# ADRC Consortium for Clarity in ADRD Research Through Imaging (CLARiTI)

CLARiTI

**in collaboration with the**

# National Centralized Repository for Alzheimer's Disease and Related Dementias

NCRAD

**Biospecimen Collection, Processing, and Shipment Manual of Procedures**

**Version 04.2025**

# CLARiTI Protocol Update: V04.2025

| Section | Change |
|---|---|
| Document Footer | The version date was updated for this amendment. |
| 6.1.1 | New label examples added. |
| Throughout Document | Minor changes made to phrasing and wording. No alterations to procedures were made. |

*Table of Contents*

## 1.0 Abbreviations

| | |
|---|---|
| AD | Alzheimer's Disease |
| CLARITI | ADRC Consortium for Clarity in ADRD Research Through Imaging |
| DNA | Deoxyribonucleic Acid |
| EDTA | Ethylene Diamine Tetra-acetic Acid |
| IATA | International Air Transport Association |
| NACC | National Alzheimer's Coordinating Center |
| NCRAD | National Centralized Repository for Alzheimer's Disease and Related Dementias |
| PHI | Protected Health Information |
| RBC | Red Blood Cells |
| RCF | Relative Centrifugal Force |
| RPM | Revolutions Per Minute |

## 2.0 Purpose

The collection of biofluids is an important part of the ADRC Consortium for Clarity in ADRD Research Through Imaging (CLARiTI) Study. The purpose of this manual is to provide study staff (PIs, study coordinators, phlebotomists) at the various study sites with instructions for collection and submission of biological samples for CLARITI study visits. It includes instructions for biofluid submission to NCRAD located in Indianapolis at Indiana University.

*Centers may collect and send the following samples to NCRAD:*

- Plasma
- Buffy Coat (DNA Extraction)

This manual includes instructions for collection of blood, fractionation of blood from collection tubes, aliquoting, labeling, storage prior to shipping, and shipping to NCRAD.

These procedures are relevant to all study personnel responsible for processing specimens provided to NCRAD for the CLARITI protocol.

# 3.0 NCRAD Information

## 3.1 NCRAD Contacts

**Tatiana Foroud, PhD, Core Leader**
Phone: 317-274-2218

**Kelley Faber, MS, CCRC, Senior Project Manager**
Phone: 317-274-7360
Email: kelfaber@iu.edu

**Mica Gosnell, MS, Clinical Research Coordinator**
Phone: 317-274-7423
Email: gosnellm@iu.edu

**General NCRAD Contact Information**
Phone: 1-800-526-2839 or 317-278-8413
Email: alzstudy@iu.edu
Website: www.ncrad.org

**Sample Shipment Mailing Address**
CLARITI at NCRAD
Indiana University School of Medicine
351 W. 10th St. TK-217
Indianapolis, IN 46202
Phone: 1-800-526-2839

## 3.2 NCRAD Hours of Operation

Indiana University business hours are from 8 AM to 5 PM Eastern Time, Monday through Friday.

Frozen samples must be shipped **Monday-Wednesday only.**

For packing and shipment details of samples, please refer to Section 9.0 of this protocol.

Check the weather report to make sure impending weather events (blizzards, hurricanes, etc.) will not impact the shipping or delivery of the samples.

### 3.3 NCRAD Holiday Observations

| Date | Holiday |
|---|---|
| January 1 | New Year's Day |
| 3rd Monday in January | Martin Luther King, Jr Day |
| 4th Monday in May | Memorial Day |
| June 19 | Juneteenth |
| July 4 | Independence Day |
| 1st Monday in September | Labor Day |
| 4th Thursday in November | Thanksgiving |
| 4th Friday in November | Friday after Thanksgiving |
| December 25 | Christmas Day |
| December 26-31 | Winter Break |

Please note that between December 24th and January 2nd, Indiana University will be open Monday through Friday for essential operations **ONLY** and will re-open for normal operations on January 2nd. If possible, biological specimens for submission to Indiana University should **NOT** be collected and shipped to Indiana University after the second week in December. Should it be necessary to ship blood samples for DNA extraction to Indiana University during this period, please contact the Indiana University staff before December 20th by e-mailing alzstudy@iu.edu, so that they can arrange to have staff available to process incoming samples. **Please see: https://ncrad.org/contact/holiday-closures for additional information.**

- Please note that courier services may observe a different set of holidays.
- Please be sure to verify shipping dates with your courier prior to any holiday.
- **Weekend/holiday delivery must be arranged in advance with NCRAD staff.**

## 4.0 CLARITI Laboratory Collection

### 4.1 Site Required Equipment

The following materials and equipment are necessary for the processing of specimens at the collection site and are to be **supplied by the local site**:

- Personal Protective Equipment: lab coat, nitrile/latex gloves, safety glasses
- Tourniquet
- Alcohol Prep Pad
- Gauze Pad
- Bandage

- Butterfly needles and hub
- Microcentrifuge tube rack
- Sharps bin and lid
- Wet Ice Bucket
- Wet ice
- Pelleted dry ice

In order to process samples consistently across all projects and ensure the highest quality samples possible, project sites must have access to the following equipment:

- Centrifuge capable of ≥ 2000 x g with refrigeration to 4°C
- -80°C Freezer

In order to ship specimens, you must provide:

- Pelleted dry ice (approximately 45 lbs per shipment)

## 4.2 Biospecimens Sent to NCRAD

Samples are to be submitted according to the shipping methods outlined in Section 9.0. Guidelines for the processing, storage location, and timing of sample collection are listed in the tables below.

