



Biospecimen Exchange for Neurological Disorders

## The Biomarkers in the Hyperbaric Oxygen Brain Injury Treatment Trial (BioHOBIT)

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BIOSPECIMEN COLLECTION & PROCESSING

# Overview

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1. Specimen uniformity and quality
2. Site Equipment
3. Procedures
  - Kit Contents and Ordering
  - Sample Labelling
  - Sample Collection and Processing
  - Shipping Samples
  - Non-Conformance
4. Contact Information

# Specimen Uniformity and Quality

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GENERAL REMINDERS

# Specimen Standardization and Quality

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Most biomarkers are sensitive to *time* and *temperature*

- Standardization of processing across sites is key
- Specimens must be processed within 2 hours of collection
- Reference the *BioSEND Biomarker Specimen Collection, Processing, and Shipment Manual* as needed
- Do not replace or supplement any kit components without first receiving approval from BioSEND/NINDS

Questions? Email [biosend@iu.edu](mailto:biosend@iu.edu)

# Site Consumables and Equipment

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*Sites will need to supply the following items:*

- Gloves
- Alcohol wipes
- Butterfly needles
- Tourniquet
- Gauze pads
- Bandages
- Microcentrifuge tube rack
- Sharps bin and lid
- Crushed ice
- Pipettes and pipette tips
- Centrifuge capable of maintaining 4°C
- -80°C Freezer
- Dry ice

# Procedures

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MAINTAINING SPECIMEN UNIFORMITY AND QUALITY

# Kit Contents and Ordering

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- Kit and supply ordering will be through WebDCU
- Please ensure kits are marked as shipped in WebDCU, as this triggers the notification to BioSEND that your site needs more kits

# Kit Contents and Ordering: Standard Kits

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## Standard Kit:

- Contains supplies for blood and CSF
- Can be used for any time point





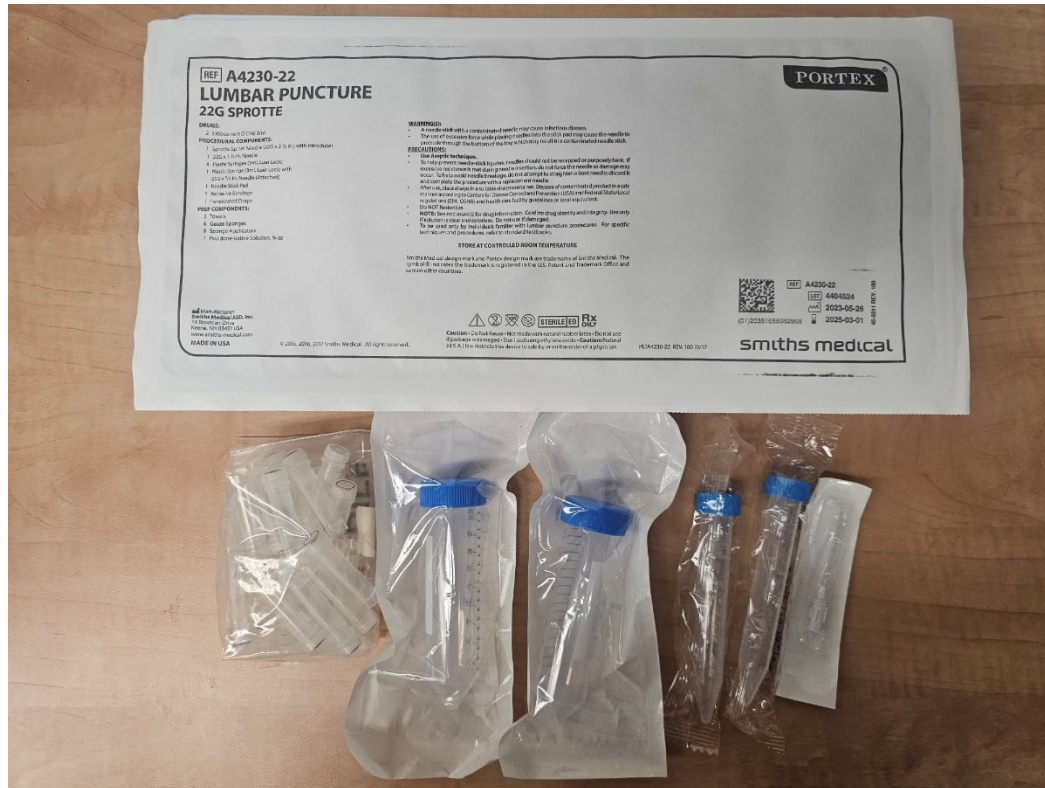
# Kit Contents and Ordering: Blood Kits

Shipping Kit:



