Atrium Health Wake Forest Baptist	**DOCUMENT TYPE:** Procedure	**ORIGIN DATE:** 3/11/2020
CLIA Lab Director: Dr. Gregory Pomper	**LAB DEPARTMENT:** Central Processing Lab	**CONTACT:** Central Processing Lab

APPLICABLE LABORATORY(S)):
☒ North Carolina Baptist Hospital (NCBH)
☐ Lexington Medical Center (LMC)
☐ Davie Medical Center (DMC)
☐ Wilkes Medical Center (WMC)
☐ High Point Medical Center (HPMC)
☐ Westchester
☐ Clemmons

PURPOSE

This purpose of this procedure is to provide guidelines for Central Processing staff to process patient samples in a consistent manner in order to produce a quality specimen for testing.

SCOPE

i. Procedure Owner/Implementer: Central Processing Lab
ii. Procedure Prepared by: Central Processing Management
iii. Who Performs Procedure: Central Processing Team Members

DEFINITIONS

A. Procedure: A process or method for accomplishing a specific task or objective.
B. WFBH Lab System: Wake Forest Baptist Lab System is a health system that includes Wake Forest Baptist Medical Center and all affiliated organizations including Wake Forest University Health Sciences (WFUHS), North Carolina Baptist Hospital (NCBH), Lexington Medical Center (LMC), Davie Medical Center (DMC), Wilkes Medical Center (WMC), High Point Medical Center (HPMC), Lab at Westchester and Lab at Clemmons.

SUPPLIES/MATERIALS

Use appropriate personal protective equipment (PPE) when handling biohazardous specimens.

PROCEDURE GUIDELINES

A. Procedure

1. The person in spin should rotate through the accessioning and tube room areas to pick up pre-sorted samples in racks. The spin person has been provided a cart in order to carry the workload and distribute to the various lab sections.

2. Centrifuge samples

    a. Routine samples which are not placed on the chemistry track are centrifuged in a benchtop centrifuge. Place cover on the carriers in the large centrifuges to minimize aerosols in the event of leakage or breakage of any tubes.
    b. Spin STAT samples using designated benchtop centrifuges.
    c. PREGS (serum pregnancy) and PREGU (urine pregnancy) samples are spun and delivered to the designated rack at the chemistry bench.

3. Hematology will check samples for clots.

4. Aliquot samples

    a. Initial the aliquot label, verifying the ID of the primary tube with the aliquot label. This is the last opportunity to assure the ID of the sample with the primary tube.

5. Distribute samples

    a. All STAT samples should be placed in red STAT racks for the automation line, or in the front of the white (spun) chemistry racks.
    b. Samples that are not centrifuged are listed in Attachment A.
    c. Baby/pediatric tube chemistry samples, short chemistry samples, and other samples not acceptable for the automation line should be centrifuged and placed in the designated Chemistry rack at the Chemistry bench.
    d. Short hematology samples should be delivered to the designated Hematology rack at the Hematology bench.
    e. Tests that are not performed at a WFBMC lab should be delivered to the Sendouts bench. Designated Central Processing personnel should be notified on second and third shifts, weekends and holidays when a sample is in the sendouts area. If the Spin person is not sure whether a sendout sample needs to be centrifuged, deliver the sample to sendouts and they will indicate to Spin if sample requires centrifugation (by writing “SO” on the Beaker label and placing at the Spin bench).

6. Extra tubes

    a. Extra Gold tops and Extra Lavender tops are ordered in Beaker for extra outreach or outpatient gold and lavender tubes. Any type of Extra pediatric tubes are ordered in Beaker. Any Extra Urine or Extra Urine Culture tubes are ordered in Beaker.

b. Extra gold tops and extra urine in chemistry tubes are placed on the chemistry automation line for tracking and storage.
c. Extra lavender tops are placed in the designated Hematology rack at the Hematology bench.
d. Extra blue tubes are delivered unspun to the CBC bench.
e. Extra pediatric chemistry tubes are centrifuged and placed in the designated Chemistry rack at the Chemistry bench.
f. Extra pediatric lavender top tubes are placed in the designated Hematology rack at the Hematology bench.
g. Extra urine in a conical tube is stored in the Spin fridge extra rack for that date.
h. Extra urine culture tubes are given to micro.
i. Extra body fluids such as CSF are stored in the Spin fridge extra rack for that date.
j. Extra body fluids ordered by Sendouts for Freeze and Hold orders are stored in the Spin freezer in the assigned Fluid storage rack position.
k. Extra blood samples for inpatients and ED patients are not ordered in Beaker. These samples are stored at room temperature in a designated rack on the Spin bench for 24 hours.

