Fred Hutchinson Cancer Center Clinical Laboratories
825 Eastlake Ave E
PO Box 19023
Seattle, WA 98109-1023

Fred Hutchinson Cancer Center Specialty Laboratories
188 E Blaine St Ste 250
Seattle, WA 98102-3983

Fred Hutchinson Cancer Center Cellular Therapy Laboratory
1100 Eastlake Ave E
Seattle, WA 98109-4487

Fred Hutchinson Cancer Center Community Site Laboratories
Evergreen 12040 NE 128th St
Kirkland, WA 98034

SPECIMEN COLLECTION & HANDLING MANUAL

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Introduction*

This manual summarizes requirements for collecting and handling specimens for testing in the Clinical Laboratories of the Fred Hutchinson Cancer Center. It has been prepared and revised as part of our ongoing efforts to provide the best possible patient care.

The directors, supervisors and technologists/technicians of the respective laboratories, and the QA Senior Manager, Clinical Labs have written these procedures. Revisions and supplements will be provided as needed.

We urge you to let us know of any errors, ambiguities, or other deficiencies in this manual. Please contact the director or manager of the appropriate laboratory. You may also contact Clinical Lab Administration at 606-1396.

Teresa Hyun, MD, PhD
Director of Clinical Laboratories
Fred Hutchinson Cancer Center

Keith Loeb, MD, PhD
Laboratories Medical Director for Community Sites
Fred Hutchinson Cancer Center

Xueyan Chen, MD, PhD
Director of Specialty Laboratories
Fred Hutchinson Cancer Center
*Note: All contact numbers listed throughout this manual assume a 206-area code unless otherwise specified.
<table>
<thead>
<tr>
<th>Laboratory</th>
<th>Building</th>
<th>Room</th>
<th>Phone</th>
<th>Pager</th>
<th>Service Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alliance Lab - Blood Draw</strong></td>
<td>SLU</td>
<td>1500</td>
<td>Blood Draw: 606-1214; Reception: 606-6201</td>
<td></td>
<td>M-F 6am – 6pm; Weekends &amp; Holidays 8am – 4:30pm</td>
</tr>
<tr>
<td><strong>Alliance Lab – EVG</strong></td>
<td>12040 NE 128th St Kirkland, WA 98034</td>
<td>EV-100</td>
<td>425-441-2640</td>
<td></td>
<td>M-F 8am – 5:30pm</td>
</tr>
<tr>
<td><strong>Alliance Lab - Specimen Processing</strong></td>
<td>SLU</td>
<td>1500</td>
<td>606-1088</td>
<td></td>
<td>M-F 6am – 10pm; Weekends &amp; Holidays 7:30am – 5:30pm</td>
</tr>
<tr>
<td><strong>Alliance Lab - Testing</strong></td>
<td>SLU</td>
<td>1500</td>
<td>Main: 606-1088; Chem: 606-1094; Coag: 606-1094; Heme: 606-1084</td>
<td></td>
<td>M-F 6am – 10pm; Weekends &amp; Holidays 8am – 6pm</td>
</tr>
<tr>
<td><strong>Cellular Therapy Lab</strong></td>
<td>1100 Eastlake</td>
<td>E1-419</td>
<td>606-1200</td>
<td>Weekends &amp; Holidays</td>
<td>M-F 7am – 8pm; Weekends &amp; Holidays 9am – 5pm; leave a message on voicemail; on-call tech will respond</td>
</tr>
<tr>
<td><strong>CIL</strong></td>
<td>188 E Blaine</td>
<td>STE 250</td>
<td>Lab Coordinator Office (LABCO): 606-7700</td>
<td></td>
<td>M-F 8:30am – 5pm</td>
</tr>
<tr>
<td><strong>Cytogenetics</strong></td>
<td>188 E Blaine</td>
<td>STE 250</td>
<td>Main Line: 206-606-1390</td>
<td>206-340-7207</td>
<td>M-F 8am-5pm; Weekends &amp; Holidays on call 9am-5pm</td>
</tr>
<tr>
<td><strong>7th Floor Satellite Lab</strong></td>
<td>SLU</td>
<td>7220</td>
<td>Testing: 606-4268; SPS: 606-4269</td>
<td></td>
<td>M-F 6:30am – 3:00pm; After hours: contact Alliance Lab</td>
</tr>
<tr>
<td><strong>6th Floor Satellite Lab</strong></td>
<td>SLU</td>
<td>6049</td>
<td>Testing: 606-6049; SPS: 606-6050</td>
<td></td>
<td>M-F 6:30am – 2:30pm; After hours: contact Alliance Lab</td>
</tr>
<tr>
<td><strong>Pathology</strong></td>
<td>SLU</td>
<td>7910</td>
<td>606-1355</td>
<td>Technologist 573-0892</td>
<td>Monday 9:00am – 6:30pm; Tues-Fri 6:00am – 6:30pm; Sat 6:00am – 2:30pm; Sun and all other times contact Path Technologist</td>
</tr>
</tbody>
</table>
After Hours/Special Instructions

**Alliance Lab**

Testing:  Hematology, limited chemistry, coagulation, blood gas analysis, and urinalysis. Routes tests not performed in the Alliance Laboratory to outside reference and research labs. Provides transfusion service support.

Location:  SLU Room 1-500, Phone 606-1088
Routine hours:  M – F, 6am – 10pm; 8am – 6pm, weekends and holidays
After hours:  patients are seen at UWMC.

Blood Draw:  SLU Room 1-500, Telephone: 606-1214 or 606-6201
Routine Hours:  M – F 6am – 6pm (with nursing), 6pm-8pm (VP only).
8am – 4:30pm weekends and holidays
After hours:  Infusion until 10pm. After 10pm patients are seen at UWMC.

Alliance Lab Specimen Processing:  SLU Room 1-500; Telephone: 606-1088
Routine hours:  M – F, 6:00am – 10pm; 7:30am – 5:30pm, weekends and holidays
After hours:  patients are seen at UWMC.

Alliance Lab Evergreen:
After hours: samples routed directly from Evergreen clinic to Alliance Lab via Delivery Express

Cellular Therapy:

CD34 Assay
Location:  1100 Eastlake E, Room E1-419, Telephone: 606-1200
Routine hours:  M – F 7am – 8pm, Processing 7am – 5pm
Weekends and holidays 9am – 5pm; Processing 9am – 3pm
After hours:  Pager 206-540-2851
After hours specimen handling: Redraw a fresh specimen in the morning.
**Clinical Immunogenetics Lab:**

**HLA Typing and Chimerism Testing**

Location: 188 E Blaine STE 250, Telephone (Lab Coordinator Office): 606-7700

Routine hours: M – F 8:30am – 5pm (see specific tests for cutoff times for specimen receipt)

*After hours specimen handling:* Draw sample and keep at room temperature. Deliver to the lab at 8am on the next working day.

**Cytogenetics Lab:**

**Chromosome analysis, FISH, Genomic Array, TRS, and Fibroblast Expansion**

Location: 188 E Blaine, STE 250, Telephone: 206-606-1390 main line

Routine hours: M – F 8am – 5pm

*After hours:* on call 9am – 5pm weekend and holidays, Pager 206-340-7207

*After hours specimen handling:* Draw venous blood or marrow in tubes containing an appropriate anticoagulant (sodium heparin for chromosome analysis and FISH; EDTA for Genomic Array). Store at room temperature until delivery to the lab during day shift or on-call hours. DO NOT HOLD SPECIMENS OVER THE WEEKEND - contact pager: 206-340-7207.

**Pathology:**

**Histology and Morphology**

Location: SLU Room G7-910, Telephone: 606-1355

Routine hours: Monday 9am – 6:30pm; Tuesday – Friday 6:00am – 6:30pm

*Sunday and all other times,* contact the on-call Pathology Technologist at 206 573-0892.

There is an on-call pathologist & Histology tech 24 hours/ 7 days a week including holidays and weekends.

*After hours:* In advance of the procedure, notify the Fred Hutchinson Cancer Center Pathology on-call technologist at the cell number 206-573-0892. When the specimen is available, notify the on-call technologist at 206-573-0892

**Pharmacokinetics:**

**Performs Therapeutic Drug Monitoring, Busulfan Testing and Pharmacogenetics Testing**

Location: 188 E Blaine, STE 250, Telephone: 606-7389

Routine hours: Tuesday – Saturday 8am – 5pm. On-call Sundays, Mondays, and Holidays.

*After hours:* Contact pager 206-994-5942

**Microbiology Specimens:**

Sent by Specimen Processing to UWMC Microbiology; NW177; 598-6471

**Virology Specimens (except COVID-19):**

Sent by Specimen Processing to UW Virology lab at 1616 Eastlake; 685-8037

**COVID-19 Specimens:**

Sent by Specimen Processing to UW Virology COVID Lab at 1601 Lind Ave SW, Renton, WA; 685-6656, Option 4
**FRED HUTCHINSON CANCER CENTER / RESEARCH / AFFILIATED LABORATORIES LOCATIONS RESOURCE GUIDE**

<table>
<thead>
<tr>
<th>Lab Name</th>
<th>Type of Lab</th>
<th>Lab Location</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bloodworks Northwest</td>
<td>Transfusion Medicine</td>
<td>921 Terry</td>
<td>292-6525</td>
</tr>
<tr>
<td>Transfusion Support Office-</td>
<td>Transfusion Support</td>
<td>CE2-128</td>
<td>606-1014</td>
</tr>
<tr>
<td>Fred Hutchinson Cancer Center</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UW Laboratory Client Support Services</td>
<td>Clinical Labs</td>
<td>UW Montlake</td>
<td>520-4600</td>
</tr>
<tr>
<td>UW Hematopathology</td>
<td>Flow Cytometry &amp; Molecular</td>
<td>G7-800</td>
<td>606-7060</td>
</tr>
<tr>
<td>Studies</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For information on Seattle Children’s Laboratories visit [https://www.seattlechildrens.org/healthcare-professionals/access-services/diagnostic-services/laboratories/](https://www.seattlechildrens.org/healthcare-professionals/access-services/diagnostic-services/laboratories/)

For information on UW Laboratories visit [http://depts.washington.edu/labweb/](http://depts.washington.edu/labweb/)

For information and contact info on Fred Hutchinson Cancer Center Laboratories visit [https://www.fredhutch.org/en/faculty-lab-directory.html](https://www.fredhutch.org/en/faculty-lab-directory.html)
FRED HUTCHINSON CANCER CENTER

Policies

Medical Necessity Information
When ordering tests, only those that are medically necessary for diagnosis and treatment of the patient should be ordered. The ordering physician or practitioner must provide an ICD code (International Classification of Diseases—current Revision) or narrative description for each test ordered. Medicare does not pay for screening tests, except for certain specifically approved tests.

While ordering custom panels or organ/disease related panels might be convenient, tests that are not medically necessary might be included. Lab requisitions include all tests included in each panel. Any test in a panel may be ordered as an individual test to avoid ordering tests that are not medically necessary.