### *4.2.1 Biofluid Collection Schedule*

| | Visit Schedule | |
|---|---|---|
| **Biospecimen** | **Baseline** | **Follow Up** |
| **Plasma** | X | X |
| **Buffy Coat (DNA)** | X | X |

Whole blood is collected into three purple-top EDTA tubes. The 10 ml EDTA tubes are processed locally into plasma and buffy coat fractions; they are then aliquoted, frozen at the study site, and shipped to NCRAD.

Consent forms must specify that any biological samples and de-identified clinical data may be shared with academic and/or industry collaborators through NCRAD. Recommended consent language can be found on the NCRAD website at: https://ncrad.org/bank-samples/sample-management/recommended-consent-language. A copy of the consent form for each participant should be kept on file by the site investigator.

### *4.2.2 Biofluid Collection Chart*

| Collection Tube | Drawn At | Specimen Type | Aliquot Volume | Total Number of Aliquots | Shipping Temperature |
|---|---|---|---|---|---|
| **3 EDTA (Purple-Top) Blood Collection Tubes (10 ml)** | Each visit | Plasma | 1.5 ml plasma aliquots | Up to 10 | Frozen |
| | Each visit | Buffy Coat | ~1.0 ml buffy coat aliquots | Up to 3 | Frozen |

## 5.0 Specimen Collection Kits, Shipping Kits, and Supplies

NCRAD will provide: 1) Blood sample collection kits for research specimens to be stored at NCRAD, the Blood Supplemental Supply Kit, the Frozen Shipment Kit; 2) clinical lab supplies (with the exception of pelleted dry ice and equipment supplies listed in Section 5.1). The provided materials include blood tubes, pipettes, boxes for plasma and buffy coat aliquots, as well shipping materials to send biospecimens to NCRAD. Kit number labels, site and PTID labels, and collection tube and aliquot labels will all be provided by NCRAD. Details regarding the blood kits are found in this Manual of Procedures. Collection tube and aliquot labels will be preprinted with study information specific to the type of sample being drawn. Ensure that all tubes are properly labeled during processing and at the time of shipment according to Section 7.1.

### 5.1 NCRAD Specimen Collection Kit Contents

Collection kits contain the following (for each participant) and provide the necessary supplies to collect samples from a given participant. Do not replace or supplement any of the tubes or kit components provided with your own supplies unless you have received approval from the NCRAD Study team to do so. *Please store all kits at room temperature until use.*

**CLARITI Blood Kit**

| Quantity | CLARITI Blood Kit Components |
|---|---|
| 1 | Large Plastic Bag |
| 1 | 4x5 Plastic Bag |
| 3 | EDTA (purple-top) blood collection tube (10 ml) |
| 1 | 50 ml conical polypropylene tube (blue cap) |
| 9 | Cryovial (2.0 ml) with purple cap |
| 1 | Cryovial (2.0 ml) with blue cap |
| 3 | Cryovial (2.0 ml) with clear cap |
| 16 | Preprinted Collection Tube and Aliquot Labels |
| 3 | Preprinted Kit Number Label |

| | |
|---|---|
| 4 | Label for handwritten Site and PTID |
| 1 | Cryovial box (holds up to 25 cryovials) |
| 4 | Disposable graduated transfer pipettes (3 ml) |

**CLARITI Blood Supplemental Supply Kit**

| Quantity | CLARITI Blood Supplemental Supply Kit Components |
|---|---|
| 1 | Large Plastic Bag |
| 2 | 4x5 Plastic Bag |
| 6 | EDTA (purple-top) blood collection tube (10 ml) |
| 2 | 50 ml conical polypropylene tube (blue cap) |
| 18 | Cryovial (2.0 ml) with purple cap |
| 2 | Cryovial (2.0 ml) with blue cap |
| 6 | Cryovial (2.0 ml) with clear cap |
| 8 | Label for handwritten Site and PTID |
| 2 | Cryovial box (holds up to 25 cryovials) |
| 8 | Disposable graduated transfer pipettes (3 ml) |

**NCRAD Frozen Shipping Supply Kit (Large Shippers)**

| Quantity | Frozen Shipping Kit Components for Blood-Based Biomarkers |
|---|---|
| 1 | Large Plastic Bag |
| 8 | Plastic Biohazard bag with absorbent sheet (small) |
| 1 | UPS Airbill Sleeve |
| 1 | Shipping box/Styrofoam container (large) |
| 1 | UN3373 label |
| 1 | Dry ice shipping label |
| 1 | Fragile label |

**Individual Supplies**

| Quantities | Items Available upon request within the NCRAD Kit Module |
|---|---|
| By Request | Cryovial box (holds up to 25 cryovials) |
| By Request | Cryovial (2.0 ml) with purple cap |
| By Request | Cryovial (2.0 ml) with blue cap |
| By Request | Cryovial (2.0 ml) with clear cap |
| By Request | 50 ml conical polypropylene tube (blue cap) |
| By Request | UPS Airbill Sleeve |

| | |
|---|---|
| By Request | Shipping container for dry ice shipment (shipping and Styrofoam box)-large shipper |
| By Request | Styrofoam shipping containers (11”x 9”x 8”, 1 1/2” wall) -small shipper |
| By Request | Plastic biohazard bag with absorbent sheet (small) |
| By Request | Disposable graduated transfer pipette (3 ml) |
| By Request | EDTA (Purple-Top) Blood Collection Tube (10 ml) |
| By Request | UN3373 label |
| By Request | Dry ice shipping label |
| By Request | Fragile label |
| By Request | Fine Point Permanent Markers |
| By Request | Site and PTID Labels |