7. Samples for other WFBH Labs

a. Special hematology sample processing instructions are listed in Attachment C. Note that special hematology processing instructions include centrifuging and aliquoting samples on second and third shift, and on weekends. See Attachment A for after hours notes.
Special hematology protocol (research) samples received after hours will come with specimen handling instructions. If protocol instructions do not specify spin speed/time, then samples may be spun at the usual Spin centrifuge settings.
b. Reproductive Endocrinology (REI) samples are centrifuged and serum is aliquoted into a labeled chemistry no additive tube. The serum is frozen in the designated rack in the Spin freezer until the next business day. The original sample tube is stored in the Spin refrigerator extra rack for that date. First shift Spin maintenance includes placing REI samples on a packing list for courier pickup.
c. HLA samples ordered with HL test codes are placed on packing lists and placed in the HLA bin unspun. HLA samples ordered as Unlisted Labs (MT test codes) are placed in the sendouts bin after being received in Central Processing.
d. Clemmons Allergy samples are centrifuged and placed in the designated Clemmons Allergy rack in the Spin refrigerator. First shift Spin maintenance includes placing Clemmons Allergy samples on a packing list for courier pickup.
e. PCR samples (lavender top tubes) for Molecular Diagnostics lab should be stored in the Sendouts refrigerator (bottom shelf labeled rack) after hours and on weekends.
f. Autopsy samples (red top tubes) are centrifuged. Serum is aliquoted into labeled chemistry no additive tubes and stored in the assigned Autopsy

storage rack position. The original red top tube is stored in the Spin refrigerator extra rack for that date.

g. Cytology samples are processed according to the Cytology Specimen Handling procedure.
h. Surgical Pathology/Histology samples are processed according to the Surg Path/Histology Specimen Handling procedure.
i. Employee Health specimens (including primate exposures and viral cultures) are processed according to the Employee Health Specimen Handling procedure.

8. Urine samples

Urine Chemistry

a. 24-hour urines: Accession will measure the total volume of 24-hour urine samples and record the volume on the requisition with their initials. Accessioning will receive the sample, record total volume on test labels, and aliquot into appropriate testing container(s). See section 9 for instructions on determining Total Volume of 24-hour Urines. Check that the total volume of the 24-hour urine is recorded on all testing labels.
b. Pour off and label an aliquot of the 24-hour urine in a 10mL conical tube. Verify specimen matches label, initial the label and place aliquot in the extra rack in the Spin refrigerator.
c. See Attachment B for 24-hour urine collection requirements. Provide an instruction sheet for each 24-hour urine collection kit that is sent to clinics or patients.
d. For 24-hour Research Urines, measure the total volume and record on all labels and the urine container. Pour an aliquot into a labeled urine cup. Use the aliquot for any requested tests. Give the original 24-hour urine container back to the research team. Receive the sample and aliquot any requested tests.
e. Aliquot urine chemistry tests into urine no additive tubes and place on the chemistry track.
f. Aliquot urine pregnancy tests (PREGU) into urine no additive tubes and centrifuge at the Spin bench. Place centrifuged tube in the designated rack at the Chemistry bench.
f. Retain all ED and OR urine samples and place in hold rack in the Spin refrigerator.

Urinalysis and Osmolality

a. Pour urine for urinalysis testing in a conical tube. Verify patient information and initial any aliquot labels. Deliver to urinalysis bench for testing. Verify the sample is for urinalysis testing before delivering to the bench, because no other tests can be run on the sample after it has been on the urinalysis analyzer.
b. Pour urine for osmolality testing into a urine no additive tube or conical tube and deliver to the urinalysis bench for testing. Place sample in Osmo rack at the urinalysis bench. If both UA and Osmo are ordered on

one sample, place the sample in the Osmo rack. Verify patient information and initial any aliquot labels.

c. Retain all ED and OR urine samples and place in hold rack in the Spin refrigerator.

