under the return address label. |
| • Keep Frozen Label (optional): | placed on any side |

It is necessary to weigh the entire shipping container. The weight of the dry ice in kilograms is written on the Black and White Class 9 Label (Appendix 8) in the space provided and filled in on the FedEx airbill.

The LCBR mailing address at the University of Vermont is:

Elaine Cornell
University of Vermont-Pathology
208 South Park Drive, Suite 2
Colchester, VT 05446
(802) 656-8963

The Fisher BioServices mailing address is:

Don Whitehouse
Fisher BioServices
625 Lofstrand Lane
Rockville, MD 20850
(301) 340-1620

FAX the following information to Fisher BioServices at (301) 838-9753 or LCBR at 802-656-8965, as applicable, when a shipment is sent:

Date of shipment
Expected arrival date
Number of styrofoam mailers shipped
FedEx airbill number

5.3.3 Methods for shipping whole blood samples

The refrigerated samples to be shipped on Monday are those from that day and the previous Thursday and Friday. The samples to be shipped on Wednesday are those from that day and Tuesday.

- The samples should be placed in a 3” tall box with a 9 x 9 grid. If the stoppers get in the way of each other, you may skip a space.
The refrigerated EDTA blood collection tubes are rubber-banded together, wrapped in absorbent material then sealed in a zip-lock plastic bag. The sealed bag is then placed in the screw cap plastic jar.
- Line the styrofoam mailer with absorbent material (e.g., paper towels)
- Place one or two ice packs or frozen gel packs **not dry ice** into the bottom of the mailer. Add a layer of newspaper.
- Carefully place the screw cap plastic jar(s) bagged samples into the styrofoam mailer on top of the newspaper, then cover with another layer of newspaper. Place another one or two ice packs on top and around it. **Do not let the ice pack come into direct contact with the plastic jar sample box.**
- It may be helpful to pack any remaining empty space with newspaper to prevent the package from shifting during shipment.
- Fill out the LCBR Shipping Form for Whole Blood (Draw tube #2) (Appendix 10), listing the sample barcode, participant’s HABCID, the date of the Year 10 clinic visit for each sample in the box. The easiest way to do this is by copying this information from the stack of xeroxed Phlebotomy and Laboratory Processing forms in your daily work folder, making sure you don’t include any cryovials that have already been shipped. Once the Shipping Form is completed, double check against the tubes in the plastic jar box to be shipped, to ensure that all tubes are listed on the form and all tubes listed on the form are in the shipment box.
- Keep a copy of the shipping form to fax to LCBR with the FedEx tracking number. Enclose one copy with the styrofoam mailer.

- Seal the top of the styrofoam container with tape.
- Enclose the styrofoam container in the outer cardboard sleeve.
- Place the LCBR Shipping Form for Whole Blood (Draw tube #2) on top of the styrofoam container before closing up the outer sleeve with tape. Do not enclose copies of the Plebotomy and Laboratory Processing forms with this shipment, as they will be included in the shipment of frozen samples for the same participants.
- Seal the outer sleeve with tape.
- Be sure to use appropriate styrofoam mailers that LCBR provides.
- Fill out the FedEx Airbill as above, except that the “Dry Ice” box should not be checked in section 5.
- Fax the LCBR Shipping Form for Whole Blood to LCBR at 802-656-8965. Include the FedEx tracking number, so the samples can be tracked down promptly if they fail to arrive on time.

The LCBR mailing address at the University of Vermont is:

Elaine Cornell
University of Vermont-Pathology
208 South Park Drive, Suite 2
Colchester, VT 05446
(802) 656-8963

5.4 Shipping PAXgene blood samples

5.4.1 General

All samples are shipped on Monday to Dr. Meibohm by Federal Express overnight delivery.

When Monday is a holiday, the Monday shipment may be shipped on Tuesday.

Pittsburgh will charge shipments to its Federal Express account. Dr. Meibohm’s lab will collect the specimens directly from the Memphis clinic.

This shipping protocol follows the procedures mandated by the International Air Transport Association’s Dangerous Goods Regulations-Packaging Instructions 650 and 904. All items from the shipping checklist (Appendix 5) should be kept in stock at all times.

5.4.2 Methods for shipping PAXgene samples

Make complete copies (all pages) of corresponding Phlebotomy and Laboratory Processing forms for the shipment. Samples should be prepared for shipping as follows (**Pittsburgh Only**):

- Line the styrofoam mailer with absorbent material (e.g., paper towels).

- Place approximately one third of the dry ice on the bottom of the mailer.
- Band sets of PAXgenes tubes together with a rubber band, wrap in paper towels and place in a ziplock storage bag and seal the bag and place in the shipping container.
- Place the remaining dry ice (approximately 7 - 14 lbs total) on top and around the samples to fill the styrofoam container.
- Seal the top of the styrofoam container with tape.
- Enclose the styrofoam container in the outer cardboard sleeve.
- Place the copies of the Phlebotomy and Laboratory Processing forms on top of the styrofoam container before closing up the outer sleeve with tape.

Fill out the FedEx Airbill as follows: PITTSBURGH ONLY

- Type in your FedEx account number
- Type the date of the shipment
- Type the name of the person sending the shipment under Section one, where it says 'From'
- Type in your address and telephone number in Section one.
- Type the recipient's name, address, and telephone number in Section two. *The telephone number is mandatory.*
- Type an 'X' in the Bill Sender (Pittsburgh's budget has money to defray shipping costs)
- Type an 'X' in Priority Overnight under Section 4a
- Type an 'X' in the Other Packaging box in Section 5
- Type an 'X' in the Deliver Weekday box (Box 2).
- Place an 'X' in the "Dry Ice" box in Section five (Box 6). Enter the weight of the dry ice in kilograms as specified and the number of boxes shipped.
- In section 6, place an 'X' in the 'Yes (Shipper's declaration not required)' box

Affix the completed airbill to the front side of the package in the plastic pouch (see Appendix 7).