Reflexive Testing
Some of our tests can be ordered as reflex tests or panels in which additional testing is done automatically in response to particular results from the initial testing. These tests or panels are included on the lab requisition and indicate when reflexive testing will be done.

Repeat Testing
Whenever there is a question about the validity of a test result, a repeat will be performed at no additional charges if there is specimen available.

Reporting
Results that have been entered into the Pathology LIS (Epic Beaker), the Alliance Lab LIS (SunQuest, also used by CIL for Chimerism) or LabWare LIMS (Pharmacokinetics, Cytogenetics, Clinical Immunogenetics Lab (CIL), Cellular Therapy Lab (CIL), Cellular Therapy) are available for viewing in Epic. Reports not available in Epic are faxed or printed to Health Information Management (HIM) and the patient care areas.

Referral to Another Lab
Testing not provided by the Fred Hutchinson Cancer Center or Affiliate Laboratories will be referred to another qualified laboratory licensed to perform high complexity testing in the specialty/subspecialty as defined by the Clinical Laboratory Improvement Amendment (CLIA).

Fred Hutchinson Cancer Center has established a reference laboratory policy in cooperation with UW Department of Laboratory Medicine and Pathology to ensure appropriate and adequate organizational oversight, to safeguard the Fred Hutchinson Cancer Center conflict of interest policies and to ensure standard processes for laboratory testing outside the Fred Hutchinson Cancer Center and UW Medicine Organizations.

The Laboratory Director for the UW Medicine Department of Laboratory Medicine has designated the division directors, in consultation with laboratory medicine residents, institutional medical staff or physician clients (where appropriate), as primarily responsible for
the selection of the reference laboratory locations and clinical oversight of the referral testing process.

UW Department of Laboratory Medicine and Pathology oversight is established by the assignment of specific division directors to each test referred to other laboratories. The appropriate division director assignment is based on clinical expertise and experience in the general classification of the assay. Assignments are adjusted as needed and are reviewed annually.

The UW Department of Laboratory Medicine and Pathology Resident (LMR) must approve requests for non-defined reference laboratory tests and select an appropriate reference lab.

The final reports will include the name of the laboratory performing the test.

### Procedure for Requesting Reference Lab Testing

1. Providers requesting reference lab tests must complete a physician’s order to be filed in the patient’s medical record.

2. Requests for reference lab testing should be submitted to the Alliance Laboratory which will coordinate the administrative functions necessary for UW LMR approval of the test(s) and specimen collection. In general, reference laboratory test requests should be submitted to the Alliance Lab in writing on a Fred Hutchinson Cancer Center Clinical Laboratory test request form. The Alliance Lab may be phoned in advance if advance administrative coordination is necessary (see below).

3. In general, a minimum of 24 hours advance notice is required by the Alliance Laboratory staff to allow administrative coordination, minimize patient waiting, and ensure appropriate specimen collection. Ordering providers or their staff should notify the Alliance Laboratory for reference laboratory testing need by submitting in advance a test request form or by calling 606-1088.

4. The UW LMR may need to speak directly with the ordering provider and require time to determine if clinical testing is available and to select an appropriate lab for testing. Alliance Lab staff will provide the ordering provider name and contact information upon LMR request.

5. **Denial of testing:** UW LMR denial of testing is most often the result of either clinical testing that is unavailable or the test is offered only on a research basis. The ordering provider will be notified of the denial by either the UW LMR or Alliance Laboratory staff.

6. Inquiries about establishing new laboratory testing opportunities at the Fred Hutchinson Cancer Center or UW Department of Laboratory Medicine and Pathology or at other reference laboratories should be directed to the Fred Hutchinson Cancer Center Clinical Laboratory Medical Director or the Fred Hutchinson Cancer Center Director of Clinical Laboratories.
Fred Hutchinson Cancer Center

SPECIMEN HANDLING GUIDELINES

I. Labeling the Specimen

Specimens may be labeled with a Sunquest-generated label, an Epic label, or a hand-written label. The following information must appear on the specimen label:

1. Patient name: last name, first name, middle initial, or middle name
2. Patient Medical Record Number (MRN)
3. Patient Date of Birth*

4. Specimen source when applicable, i.e., throat, urine

*Bloodworks Northwest does not accept the date of birth as a specimen identifier.

**Note:** Specimens collected for blood bank testing require two staff members to verbally verify the spelling of the patient’s name, the MRN, and date of birth. Both staff members will initial the specimen tube and handwrite on the label the date and time the specimen was collected.

**Note:** Label to be attached in the presence of the patient.

II. Requisition

For those lab tests requiring a requisition form, a CPOE requisition will be generated. The following information is included on the requisition:

1. Patient last name, first name, middle initial, or middle name
2. Patient date of birth
3. Patient Medical Record Number (MRN)
4. Patient location
5. Specimen and site, if applicable
6. Date sample collected/to be collected
7. Time sample collected/to be collected
8. The location where the specimen is to be collected (Alliance Lab, Apheresis, or Infusion Room)
9. Test(s) required
10. Physician name and billing ID number (UPN)
11. ICD code or descriptive diagnosis
12. Please provide any other pertinent clinical information/history that is available
13. Where applicable, a sample drawn from a donor or family member should include the patient name and the donor’s relationship to the patient.

Verify that the information on the requisition matches the information on the specimen that it accompanies.

III. Specimens Processed in the Fred Hutchinson Cancer Center Labs

Orders defined in Sunquest will interface with the lab system from Epic. Specialty labs will receive requisitions printed from Epic and will continue to log in specimens in LabWare.

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IV. Packaging and Transport of Specimens Not Processed in the Fred Hutchinson Cancer Center Labs

Specimens sent to testing laboratories at FHCRC and the Fred Hutchinson Cancer Center Clinic shall be packaged into sealed biohazard marked zip-lock bags. Test request forms accompanying these specimens should be placed in the pouch on the outside of the bag.

Specimens transported via the Fred Hutchinson Cancer Center Clinic tube system will be double-bagged in sealed zip-lock biohazard marked bags.

Specimens transported outside of the Fred Hutchinson Cancer Center Clinic must be packaged into containers with hard sides (i.e., Styrofoam, plastic with screw top lid, cardboard box with appropriate Styrofoam specimen holder, etc.) and securely closed with packaging tape. Shipping containers will contain absorbent material. A biohazard sticker must be affixed to the outside of the shipping container. A sticker stating “diagnostic specimens” must be affixed to the outside of the shipping container. Complete a commodities tracking/routing slip appropriate for the destination of the specimen (UWMC, Seattle Children’s, SLU, etc.)

V. Criteria for Rejection of Specimens

It is within the discretion of the receiving laboratory to determine if a specimen has been compromised, justifying the rejection of the specimen. Below are specific reasons that may apply.

A. Mislabeled specimens and requisitions

Specimens submitted to the Alliance laboratories must adhere to all collecting, labeling, packaging, transporting, and storing guidelines outlined in this manual. Misidentified or unlabeled specimens or requisitions will not be accepted. Mislabeled specimens are defined as:

- Specimens that are not labeled
- Specimens labeled on the container lid only.
- Specimens labeled with a patient name and/or identification number different from that on the accompanying lab requisition form.
- Specimens were drawn from the correct patient but labeled with the wrong name and identification number or date of birth.
- Specimens with matching specimen and requisition labels but drawn from the wrong patient.
- Specimens not labeled with two patient identifiers.

The laboratory receiving the specimen will immediately notify the ordering location of the error and request a new specimen.

If extenuating circumstances exist that prevent re-collection of the specimen and the patient care provider requests that the test be performed on a specimen meeting the definition of a mislabeled specimen, the lab will follow the Mislabeled Laboratory Specimens and Requisitions LAPP Gen.01. This LAPP can be found on PolicyStat.

B. Hemolysis of the blood sample

Hemolysis results from the destruction of RBCs and the liberation of hemoglobin into the fluid portion of the specimen. This will not be known until the sample has been separated. Severe hemolysis will affect certain tests (such as Potassium and Lactate Dehydrogenase), and the
sample will have to be redrawn.
Hemolysis can be caused by:

- mixing additive tubes too vigorously or using rough handling during transport
- drawing blood from a vein that has a hematoma.
- pulling back the plunger on a syringe too quickly
- using a needle with too small of a bore for the venipuncture
- using too large a tube when using a small diameter butterfly needle
- frothing of the blood caused by an improper fit of the needle on a syringe.
- forcing the blood from a syringe into an evacuated tube

C. Specimen clotted.

Inadequate mixing of the Vacutainer™ tubes as soon as possible after the phlebotomy will result in the blood not mixing with the anti-coagulant. By gently inverting the Vacutainer™ tube 5-10 times, the blood will mix, and clotting will not occur.

D. Insufficient Specimen Quantity or Quantity Not Sufficient (QNS)

Blood-testing volumes are reviewed annually for appropriateness, and every effort is made to minimize these volumes. Please check the test to see what the minimum requirements are for that procedure. Specimens with insufficient volumes for testing will have to be redrawn.

VI. Collection Guide

A. Contamination

Non-additive tubes are drawn before additive tubes to avoid contamination with the additive.

B. Additive-Containing Tubes

Even for tubes with additives, there is a recommended "order of draw" to avoid cross-contamination that can result in erroneous test values. Additive-Containing tubes should be drawn as follows:

1. Blue top tubes (Na Citrate)
2. Green top tubes (Heparin)
3. Purple top tubes (EDTA)

Note: Gently invert tubes 5-10 times to mix the blood with the additive.

C. Order of Draw

The recommended "order of draw" when collecting several specimens from a single venipuncture and using an evacuated tube system is as follows:

1. Syringe for blood cultures
2. Glass Red Top
3. PORTEX 3ml ABG heparinized syringe
4. Blue Top or Black Top
5. Royal Blue Top No Additive
6. Gold or Red Gray Tiger Top or Orange Top
7. Plastic Red Top Tube
8. Lime Green Top
9. Green Top
10. Lavender (Purple) Top
11. Royal Blue Top with EDTA
12. Copper Top (Rarecyte BCT)
13. Gray Top
14. Yellow Top
16. Specialty Tubes — Unless otherwise noted.

Research is drawn with clinical samples following the correct order of draw.

⚠️ If blood cultures are not drawn and the 1st tube to be drawn is the Blue Top, a Discard Tube or a glass Red Top tube for testing MUST be drawn first to eliminate possible thromboplastin contamination from the site of the venipuncture. Note that plastic red top tubes contain a clot activator. You must use the translucent red top tube with no clot activator as a discard tube. Laboratory staff is able to assist with determining the correct tube for discard.

D. Minimizing unnecessarily large blood draw volumes

Blood losses from phlebotomy, particularly in pediatric patients and those with many venipunctures, may be a cause of iatrogenic anemia and increased transfusion needs. Adverse consequences of excess venipunctures include complications during collection for patients and health care workers, hazards from subsequent transfusions, contending with increased amounts of hazardous waste, and greater cost.