Microbiology Samples

a. Tube room staff should identify urine for culture only and deliver to microbiology immediately. Place any STAT samples in the STAT micro bin. Urine for cultures must be expedited as urine cultures must be set up within two hours of collection.
b. If other tests are ordered in addition to micro, aliquot urine into appropriate tubes. Aliquot urine into culture preservative tube for culture/Gram stain testing and deliver to micro. Verify patient information and initial any aliquot labels.

Pediatric Catheter Bag Samples

a. Pediatric catheter bags contain a small sample quantity and must be handled carefully.
b. If the sample has a culture/Gram stain order, give the unopened sample to the microbiology lab to process first. Ensure the labels for any other tests are included with the sample.
c. If the sample does not have a microbiology order:
    i. Carefully remove the bag from the urine cup.
    ii. Using scissors, cut a corner off the bag.
    iii. Empty the urine into the urine cup.
    iv. Aliquot sample as needed for testing. Microcentrifuge tubes may be used for chemistry testing small volumes (small clear bullet tubes with attached cap).

9. Determining Total Volume of 24-Hour Urines

With a Matching Container

a. Choose a matching empty container from the Spin bench.
b. Place the empty container on the scale. Press and hold the tare button until the scale reads “00.” Remove the empty container.
c. Place the patient sample container on the scale and record the total volume on the packing list/requisition (or blank sheet of paper with patient information if no requisition is available). **Note:** 1 gram = 1 mL
d. Place document with total volume at the accessioning bench.

With a Unique Container

a. Press and hold the tare button on the scale until it reads “00.”
b. Place the patient sample container on the scale and record the weight on the packing list/requisition (or blank sheet of paper with patient information if no requisition is available).

c. Label a urine collection cup with patient information and fill the cup from the 24-hour urine container.
d. Empty the 24-hour urine container down the designated Spin sink and rinse sink with water.
e. Weigh the empty 24-hour urine container.
f. Subtract the weight of the empty container from the total weight of the filled container (from step b). The result is the total volume.
Note: 1 gram = 1 mL
g. Write the total volume on the packing list/requisition and on the urine cup. Place the packing list/requisition at the accessioning bench.

LITERATURE REFERENCES

None

RELATED PROCEDURES/POLICIES IN NAVEX

None

ATTACHMENTS/LINKED DOCUMENTS IN TITLE 21

Attachment A: Spin Notes
Attachment B: Urine Collection Requirements
Attachment C: Special Hematology Processing Instructions
Maintenance – Daily, Weekly, Monthly, As Needed
Autopsy Specimen Handling
Employee Health Specimen Handling
PCR Specimen Handling
Cytology Specimen Handling
Surgical Pathology Histology Specimen Handling
Fluid Specimen Handling and Processing
Patient Instructions for 24 hour urine

REVISION DATES: REVIEW CHANGE SUMMARY AS REPRESENTED IN TITLE 21.

Urines

ED/ OR Urines - any leftover in the Extra rack in Spin fridge

Urines for Urinalysis:

UATX UAMR UA UANM
UEOS USG UOSMO

Urines for Chemistry:

PREGU (NOT ON THE TRACK): Spin and take directly to Chemistry.

All tests in 3mL plain tubes

24 Hour Urine:

Total Volume on all labels. Plain 3mL urine tube for each test.
Extra 10 ml conical tube in Spin fridge extra rack for each 24 hour urine.
Remove/Mark out any Patient ID on container before discarding.

24 Hour Urine for Research:

Total Volume on all labels and on 24 hour urine container. Pour aliquot into a urine cup.
Plain 3mL urine tube for each test.
Extra 10mL conical tube in Spin fridge extra rack.
Research team waits at the window to get urine container with Total Volume back.

Spin and Deliver to Chemistry Bench

PREGS (serum pregnancy) and PREGU (urine pregnancy)

DO NOT SPIN

PFA – Platelet Function Analysis (2 Blue) **Coag**

PLAG – Platelet Aggregation (5 Blue) **Coag**

PLTX – Platelet Count (Blue or Green) **Hema**

RIPA – Ristocetin Agglutination (4 Blue) **Coag**

PAS- Platelet Aggregation Screen (4 Blue) **Coag**

Kaolin TEG, Trauma TEG, Global TEG, RAPIDT w/HEP, FFIB w/HEP, RapidTEG, FFIB, Kaolin w/HEP **– Hematology**

Extra blue **- Hematology**

Body Fluids

Hematology:

All in a 3mL plain syringe, tube or Na Heparin.
An EDTA tube for a Synovial Fluid Cell Count **ONLY** is ok.