## 5.2 Kit Supply to Study Sites

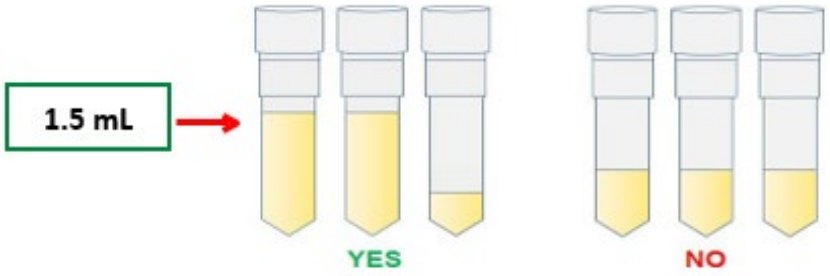
Each site will be responsible for ordering and maintaining a steady supply of kits from NCRAD. We advise sites to keep a supply of each kit type available and to monitor expiration dates. Be sure to check your supplies and order additional materials before you run out or supplies expire so you are prepared for study visits. Please go to:
http://kits.iu.edu/CLARiTI to request additional kits and follow the prompts to request the desired supplies.

Please allow **THREE weeks** for kit orders to be processed and delivered.

## 5.3 Filling Cryovials

In order to ensure that NCRAD receives a sufficient amount of sample for processing and storage and to avoid cracking of the tubes prior to shipment, each aliquot tube should be filled to the assigned volume after processing is completed (refer to detailed processing instructions for average yield per sample). Over-filled tubes may burst once placed in the freezer, resulting in a loss of sample.

Aliquot the remaining biologic material as the residual volume and ship to NCRAD. Ship *all* material to NCRAD. Fill as many aliquot tubes as possible. For example, if 3.7 ml of a plasma sample is obtained, fill 2 cryovials with 1.5 ml, and one additional cryovial with the remaining 0.7 ml.




**Please note:** It is critical for the integrity of future studies using these samples that study staff note if an aliquot tube contains a residual volume (anything under 1.5 ml). Please highlight that the aliquot contains a small volume by utilizing the blue cryovial cap provided in each kit. Please record the last four digits of the residual aliquot on the Biological Sample and Notification Form. If there are any unused cryovials, please do not send the empty cryovials to NCRAD. These unused cryovials (ensure labels are removed) can be saved as part of a supplemental supply at your site or the cryovials can be disposed of per your site's requirements.

To assist in the preparation and aliquoting of samples, colored caps are used for the aliquot tubes. The chart below summarizes the association between cap color and type of aliquot.

| Cap Color | Sample Type |
|---|---|
| Purple | Plasma |
| Clear | Buffy Coat |
| Blue | Residual sample |

# 6.0 Blood Collection and Processing Procedures

## 6.1 Labeling Samples

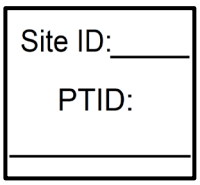
In order to ensure the highest quality samples are collected, it is essential to follow the specific collection and shipment procedures detailed in the following pages. Please read the following instructions first before collecting any specimens. Have all your supplies and equipment out and prepared prior to drawing blood.

### *6.1.1 Label Type Summary*

1. Kit Number Label
2. Site and PTID Label

3. Collection Tube and Aliquot Label

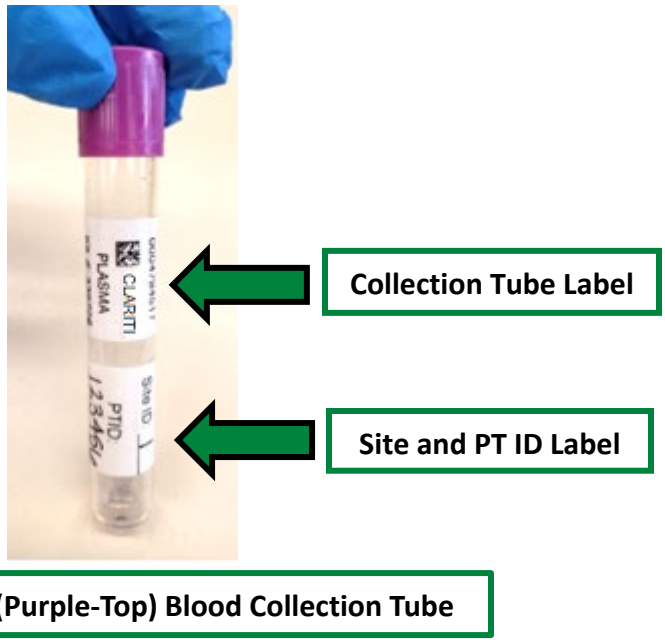

**Kit Number Labels** tie together all specimens collected from one participant at one visit. They should be placed on each cryobox, and in the designated location on the Blood Sample and Shipment Notification Forms.




**Site and PTID Labels** are used to document the individual's unique Site and PTID. Place one label on each blood collection tube.


Place one **Collection Tube and Aliquot Label** on each blood collection tube and cryovial.


The cryovial tubes have labels that say "ALIQUOT" and are marked with the specimen type.