Wherever possible, efforts should be made to reduce blood collection volumes in the following manner:

1. Combining tests with similar specimen tube type and processing and storage and transport requirements.

2. Reducing the number of blood collection tubes to produce the minimum volume needed for laboratory testing.

Minimal specimen requirements for tests performed at the Fred Hutchinson Cancer Center Cellular Therapy, Clinical Immunogenetics, Cytogenetics, Pathology, Pharmacokinetics, Alliance Laboratory (including IMTX and GI Oncology) and POCT are specified in this manual: see entry for each test.

Minimal specimen collection requirements for tests performed at UW Department of Laboratory Medicine and Pathology labs can be located in the UW Laboratory online test guide https://menu.labmed.washington.edu/index
The staff member providing the timed urine/stool container(s) is responsible for labeling the container(s) before giving them to the patient.

The following information must appear on the specimen label:

1. Patient name: Last name, first name and middle initial
2. Patient Medical Record Number (MRN)
3. Patient Date of Birth
4. Date and Time the specimen was collected

Provide the patient with the Timed Urine Collection or Timed Stool Collection instruction form, or the Stool Collection form (not timed).

Patient Instructions for timed urine collection
Patient Instructions for timed stool collection
Patient Instructions for stool collection (not timed)
Timed Urine Collection

The best diagnostic results are based on a complete 24-hour urine collection, so it is important for you to follow this procedure carefully.

1. Start the collection at any time that is convenient for you.
2. To start, empty your bladder and discard the urine. Record the start time on this form.
3. Using the urine “hat” or urinal, save all urine from this point on in the container provided. If you need another container, the Alliance Lab staff, your team nurse, or nurse case manager will provide one for you.
4. At exactly 24 hours after your start time, empty your bladder and add this urine to the container. Record this time on this form. Do not put any additional urine into the container.
5. Store the container in the refrigerator during the collection period.
6. If any urine is spilled or discarded during the 24-hour period, stop the collection. Discard the urine and discard the container in the trash. (**Note: If your container has HCL added, please bring the collection container to the Alliance Lab to discard). In order to begin collection again, request another collection container from the Alliance Lab or your team/clinical nurse.
7. Deliver the container along with this form to the Alliance Lab (1st floor-Specimen Window) as soon as possible (preferably the same day).

If you have been asked to collect urine for the following tests, please note the restrictions listed below:

<table>
<thead>
<tr>
<th>Test</th>
<th>Restrictions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bence Jones Quantitation</td>
<td>No Restrictions. No additive required. REFRIGERATE DURING COLLECTION.</td>
</tr>
<tr>
<td>Catecholamines (Epinephrine, Norepinephrine, Dopamine Metanephrine)</td>
<td>15 mL HCL must be added to container prior to collection. Please see Alliance Lab staff. REFRIGERATE DURING COLLECTION. (**Note: HCL can cause burns and irritations. Avoid contact with skin or eyes.) Discontinue one week prior to and during collection: mythyldopa (Aldomet), &amp; related antihypertensives, tetracyclines, quinidine, and quinoline.</td>
</tr>
<tr>
<td>Creatinine Clearance</td>
<td>A blood Creatinine level is required within 48 hours of the conclusion of the urine collection. Please check in with the lab to see if you need blood drawn for this test. No Restrictions. No additive required. REFRIGERATE DURING COLLECTION.</td>
</tr>
<tr>
<td>Creatinine, Protein, Protein Electrophoresis</td>
<td>No Restrictions. No additive required. REFRIGERATE DURING COLLECTION.</td>
</tr>
<tr>
<td>Cortisol</td>
<td>10 g of boric acid must be added to container at start of collection. REFRIGERATE DURING COLLECTION.</td>
</tr>
<tr>
<td>Prophyrins Quantitation (includes porphobilinogen)</td>
<td>5g sodium carbonate (NOT sodium bicarbonate) must be added to container prior to collection. Please see Alliance Lab staff. REFRIGERATE DURING COLLECTION. Protect from light. Keep collection container in brown paper bag. Blood specimen and stool collection may be required as well. Please check with your Team Nurse or Nurse Case Manager to determine if these are necessary.</td>
</tr>
<tr>
<td>VMA</td>
<td>15 mL HCL must be added to container prior to collection. Please see Alliance Lab staff. REFRIGERATE DURING COLLECTION. (**Note: HCL can cause burns and irritations. Avoid contact with skin or eyes.)</td>
</tr>
<tr>
<td>5HIAA (5-Hydroxyindolacetic Acid)</td>
<td>15 mL HCL must be added to container prior to collection. Please see Alliance Lab staff. REFRIGERATE DURING COLLECTION. (**Note: HCL can cause burns and irritations. Avoid contact with skin or eyes.) Discontinue two days before and during collection: acetanilide, aspirin, avocados, bananas, chlorpromazine, cough medicines, eggplant, methamphetamines, nicotine, nortriptyline, nuts, phenothiazine, pineapple, and plums.</td>
</tr>
</tbody>
</table>

Patient Name: ___________________ Start Date: _____/_____/_____ Start Time: __________

Stop Date: _____/_____/_____ Stop Time: __________

Return to Table of Contents
**Timed Stool Collection for Fecal Fat**

The best diagnostic results are based on a complete 36 to 72-hour collection. Therefore, it is important for you to follow this procedure carefully.

1. You must be off any mineral oil compound for three days prior to start of your stool collection.
2. Start the collection at any time that is convenient for you.
3. Collect stool into collection “hat” and transfer to the specimen container provided.
4. Do not fill the container more than half full. You may request another collection container from the Alliance Lab staff.
5. Keep the specimen container refrigerated during the collection time period.
6. Seal the lid securely and deliver the container(s) along with this form to the Alliance Lab as soon as possible (preferably the same day).

**Note:**
- Store the container in the refrigerator during the collection period.
- **DO NOT DISCARD ANY STOOL SPECIMEN DURING THE COLLECTION TIME FRAME.**

**Patient Name:** ____________________________

**Patient Medical Record Number:** ____________________________

**Patient Date of Birth:** ____________________________

Date Started: _____/_____/_____  Time Started: ____________________________

Date Completed: _____/_____/_____  Time Completed: ____________________________
Alliance Laboratory

Stool Collection Instructions

You have been asked by the medical team to obtain a stool specimen. We ask that you collect the specimen according to the following instructions.

❖ **NOTE:** Antacids, barium bismuth, anti-diarrhea medication or oily laxatives should not be used prior to collection.

❖ **Containers should be labeled prior to collection with the patient’s name and either the date of birth or the MRN (the U number).**

1. Stool sample containers and a collection device (hat shaped white plastic) have been provided to you.
2. The stool sample should not be contaminated with urine or toilet paper.
3. Collect stool in the white plastic container (the hat) that is provided:
   a. Lift the toilet seat.
   b. Place the device over the toilet bowl.
   c. Place the toilet seat down.
   d. Pass the stool into the white plastic (hat) container without it being contaminated with urine.
4. Once stool is in the hat, use a wooden stick (or pour) to remove portions of the stool and place it into the containers provided, collecting any mucus or blood with the specimen. **Depending on the tests ordered by your provider, you may receive one or all of the containers below:**
   a. For C. difficile and/or virology tests, place a portion of the stool sample into separate sterile clear containers without additive.
   b. For bacterial culture, place stool into the Para-Pak C&S Orange Cap container to the fill line, tighten the cap, and shake firmly to ensure that the specimen is adequately mixed.
   c. For Ova and Parasite Exam, place stool into the Para-Pak EcoFix Green Cap container to the fill line, tighten the cap, and shake firmly to ensure that the specimen is adequately mixed.
5. **Verify the containers are labeled correctly with your name and another identifier.**
6. Place the containers into the biohazard bag and seal the bag.
7. Remove gloves and wash hands.

Note: The specimen should be delivered to the Alliance Laboratory drop-off window within 24 hours after collection. **Samples collected in preservative should be kept at room temperature. Samples collected without preservative should be refrigerated.**

**Lab Hours:**

- Monday – Friday: 6am – 6pm
- Saturday & Sunday: 8am – 4:30pm
- Holidays: 8am – 4:30pm
ALLIANCE LAB

This table provides additional information for tests performed in the Fred Hutchinson Cancer Center Alliance Laboratory SLU and Community Sites. Note: several tests that were formerly listed in these tables have been removed from this list because they are performed elsewhere (UWMC, HMC). Additional information is available on the UWMC Online Test Guide: https://menu.labmed.washington.edu/index

Turnaround times are 60 minutes except as noted under Comments. Turnaround times for Community Sites performed at SLU is less than 8 hours. Turnaround time is defined as the time from specimen receipt to result reporting. Not included in the turnaround time are specimen transport time, blood draw waiting time, and blood draw time. These may also delay results.

<table>
<thead>
<tr>
<th>TEST MNEMONIC</th>
<th>DESCRIPTION</th>
<th>TESTS INCLUDED</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMP</td>
<td>Basic Metabolic Panel</td>
<td>Na, K, Cl, CO₂, Glu, BUN, Creat, Ca, calculated glomerular filtration rate</td>
<td></td>
</tr>
<tr>
<td>LYT</td>
<td>Electrolytes</td>
<td>Na, K, Cl, CO₂</td>
<td></td>
</tr>
<tr>
<td>LIPID</td>
<td>Lipid Panel</td>
<td>Chol, HDL, Trigs, LDL</td>
<td></td>
</tr>
<tr>
<td>HFPA</td>
<td>Hepatic Function Panel</td>
<td>ALT, AST, ALK, Albumin, Bili T/D, Total protein</td>
<td></td>
</tr>
<tr>
<td>RENFP</td>
<td>Renal Function Panel</td>
<td>Albumin, Ca, CO₂, Cl, Creat, Glu, Phosphorus, Na, K, BUN, calculated glomerular filtration rate</td>
<td></td>
</tr>
<tr>
<td>RENFHF</td>
<td>Renal/Hepatic Function Panel</td>
<td>Albumin, Na, K, Cl, CO₂, Glu, BUN, Creat, Bili T/D, Ca, Phos, ALK, AST, ALT, calculated glomerular filtration rate</td>
<td></td>
</tr>
<tr>
<td>COMP</td>
<td>Comprehensive Metabolic Panel</td>
<td>Na, K, Cl, CO₂, Glu, BUN, Creat, Ca, Total Protein, Albumin, ALT, AST, ALK, T Bili, calculated glomerular filtration rate</td>
<td></td>
</tr>
<tr>
<td>TSHRF4</td>
<td>TSH with Reflexive Free T4</td>
<td>TSH, Free T4</td>
<td></td>
</tr>
</tbody>
</table>
## CHEMISTRY INDIVIDUAL TESTS