The following additional labels are to be attached to each shipping box. (A diagram showing the placement of these labels on the shipping container is shown in Appendix 9):

- Return Address Label: placed on top in upper left corner.
- Consignee Address Label: placed on top in bottom right corner.
- Black and White Class 9 Label: placed on top in upper right hand corner.
(UN1845, see Appendix 10)
- Diagnostic Specimen Label: placed on top under the return address label.
- Keep Frozen Label (optional): placed on any side

It is necessary to weigh the entire shipping container. The weight of the dry ice in kilograms is written on the Black and White Class 9 Label (Appendix 8) in the space provided and filled in on the FedEx airbill.

The mailing address is:

Dr. Bernd Meibohm
University of Tennessee Health Sciences Center
Dept. of Pharmaceutical Sciences

847 Union Ave, Suite 5p
Memphis, TN 38163
(901) 448-6990

FAX the following information to Dr. Meibohm at (901) 448-6940, when a shipment is sent:

Date of shipment
Expected arrival date
Number of styrofoam mailers shipped
FedEx airbill number

6. Procedures for performing the measurements at home

This procedure is the same for home visits as for clinic visits. The samples will be placed on ice (except for serum) and returned to the lab as soon as possible after the home visit, preferably within 1 hour. Be sure to check the "time blood draw completed" field on the Phlebotomy form and begin processing within the time limits described in Section 5.2. This may not be possible if there was a delay in getting the samples back to the lab. It is therefore doubly important to record the time processing was started on the Lab Processing form.

7. Quality assurance

7.1 Training requirements

Clinical experience with processing of blood samples is strongly recommended. Additional training should include:

- Read and study manual
- Attend Health ABC training session on techniques (or observe processing by experienced examiner)
- Discuss problems and questions with local expert or QC officer
- Certification by the Department of Transportation or other organization for packaging and shipment of biological specimens (information on training courses can be found at <http://hazmat.dot.gov/training.htm#classes> or <http://www.fedex.com/us/services/options/seminars.html>)

7.2 Certification requirements

- Complete training requirements
- Recite shipping schedule for applicable field center
- Process samples from volunteer or participant while being observed by QC officer using QC checklist

7.3 Quality assurance checklist

Preparation

- Aliquot racks correctly set up
- PAXgene tubes at room temperature
- Cryovials correctly labeled
- Hepatitis B vaccination given or offered to all personnel handling blood

Processing EDTA whole blood and plasma

- Time checked to ensure that tube #3 is processed within 15 minutes of completion of phlebotomy
- Tube #3 centrifuged at 4° C for 10 min at 3000 G
- Plasma correctly aliquoted
- No cells contaminating aliquots (except buffy coat aliquot)
- Buffy coat correctly aliquoted

Processing serum tubes

- Time checked to ensure that tube #1 has stood at room temperature for at least 40 minutes, maximum 90 minutes
- Tube #1 centrifuged for 10 minutes at 3000 G.
- Centrifuge correctly balanced with water tube(s)
- Serum correctly aliquoted

Processing PAXgene Tube

- Invert tube #4 10 times
- Puts tube in conventional freezer -20° C

Freezing

- Aliquots checked to ensure they are not wet
- Rack placed upright in -20° C freezer or samples placed on dry ice

Whole blood

- Sample placed immediately in refrigerator after filling.

Shipment procedure – whole blood

- Shipment person certified by DOT
- Boxes correctly wrapped, etc.
- Styrofoam mailers correctly packed – absorbent material, ice pack or frozen gel pack not dry ice, newspaper, sample packaged in plastic jar, more newspaper, more ice packs, top sealed with tape.

End of day procedure

- Phlebotomy and Laboratory Processing forms placed in daily work folder
- Frozen aliquots removed from rack and placed in appropriate freezer boxes
- Freezer boxes correctly labeled
- Collection tube 02 placed in a separate jar for LCBR
- Aliquots 01 and 02 stored appropriately in freezer box for shipment to LCBR
- Aliquots 03-11 placed in freezer boxes for McKesson
- PAXgene tubes stored in ziplock bags in regular freezer

Shipment procedures -- dry ice

- Shipment person certified by DOT
- Freezer boxes (and plastic jars if used) correctly wrapped -- absorbent material, rubber band, and zip-lock bag
- Styrofoam mailers correctly packed -- absorbent material, dry ice, top sealed with tape
- Styrofoam mailer sealed in cardboard sleeve
- FedEx airbill correctly filled out
- Labels correctly affixed

Appendix 1 Sample Label Sheet (Bar Codes)