**Labeled EDTA (Purple-Top) Blood Collection Tube**

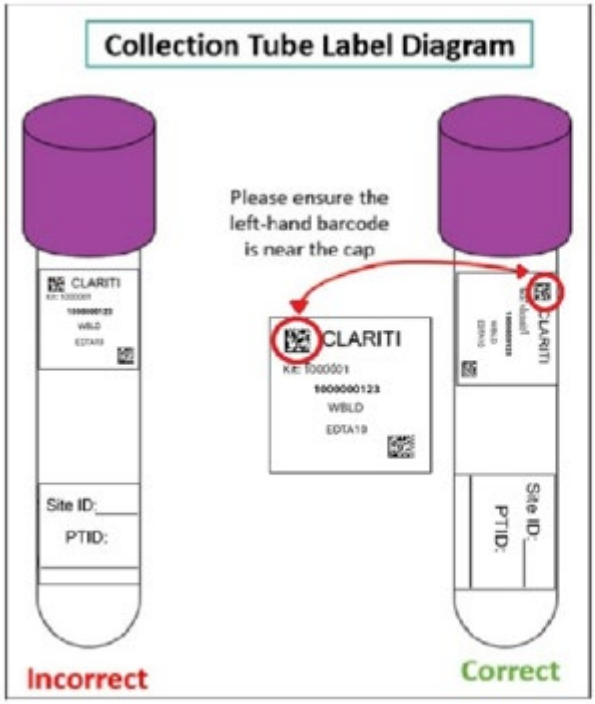
**Each collection tube will contain two labels**: the collection tube label and the Site and PTID Label. Be sure to place labels in the same configuration

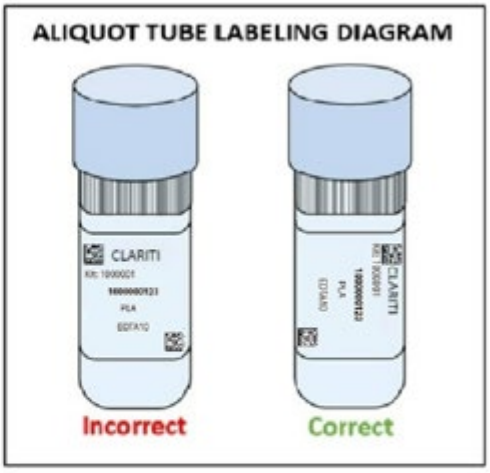
consistently among tubes, with the barcoded label near the top of the tube and the handwritten Site and PTID label near the bottom of the tube.

In order to ensure the label adheres properly and remains on the tube, please follow these instructions:

- Place Collection Tube and Aliquot Labels on **ALL** collection tubes and cryovials **BEFORE** sample collection. This should help to ensure the label properly adheres to the tube before exposure to moisture or different temperatures.
- Using a fine point permanent marker, fill-in and place the Site and PTID Labels on the EDTA (purple-top) tubes **BEFORE** sample collection. These labels are placed on collection tubes in addition to the Collection Tube Label.
- The Collection Tube Labels contain a 2D barcode on the top left-hand side and bottom right-hand side of the label. Place the top left barcode toward the tube cap.
- Place label **horizontally** on the tube (wrapped around sideways if the tube is upright).

Take a moment to ensure the label is **completely adhered** to each tube. It may be helpful to roll the tube between your fingers after applying the label.



## 6.2 Whole Blood Collection with 10 ml EDTA (Purple-Top) Tube for Plasma and Buffy Coat

1. Store empty EDTA tubes at room temperature, 64°F - 77°F (18 °C – 25 °C) before use.

2. Set centrifuge to 4°C to pre-chill before use.

3. Place completed site and PTID Label and preprinted **PLASMA** Collection Tube Label on the purple-top EDTA tubes. Place preprinted **PLASMA** Aliquot Labels on the 2 ml cryovials with purple caps and 2 ml cryovial with blue cap (if necessary, for residual). Place preprinted **BUFFY COAT** Aliquot Label on the 2 ml cryovials with clear caps.

4. Using a blood collection set and a holder, collect blood into the **EDTA (Purple-Top) Blood Collection Tube (10 ml)** using your organization's recommended procedure for standard venipuncture technique.

   **The following techniques shall be used to prevent possible backflow:**
   a. Place participant's arm in a downward position.
   b. Hold tube in a vertical position, below the participant's arm during blood collection.
   c. Release tourniquet as soon as blood starts to flow into final tube.
   d. Make sure tube additives do not touch stopper or end of the needle during venipuncture.

5. Allow at least 10 seconds for a complete blood draw to take place in each tube. **Ensure that the blood has stopped flowing into the tube before removing the tube from the holder.** The tube with its vacuum is designed to draw 10 ml of blood into the tube.
   a. If complications arise during the blood draw, please note the difficulties on the 'Biological Sample and Shipment Notification Form'. Do not attempt to draw an additional EDTA tube at this time. Process blood obtained in existing EDTA tube.

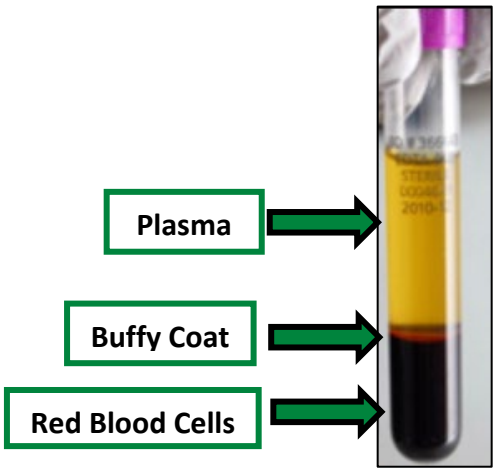
6. Immediately after blood collection, gently invert/mix (180 degree turns) the EDTA tube 8-10 times.