# Kit Contents and Ordering: CSF Kits

CSF:



LP Tray:





# Collection Volumes

Total blood, urine and CSF volumes

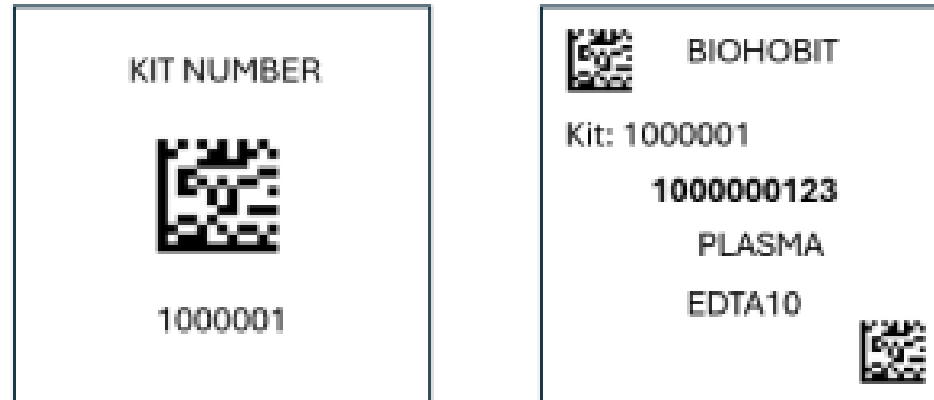
Sample Type	Amount
Whole Blood for Plasma and Buffy Coat	7 ml
Whole Blood for Serum	7 ml
Cerebrospinal Fluid	6 ml

# Sample Labelling: Example Labels

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## Labels are provided by Indiana University

- Please check that all samples are properly labelled to ensure correct identification by IU
- If do not have enough labels to complete a visit, please contact IU *immediately*
- Labelling the tubes during processing prevents sample mix-ups

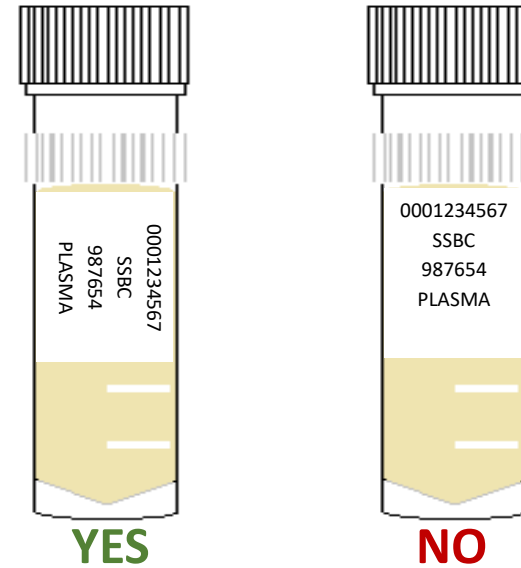


# Sample Labelling: Label Placement

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Please...

- Label all collection and aliquot tubes before cooling, collecting, processing, or freezing samples
- Label only 1 subject's tubes at a time to avoid mix-ups
- Wrap the label around the tube horizontally - label position is important for all tube types
- Make sure the label is completely adhered by rolling between your fingers