<table>
<thead>
<tr>
<th>TEST MNEMONIC</th>
<th>DESCRIPTION</th>
<th>TESTS INCLUDED</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALB</td>
<td>Albumin</td>
<td>Albumin</td>
<td></td>
</tr>
<tr>
<td>ALK</td>
<td>Alkaline Phosphatase</td>
<td>Alkaline Phosphatase</td>
<td></td>
</tr>
<tr>
<td>AY</td>
<td>Amylase</td>
<td>Amylase</td>
<td></td>
</tr>
<tr>
<td>AST</td>
<td>AST</td>
<td>AST</td>
<td></td>
</tr>
<tr>
<td>BIL</td>
<td>Bilirubin, Total</td>
<td>Bilirubin, Total</td>
<td></td>
</tr>
<tr>
<td>BILT/D</td>
<td>Bilirubin, Total/Direct</td>
<td>Bilirubin, Total/Direct</td>
<td></td>
</tr>
<tr>
<td>BUN</td>
<td>BUN</td>
<td>BUN</td>
<td></td>
</tr>
<tr>
<td>CA</td>
<td>Calcium, Total</td>
<td>Calcium, Total</td>
<td></td>
</tr>
<tr>
<td>CA199</td>
<td>CA 19.9</td>
<td>CA 19.9</td>
<td></td>
</tr>
<tr>
<td>CEA</td>
<td>Carcinoembryonic Antigen</td>
<td>Carcinoembryonic antigen</td>
<td>90 minutes TAT</td>
</tr>
<tr>
<td>CHOL</td>
<td>Cholesterol, Total</td>
<td>Cholesterol, Total</td>
<td></td>
</tr>
<tr>
<td>CK</td>
<td>Creatine Kinase</td>
<td>Creatine Kinase</td>
<td></td>
</tr>
<tr>
<td>CREG</td>
<td>Creatinine</td>
<td>Creatinine, calculated glomerular filtration rate</td>
<td></td>
</tr>
<tr>
<td>CRT</td>
<td>Cortisol</td>
<td>Cortisol</td>
<td></td>
</tr>
<tr>
<td>GGT</td>
<td>GGT</td>
<td>GGT</td>
<td></td>
</tr>
<tr>
<td>GLU</td>
<td>Glucose</td>
<td>Glucose</td>
<td></td>
</tr>
<tr>
<td>GLUF</td>
<td>Glucose, Fasting</td>
<td>Glucose, Fasting</td>
<td></td>
</tr>
<tr>
<td>HDL</td>
<td>HDL cholesterol</td>
<td>HDL cholesterol</td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>Potassium</td>
<td>Potassium</td>
<td></td>
</tr>
<tr>
<td>LD</td>
<td>LD</td>
<td>LD</td>
<td></td>
</tr>
<tr>
<td>LDL</td>
<td>LDL cholesterol</td>
<td>Calculation must be run with Lipid Panel</td>
<td></td>
</tr>
<tr>
<td>LPASE</td>
<td>Lipase</td>
<td>Lipase</td>
<td></td>
</tr>
<tr>
<td>MG</td>
<td>Magnesium</td>
<td>Magnesium</td>
<td></td>
</tr>
<tr>
<td>NA</td>
<td>Sodium</td>
<td>Sodium</td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>Phosphorus</td>
<td>Phosphorus</td>
<td></td>
</tr>
<tr>
<td>PGSTAT</td>
<td>Qualitative Serum Pregnancy</td>
<td>Positive or negative pregnancy test</td>
<td></td>
</tr>
<tr>
<td>----------</td>
<td>-----------------------------</td>
<td>-------------------------------------</td>
<td></td>
</tr>
<tr>
<td>PLNH3</td>
<td>Ammonia, Plasma</td>
<td>Ammonia</td>
<td></td>
</tr>
</tbody>
</table>
### ALLIANCE LAB - CHEMISTRY INDIVIDUAL TESTS (cont.)

<table>
<thead>
<tr>
<th>TEST MNEMONIC</th>
<th>DESCRIPTION</th>
<th>TESTS INCLUDED</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSA</td>
<td>Prostate Specific Antigen</td>
<td>Prostate Specific Antigen, Total</td>
<td>90 minutes TAT</td>
</tr>
<tr>
<td>SOCULT</td>
<td>Stool Occult Blood</td>
<td>Stool occult blood</td>
<td></td>
</tr>
<tr>
<td>T4FR</td>
<td>Thyroxine, Free</td>
<td>Free T4</td>
<td></td>
</tr>
<tr>
<td>TP</td>
<td>Total Protein</td>
<td>Total Protein</td>
<td></td>
</tr>
<tr>
<td>TRIG</td>
<td>Triglycerides</td>
<td>Triglycerides</td>
<td></td>
</tr>
<tr>
<td>TROPIG</td>
<td>Troponin I (High Sensitivity)</td>
<td>Troponin I (High Sensitivity)</td>
<td></td>
</tr>
<tr>
<td>TSH</td>
<td>Thyroid Stimulating Hormone</td>
<td>Thyroid Stimulating Hormone</td>
<td></td>
</tr>
<tr>
<td>URIC</td>
<td>Uric Acid</td>
<td>Uric Acid</td>
<td></td>
</tr>
<tr>
<td>WIC</td>
<td>Calcium, Ionized, Whole Blood</td>
<td>Calcium, Ionized</td>
<td></td>
</tr>
</tbody>
</table>

### HEMATOLOGY

<table>
<thead>
<tr>
<th>TEST MNEMONIC</th>
<th>DESCRIPTION</th>
<th>TESTS INCLUDED</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBC</td>
<td>Hemogram</td>
<td>HCT, HB, WBC, RBC, Platelet &amp; RBC indices</td>
<td></td>
</tr>
<tr>
<td>CBANC</td>
<td>Hemogram and Abs Neutrophil Count</td>
<td>HCT, HB, WBC, RBC, Platelet, RBC indices &amp; Abs Neutrophil count</td>
<td></td>
</tr>
<tr>
<td>CBD</td>
<td>CBC w/ Diff/Smear Eval</td>
<td>HCT, HB, WBC, RBC, Platelets &amp; RBC indices w/ Diff</td>
<td></td>
</tr>
<tr>
<td>CPLTG</td>
<td>Citrated Platelet Count</td>
<td>Platelets</td>
<td></td>
</tr>
<tr>
<td>ESR</td>
<td>Erythrocyte Sedimentation Rate</td>
<td></td>
<td>90 minutes TAT</td>
</tr>
<tr>
<td>HBHCT</td>
<td>Hemoglobin and Hematocrit</td>
<td>Hemoglobin, Hematocrit</td>
<td></td>
</tr>
<tr>
<td>IPF</td>
<td>Immature Platelet Fraction</td>
<td>Immature Platelet Fraction</td>
<td></td>
</tr>
<tr>
<td>PLTG</td>
<td>Platelet</td>
<td>Platelet</td>
<td></td>
</tr>
<tr>
<td>RETIC</td>
<td>Reticulocyte</td>
<td>Reticulocyte</td>
<td></td>
</tr>
</tbody>
</table>
# ALLIANCE LAB - COAGULATION

<table>
<thead>
<tr>
<th>TEST MNEMONIC</th>
<th>DESCRIPTION</th>
<th>TESTS INCLUDED</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRO</td>
<td>Prothrombin Time</td>
<td>Prothrombin Time</td>
<td></td>
</tr>
<tr>
<td>PTT</td>
<td>Activated Partial Thromboplastin Time</td>
<td>Activated Partial Thromboplastin Time</td>
<td></td>
</tr>
<tr>
<td>FIBCL</td>
<td>Fibrinogen</td>
<td>Fibrinogen</td>
<td></td>
</tr>
<tr>
<td>DDI</td>
<td>D-Dimer</td>
<td>D-Dimer</td>
<td></td>
</tr>
</tbody>
</table>

# ALLIANCE LAB – MOLECULAR

<table>
<thead>
<tr>
<th>TEST MNEMONIC</th>
<th>DESCRIPTION</th>
<th>TESTS INCLUDED</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>FABRCV</td>
<td>COVID/FLU/RSV Respiratory Panel, Rapid PCR</td>
<td>Qualitative COVID, FLU A, FLU B, and RSV by Cepheid PCR</td>
<td>For symptomatic clinical patients at SLU only. All other sites, research, and asymptomatic testing – consider NCVQLT, FLURSV, &amp; REVSQF.</td>
</tr>
<tr>
<td>NCVRPD</td>
<td>SARS-CoV-2 (COVID-19) Qualitative Rapid PCR</td>
<td>Qualitative COVID by Cepheid PCR</td>
<td>Requires pre-approval from Fred Hutchinson Cancer Center Infection Prevention</td>
</tr>
</tbody>
</table>

# URINES

<table>
<thead>
<tr>
<th>TEST MNEMONIC</th>
<th>DESCRIPTION</th>
<th>TESTS INCLUDED</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>UAWK</td>
<td>Urinalysis, workup</td>
<td>Urine dipstick tests, microscopic performed if macroscopic abnormal</td>
<td></td>
</tr>
<tr>
<td>UAC</td>
<td>Urinalysis, complete</td>
<td>Urine dipstick tests, microscopic</td>
<td></td>
</tr>
<tr>
<td>UCLEAR</td>
<td>Creatinine clearance</td>
<td>Urine creatinine</td>
<td>Serum creatinine level required</td>
</tr>
<tr>
<td>UTP</td>
<td>Protein</td>
<td>Urine total protein</td>
<td></td>
</tr>
<tr>
<td>UPG</td>
<td>Urine Pregnancy</td>
<td></td>
<td>Positive or negative pregnancy test</td>
</tr>
<tr>
<td>TEST MNEMONIC</td>
<td>DESCRIPTION</td>
<td>TESTS INCLUDED</td>
<td>COMMENTS</td>
</tr>
<tr>
<td>---------------</td>
<td>-------------</td>
<td>----------------</td>
<td>----------</td>
</tr>
<tr>
<td>CCCNT</td>
<td>Cell Count</td>
<td>WBC, RBC</td>
<td></td>
</tr>
<tr>
<td>CGLU</td>
<td>Glucose</td>
<td>Glucose</td>
<td></td>
</tr>
<tr>
<td>CTP</td>
<td>Total Protein</td>
<td>Total Protein</td>
<td></td>
</tr>
<tr>
<td>CCFUGE</td>
<td>CSF Cell evaluation by Hematopathologist</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# BLOOD GASES

<table>
<thead>
<tr>
<th>TEST MNEMONIC</th>
<th>DESCRIPTION</th>
<th>TESTS INCLUDED</th>
<th>STAT TAT</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>AG</td>
<td>Arterial blood gas</td>
<td>pH, pCO₂, pO₂, HCO₃</td>
<td>30 minutes</td>
<td>COOX performed at HMC (Not collected at SLU due to short stability time)</td>
</tr>
<tr>
<td>VG</td>
<td>Venous blood gas</td>
<td>pH, pCO₂, pO₂, HCO₃</td>
<td>30 minutes</td>
<td>COOX performed at HMC (Not collected at SLU due to short stability time)</td>
</tr>
</tbody>
</table>
# Laboratory Critical Results