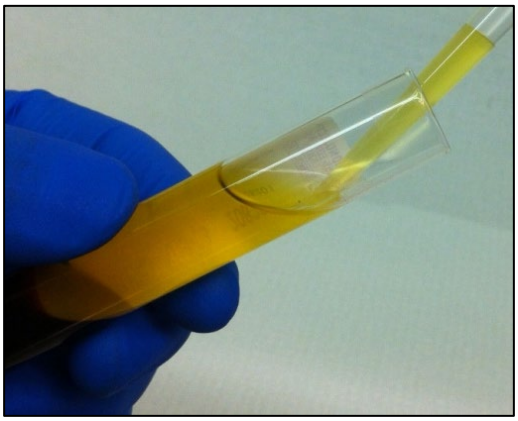
7. Immediately after inverting the EDTA tube, place it on wet ice until centrifugation begins.

8. Centrifuge balanced tubes for 10 minutes at 2000 x g at 4°C. **It is critical that the tubes be centrifuged at the appropriate speed and temperature to ensure proper plasma separation (see worksheet in Appendix A to calculate equivalent RPM for spin at 2000 x g).**
    a. While centrifuging, remember to record all times, temperatures and spin rates on the Biological Sample and Shipment Notification Form.
    b. Record original volume drawn for each tube in spaces provided on the Biological Sample Shipment and Notification Form.
    c. Plasma samples need to be spun, aliquoted, and placed in the freezer within 2 hours from the time of collection.
    d. Record time aliquoted on the Biological Sample Shipment and Notification Form.

9. Remove the plasma by tilting the tube and placing the pipette tip along the lower side of the wall being careful not to agitate the packed red blood cells at the bottom of the collection tube.

10. Each EDTA tube should yield, on average, 4-5 ml of plasma. Transfer plasma from all EDTA tubes into the 50 ml conical tube and gently invert 3 times. Aliquot 1.5 ml plasma per cryovial. When pipetting plasma from the EDTA tube into the 50 ml conical tube, be very careful to pipette the plasma top layer only, leaving the buffy coat and the red blood cell layers untouched. Be sure to only place **plasma** in cryovials with purple caps and labeled with **PLASMA** labels**.** Place residual plasma (<1.5 ml) in the blue-capped cryovial. **If a residual aliquot (<1.5 ml) is created, document the specimen number and volume on the Biological Sample and Shipment Notification Form.**

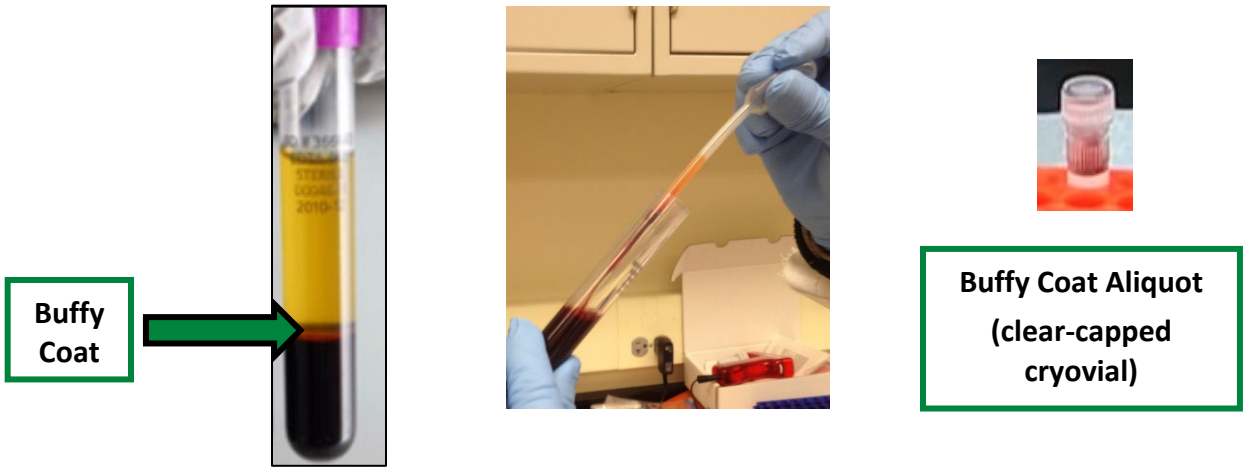


11. Place the labeled cryovials in the 25 cell cryobox and place on dry ice. **Transfer to -80°C Freezer when possible**. Store all samples at **-80°C until shipped** to NCRAD on pelleted dry ice. Record time aliquots frozen and

storage temperature of freezer on Biological Sample Shipment and Notification Form (Appendix B).

12. After plasma has been removed from the EDTA (Purple-Top) Blood Collection Tubes (10 ml), aliquot the buffy coat layer (in the top layer of cells, the buffy coat is mixed with RBCs-see figure) from one EDTA tube into a labeled, clear-capped cryovial using a micropipette. The buffy coat aliquot is expected to have a reddish color from the RBCs. Be sure to only place the buffy coat from one EDTA tube into each cryovial. Repeat this step for the second and third EDTA tubes (if collecting 30ml total), placing these buffy coats into the second and third clear-capped cryovials.




13. Dispose of collection tube with red blood cell pellet according to your site's guidelines for disposing of biomedical waste.

14. Record the specimen number and volumes of the EDTA tubes and corresponding buffy coat samples on the Biological Sample Shipment and Notification Form.

15. Place the labeled cryovials in the 25 cell cryobox and place on dry ice. **Transfer to -80°C Freezer when possible.** Store all samples at -80°C until shipped to NCRAD on pelleted dry ice. Record time aliquots frozen and

storage temperature of freezer on Biological Sample and Shipment Notification Form.