# Sample Collection and Processing

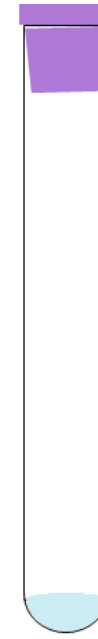
Blood Tube Draw Order

7ml Serum



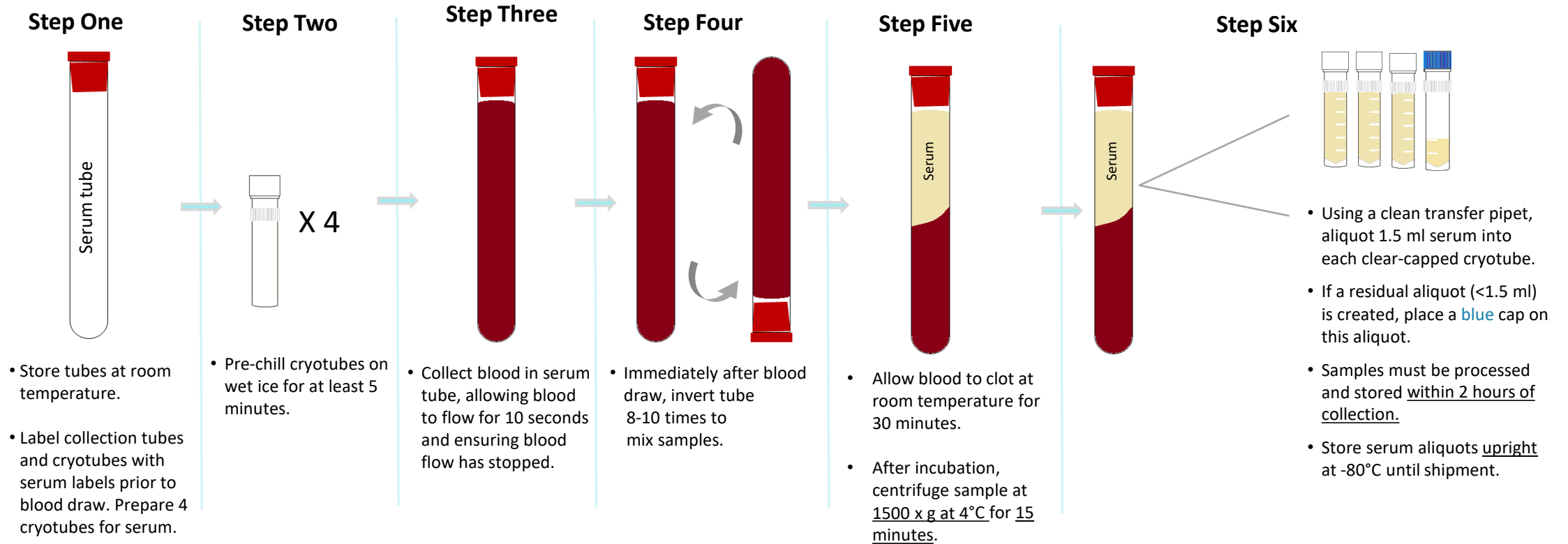
**1**

7ml EDTA