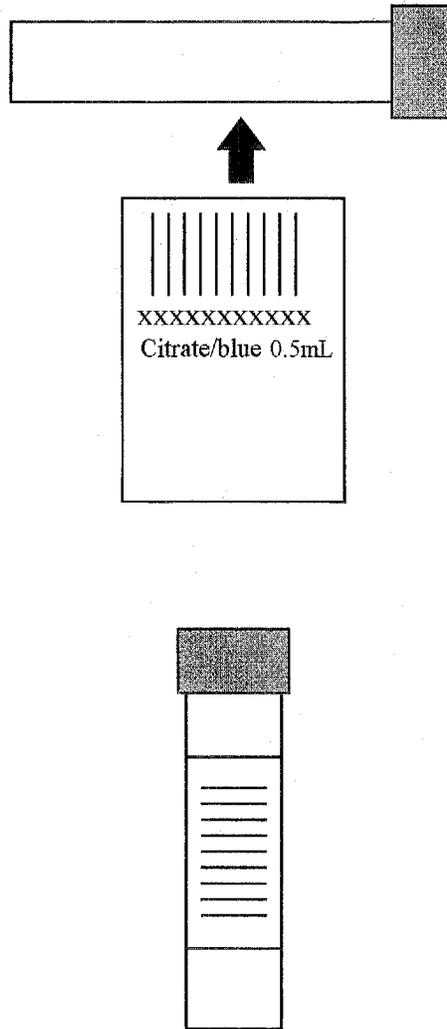
<p>##### Draw Tube 1 Red top 10 mL</p>	 <p>##### Draw Tube 2 Purple top 4 mL To LCBR</p>	<p>##### Draw Tube 3 Purple top 7 mL</p>
 <p>##### Draw Tube 4 Red top PAXgene 10 mL [2.5 mL] To B. Meibohm</p>	<p>Place this end on vial first</p>  <p>##### Back-up Vacutainer</p>	<p>Place this end on vial first</p>  <p>##### Back-up Vacutainer</p>
 <p>##### Phlebotomy Form</p>	 <p>##### Laboratory Processing Form</p>	<p>Place this end on vial first</p>  <p>#####-01 R/Serum 5.0 To LCBR</p>
<p>Place this end on vial first</p>  <p>#####-02 R/Serum 0.5 To LCBR</p>	<p>Place this end on vial first</p>  <p>#####-03 R/Serum 0.5</p>	<p>Place this end on vial first</p>  <p>#####-04 R/Serum 0.5</p>

<p>Place this end on vial first</p>  <p>#####-05 R/Serum 0.5</p>	<p>Place this end on vial first</p>  <p>#####-06 R/Serum 0.5</p>	<p>Place this end on vial first</p>  <p>#####-07 W/EDTA 0.5</p>
<p>Place this end on vial first</p>  <p>#####-08 W/EDTA 0.5</p>	<p>Place this end on vial first</p>  <p>#####-09 W/EDTA 0.5</p>	<p>Place this end on vial first</p>  <p>#####-10 W/EDTA 0.5</p>
<p>Place this end on vial first</p>  <p>#####-11 C/Buffy 2.0</p>		

Appendix 2 Label Orientation on Cryovial

HEALTH ABC STUDY

Label Orientation on Cryovial



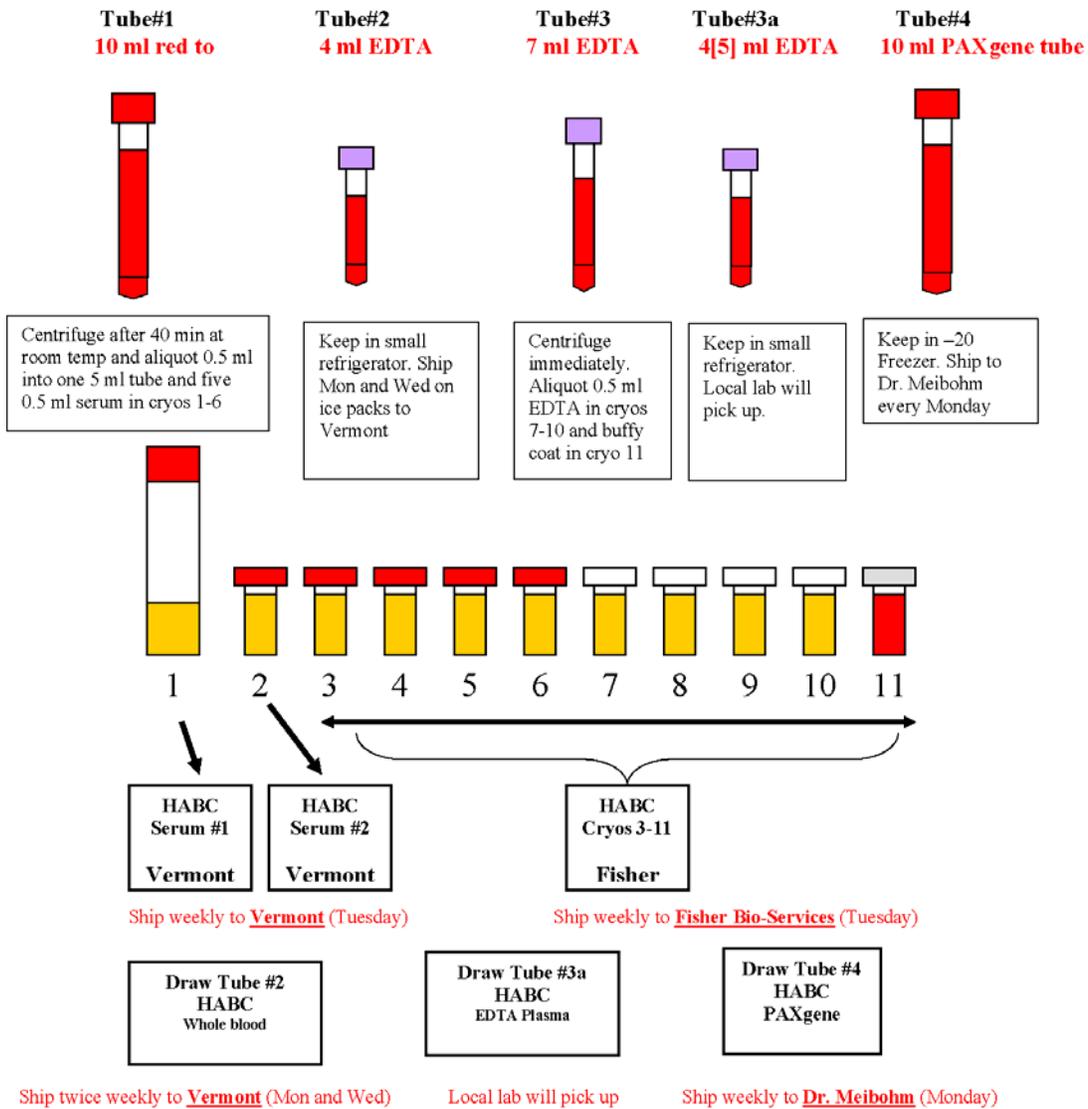
Appendix 4 Sample Processing Checklist and Guide
Page 1