Chemistry:

CSF and Synovial: DO NOT GO ON THE TRACK!
Clear body fluids may go on the track. Spin grossly cloudy fluids offline.

Ensure that the fluid type matches the test code requested. CCD for Cerebral Spinal Fluid, **SCD** for Synovial Fluid, **BALX** for Bronchial Lavage. All other fluids cell counts **–FCD.**

Freeze and Hold Fluids – container rack 1, 2 or 3 in Beaker.

Autopsy

Pour off serum, don't overfill. Store serum in Beaker Autopsy racks. Cells go in the extra rack in the spin refrigerator.

Cytology (After Hours):

Urine Cytology and Bladder Wash - Add Cytolyt (50/50)

Store all cytology samples except **PAPs** in the Heme walk in fridge, Cytology bin.

Special Hematology (After Hours):

Process as indicated on the reference sheet.

Spin and pour off plasma/serum using large label

Cells in Sendout fridge – labeled rack, Aliquot in Sendout freezer – labeled rack

Packing list with a label in the Special Heme box

PCR/Molecular Diagnostics/MD (After Hours):

Place lavender top tubes in Sendouts fridge, labeled rack on bottom shelf

Employee Health Primate Exposures

Centrifuge blood samples and aliquot serum into transport tube.

Place serum in -80°C freezer in the hematology hallway – bottom shelf Employee Health bin. Cells in extra rack in Spin fridge.

Place Herpes Swab samples in Spin fridge door – labeled bin for Employee Health swab samples

Section Codes within Specimen ID:

CH - Chemistry

HM - Hematology

SR – Serology (Micro) MC – Microbiology (Cultures)

SH – Special Hematology

MD – Molecular Diagnostics (PCR)

A – Allergy (Clemmons) – Spin and place in Allergy rack in Spin fridge

MY, QW , EX, N, MT, AP, LC, BK, BC, ST, – Send Outs

FL- Flow

MG, CG, NG - Genetics

Make rounds of pick up and deliveries of specimens approximately every 10 minutes.

Spin Procedures Attachment B: Urine Collection Requirements

Test	Preservative	Time	Lab	Aliquot	Notes
Aminolevulinic Acid (ALA)	30mL of 30% acetic acid for 24hr urine	24hr or Random	LabCorp	3mL	Protect from light
Aldosterone, 24 hour	None	24hr	LabCorp	10mL	
Amino Acids	None	Random	LabCorp	5mL	
Amylase	None	24hr or Random	Chem	12 x 75 tube	
Arsenic with Reflex, Random	None	Random	LabCorp	5mL	
Arsenic Toxic Species, 24 hour	None	24hr	LabCorp	5mL	
Calcium	None	24hr or Random	Chem	12x75 tube	
Catecholamines, Urine Fractionated 24 hour	30mL of 6N HCl	24hr	LabCorp	30mL	
Catecholamines, Urine Fractionated, Random		Random	LabCorp	10mL	
Chloride	None	Random or 24hr	Chem	12x75 tube	
Citrate (Citric Acid), 24-hour	30mL 6N HCl	24hr	LabCorp	10mL	
Citrate (Citric Acid), Random	None	Random	LabCorp	10mL	
Copper	None	24hr or Random	LabCorp	5mL	
Cortisol, Free - Adult	None	24hr or Random	LabCorp	100mL	30 mL of 6N HCl is ok.
Creatinine	None	24hr or Random	Chem	12 x 75 tube	
Cystine, Quant, 24 hour	None	24hr	LabCorp	5mL	30 mL of 6N HCl is ok.