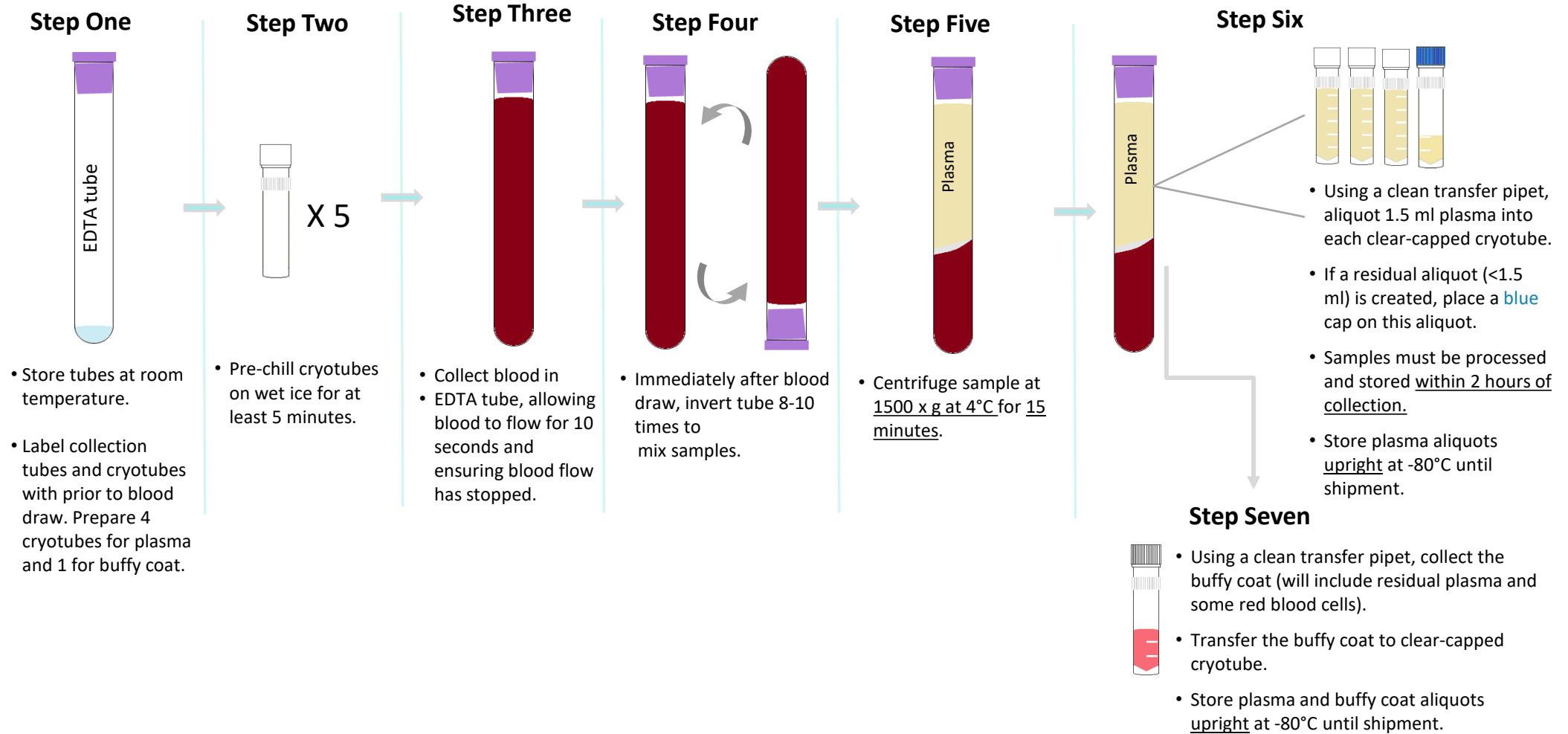
**2**

# Sample Collection and Processing: Serum

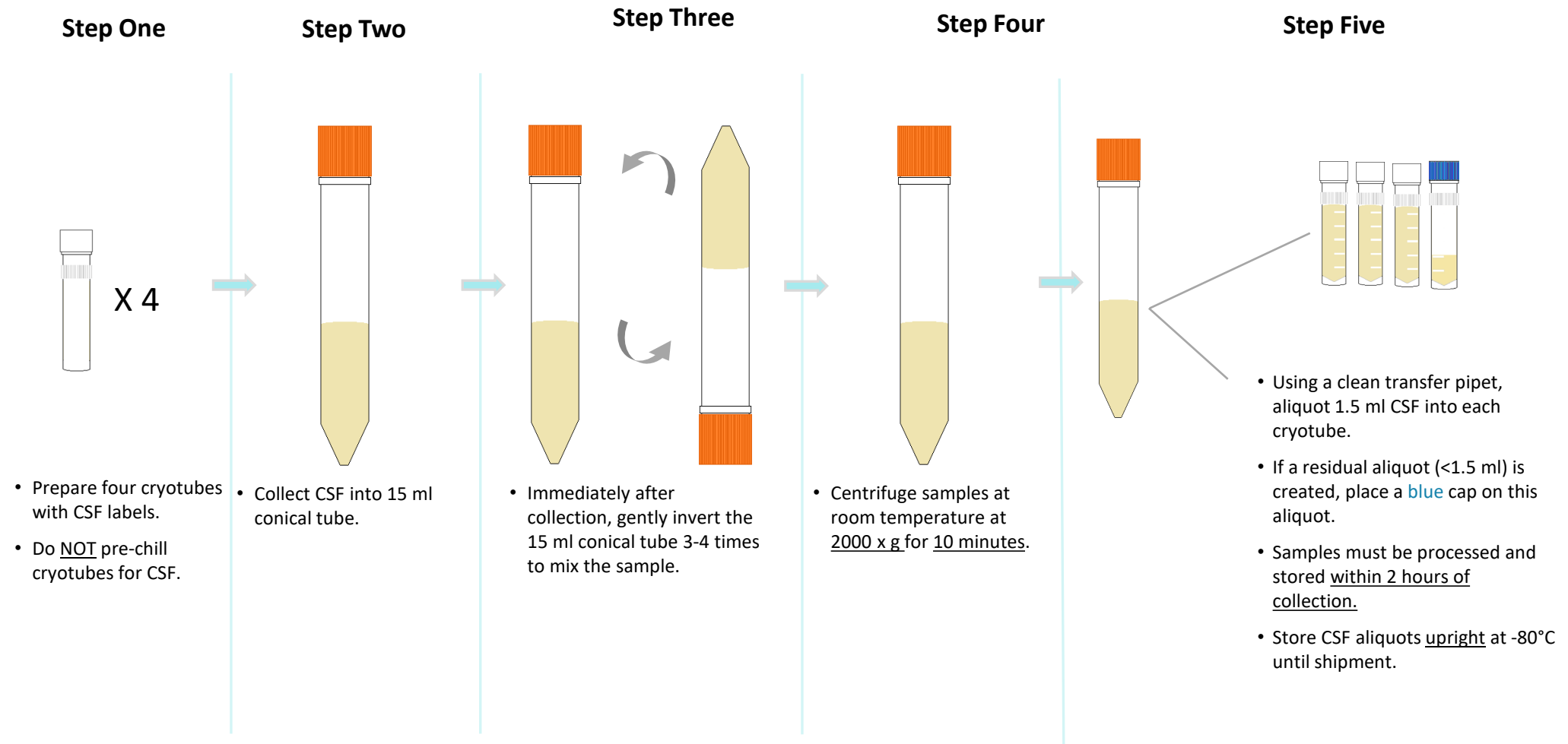




# Sample Collection and Processing: Plasma & Buffy Coat



# Sample Collection and Processing: CSF

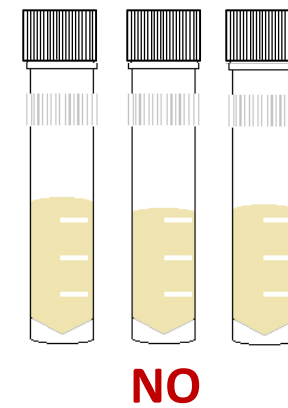
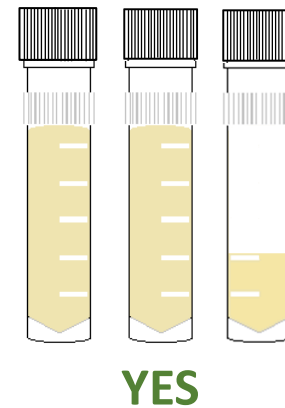