## Serum or Plasma

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Less than</th>
<th>Greater than</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Na</td>
<td>120</td>
<td>160</td>
<td>mEq/L</td>
</tr>
<tr>
<td>K</td>
<td>3.0</td>
<td>6.0</td>
<td>mEq/L</td>
</tr>
<tr>
<td>HCO₃/CO₂</td>
<td>10</td>
<td>40</td>
<td>mEq/L</td>
</tr>
<tr>
<td>Glucose</td>
<td>55</td>
<td>500</td>
<td>mg/dl</td>
</tr>
<tr>
<td>Ca</td>
<td>6.0</td>
<td>13.0</td>
<td>mg/dl</td>
</tr>
<tr>
<td>Phosphate</td>
<td>1.0</td>
<td>none</td>
<td>mg/dl</td>
</tr>
<tr>
<td>Mg</td>
<td>1.2</td>
<td>4.7</td>
<td>mg/dl</td>
</tr>
<tr>
<td>Troponin I (High Sensitivity)</td>
<td>N/A</td>
<td>0.39</td>
<td>ng/mL</td>
</tr>
<tr>
<td>CSF glucose</td>
<td>20</td>
<td>N/A</td>
<td>mg/dl</td>
</tr>
</tbody>
</table>

## Whole Blood

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Less than</th>
<th>Greater than</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ionized Calcium</td>
<td>0.78</td>
<td>1.58</td>
<td>mmol/L</td>
</tr>
</tbody>
</table>

## Arterial Blood Gases

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Less than</th>
<th>Greater than</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>7.20</td>
<td>7.58</td>
<td></td>
</tr>
<tr>
<td>pCO₂</td>
<td>9</td>
<td>65</td>
<td>mmHg</td>
</tr>
<tr>
<td>pO₂</td>
<td>40</td>
<td>N/A</td>
<td>mmHg</td>
</tr>
<tr>
<td>HCO₃</td>
<td>10</td>
<td>40</td>
<td>mEq/L</td>
</tr>
</tbody>
</table>

## Hematology

*Absolute neutrophils*: The first time that a patient is seen, the critical value applies, and this count must be called to the appropriate individual on the 3rd, 4th, 5th, 6th, 7th floor or Apheresis.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Less than</th>
<th>Greater than</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hematocrit</td>
<td>20</td>
<td>none</td>
<td>%</td>
</tr>
<tr>
<td>Hemoglobin</td>
<td>6.0</td>
<td>none</td>
<td>g/dL</td>
</tr>
<tr>
<td>Platelet</td>
<td>20</td>
<td>1000</td>
<td>x 10³ /uL</td>
</tr>
<tr>
<td>Hemoglobin</td>
<td>6.0</td>
<td>none</td>
<td>mg/dl</td>
</tr>
</tbody>
</table>

## Coagulation

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Less than</th>
<th>Greater than</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prothrombin Time</td>
<td>N/A</td>
<td>5</td>
<td>INR</td>
</tr>
<tr>
<td>aPTT</td>
<td>N/A</td>
<td>120</td>
<td>Sec</td>
</tr>
<tr>
<td>Fibrinogen</td>
<td>100</td>
<td>N/A</td>
<td>mg/dL</td>
</tr>
</tbody>
</table>

❖ All patients are monitored, and careful attention paid to previous counts. If there is a clinically significant fall in platelets, as determined by a Medical Laboratory Scientist/Technician trained in Hematology, the appropriate nurse is called.
### ALLIANCE LAB REFERENCE RANGES

#### HEMATOLOGY

<table>
<thead>
<tr>
<th>RBC</th>
<th>Units: mil/uL</th>
<th>Hemoglobin</th>
<th>Units: g/dL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Female</strong></td>
<td></td>
<td><strong>Male</strong></td>
<td></td>
</tr>
<tr>
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<td>Range</td>
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<th>Units: %</th>
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<th>Units: mm/hr</th>
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| Female/Male  |       |                |       |
| Cell         | Range |                |       |
| Red Blood Cell |      | 0              |       |
| Mononuclear Cell |   | 0 - 5          |       |

| Cell         | Range |                |       |
| Neutrophils  | 2 ± 4  |                |       |
| Lymphocytes  | 60 ± 20 |                |       |
| Monocytes    | 30 ± 15 |               |       |

**COAGULATION**

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**CHEMISTRY**

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<td></td>
<td>239</td>
<td></td>
</tr>
<tr>
<td>HDL-Cholesterol</td>
<td>&gt;39</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt;59</td>
<td>40-59</td>
</tr>
<tr>
<td></td>
<td>Acceptable</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>&lt;40</td>
</tr>
<tr>
<td>Triglyceride</td>
<td>&lt;150</td>
<td>150-199</td>
</tr>
<tr>
<td></td>
<td>200-499</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt;499</td>
<td></td>
</tr>
<tr>
<td>Ammonia</td>
<td>110-180</td>
<td></td>
</tr>
<tr>
<td></td>
<td>95-155</td>
<td></td>
</tr>
<tr>
<td></td>
<td>35-85</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0-65</td>
<td></td>
</tr>
<tr>
<td>Amylase</td>
<td>27-106</td>
<td></td>
</tr>
<tr>
<td>Lipase</td>
<td>&lt;70</td>
<td></td>
</tr>
<tr>
<td>Ionized Calcium (Whole Blood)</td>
<td>1.18-1.38</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.16-1.45</td>
<td></td>
</tr>
<tr>
<td>Prostate Specific Antigen</td>
<td>0.00-5.00</td>
<td></td>
</tr>
<tr>
<td>CEA</td>
<td>0.0-5.0</td>
<td></td>
</tr>
<tr>
<td>Troponin I (High Sensitivity)</td>
<td>&lt;0.04 Normal</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.04 - 0.39</td>
<td>Elevated above the 99th percentile of a healthy population</td>
</tr>
<tr>
<td>CSF Protein</td>
<td>15-45</td>
<td>mg/dL</td>
</tr>
</tbody>
</table>
ALLIANCE LAB REFERENCE RANGES

ALKALINE PHOSPHATASE

<table>
<thead>
<tr>
<th>AGE</th>
<th>MALE</th>
<th>FEMALE</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>75</td>
<td>52-227</td>
<td>49-199</td>
<td>U/L</td>
</tr>
<tr>
<td>65</td>
<td>36-161</td>
<td>38-172</td>
<td>U/L</td>
</tr>
<tr>
<td>55</td>
<td>37-159</td>
<td>31-132</td>
<td>U/L</td>
</tr>
<tr>
<td>45</td>
<td>39-139</td>
<td>34-121</td>
<td>U/L</td>
</tr>
<tr>
<td>35</td>
<td>36-122</td>
<td>25-112</td>
<td>U/L</td>
</tr>
<tr>
<td>25</td>
<td>35-109</td>
<td>25-100</td>
<td>U/L</td>
</tr>
<tr>
<td>18</td>
<td>42-136</td>
<td>26-98</td>
<td>U/L</td>
</tr>
<tr>
<td>14</td>
<td>72-400</td>
<td>43-226</td>
<td>U/L</td>
</tr>
<tr>
<td>12</td>
<td>119-426</td>
<td>89-285</td>
<td>U/L</td>
</tr>
<tr>
<td>10</td>
<td>115-324</td>
<td>132-366</td>
<td>U/L</td>
</tr>
<tr>
<td>0</td>
<td>115-324</td>
<td>111-281</td>
<td>U/L</td>
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</table>

BLOOD GASES

<table>
<thead>
<tr>
<th>Blood gas, Arterial (Adult)</th>
<th>Reference Range</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>7.35-7.45</td>
<td></td>
</tr>
<tr>
<td>pCO₂</td>
<td>33-48</td>
<td>mmHg</td>
</tr>
<tr>
<td>pO₂</td>
<td>1-39y: 80-104</td>
<td></td>
</tr>
<tr>
<td></td>
<td>40-59y: 70-95</td>
<td></td>
</tr>
<tr>
<td></td>
<td>60-150y: 63-87</td>
<td></td>
</tr>
<tr>
<td>Bicarbonate</td>
<td>22-26</td>
<td>mEq/L</td>
</tr>
<tr>
<td>O₂ Saturation</td>
<td>95-99</td>
<td>%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Blood gas, Venous (Adult)</th>
<th>Reference Range</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>7.32-7.40</td>
<td></td>
</tr>
<tr>
<td>pCO₂</td>
<td>42-50</td>
<td>mmHg</td>
</tr>
<tr>
<td>pO₂</td>
<td>35-40</td>
<td>mmHg</td>
</tr>
<tr>
<td>Bicarbonate</td>
<td>23-27</td>
<td>mEq/L</td>
</tr>
<tr>
<td>O₂ Saturation</td>
<td>70-75</td>
<td>%</td>
</tr>
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</table>

MOLECULAR

<table>
<thead>
<tr>
<th>Qualitative COVID/FLU/RSV by Cepheid PCR</th>
<th>Reference Range</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>SARS-CoV-2 (COVID-19)</td>
<td>Negative</td>
<td></td>
</tr>
<tr>
<td>FLU A</td>
<td>Negative</td>
<td></td>
</tr>
<tr>
<td>FLU B</td>
<td>Negative</td>
<td></td>
</tr>
<tr>
<td>RSV</td>
<td>Negative</td>
<td></td>
</tr>
</tbody>
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# ALLIANCE LAB REFERENCE RANGES

## URINALYSIS

<table>
<thead>
<tr>
<th>Test (Dipstick)</th>
<th>Reference Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>5.0-8.0</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.002-1.027</td>
</tr>
<tr>
<td>Protein</td>
<td>negative</td>
</tr>
<tr>
<td>Glucose</td>
<td>negative</td>
</tr>
<tr>
<td>Ketone</td>
<td>negative</td>
</tr>
<tr>
<td>Bilirubin</td>
<td>negative</td>
</tr>
<tr>
<td>Blood</td>
<td>negative</td>
</tr>
<tr>
<td>Nitrite</td>
<td>negative</td>
</tr>
<tr>
<td>Urobilinogen</td>
<td>0.1-1.9 Ehrlich units</td>
</tr>
<tr>
<td>Leucocyte esterase</td>
<td>negative</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test (Microscopic)</th>
<th>Reference Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>WBC/hpf</td>
<td>0-5</td>
</tr>
<tr>
<td>RBC/hpf</td>
<td>0-2</td>
</tr>
<tr>
<td>Casts/lpf</td>
<td>0</td>
</tr>
<tr>
<td>Crystals/lpf</td>
<td>0</td>
</tr>
<tr>
<td>Bacteria/hpf</td>
<td>0</td>
</tr>
<tr>
<td>Squamous epithelial cells/lpf</td>
<td>0-5 (neg)</td>
</tr>
<tr>
<td>Renal/transitional epithelial cells/hpf</td>
<td>&lt;3 (neg)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Analyte</th>
<th>Reference Range</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urine Total Protein</td>
<td>0-14 (random specimen)</td>
<td>mg/dL</td>
</tr>
<tr>
<td></td>
<td>0.050-0.080 (24-hour specimen)</td>
<td>g/24hour</td>
</tr>
<tr>
<td>Urine Creatinine</td>
<td>Child 0-9 years 700 - 1800</td>
<td>mg/24 hours</td>
</tr>
<tr>
<td></td>
<td>Male &gt; 9 years 1000 - 2000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Female &gt; 9 Years 700 - 1800</td>
<td></td>
</tr>
<tr>
<td>Creatinine Clearance</td>
<td>Newborn 40-60</td>
<td>mL/min/m²</td>
</tr>
<tr>
<td></td>
<td>Male 75-120</td>
<td>mL/min</td>
</tr>
<tr>
<td></td>
<td>Female 65-105</td>
<td>mL/min</td>
</tr>
</tbody>
</table>
CD34 ASSAY

Lab Request Form
Cellular Therapy, 1100 Eastlake Avenue E, E1-419
Fred Hutchinson Cancer Center CTL Test Requisition/Billing form – for
Peripheral Blood Leukocytes (PBL)
For Fred Hutchinson Cancer Center Ambulatory Clinic, CPOE
requisition will be generated for those lab tests requiring a requisition
form.
Phone
606-1200
Availability
M – F Lab Hours 7am – 8pm
Processing Hours 7am – 5pm
Weekends & Holidays Lab Hours 9am – 5pm
Processing Hours 9am – 3pm
Turnaround Time
Three hours after sample received or lab start-up
Specimen Volume
Peripheral Blood
2 - 4 mL
Pediatric Volume
2 - 4 mL
Container
EDTA (2.0 mL purple top)
Collection
Routine venipuncture or line draw
Special Handling
Room temperature, label as STAT
Causes for Rejection
Misidentified specimens and requisitions, specimen QNS,
improperly stored specimen, specimen clotted.
Reference Ranges
No normal values established for mobilized specimens.
After Hours
Draw a fresh specimen in the morning (no after-hours specimen
handling).
### Related Terms
Arterial blood gas, Blood gas, ABG, Gases

### Panel includes
Measured parameters include pH, pCO₂ and pO₂;
Calculated parameters include HCO₃, base excess, and oxygen saturation.