- Crushed ice in ice bucket or plastic tub
- Pipets: 1.0 mL and 0.5 mL volumes
- Transfer pipets
- Labeled cryovials in rack
- Lab coat and gloves
- Biohazardous waste disposal
- Refrigerated centrifuge capable of spinning at 3000 g-minutes
- Balance tubes for the centrifuge
- 10% bleach solution
- 2" and 3" Freezer boxes with 9 x 9 grids
- Screw cap plastic jars (supplied by LCBR)
- Rubber bands
- Sturdy zip-lock plastic bags

See Appendix 11 for detailed list of equipment and supplies, including shipment containers.

Appendix 4 Sample Processing Checklist and Guide
Page 2

Health ABC
PROCESSING GUIDE



Appendix 5 Freezer Box Diagrams

Freezer Box Diagram for Shipping Serum Cryovial# 01 to LCBR if NOT Packaged in a Plastic Jar.

Numbers = cryovial #

1 total blood sample cryovials per participant

start #1

Top

Ppt #1 01	Ppt #2 01	Ppt #3 01	Ppt #4 01	Ppt #5 01	Ppt #6 01	Ppt #7 01	Ppt #8 01	Ppt #9 01
Ppt #10 01	Ppt #11 01	Ppt #12 01	Ppt #13 01	Ppt #14 01	Ppt #15 01	Ppt #16 01	Ppt #17 01	Ppt #18 01
Ppt #19 01	Ppt #20 01	Ppt #21 01	Ppt #22 01	Ppt #23 01	Ppt #24 01	Ppt #25 01	Ppt #26 01	Ppt #27 01
Ppt #28 01	Ppt #29 01	Ppt #30 01	Ppt #31 01	Ppt #32 01	Ppt #33 01	Ppt #34 01	Ppt #35 01	Ppt #36 01
Ppt #37 01	Ppt #38 01	Ppt #39 01	Ppt #40 01	Ppt #41 01	Ppt #42 01	Ppt #43 01	Ppt #44 01	Ppt #45 01
Ppt #46 01	Ppt #47 01	Ppt #48 01	Ppt #49 01	Ppt #50 01	Ppt #51 01	Ppt #52 01	Ppt #53 01	Ppt #54 01
Ppt #55 01	Ppt #56 01	Ppt #57 01	Ppt #58 01	Ppt #59 01	Ppt #60 01	Ppt #61 01	Ppt #62 01	Ppt #63 01
Ppt #64 01	Ppt #65 01	Ppt #66 01	Ppt #67 01	Ppt #68 01	Ppt #69 01	Ppt #70 01	Ppt #71 01	Ppt #72 01
Ppt #73 01	Ppt #74 01	Ppt #75 01	Ppt #76 01	Ppt #77 01	Ppt #78 01	Ppt #79 01	Ppt #80 01	X

Bottom

End#81

continue to
next box....

Label outside of box: Serum Box #1 Date: ____ / ____ / ____

Appendix 5 Freezer Box Diagrams

Freezer Box Diagram for Shipping Serum Cryovial# 02 to LCBR

Numbers = cryovial #

1 total blood sample cryovials per participant

start #1

Top

Ppt #1 02	Ppt #2 02	Ppt #3 02	Ppt #4 02	Ppt #5 02	Ppt #6 02	Ppt #7 02	Ppt #8 02	Ppt #9 02
Ppt #10 02	Ppt #11 02	Ppt #12 02	Ppt #13 02	Ppt #14 02	Ppt #15 02	Ppt #16 02	Ppt #17 02	Ppt #18 02
Ppt #19 02	Ppt #20 02	Ppt #21 02	Ppt #22 02	Ppt #23 02	Ppt #24 02	Ppt #25 02	Ppt #26 02	Ppt #27 02
Ppt #28 02	Ppt #29 02	Ppt #30 02	Ppt #31 02	Ppt #32 02	Ppt #33 02	Ppt #34 02	Ppt #35 02	Ppt #36 02
Ppt #37 02	Ppt #38 02	Ppt #39 02	Ppt #40 02	Ppt #41 02	Ppt #42 02	Ppt #43 02	Ppt #44 02	Ppt #45 02
Ppt #46 02	Ppt #47 02	Ppt #48 02	Ppt #49 02	Ppt #50 02	Ppt #51 02	Ppt #52 02	Ppt #53 02	Ppt #54 02
Ppt #55 02	Ppt #56 02	Ppt #57 02	Ppt #58 02	Ppt #59 02	Ppt #60 02	Ppt #61 02	Ppt #62 02	Ppt #63 02
Ppt #64 02	Ppt #65 02	Ppt #66 02	Ppt #67 02	Ppt #68 02	Ppt #69 02	Ppt #70 02	Ppt #71 02	Ppt #72 02
Ppt #73 02	Ppt #74 02	Ppt #75 02	Ppt #76 02	Ppt #77 02	Ppt #78 02	Ppt #79 02	Ppt #80 02	X

Bottom

End#81

continue to
next box....