# Sample Collection and Processing: Aliquots

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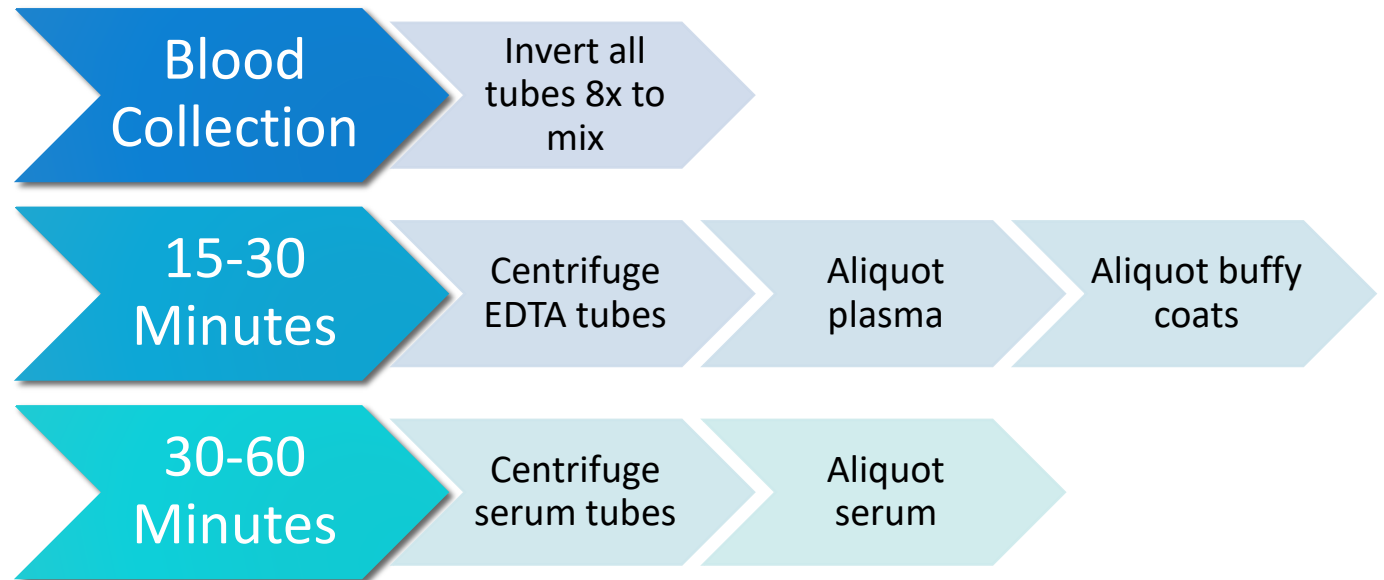
Filling biomarker serum, plasma, and CSF aliquots:

- Fill as many cryovials as possible to 1.5 ml (plasma, serum & CSF)
- Over-filled vials may burst in freezer!
- Ship ALL material to IU, even if final vial is less than standard volume



# Sample Collection and Processing: Timeline

Timeline for blood processing



# Sample Collection and Processing: Issue #1

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## Troubleshooting Blood Collection

### Issue #1: Tube with little/no vacuum

- Always check expiration date on the tube before beginning blood draw and discard expired tubes
- Store tubes at “room temperature” – extreme temperature can affect vacuum
- Keep extra vacutainer tubes from supplemental kit nearby during blood draw to replace “bad” tubes
- If this is a frequent occurrence, report tube type and lot number to IU.

# Sample Collection and Processing: Issue #2

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## Troubleshooting Blood Collection

### Issue #2: Hemolyzed serum and/or plasma caused by incorrect collection

Cause: Blood Collection Methods	Corrective Action
Improper venipuncture site	Draw from median cubital, basilic, and cephalic veins from antecubital region of arm
Prolonged tourniquet use	Tourniquet should be released after no more than 1 min, excessive fist clenching should be avoided
Not allowing alcohol to dry on skin before venipuncture	Without touching, allow the venipuncture site to air dry
Use of too large/small bore needle resulting in excess force applied to blood	Avoid using too small/large needle. Needle size dependent on the subject's physical characteristics & amount of blood to be drawn. Most commonly used sizes are 19 – 23.
Pulling/pushing plunger too fast while drawing/transferring blood	Avoid drawing the syringe plunger too forcefully when collecting blood
Ensure all blood collection assemblies are fitted securely, to avoid frothing	

For more information, visit: [http://www.bd.com/vacutainer/pdfs/techtalk/TechTalk\\_Jan2004\\_VS7167.pdf](http://www.bd.com/vacutainer/pdfs/techtalk/TechTalk_Jan2004_VS7167.pdf)

# Sample Collection and Processing: Issue #2 continued

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## Troubleshooting Blood Collection

### Issue #2: Hemolyzed serum and/or plasma caused by incorrect processing

Cause: Sample Processing Methods	Corrective Actions
Vigorous mixing/shaking	Gently invert blood collection tube when mixing additive with specimen, follow guidelines in Biologics Manual regarding number of times to invert each type of tube
Not allowing serum to clot for recommended time	Serum tubes without clot activator should be allowed to clot for 60 min in a vertical position
Exposure to excessive heat or cold	Keep samples at ambient temperature until processing
Prolonged contact of serum/plasma with cells	Do not store uncentrifuged samples beyond recommended time