### Lab
- Alliance Lab, Room G1-500
- Satellite Labs, South Lake Union
- Community Site Labs

### Request Form
Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.
Pulmonary Function Testing (PFT) staff will print a CPOE requisition to accompany the specimen.

### Phone
- SLU 606-1088
- EVG 425-441-2640

### Testing Frequency
Throughout service hours

### Availability
STAT or routine

### Specimen
Arterial Blood

### Volume
3mL; minimum volume is 300 µL (0.3mL) in a tuberculin syringe.

### Pediatric Volume
See Capillary Blood Gases

### Container
Blood should be drawn into gas-tight plastic syringe using 1000-units sodium or lithium heparin. Other anticoagulants are not acceptable.

### Patient Preparation
Acknowledging that patients requiring blood gas analysis may be unstable, the patient should be as physiologically stable as possible when the arterial blood specimen is collected. Ideally, a patient’s ventilation should be stable during specimen collection. Therefore, a patient breathing spontaneously should be at rest at least 5 minutes or, if possible, for as long as it takes for the ventilation pattern to become stable.

### Collection
Collect samples in airtight plastic syringe. Completely wet the inside of the barrel of the syringe. The sodium heparin acts as an anticoagulant. Place a needle on the syringe and expel the sodium heparin to fill the dead space of the syringe and needle. Draw samples anaerobically, without introducing air bubbles in the syringe, and cap the syringe. If bubbles develop during sample collection, remove them immediately.

(Continued)
(Blood Gas, Arterial, continued)

**Special Instructions**
Requisition must indicate time drawn, type of sample (arterial, venous, or capillary), FiO\(_2\) and ventillatory support type, and patient temperature. Notifying the lab of a pending sample is helpful. Deliver to the lab immediately following collection.

**Causes for Rejection**
Large air bubbles will cause all values to be erroneous. The magnitude of error will be determined by the size of the air bubble, sample and sample air bubble interface, length of time bubble was in contact with sample before analysis and the gradient between sample gas tensions and room air gas tensions. Small bubbles, if immediately expelled, will generally not cause any significant error. Samples with large (more than 0.2 mL) bubbles should be discarded and a new, anaerobic sample obtained. Needle attached, sample clotted, specimen received more than 1 hour after collection.

**Reference Ranges/Critical Values**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Reference Range</th>
<th>Critical Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>7.35 – 7.45</td>
<td>&lt;7.20 or &gt;7.58</td>
</tr>
<tr>
<td>pCO(_2)</td>
<td>33 – 48 mm Hg</td>
<td>&lt;9 or &gt;65 mm Hg</td>
</tr>
<tr>
<td>pO(_2)</td>
<td>80 – 104 mm Hg</td>
<td>&lt;40 mm Hg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(&lt;20 mm Hg venous)</td>
</tr>
<tr>
<td>HCO(_3)</td>
<td>24-31 mEq/L</td>
<td>&lt;10 or &gt;40mEq/L</td>
</tr>
<tr>
<td>O(_2) Saturation</td>
<td>95-99%</td>
<td></td>
</tr>
</tbody>
</table>
BASIC METABOLIC PANEL

Related Terms Panel includes
BMP
Sodium, potassium, chloride, carbon dioxide, glucose, urea nitrogen (BUN), creatinine, calcium, calculated glomerular filtration rate.
Ion Gap is calculated: \( \text{Gap} = \text{Na} - (\text{Cl} + \text{CO}_2) \)

Glomerular filtration rate (GFR) is calculated by the Modification of Diet in Renal Disease (MDRD) Study equation, which is reasonably accurate in non-hospitalized patients with chronic kidney disease but tends to underestimate GFR in other populations. It is inaccurate in patients with rapidly changing renal function. See NEJM 2006; 354:2473.

Lab
Alliance Lab, Room G1-500
Satellite Labs, South Lake Union
Community Site Labs

Request Form
Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.
CPOE orders will be interfaced to Sunquest upon order activation in Epic.

Phone
SLU 606-1088
EVG 425-441-2640

Testing Frequency Throughout service hours
Availability STAT or routine
Specimen Plasma or Serum
Volume 2 mL
Pediatric Volume Pediatric capillary collection: 500 µL (0.5 mL) serum collected in microtube or "bullet" tube.
Container 5 mL lime top PST, green top, red top, gold top SST or orange top RST
Collection Routine venipuncture or line draw
Causes for See individual tests.
Rejection
Reference Range See individual tests.
Critical Values See individual tests.
# COMPREHENSIVE METABOLIC PANEL

## Related Terms
- COMP

## Panel includes
Sodium, potassium, chloride, carbon dioxide, calculation for Ion Gap, glucose, urea nitrogen (BUN), calcium, creatinine, alanine aminotransferase (ALT), alkaline phosphatase (ALP), aspartate aminotransferase (AST), bilirubin (total), total protein, albumin, calculated glomerular filtration rate

Ion Gap = Na – (Cl + CO₂)

Glomerular filtration rate (GFR) is calculated by the Modification of Diet in Renal Disease (MDRD) Study equation, which is reasonably accurate in non-hospitalized patients with chronic kidney disease but tends to underestimate GFR in other populations. It is inaccurate in patients with rapidly changing renal function. See NEJM 2006; 354:2473

## Lab
- Alliance Lab, Room G1-500
- Satellite Labs, South Lake Union
- Community Site Labs

## Request Form
Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes
CPOE orders will be interfaced to Sunquest upon order activation in Epic.

## Phone
- SLU 606-1088
- EVG 425-441-2640

## Testing Frequency
Throughout service hours

## Availability
- STAT or routine

## Specimen
- Plasma or Serum

## Volume
- 1 mL

## Pediatric Volume
Pediatric capillary collection:
- 500 μL serum collected in microtube or "bullet" tube

## Container
- 5 mL lime top PST, green top, red top, gold top SST or orange top RST tube

## Collection
Routine venipuncture or line draw

## Causes for Rejection
See individual tests.

## Reference Ranges
See individual tests.

## Critical Values
See individual tests
ELECTROLYTES

**Related Terms**
Lutes

**Panel includes**
Sodium, potassium, chloride, CO₂
Ion Gap is calculated: Gap = Na – (Cl + CO₂)

**Lab**
Alliance Lab, Room G1-500
Satellite Labs, South Lake Union
Community Site Labs

**Request Form**
Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.
CPOE orders will be interfaced to Sunquest upon order activation in Epic.

**Phone**
SLU 606-1088
EVG 425-441-2640

**Testing Frequency**
Throughout service hours

**Availability**
STAT or routine

**Specimen**
Plasma or Serum

**Volume**
2 mL

**Pediatric Volume**
Pediatric capillary collection:
500 µL (0.5 mL) serum collected in microtube or "bullet" tube.

**Container**
5 mL lime top PST, green top, red top, gold top SST or orange top RST tube

**Collection**
Routine venipuncture or line draw

**Causes for Rejection**
See individual tests.

**Reference Ranges**
See individual tests.

**Critical Values**
See individual tests.
# HEPATIC FUNCTION PANEL

<table>
<thead>
<tr>
<th>Related Terms</th>
<th>Liver Panel, Liver Studies, Hepatic Function, LFT, Liver Function Tests, Hepatic Profile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panel includes</td>
<td>Alanine aminotransferase (ALT), alkaline phosphatase (ALP), aspartate aminotransferase (AST), bilirubin (total &amp; direct), total protein, albumin.</td>
</tr>
<tr>
<td>Lab</td>
<td>Alliance Lab, Room G1-500 Satellite Labs, South Lake Union Community Site Labs</td>
</tr>
<tr>
<td>Request Form</td>
<td>Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes. CPOE orders will be interfaced to Sunquest upon order activation in Epic.</td>
</tr>
<tr>
<td>Phone</td>
<td>SLU 606-1088 EVG 425-441-2640</td>
</tr>
<tr>
<td>Testing Frequency</td>
<td>Throughout service hours</td>
</tr>
<tr>
<td>Availability</td>
<td>STAT or routine</td>
</tr>
<tr>
<td>Specimen</td>
<td>Plasma or Serum</td>
</tr>
<tr>
<td>Volume</td>
<td>1 mL</td>
</tr>
<tr>
<td>Pediatric Volume</td>
<td>Pediatric capillary collection: 500 µL (0.5 mL) serum collected in microtube or &quot;bullet&quot; tube.</td>
</tr>
<tr>
<td>Container</td>
<td>5 mL lime top PST, green top, red top, gold top SST or orange top RST tube</td>
</tr>
<tr>
<td>Collection</td>
<td>Routine venipuncture or line draw</td>
</tr>
<tr>
<td>Causes for Rejection</td>
<td>See individual tests.</td>
</tr>
<tr>
<td>Reference Ranges</td>
<td>See individual tests.</td>
</tr>
<tr>
<td>Critical Values</td>
<td>See individual tests.</td>
</tr>
</tbody>
</table>
# LIPID PANEL

## Related Terms

- Lipid Profile

## Panel includes

- Cholesterol, triglycerides, HDL cholesterol, calculated LDL cholesterol, non-HDL Cholesterol, Cholesterol/HDL Ratio
- \( \text{LDL} = \text{Chol} - (\text{Trig}/5) - \text{HDL} \)
- \( \text{Non-HDL Cholesterol} = \text{Cholesterol} - \text{HDL} \)
- \( \text{Cholesterol/HDL Ratio} = \text{Cholesterol}/\text{HDL} \)

## Lab

- Alliance Lab, Room G1-500
- Satellite Labs, South Lake Union
- Community Site Labs

## Request Form

- Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.
- CPOE orders will be interfaced to Sunquest upon order activation in Epic.