Label outside of box: Serum Box #1 Date: ____ / ____ / ____

**Freezer Box Diagram for Shipping Plasma and Serum Samples
to Fisher BioServices**

Numbers = cryovial #

9 total blood sample cryovials per participant

start #1

Top

Ppt #1 03	04	05	06	07	08	09	10	11
Ppt #2 03	04	05	06	07	08	09	10	11
Ppt #3 03	04	05	06	07	08	09	10	11
Ppt #4 03	04	05	06	07	08	09	10	11
Ppt #5 03	04	05	06	07	08	09	10	11
Ppt #6 03	04	05	06	07	08	09	10	11
Ppt #7 03	04	05	06	07	08	09	10	11
Ppt #8 03	04	05	06	07	08	09	10	11
Ppt #9 03	04	05	06	07	08	09	10	11

Bottom

End#81

Continue to next box. . .

Label outside of box: Serum, EDTA, and Plasma Box #1 Date: _____ / _____ / _____

Appendix 6 Sample Shipping Checklist

- Styrofoam Mailing Container (2 different sizes) with outer cardboard sleeve
 - Polyfoam Packers # 430*
 - Polyfoam Packers # 346*
- Absorbent material
- 2" Freezer boxes with 9x9 grids (supplied by Fisher BioServices and LCBR)
- 3" Freezer boxes with 9x9 grids (supplied by LCBR) – *alternative option for cryo#01.*
- Screw cap wide mouth plastic jars (supplied by LCBR)
- Leakproof Zip-lock bags
- Packaging tape
- Dry ice (approximately 20 lbs. per shipment)
- Ice packs for whole blood shipments
- FedEx Labels (provided by carrier)
- "Diagnostic Specimens" and "Keep Frozen" labels:
sites can produce these labels.
- Copies of Completed Phlebotomy/Processing Forms
- Rubber bands for boxes

Freezer boxes supplied by Fisher and LCBR and shipping boxes supplied by Fisher, LCBR, and Steve Kritchevsky

Appendix 7 Examples of FedEx Labels

FedEx USA Airbill Express FedEx Tracking Number **832656379719**

1 From Please print or type here
 Date _____ Sender's FedEx Account Number _____
 Sender's Name _____ Phone () _____
 Company _____
 Address _____
 City _____ State _____ ZIP _____

2 Your Internal Billing Reference
 FedEx customers bill based on items

3 To
 Recipient's Name **Don Whitehouse** Phone () **301 340-1620**
 Company **Fisher BioServices**
 Address **625 LOPSTRAND LANE**
 City **ROCKVILLE** State **MD** ZIP **20850**

Try online shipping at fedex.com

By using this Airbill you agree to the service conditions on the back of this Airbill and in our current Service Guide, including terms that limit our liability.

Questions? Visit our Web site at fedex.com or call 1.800.Go.FedEx® 800.463.3339

Form 0200 Sender's Copy

4a Express Package Service Packages up to 150 lbs.
 FedEx Priority Overnight Next business morning
 FedEx Standard Overnight Next business afternoon
 FedEx First Overnight Delivery guaranteed next business morning before next business day

FedEx 2Day Second business day
 FedEx Express Saver Third business day
 NEW! FedEx Extra Hours Late after hours with next business day delivery

4b Express Freight Service Packages over 150 lbs.
 FedEx 1Day Freight* Next business day
 FedEx 2Day Freight Second business day
 FedEx 3Day Freight Third business day

5 Packaging *Declared value limit \$500
 FedEx Envelope*
 FedEx Pak* Includes FedEx SurePost, FedEx Large Pak and FedEx SurePost
 Other Pkg. Includes FedEx Box, FedEx Tube, and custom wrap

6 Special Handling Includes FedEx address in Section 3
 SATURDAY Delivery Available only for FedEx Priority Overnight and FedEx 2Day service
 HOLD Weekday at FedEx Location FedEx Availability for FedEx First Overnight
 HOLD Saturday at FedEx Location Available only for FedEx Priority Overnight and FedEx 2Day service

Does this shipment contain dangerous goods?
 No Yes (See Section 6.1)
 Yes (See Section 6.1) Shipper's Declaration of Hazardous Materials
 Dry Ice (See Section 6.1) Dangerous Goods label. Dry ice cannot be shipped in FedEx packaging or with FedEx Extra Hours service. Cargo Aircraft Only

7 Payment Bill to: Sender (FedEx bill) Recipient Third Party Credit Card Cash/Check

Total Packages: _____ Total Weight: _____ Total Declared Value*: \$ _____

8 Release Signature Sign to release delivery without obtaining signature
 By signing this Airbill you authorize us to deliver this shipment without obtaining a signature and agree to indemnify and hold us harmless from any resulting claims.

FedEx USA Airbill Express FedEx Tracking Number **832656379720**

1 From Please print or type here
 Date _____ Sender's FedEx Account Number _____
 Sender's Name _____ Phone () _____
 Company _____
 Address _____
 City _____ State _____ ZIP _____

2 Your Internal Billing Reference **HABC**
 FedEx customers bill based on items

3 To
 Recipient's Name **ELAINE CORNELL** Phone () **802 656-8963**
 Company **UNIVERSITY OF VERMONT-PATHOLOGY**
 Address **208 SOUTH PARK DRIVE, SUITE 2**
 City **COLCHESTER** State **VT** ZIP **05446**

Try online shipping at fedex.com

By using this Airbill you agree to the service conditions on the back of this Airbill and in our current Service Guide, including terms that limit our liability.