Plasma Aliquots (up to 10 possible) and Buffy Coats (3)

# Plasma and Buffy Coat Preparation EDTA Purple-Top Tube (3 x 10 ml)

**Step One**

- Store tubes at room temp.
- Each tube should be labeled with Collection Tube and Site and PTID Labels.

**Step Two**

- Collect blood into each EDTA Tube, allowing blood to flow for 10 seconds and ensuring blood flow has stopped.

**Step Three**

- Immediately after blood draw, invert tubes 8-10 times to mix samples.

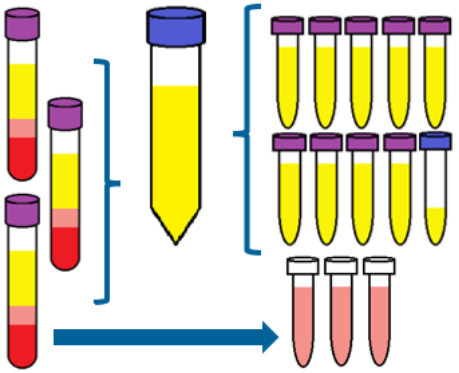
**Step Four**

- Place thoroughly mixed tube on wet ice until centrifugation begins.

**Step Five**

- Centrifuge samples at 2000 x g for 10 minutes at 4°C.

**Step Six**



- Pool all plasma from the 3 EDTA tubes into a 50 ml conical tube and invert gently 3 times to mix the plasma.

**Step Seven**

- Label purple-capped cryovials with "PLASMA" labels.
- Aliquot 1.5 ml plasma into each cryovial.
- If residual aliquot is created, document specimen number and volume on Sample Form.
- Store plasma aliquots upright at -80°C until shipment to NCRAD.

**Step Eight**

- Label clear-capped cryovials with "BUFFY COAT" labels.
- Using a clean transfer pipette, collect the buffy coat (may have residual plasma and some RBCs included).
- Transfer the buffy coat from each EDTA tube into its own cryovial.
- Store buffy coat aliquots upright at -80°C until shipment to NCRAD.
- Spin, aliquot, and freeze all plasma and buffy coat aliquots within 2 hours of collection.

## 7.0 Incomplete or Difficult Blood Draws

If challenges arise during the blood draw process, it is advised that the phlebotomist discontinue the draw. Attempt to process and submit any blood-based specimens that have already been collected to NCRAD.

Situations may arise that prevent study coordinators from obtaining the total amount scheduled for biospecimens. In these situations, please follow the below steps:

1. *If the biospecimens at a scheduled visit **are partially** collected:*
    a. Attempt to process and submit any samples that were able to be collected during the visit.
    b. Document difficulties on the 'Biological Sample and Shipment Notification Form' prior to submission to and NCRAD.
        i. Indicate blood draw difficulties at the bottom of the 'Biological Sample and Shipment Notification Form' within the "Notes" section.
        ii. Complete the 'Biological Sample and Shipment Notification Form' with tube volume approximations and number of aliquots created.

## 8.0 Packaging & Shipping Instructions

**ALL** study personnel responsible for shipping should be certified in biospecimen shipping. If you have difficulty finding biospecimen shipping training, please notify a NCRAD coordinator.

In addition to tracking and reconciliation of samples, the condition and number of samples received are tracked by NCRAD for each sample type. Investigators and clinical coordinators for each project are responsible to ensure the requested amounts of each fluid are collected to the best of their ability and that frozen samples are packed with sufficient amounts of pelleted dry ice to avoid thawing in the shipment process.

### 8.1 Frozen Packaging Instructions

**FROZEN SAMPLES MUST BE SHIPPED MONDAY-WEDNESDAY ONLY!**

The most important issue for shipping is to maintain the temperature of the samples. The frozen samples must never thaw; not even the outside of the tubes should be allowed to defrost. This is best accomplished by making sure the Styrofoam container is filled completely with pelleted dry ice.

Specimens being shipped to NCRAD should be considered as Category B UN3373 specimens and as such must be tripled packaged and compliant with IATA Packing Instructions 650. *See the Latest Edition of the IATA Regulations for complete documentation.*

Triple packaging consists of a primary receptacle(s), a secondary packaging, and a rigid outer packaging. The primary receptacles must be packed in secondary packaging in such a way that, under normal conditions of transport, they cannot break, be punctured, or leak their contents into the secondary packaging. Secondary packaging must be secured in outer packaging with suitable cushioning material. Any leakage of the contents must not compromise the integrity of the cushioning material or of the outer packaging.

**Packing and Labeling Guidelines**

- The primary receptacle (cryovial) must be leak proof and must not contain more than 1L total.
- The secondary packaging (biohazard bag) must be leak proof and if multiple blood tubes are placed in a single secondary packaging, they must be either individually wrapped or separated to prevent direct contact with adjacent blood tubes.
- Absorbent material must be placed between the primary receptacle and the secondary packaging. The absorbent material should be of sufficient quantity in order to absorb the entire contents of the specimens being shipped. Examples of absorbent material are paper towels, absorbent pads, cotton balls, or cellulose wadding.
- A shipping manifest of specimens being shipped must be included between the secondary and outer packaging.
- The outer shipping container must display the following labels:
  - ✓ Sender's name and address
  - ✓ Recipient's name and address
  - ✓ Responsible Person
  - ✓ Fragile
  - ✓ The words "Biological Substance, Category B"
  - ✓ UN3373
  - ✓ UPS Dry Ice label and net weight of dry ice contained


### *8.1.1 NCRAD Packaging Instructions – Frozen Shipments*

1. Notify NCRAD of shipment by emailing NCRAD coordinators at alzstudy@iu.edu. Attach the following to the email:

   a. Completed Sample Form (Appendix B) to the email notification (email NCRAD coordinator prior to shipment to receive sample form).
   b. If email is unavailable please call NCRAD at 1-800-526-2839 or 317-278-8413 and do not ship until you've contacted and notified NCRAD coordinators about the shipment in advance.