## Phone

- SLU 606-1088
- EVG 425-441-2640

## Testing Frequency

- Throughout service hours

## Availability

- Routine

## Specimen

- Plasma or Serum

## Volume

- 1 mL

## Pediatric Volume

- Pediatric capillary collection; 500µL (0.5mL) serum collected in microtube or “bullet” tube.

## Container

- 5mL lime top PST, green top, red top, gold top SST or orange top RST tube

## Collection

- Routine venipuncture or line draw

## Causes for Rejection

- See individual tests.

## Reference Ranges

- See individual tests.

## Critical Values

- See individual tests.
RENAL FUNCTION PANEL

Panel includes
Sodium, potassium, chloride, carbon dioxide, calculation for Ion Gap, glucose, urea nitrogen (BUN), creatinine, calcium, phosphorus, albumin, calculated glomerular filtration rate

Ion Gap is calculated: \[ \text{Gap} = \text{Na} - (\text{Cl} + \text{CO}_2) \]

Glomerular filtration rate (GFR) is calculated by the Modification of Diet in Renal Disease (MDRD) Study equation, which is reasonably accurate in non-hospitalized patients with chronic kidney disease but tends to underestimate GFR in other populations. It is inaccurate in patients with rapidly changing renal function. See NEJM 2006; 354:2473.

Lab
Alliance Lab, Room G1-500
Satellite Labs, South Lake Union
Community Site Labs

Request Form
Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.
CPOE orders will be interfaced to Sunquest upon order activation in Epic.

Phone
SLU 606-1088
EVG 425-441-2640

Testing Frequency
Throughout service hours

Availability
Stat or Routine

Specimen
Plasma or Serum

Volume
1 mL

Pediatric Volume
Pediatric capillary collection: 500µL (0.5 mL) serum collected in microtube or “bullet” tube.

Container
5 mL lime top PST, green top, red top, gold top SST or orange top RST tube

Collection
Routine venipuncture or line draw

Causes for Rejection
See individual tests.

Reference Ranges
See individual tests.

Critical Values
See individual tests.
RENAL/HEPATIC FUNCTION PANEL

Panel includes

Sodium, potassium, chloride, carbon dioxide, calculation for Ion Gap, glucose, urea nitrogen (BUN), creatinine, calcium, phosphorus, albumin, total protein, albumin, total/direct bilirubin, alkaline phosphatase (ALK), aspartate aminotransferase (AST), alanine aminotransferase (ALT), phosphate, calculated glomerular filtration rate

Ion Gap = Na – (Cl + CO₂)

Glomerular filtration rate (GFR) is calculated by the Modification of Diet in Renal Disease (MDRD) Study equation, which is reasonably accurate in non-hospitalized patients with chronic kidney disease but tends to underestimate GFR in other populations. It is inaccurate in patients with rapidly changing renal function. See NEJM 2006; 354:2437

Lab

Alliance Lab, Room G1-500
Satellite Labs, South Lake Union
Community Site Labs

Request Form

Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes
CPOE orders will be interfaced to Sunquest upon order activation in Epic.

Phone

SLU 606-1088
EVG 425-441-2640

Testing Frequency

Throughout service hours

Availability

Stat or Routine

Specimen

Plasma or Serum

Volume

1 mL

Pediatric Volume

Pediatric capillary collection: 500µL (0.5 mL) serum collected in microtube or “bullet” tube.

Container

5 mL lime top PST, green top, red top, gold top SST or orange top RST tube

Collection

Routine venipuncture or line draw

Causes for Rejection

See individual tests.

Reference Ranges

See individual tests.

Critical Values

See individual tests.
# TSH WITH REFLEXIVE FREE T4

<table>
<thead>
<tr>
<th>Related Terms</th>
<th>TSHRF4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panel includes</td>
<td>TSH, Free T4</td>
</tr>
<tr>
<td>Lab</td>
<td>Alliance Lab, Room G1-500</td>
</tr>
<tr>
<td></td>
<td>Satellite Labs, South Lake Union</td>
</tr>
<tr>
<td></td>
<td>Community Site Labs</td>
</tr>
<tr>
<td>Request Form</td>
<td>Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes. CPOE orders will be interfaced to Sunquest upon order activation in Epic.</td>
</tr>
<tr>
<td>Phone</td>
<td>SLU 606-1088</td>
</tr>
<tr>
<td></td>
<td>EVG 425-441-2640</td>
</tr>
<tr>
<td>Testing Frequency</td>
<td>Throughout service hours</td>
</tr>
<tr>
<td>Availability</td>
<td>STAT or routine</td>
</tr>
<tr>
<td>Specimen</td>
<td>Serum</td>
</tr>
<tr>
<td>Volume</td>
<td>2.0 mL, minimum 0.8 mL</td>
</tr>
<tr>
<td>Container</td>
<td>5 mL orange top tube preferred or gold top, SST, or red top tube SST.</td>
</tr>
<tr>
<td>Collection</td>
<td>Routine venipuncture or line draw</td>
</tr>
<tr>
<td>Causes for</td>
<td>See individual tests.</td>
</tr>
<tr>
<td>Rejection</td>
<td>See individual tests.</td>
</tr>
<tr>
<td>Reference Range</td>
<td>See individual tests.</td>
</tr>
</tbody>
</table>
URINALYSIS

Related Terms

UA

Panel includes
Color, appearance, bilirubin, leukocyte esterase, nitrite, specific gravity, pH, protein, glucose, ketones, blood, and microscopic analysis if ordered or indicated by chemistries.

Lab
Alliance Lab, Room G1-500
Satellite Labs, South Lake Union
Community Site Labs

Request Form
Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.
CPOE orders will be interfaced to Sunquest upon order activation in Epic.

Phone
SLU 606-1088
EVG 425-441-2640

Testing Frequency
Throughout service hours

Availability
STAT or routine

Specimen
Random Urine

Volume
12 mL can be done on <12 mL in extenuating instances such as infants.

Container
Sterile plastic urine container, approved BD collection kit with cup, red/yellow tube, and gray tube at community sites

Collection
Freshly voided clean-catch random urine or catheterized specimen.

Storage Instructions
Fresh urine cups must be examined within 2 hours of collection, appropriately collected BD urine collection kits are stable for 24-72 hours depending on tests ordered.

Causes for Rejection
Specimens contaminated with feces, less than 1 mL of urine or specimens in fresh urine cups >2 hours old.

Reference Ranges
Urinalysis macroscopic:
color straw-dark yellow; appearance clear-hazy; pH 5-8; specific gravity 1.005-1.030; protein negative; glucose negative; ketones negative; bilirubin negative; blood negative: nitrite negative; urobilinogen 0.1-1 Ehrlich units; leucocyte esterase: negative.
Urinalysis microscopic: RBC 0-2/hpf; WBC 0-5/hpf; casts negative.
ALANINE AMINOTRANSFERASE (ALT)

Related Terms
ALT, SGPT

Test included in these panels:
- Comprehensive Metabolic Panel
- Hepatic Function Panel
- Renal/Hepatic Function Panel

Lab
Alliance Lab, Room G1-500
Satellite Labs, South Lake Union
Community Site Labs

Request Form
Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.
CPOE orders will be interfaced to Sunquest upon order activation in Epic.

Phone
SLU 606-1088
EVG 425-441-2640

Testing Frequency
Throughout service hours

Availability
STAT or routine

Specimen
Plasma or Serum

Volume
0.5 mL

Pediatric Volume
Pediatric capillary collection: 200µL (0.2 mL) serum collected in microtube or "bullet" tube.

Container
5 mL lime top PST, green top, red top, gold top SST or orange top RST; NO EDTA samples

Collection
Routine venipuncture or line draw

Special Handling
Samples must be separated from red cells as soon as possible after collection. Erythrocytes contain 3x – 5x more ALT than does serum.

Causes for Rejection
Hemolysis, lipemia, bilirubin, misidentified specimens and requisitions, specimen QNS

Reference Ranges

<table>
<thead>
<tr>
<th>Age</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 49</td>
<td>10 - 64 U/L</td>
<td>7-33U/L</td>
</tr>
<tr>
<td>≥ 50</td>
<td>10 - 48 U/L</td>
<td>7-33U/L</td>
</tr>
</tbody>
</table>
ALBUMIN

Test is included in these panels:

- Hepatic Function Panel
- Renal Function Panel
- Renal/Hepatic Function Panel
- Comprehensive Metabolic Panel

Lab

Alliance Lab, Room G1-500
Satellite Labs, South Lake Union
Community Site Labs

Request Form

Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.
CPOE orders will be interfaced to Sunquest upon order activation in Epic.

Phone

SLU 606-1088
EVG 425-441-2640

Testing Frequency

Throughout service hours

Availability

STAT or routine

Specimen

Plasma or Serum

Volume

0.5 mL

Pediatric Volume

Pediatric capillary collection: 200 µL (0.2 mL) serum collected in microtube or "bullet" tube.

Container

5 mL lime top PST, green top, red top, gold top SST or orange top RST

Collection

Routine venipuncture or line draw

Causes for Rejection

Gross hemolysis, lipemia or bilirubin, misidentified specimens and requisitions, specimen QNS.

Reference Ranges

3.5 – 5.2 g/dL
ALKALINE PHOSPHATASE (ALK)

Related Terms  ALK, Alk Phos, ALP, Phosphatase, Alkaline
Test included in these panels:
  - Hepatic Function Panel
  - Renal/Hepatic Function Panel
  - Comprehensive Metabolic Panel

Lab  Alliance Lab, Room G1-500
     Satellite Labs, South Lake Union
     Community Site Labs
Request Form  Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.
              CPOE orders will be interfaced to Sunquest upon order activation in Epic.
Phone  SLU 606-1088
        EVG 425-441-2640
Testing Frequency  Throughout service hours
Availability  STAT or routine
Specimen  Plasma or Serum
Volume  0.5 mL
Pediatric Volume  Pediatric capillary collection: 200 µL (0.2mL) serum collected in microtube or “bullet” tube.
Container  5 mL lime top PST, green top, red top, gold top SST or orange top RST;
           NO EDTA or oxalate samples
Collection  Routine venipuncture or line draw
Causes for Rejection  Hemolysis, misidentified specimens and requisitions, specimen QNS, serum not separated from cells within 2 hours after collection.