Questions? Visit our Web site at fedex.com or call 1.800.Go.FedEx® 800.463.3339

Form 0200 Sender's Copy

4a Express Package Service Packages up to 150 lbs.
 FedEx Priority Overnight Next business morning
 FedEx Standard Overnight Next business afternoon
 FedEx First Overnight Delivery guaranteed next business morning before next business day

FedEx 2Day Second business day
 FedEx Express Saver Third business day
 NEW! FedEx Extra Hours Late after hours with next business day delivery

4b Express Freight Service Packages over 150 lbs.
 FedEx 1Day Freight* Next business day
 FedEx 2Day Freight Second business day
 FedEx 3Day Freight Third business day

5 Packaging *Declared value limit \$500
 FedEx Envelope*
 FedEx Pak* Includes FedEx SurePost, FedEx Large Pak, and FedEx SurePost
 Other Pkg. Includes FedEx Box, FedEx Tube, and custom wrap

6 Special Handling Includes FedEx address in Section 3
 SATURDAY Delivery Available only for FedEx Priority Overnight and FedEx 2Day service
 HOLD Weekday at FedEx Location FedEx Availability for FedEx First Overnight
 HOLD Saturday at FedEx Location Available only for FedEx Priority Overnight and FedEx 2Day service

Does this shipment contain dangerous goods?
 No Yes (See Section 6.1)
 Yes (See Section 6.1) Shipper's Declaration of Hazardous Materials
 Dry Ice (See Section 6.1) Dangerous Goods label. Dry ice cannot be shipped in FedEx packaging or with FedEx Extra Hours service. Cargo Aircraft Only

7 Payment Bill to: Sender (FedEx bill) Recipient Third Party Credit Card Cash/Check

Total Packages: _____ Total Weight: _____ Total Declared Value*: \$ _____

8 Release Signature Sign to release delivery without obtaining signature
 By signing this Airbill you authorize us to deliver this shipment without obtaining a signature and agree to indemnify and hold us harmless from any resulting claims.

Appendix 8 Dry Ice Label and Labeling Diagram
(page 1 of 2)

Shipper's Declaration not Required.

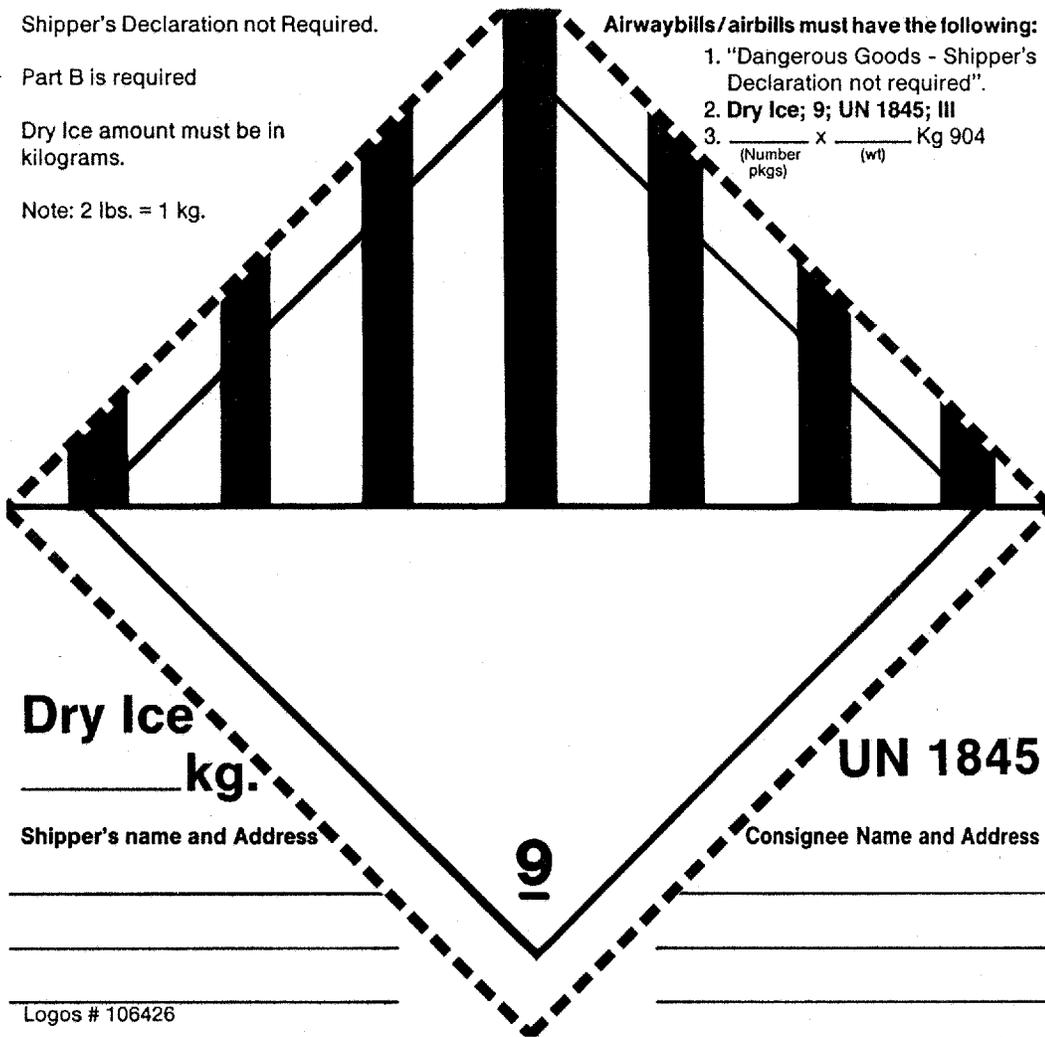
Part B is required

Dry Ice amount must be in kilograms.