Spin Procedures Attachment B: Urine Collection Requirements

Test	Preservative	Time	Lab	Aliquot	Notes
Delta Amino Levulinic Acid (ALA or Delta ALA)	See Aminolevulinic Acid				
Drug Screen	None	Random	Chem	12 x 75 tube	
Heavy Metals Screen	None	24hr or Random	LabCorp	15mL	
5-HIAA, 24hr with Creatinine	None.	24hr	LabCorp	4mL	
5-HIAA, Random	None	Random	LabCorp	2mL	
HVA (Homovanillic Acid)	None	24 hr or Random	LabCorp	10mL	30 mL of 6N HCl is ok.
Iodine, Urine 24hr	None	24hr	LabCorp	5mL	
Lead, Urine 24hr	See Heavy Metals Screen				
Light Chains	None	24hr or Random	LabCorp	1.5mL	
Magnesium	None	24hr or Random	Chem	12x75 tube	
Metanephrines, Fractionated	None	24hr or Random	LabCorp	10mL	30 mL of 6N HCl is ok.
Microalbumin	None	Random	Chem	12 x 75 tube	
Myoglobin	None	Random	LabCorp	10mL	
Na/K - Random	none	Random	Chem	12 x 75 tube	
Na/K - 24hr	none	24hr	Chem	12 x 75 tube	
Organic Acids	None	Random	LabCorp	10mL	
Oxalate, 24 hour	30mL 6N HCl	24hr	LabCorp	10mL	
Phosphorus	None	24hr or Random	Chem	12 x 75 tube	

Spin Procedures Attachment B: Urine Collection Requirements

Test	Preservative	Time	Lab	Aliquot	Notes
Porphobilinogen, Quantitative, 24hr or random	30mL of 30% glacial acetic acid	24hr or Random	LabCorp	3mL	Protect from light
Porphyrins, Quant and Fractionated	None; Protect from Light	24hr or Random	UTMB	10mL	
Porphyrins, Random	None	Random	LabCorp	2mL	Protect from light
Potassium - see Na/K	None	24hr or Random	Chem	12 x 75 tube	
Protein	None	24hr or Random	Chem	12 x 75 tube	
Serotonin	See 5-HIAA				
Sodium – see Na/K	None	24hr or Random	Chem	12 x 75 tube	
UFIX/UPE	None	Random	Chem	12 x 75 tube	
Urea	None	24hr or Random	Chem	12 x 75 tube	
Uric Acid	None	24hr or Random	Chem	12 x 75 tube	
Urine Stone Protocol - includes Chloride, Creatinine, Protein, Uric Acid, Calcium, Urea Nitrogen, Phos, Mg, Alb, Na/K	None or 10gm boric acid acceptable for 24 hour urine (either is acceptable for 24 hour urine)	24hr or Random	Chem	2 10mL aliquots or 1 cup	
VMA, 24 hr	None or 30mL 6N HCl acceptable	24hr	LabCorp	4mL	
VMA, Random	None	Random	LabCorp	10mL	
Zinc	None	24hr or Random	LabCorp	5mL	

Spin Procedures Attachment C: Special Hematology Processing Instructions

Test	Test Code	Tube Type	Processing Instructions
LAP Score	LAPS	green	7a-3p M-F place in SpecHem box; 3p-7a M-F or weekend give to Hematology lab
Osmotic Fragility	OSFRG	green (no gel)	7a-3p M-TH Call 6-4511 to notify Spec Heme of receipt; 3p-7a M-F or weekend credit as TNAT
Whole Blood Viscosity	BVISB	lavender	M-F by 3pm Call 6-4511 to notify Spec Heme of receipt (after hrs place in fridge); On weekend credit as TNAT
Plasma Viscosity	PVISB	lavender	
Protein C Activity	PRTCA	blue	7a-3p M-F place in SpecHem box; 3p-7a M-F or weekend, spin, store plasma aliquot frozen, RBC's in Sendouts fridge*
Plasminogen Activity	PLGNA	blue	
Free Protein S	PRTSA	blue	
Factor V Leiden	FVX10	blue	
Prothrombin 20210 Mutation	F2	blue	
MTHFR C677T Mutation	MTHR	blue	
HFE C282Y Mutation	HFECT	blue or lavender	
HFE H63D Mutation	HFEHA	blue or lavender	
ADAMTS13 Activity	ADMS13	gold, red or blue	
ADAMTS13 Inhibitor	ADM13I	gold, red or blue	
VWF Activity	VWFACT	blue	
VWF Antigen	VWFAG	blue	
von Willebrand Multimers	VWFM	blue	
Heparin Induced Platelet Antibodies	HIPA	blue, red or lavender	
JAK2 V617F Mutation	JAK2VF	blue or lavender	7a-3p M-F place in SpecHem box; 3p-7a M-F or weekend, store, in Sendouts fridge (do not need to centrifuge)

*When pulling off plasma, leave ~1/4 inch of plasma on RBC's; put all plasma in 1 aliquot per blue top

**Do not centrifuge any lavender top tube for Special Hematology. Place whole blood sample in Sendouts fridge after hours.