2. Place the cryovial boxes containing frozen samples into a biohazard bag. You can ship up to 8 cryovial boxes per large shipper.

3. As the cryovial box is placed in the plastic biohazard bag, do NOT remove the absorbent material found in the bag. Seal according to the instructions on the bag.

4. Place approximately 2-3 inches of pelleted dry ice in the bottom of the Styrofoam shipping container.

5. Place the biohazard bags into the provided Styrofoam-lined shipping container on top of the pelleted dry ice. Please ensure that cryovial boxes are placed so the cryovials are upright in the shipping container.

6. Fully cover the biohazard bags containing the cryovial boxes tubes and fill the shipper to the top with pelleted dry ice.

7. After the samples have been placed into the shipping container, completely fill the inner Styrofoam with dry ice pellets to ensure the frozen state of the specimens during transit.

8. Replace the lid on the Styrofoam carton. Place the completed Blood Sample and Shipment Notification Form in the package on top of the Styrofoam lid for each patient specimen, and close and seal the outer cardboard shipping carton with packing tape.

9. Complete the UPS Dry Ice Label with the following information:
   a. Net weight of dry ice in kg (must match amount on the airbill)
   b. Do not cover any part of this label with other stickers, including preprinted address labels.

10. Apply all provided warning labels and UPS return airbill to the outside of package, taking care not to overlap labels. **Complete the required**

**fields on the UPS Dry Ice label or UPS may reject or return your package.**

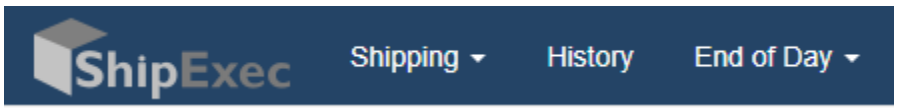
11. If possible, hold packaged samples in -80°C freezer until time of UPS pick-up/drop-off. If storage in a -80°C freezer until UPS pick-up is not possible, package samples no more than 4 hours before the expected pick-up time.

12. Use UPS tracking to ensure the delivery occurs as scheduled and is received by NCRAD. Please notify NCRAD by email (alzstudy@iu.edu) that a shipment has been sent and include the UPS tracking number in your email.

## 8.2 Frozen Shipping Instructions

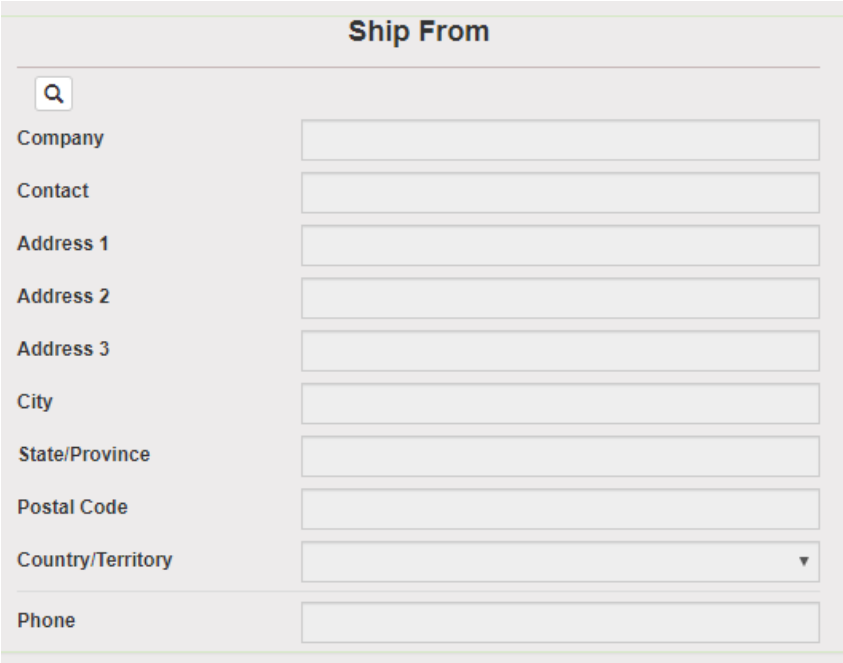
1. Log into the ShipExec Thin Client at kits.iu.edu/UPS.
    a. If a new user or contact needs access, please reach out to your study contact for access.

2. Click “Shipping” at the top of the page and select “Shipping and Rating”.




3. Select your study from the “Study Group” drop down on the right side of the main screen. Choosing your study will automatically filter the address book to only addresses within this study.

4. Click on the magnifying glass icon in the “Ship From” section to search for your shipping address.




   a. Search by Company (site), Contact (name), or Address 1 (first line of your site's street address). Click Search.
   b. Click Select to the left of the correct contact information.

5. Verify that both the shipping information AND study reference are correct for this shipment.
   a. If wrong study contact or study reference, click Reset in the bottom right of the screen to research for the correct information.
6. Enter Package Information
   a. Frozen shipments
      i. Enter the total weight of your package in the "Weight" field.
      ii. Enter the dry ice weight in the "Dry Ice Weight" field.
      iii. If the "Dry Ice Weight" field is higher than the "Weight" field, you will receive an error message after clicking Ship and need to reenter these values.
   b. Click Ship in the bottom right of the page when complete.