Note: 2 lbs. = 1 kg.

Airwaybills/airbills must have the following:

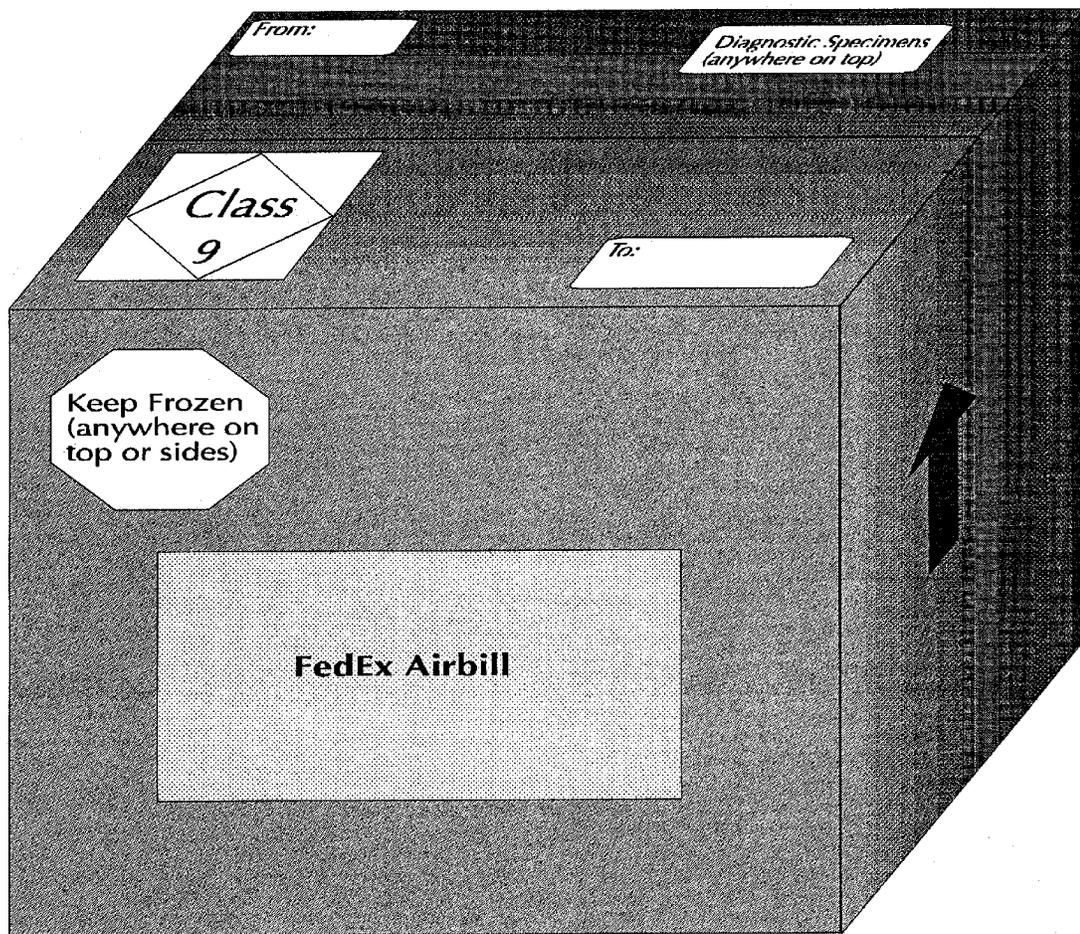
1. "Dangerous Goods - Shipper's Declaration not required".
2. Dry Ice; 9; UN 1845; III
3. $\frac{\text{Number}}{\text{(Number p kgs)}} \times \frac{\text{wt}}{\text{(wt)}} \text{ Kg 904}$



**'DIAGNOSTIC SPECIMENS'
"PACKED IN COMPLIANCE WITH
IATA PACKING INSTRUCTION 650"**

Appendix 9 Dry Ice and Labeling Diagram
(page 2 of 2)

Outer Box Labeling



NOTE: Labels must not overlap

Appendix 10 LCBR Shipping Form for Whole Blood



LCBR Shipping Form
for Whole Blood (Draw Tube #2)

Date of Shipment: / /

Month Day Year

Field Center: Memphis
 Pittsburgh

Shipment prepared by: _____

FedEx Airbill #: _____

Bar Code	HABC Enrollment ID #	Date of Year 10 Clinic Visit
		<input type="text"/> <input type="text"/> / <input type="text"/> <input type="text"/> / <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> Month Day Year
		<input type="text"/> <input type="text"/> / <input type="text"/> <input type="text"/> / <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> Month Day Year
		<input type="text"/> <input type="text"/> / <input type="text"/> <input type="text"/> / <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> Month Day Year
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		<input type="text"/> <input type="text"/> / <input type="text"/> <input type="text"/> / <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> Month Day Year
		<input type="text"/> <input type="text"/> / <input type="text"/> <input type="text"/> / <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> Month Day Year
		<input type="text"/> <input type="text"/> / <input type="text"/> <input type="text"/> / <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> Month Day Year