For more information, visit: [http://www.bd.com/vacutainer/pdfs/techtalk/TechTalk\\_Jan2004\\_VS7167.pdf](http://www.bd.com/vacutainer/pdfs/techtalk/TechTalk_Jan2004_VS7167.pdf)

# Sample Collection and Processing: Sample Data

Specimen Collection and Processing Form

A copy of the Shipping Manifest should be included in every shipment to Indiana University



Subject  
CRF

View: F181 Biosample Collection

Ashely GARWOOD Sign Out



Help

CRF Passed Verification

Create New Monitor DCR

View Audit Trail

CRF ID:	7755		F181 Biosample Collection				Rule Status:	DCR:
Site:	1047 University of Kentucky Hospital, Lexington, KY		Subject:	1229	Visit:	Day 1	Submit:	15-Oct-2021 14:29 Ronda PETREY
Accept:			Verify:					
No.	Item Description	Data Value						
Q01	Biospecimen collection timepoint	8 hours post injury						
Q02	Specimen collected	<input checked="" type="radio"/> No <input type="radio"/> Yes						
Q03	Date of specimen collection							
Q04	Lab kit ID							
<b>Instruction:</b> Blood tubes should be transported at room temperature. Allow no more than 90 minutes from time of blood draw to centrifuge start time.								
Q05	Blood sample collected							
Q06	Time of blood draw							
<b>Serum Aliquots</b>								
Q10	Time serum samples placed in freezer							
Q11	Aliquot S01 collected							
Q12	Aliquot S02 collected							
Q13	Aliquot S03 collected							
Q14	Aliquot S04 collected							
Q17	Reason any serum aliquot not collected							
<b>Plasma Aliquots</b>								
Q20	Time plasma samples placed in freezer							
Q21	Aliquot P01 collected							
Q22	Aliquot P02 collected							
Q23	Aliquot P03 collected							
Q24	Aliquot P04 collected							
Q27	Reason any plasma aliquot not collected							
<b>DNA (Buffy Coat)</b>								
Q30	Aliquot D01 collected							
Q31	Time DNA placed in freezer							
<b>CSF aliquots</b> Collect CSF sample as close to the blood collection as possible.								
Q40	CSF collected	<input type="radio"/> No <input type="radio"/> Yes						
Q41	Time CSF collected							
Q42	Time CSF centrifuge start time							
Q43	Time CSF sample placed in freezer							
Q51	Aliquot C01 collected							
Q52	Aliquot C02 collected							
Q53	Aliquot C03 collected							
Q54	Aliquot C04 collected							
Q56	Reason any CSF aliquot not collected							
<b>Issues with processing or collecting samples</b>								
Q57	Any issues with processing or collecting samples	no staff available at collection time						
GC	General comments	no staff available						

Last updated by Ronda PETREY on 15-Oct-2021 14:29



# Sample Collection and Processing Form

Submission of the Shipping Manifest portion of the form serves as shipment notification to BioSEND

- Must be completed prior to shipment
- If samples are not marked as shipped in WebDCU, BioSEND will not receive notification that samples are shipped.
- Kit requests are triggered by WebDCU's tracking system of how many kits a site has remaining. If you do not ship kits to BioSEND, it will appear in the WebDCU system as if your site still has kits available. Regularly shipping samples to BioSEND ensures that your site continues to receive kit shipments.

# Shipping Frozen Samples: Tips

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## Packing and Shipping Frozen Samples

- Biomarker serum, plasma, buffy coats and CSF all ship frozen
- Ship frozen samples on dry ice
- Frozen samples should be shipped **only** Monday through Wednesday
- Always fill carton to **top** with dry ice
- Do not pack shipment until the day of pickup



# Shipping Samples

## Packing and Shipping Frozen Samples

Class 9 Dry Ice Label should not be covered with other stickers and must be completed, or UPS will reject/return your package!