7. If your site does not already have a daily UPS pickup, you can schedule one here.
   a. Click the blue Pickup Request button. Enter the earliest pickup time and latest pickup time in 24-hr format.
   b. Give a name & phone number of someone who the UPS driver can call if having issues finding the package.

c. Give the Floor and Room Number (if needed) to be as descriptive as possible where this package needs to be picked up from. Click Save.

8. Print the airbill that is automatically downloaded.
    a. To reprint airbill, click History at the top left of the page.
        i. Shipments created from the user that day will automatically populate. If shipments from a previous day need to be located, search by ship date.
        ii. Locate the correct shipment, and click on the printer icon to the left of the tracking number under "Action" to reprint the airbill
        iii. Click print icon on right side of the tracking number line.

9. Fold airbill, and place inside plastic UPS sleeve.

10. Peel the back off of the UPS sleeve and stick the sleeve to the package top. Ensure that sleeve does not cover any warning labels (e.g. dry ice label) or overlap taped seams.

## 9.0 Data Queries and Reconciliation

Sample and Shipment Notification forms must be completed on the day that samples are collected because they include information that will be used to reconcile sample collection and receipt, as well as information essential to future analyses.

NCRAD will collaborate with the data team at NACC to reconcile information captured in the NACC database compared to samples received and logged at NCRAD. Additional discrepancies may be sent directly to the center staff to reconcile.

Data queries or discrepancies with samples shipped and received at NCRAD may result from:

- Incorrect samples collected and shipped
- Damaged or incorrectly prepared samples
- Unlabeled samples, samples labeled with incomplete information, or mislabeled samples
- Discrepant information documented on the Blood Sample and Shipment Notification Form and logged at NCRAD compared to information entered into the NACC database.

# 10.0 Appendices

## Appendix A: Rate of Centrifuge Worksheet

Please complete and return this form by email to the NCRAD Project Manager if you have any questions regarding sample processing. The correct RPM will be sent back to you.

### Submitter Information

**Name:** **Site:**

**Submitter e-mail:**

### Centrifuge Information

Please answer the following questions about your centrifuge.

### Centrifuge Type

Fixed Angle Rotor: ☐ Swing Bucket Rotor: ☐

**Radius of Rotation (mm):**

Determine the centrifuge's radius of rotation (in mm) by measuring distance from the center of the centrifuge spindle to the bottom of the device when inserted into the rotor (if measuring a swing bucket rotor, measure to the middle of the bucket).

### Calculating RPM from G-Force:

$$RCF = \left(\frac{RPM}{1{,}000}\right)^2 \times r \times 1.118 \quad \Rightarrow \quad RPM = \sqrt{\frac{RCF}{r \times 1.118}} \times 1{,}000$$

RCF = Relative Centrifugal Force (G-Force)
RPM = Rotational Speed (revolutions per minute)
R= Centrifugal radius in mm = distance from the center of the turning axis to the bottom of centrifuge

Comments:

**Please send this form to NCRAD Study Coordinator at alzstudy@iu.edu**

## Appendix B: Blood Sample and Shipment Notification Form

*Please email the form on or prior to the date of shipment.*

To: Kelley Faber Email: alzstudy@iu.edu Phone: 1-800-526-2839

**From:**_____ **UPS tracking #:** **1Z976R8W84**

**Phone:**_____ **Email:**_____

**Study: CLARITI** **Sex:** ☐M ☐F **Year of Birth:** _____

**Site ID:** _____ **PT ID**: _____

**NACC ID:** _____ **Visit:** ☐Baseline ☐Follow Up

KIT BARCODE

*Blood Collection:*

| | |
|---|---|
| Date of Draw: _____ [MMDDYY] | Time of Draw: _____ [HHMM] |
| Date participant last ate: _____ [MMDDYY] | Time participant last ate: _____ [HHMM] |

*Blood Processing:* **Plasma & Buffy Coat (EDTA Tube)**

| | | | |
|---|---|---|---|
| EDTA #1 specimen number **(Last four digits):** | _____ | Original blood volume of EDTA #1: | _____ mL |
| EDTA #2 specimen number **(Last four digits):** | _____ ☐N/A | Original blood volume of EDTA #2: | _____ mL ☐N/A |
| EDTA #3 specimen number **(Last four digits):** | _____ ☐N/A | Original blood volume of EDTA #3: | _____ mL ☐N/A |
| Time spin started: | _____ [HHMM] | Duration of centrifuge: | _____ mins |
| Temp of centrifuge: | _____ °C | Rate of centrifuge: | _____ x g |
| Time aliquoted: | _____ [HHMM] | Number of 1.5 mL plasma aliquots created (purple cap): | _____ |
| Volume of residual plasma aliquot (less than 1.5 mL in blue cap): | _____ mL ☐N/A | Specimen number of residual plasma aliquot **(Last four digits)**: | _____ ☐N/A |
| Buffy coat #1 specimen number **(Last four digits):** | _____ | Buffy coat #1 volume: | _____ mL |
| Buffy coat #2 specimen number **(Last four digits):** | _____ ☐N/A | Buffy coat #2 volume: | _____ mL ☐N/A |
| Buffy coat #3 specimen number **(Last four digits):** | _____ ☐N/A | Buffy coat #3 volume: | _____ mL ☐N/A |
| Time aliquots frozen: | _____ [HHMM] | Storage temperature of freezer: | _____ °C |

**Notes**:_____