Y10 LCBR Shipping Form, Version 1.0, 5/23/06

Appendix 11 Equipment and Supplies List

Health ABC Equipment and Supplies List

SPECIMEN COLLECTION / PROCESSING / SHIPPING

Item Specifications	Vendor/Source	Cost	Provided/Purchased by:		
			Coordin. Center	Field Center	Other
1. Centrifuges capable of spinning at 30,000 g-minutes	Purchase locally			X	
2. -20° Freezer space is required	Purchase locally			X	
3. Refrigerator space	Purchase locally			X	
4. Blue ice or gel packs	Purchase locally			X	
5. Volumetric pipets and tips: 0.5- and 2.0-mL volumes, e.g., Pipetman P-2 (289.50) and Pipetman P-10mL (289.50), or Pipetman P-10 (289.50) – TWO pipets strongly recommended to allow one set to 0.5 and one to 2.0 mL	See vendors list on next page.			X	
6. Lab coat and gloves	Purchase locally			X	
7. Biohazardous waste disposal container	Purchase locally			X	
8. Balance tubes for the centrifuge	Purchase locally			X	
9. Lab mat	Purchase locally			X	
10. 10% bleach solution	Purchase locally			X	
11. Rubber bands	Purchase locally			X	

Health ABC Equipment and Supplies List

Supply List

VENDORS:
 VWR: 800-932-5000
www.vwrsp.com
 Fisher Scientific: 800-766-7000
www.fishersci.com
 Polyfoam Packers: 800-323-7442
www.polyfoam.com
www.krackcler.com
 Kraekler Scientific: 800-334-7725 (NY)
 BD- Vacutainer: 888-237-2762
 BD: Becton Dickinson brand, available through VWR, Baxter, and Fisher
 Qiagen: www1.qiagen.com or 1-800-426-8157

Note: Prices are from the catalogs. Educational discounts should apply.

cryovials / caps/ racks	# per participant	sample type	vendor: catalog #	\$ price/pk
0.5 mL cryovial with skirt w/o cap non-sterile	9	Serum, plasma	VWR: 20170-210 or Fisher: 02-681-333	51.90/ 500
5 mL polypropylene tube with red push cap (provided by LCBR)	1	Serum	Fisher: 03-530-63	87.19/6
Red polyethylene plug-type closures for 12x75 mm tubes (provided by LCBR)	1	Serum	VWR: 60819-036	152.58 case of 3 50.85 pack of 1000
2 mL cryovial with skirt w/o cap non-sterile	1	buffy	Fisher: 02-681-343	52.50/ 500 case of 10 costs 461.98
colored screw cap: red	5	serum	VWR: 16466-074 or Fisher: 02-681-361	66.02/500 82.97/500
colored screw cap: white	4	EDTA plasma	VWR: 16466-080	66.02/500
clear screw cap	1	buffy	VWR: 16466-082 or Fisher: 02-681-358	66.02/500 83.26/500
cryovial rack	1	all	VWR: 30128-346 or Fisher: 07-200-618	56.52/ 5 49.02/2
cover for cryovial rack	1 optional	all	VWR: 30128-350	48.76/ 5

Health ABC Equipment and Supplies List

Blood collection supplies	# per participant	sample type	vendor: catalog #	\$ price/pk
PAXgene tube (10 mL)	1	Provided by Steve Kritchevsky	Provided by Steve Kritchevsky	Provided by Steve Kritchevsky
10 mL Serum draw tube (red) Glass	1	serum	Fisher: 22-301710 Monoject# 8881301710	21.75/100
4 mL K3 EDTA draw tube (purple) Plastic	1	EDTA plasma	Fisher: 22-040-036 Grenier# 454021	9.44/ 50 188.87/case of 24
7 mL K3 EDTA draw tube (purple) Glass	1	EDTA plasma	Fisher: 22-311-545 Monoject# 8881311545	21.59/ 100
vacutainer blood collection set 21G 3/4"	1		VWR: VT7251 or Fisher: 02-664-1	54.38/ 50 81.03/ 50
vacutainer needle holders (reusable)	1	NA	Fisher: 02-665-110	118.79/72 1.8810
transfer pipets (3.2 mL is fine)	1	Buffy coat	Fisher: 13-711-7	39.53/ 500
Storage/ Shipping Supplies	# suggested	sample type	vendor: catalog #	\$ price/pk
freezer boxes (supplied by Fisher)(2")	NA	all	Fisher: 11-678-24A	33.01/12
freezer boxes (supplied by LCBR)(2")	NA	Serum	Fisher: 11-678-24A	33.01/12
freezer boxes (supplied by LCBR)(3")	NA	Serum	Fisher: 11-678-24B	43.50/12
freezer boxes (supplied by S. Kritchevsky)(3")	NA	PAXgene	Fisher: 11-678-24B	43.50/12
box dividers (9X9) (supplied by S Kritchevsky)	NA		Fisher: 13-989-218	12.00/21
box dividers (9X9) (supplied by LCBR)	NA		Fisher: 13-989-218	12.00/21
Leakproof ziplock bags (12 x 12") for freezer boxes	10 per week		VWR: 11217-128	146.35/ 250
Diagnostic Specimen Packed in Compliance with IATA packing instructions 650 labels	1 roll		Therapak: #54752	500/roll \$50.00
Dry Ice labels	1 roll		Therapak: #54530	500/roll \$60.00
styrofoam shipping containers: 430 (supplied by Steve Kritchevsky)	4 for start	PAXgene	Krackeler: 70-430	96.30/ 4
styrofoam shipping containers: 346UPS (supplied by LCBR)	6 for start	Serum	Fisher: 03-530-63	87.19/6
Screw cap jars – polypropylene – natural 32 oz.	NA	EDTA Plasma	Fisher: 02-891F	146.98/24
Ice packs: U-TEK reusable packs or Reusable Refrigerant Packs	12 oz		VWR: 15715-105 Krackeler or purchase locally Fisher: 03-528B	23.39/24 27.90/24 23.20/24