The image shows a Class 9 Dry Ice Label template. It features a large triangle with vertical bars inside, and the number '9' at the bottom. The label includes fields for shipper and consignee information, and a section for dry ice weight. Red arrows point to specific areas with labels: 'Net weight of dry ice in kg' points to the weight field, 'Your name & address' points to the shipper's name and address field, and 'IU information and address' points to the consignee's name and address field.

Shipper's Declaration not Required.

Dry Ice amount must be in kilograms.

Note: 2 lbs. = 1 kg.

Airwaybills / airbills must have the following:

1. Dry Ice; 9; UN 1845
2.  $\frac{\text{Number}}{\text{(Number pks)}} \times \frac{\text{wt}}{\text{(wt)}} \text{ Kg}$

Net weight of dry ice in kg

Dry Ice  kg.

Your name & address

Shipper's Name and Address

UN 1845

Consignee Name and Address

IU information and address

9

06426 1/01 RRD

# Shipping Samples: Frozen

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## Packing and Shipping Frozen Samples



Shipping Samples – UPS: <https://kits.iu.edu/UPS>

# INDIANA UNIVERSITY

## SCHOOL OF MEDICINE

Search for address

Code  
Clear  
Company Icahn School of Medicine - Mt. Sinai  
Contact Kenny Persaud  
Address 1 1425 Madison (Icahn Building)  
Address 2 Icahn L4 39  
Address 3  
City New York  
State/Province NY  
Postal Code 10029  
Country/Territory United States

Shipment Information

Study GroupSSBC

Weight20LB

Dry Ice Weight10LB

Description of ReturnBiologic Specimens

Pickup Request

Choose Study

Enter weight

Click "Ship"

Reset

Ship

# Shipping Samples via UPS

IU UPS ShipExec Shipping Portal

- Print out UPS air waybill
- Ensure all elements (barcode, return address, etc.) printed clearly
- Fold and insert UPS air waybill into clear plastic sleeve on package

JOHN SMITH INDIANA UNIVERSITY 410 WEST 10TH STREET INDIANAPOLIS IN 46202	2 LBS	1 OF 1
RS		
SHIP TO: SCHOOL OF MEDICINE 317-278-2694 INDIANA UNIVERSITY TK 217 351 W 10TH ST INDIANAPOLIS IN 46202		
	IN 461 9-01	
		
UPS NEXT DAY AIR		1
TRACKING #: 1Z 976 R8W 84 3985 8595		
 SAMPLE		
BILLING: P/P DESC: Biological Specimens RETURN SERVICE		
Reference No.1: 4087277		
XOL 20.03.09 NV45 83.0A 12/2019		 TM

# Shipping Samples: Closures

Date	Holiday
January 1	New Year's Day
3 <sup>rd</sup> Monday in January	Martin Luther King, Jr Day
4 <sup>th</sup> Monday in May	Memorial Day
June 19	Juneteenth (observed)
July 4	Independence Day (observed)
1 <sup>st</sup> Monday in September	Labor Day
4 <sup>th</sup> Thursday in November	Thanksgiving
4 <sup>th</sup> Friday in November	Friday after Thanksgiving
December 25	Christmas

Please also consider weather when shipping. UPS will post service updates on their webpage. Reach out to BioSEND if you are unsure if it is safe to ship.

# Non-Conformance

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Non-conformance to standard procedures may reduce the utility of the biospecimens:

- Not processing serum/plasma within 2 hours of collection allows for breakdown of certain proteins and small molecules
- Over/under centrifuging changes specimen composition





# Non-Conformance Reporting con't

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Most common non-conformance issues:

- Shipment notification not sent
- Samples shipped for weekend/holiday delivery
- Sample form incomplete/inaccurate
- Low volume
- Unlabeled or mislabeled tube(s)
- Sample hemolysis



# Non-Conformance and Inventory Reporting

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Most common non-conformance issues:

- BioSEND will notify sites directly of any issues upon receipt
- BioSEND will email sites a monthly inventory report of all samples received from that site to date
- ***If you are experiencing issues, please reach out to us for help! It is much easier to prevent an issue before sample collection & shipment than trying to fix it after the fact***

# Contacts

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## Indiana University

General Questions/Shipment Notifications:

[biosend@iu.edu](mailto:biosend@iu.edu)