(Continued)
### Alkaline Phosphatase, continued

#### Reference Ranges

<table>
<thead>
<tr>
<th>Age</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>75 years</td>
<td>52-227 U/L</td>
<td>49-199 U/L</td>
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<tr>
<td>65 years</td>
<td>36-161 U/L</td>
<td>38-172 U/L</td>
</tr>
<tr>
<td>55 years</td>
<td>37-159 U/L</td>
<td>31-132 U/L</td>
</tr>
<tr>
<td>45 years</td>
<td>39-139 U/L</td>
<td>34-121 U/L</td>
</tr>
<tr>
<td>35 years</td>
<td>36-122 U/L</td>
<td>25-112 U/L</td>
</tr>
<tr>
<td>25 years</td>
<td>35-109 U/L</td>
<td>25-100 U/L</td>
</tr>
<tr>
<td>18 years</td>
<td>42-136 U/L</td>
<td>26-98 U/L</td>
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<tr>
<td>14 years</td>
<td>72-400 U/L</td>
<td>43-226 U/L</td>
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<tr>
<td>12 years</td>
<td>119-426 U/L</td>
<td>89-285 U/L</td>
</tr>
<tr>
<td>10 years</td>
<td>115-324 U/L</td>
<td>132-366 U/L</td>
</tr>
<tr>
<td>0 years</td>
<td>115-324 U/L</td>
<td>111-281 U/L</td>
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</tbody>
</table>
ASPARTATE AMINOTRANSFERASE (AST)

Related Terms
AST, GOT, Serum Glutamic Oxaloacetic Transaminase, SGOT

Test included in these panels:
- Hepatic Function Panel
- Renal/Hepatic Function Panel
- Comprehensive Metabolic Panel

Lab
Alliance Lab, Room G1-500
Satellite Labs, South Lake Union
Community Site Labs

Request Form
Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes. CPOE orders will be interfaced to Sunquest upon order activation in Epic.

Phone
SLU 606-1088
EVG 425-441-2640

Testing Frequency
Throughout service hours

Availability
STAT or routine

Specimen
Plasma or Serum

Volume
0.5 mL

Pediatric Volume
Pediatric capillary collection: 200µL (0.2mL) serum collected in microtube or “bullet” tube.

Container
5 mL lime top PST, green top, red top, gold top SST or orange top RST

Collection
Routine venipuncture or line draw

Special Handling
The concentration of AST in red cells is roughly 15x that of normal serum, therefore, hemolysis should be avoided.

Causes for Rejection
Hemolysis, misidentified specimens and requisitions, specimen QNS

Reference Ranges
9-38 U/L
AMMONIA, PLASMA

Related Terms
Ammonia, PLNH3

Lab
Alliance Lab, Room G1-500
Satellite Labs, South Lake Union
Community Site Labs

Request Form
Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.
CPOE orders will be interfaced to Sunquest upon order activation in Epic.

Phone
SLU 606-1088
EVG 425-441-2640

Testing Frequency
Throughout service hours

Availability
STAT or routine

Specimen
Plasma ON ICE

Volume
2 mL plasma, minimum 0.2mL plasma. Ideal to have tube completely filled.

Pediatric Volume
Same as above

Container
Lime or Green top refrigerated or on ice

Collection
Routine venipuncture or line draw

Causes for Rejection
Samples older than 3 hours old at 2-4 degrees C or 24 hours at -20 C, QNS, Hemolysis, misidentified specimens

Reference Ranges

<table>
<thead>
<tr>
<th>Age</th>
<th>Female</th>
<th>Male</th>
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</thead>
<tbody>
<tr>
<td>1d-13d</td>
<td>110-180</td>
<td>110-180</td>
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<tr>
<td>14d-29d</td>
<td>95-155</td>
<td>95-155</td>
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<tr>
<td>1m-11y</td>
<td>35-85</td>
<td>35-85</td>
</tr>
<tr>
<td>12y-</td>
<td>0-65</td>
<td>0-65</td>
</tr>
</tbody>
</table>
AMYLASE

Related Terms
Amylase

Lab
Alliance Lab, Room G1-500
Satellite Labs, South Lake Union
Community Site Labs

Request Form
Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.
CPOE orders will be interfaced to Sunquest upon order activation in Epic.

Phone
SLU 606-1088
EVG 425-441-2640

Testing Frequency
Throughout service hours

Availability
STAT or routine

Specimen
Preferred – lithium heparin plasma, Acceptable – serum.

Volume
0.5 mL

Pediatric Volume
200uL (0.2mL) collected in microtube.

Container
5 mL lime top (lithium heparin) PST, lithium heparin green top, red top, gold top SST or orange top RST

Collection
Routine venipuncture or line draw

Causes for Rejection
Gross hemolysis, misidentified specimens and requisitions, specimen QNS

Reference Ranges
27-106 U/L
UREA NITROGEN

Related Terms  Blood Urea Nitrogen, BUN
Test included in these panels:
  • Basic Metabolic Panel
  • Comprehensive Metabolic Panel
  • Renal Function Panel
  • Renal/Hepatic Function Panel

Lab  Alliance Lab, Room G1-500
     Satellite Labs, South Lake Union
     Community Site Labs
Request Form  Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.
               CPOE orders will be interfaced to Sunquest upon order activation in Epic.
Phone  SLU 606-1088
        EVG 425-441-2640
Testing Frequency  Throughout service hours
Availability  STAT or routine
Specimen  Plasma or Serum
Volume  0.5 mL
Pediatric Volume  Pediatric capillary collection: 200µL (0.2mL) serum collected in microtube or "bullet" tube.
Container  5 mL lime top PST, green top, red top, gold top SST or orange top RST
Collection  Routine venipuncture or line draw
Causes for rejection  Gross hemolysis, misidentified specimens and requisitions, specimen QNS
Reference Ranges  8 – 21 mg/dL
CALCIUM

**Related Terms**  Ca++
**Test included in these panels:**
- Basic Metabolic Panel
- Comprehensive Metabolic Panel
- Renal Function Panel
- Renal/Hepatic Function Panel

**Lab**
- Alliance Lab, Room G1-500
- Satellite Labs, South Lake Union
- Community Site Labs
**Request Form**
- Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.
- CPOE orders will be interfaced to Sunquest upon order activation in Epic.

**Phone**
- SLU 606-1088
- EVG 425-441-2640

**Testing Frequency**
- Throughout service hours
**Availability**
- STAT or routine
**Specimen**
- Plasma or Serum
**Volume**
- 0.5 mL
**Pediatric Volume**
- Pediatric capillary collection: 200µL (0.2mL) serum collected in microtube or "bullet" tube.
**Collection**
- Routine venipuncture or line draw

**Causes for rejection**
- Gross hemolysis, specimen QNS, misidentified specimens and requisitions

**Reference Range**
- 8.9 – 10.2 mg/dL

**Critical Values**
- <6.0 mg/dL or >13.0 mg/dL
## CA 19-9

<table>
<thead>
<tr>
<th>Related Terms</th>
<th>Cancer Antigen 19-9, Carbohydrate Antigen 19-9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab</td>
<td>Alliance Lab, Room G1-500</td>
</tr>
<tr>
<td></td>
<td>Satellite Labs, South Lake Union</td>
</tr>
<tr>
<td></td>
<td>Community Site Labs</td>
</tr>
<tr>
<td>Request Form</td>
<td>Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.</td>
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<td>CPOE orders will be interfaced to Sunquest upon order activation in Epic.</td>
</tr>
<tr>
<td>Phone</td>
<td>SLU 606-1088</td>
</tr>
<tr>
<td></td>
<td>EVG 425-441-2640</td>
</tr>
<tr>
<td>Testing Frequency</td>
<td>Throughout service hours</td>
</tr>
<tr>
<td>Availability</td>
<td>STAT or routine</td>
</tr>
<tr>
<td>Specimen</td>
<td>Serum or plasma</td>
</tr>
<tr>
<td>Volume</td>
<td>2.0 mL, minimum 0.8 mL</td>
</tr>
<tr>
<td>Container</td>
<td>5 mL orange top tube preferred or gold top, SST, red top tube SST, or lime top PST.</td>
</tr>
<tr>
<td>Collection</td>
<td>Routine venipuncture or line draw</td>
</tr>
<tr>
<td>Causes for Rejection</td>
<td>Gross hemolysis, lipemia or bilirubin, misidentified specimens and requisitions, specimen QNS</td>
</tr>
<tr>
<td>Reference Ranges</td>
<td>0 – 54 U/mL</td>
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</tbody>
</table>
CARCINOEMBRYONIC ANTIGEN

**Related Terms**
- CEA
- Alliance Lab, Room G1-500
- Satellite Labs, South Lake Union
- Community Site Labs

**Request Form**
- Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.
- CPOE orders will be interfaced to Sunquest upon order activation in Epic.

**Phone**
- SLU 606-1088
- EVG 425-441-2640

**Testing Frequency**
- Throughout service hours

**Availability**
- STAT or routine

**Specimen**
- Serum

**Volume**
- 2.0 mL, minimum 0.8

**Container**
- 5 mL orange top tube preferred: or gold top or SST or red top tube SST.

**Collection**
- Routine venipuncture or line draw

**Interfering Substances**
- Gross hemolysis, lipemia or bilirubin, misidentified specimens and requisitions, specimen QNS

**Reference Ranges**
- 0.0-5.0 ng/mL
## CEREBRAL SPINAL FLUID GLUCOSE

<table>
<thead>
<tr>
<th>Related Terms</th>
<th>CSF glucose</th>
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</thead>
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<td>Alliance Lab, Room G1-500</td>
</tr>
<tr>
<td></td>
<td>Satellite Labs, South Lake Union</td>
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<tr>
<td></td>
<td>Community Site Labs</td>
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<td>Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.</td>
</tr>
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<td>SLU 606-1088</td>
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<tr>
<td></td>
<td>EVG 425-441-2640</td>
</tr>
<tr>
<td>Testing Frequency</td>
<td>Throughout service hours</td>
</tr>
<tr>
<td>Availability</td>
<td>STAT or routine</td>
</tr>
<tr>
<td>Specimen</td>
<td>Cerebral spinal fluid</td>
</tr>
<tr>
<td>Volume</td>
<td>1 mL</td>
</tr>
<tr>
<td>Minimum Volume</td>
<td>0.4 mL</td>
</tr>
<tr>
<td>Container</td>
<td>Plastic tube with tight-fitting lid, orange top tube</td>
</tr>
<tr>
<td>Collection</td>
<td>Lumbar Puncture</td>
</tr>
<tr>
<td>Causes for Rejection</td>
<td>Insufficient quantity, misidentified specimens, and requisitions.</td>
</tr>
<tr>
<td>Reference Ranges</td>
<td>40-80 mg/dL</td>
</tr>
<tr>
<td>Critical Values</td>
<td>Less than 20 mg/dL</td>
</tr>
</tbody>
</table>
# Cerebral Spinal Fluid Protein

<table>
<thead>
<tr>
<th>Related Terms</th>
<th>CSF protein</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab</td>
<td>Alliance Lab, Room G1-500</td>
</tr>
<tr>
<td></td>
<td>Satellite Labs, South Lake Union</td>
</tr>
<tr>
<td></td>
<td>Community Site Labs</td>
</tr>
<tr>
<td>Request Form</td>
<td>Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.</td>
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<tr>
<td></td>
<td>CPOE orders will be interfaced to Sunquest upon order activation in Epic.</td>
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<tr>
<td>Phone</td>
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<td></td>
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<tr>
<td>Testing Frequency</td>
<td>Throughout service hours</td>
</tr>
<tr>
<td>Availability</td>
<td>STAT or routine</td>
</tr>
<tr>
<td>Specimen</td>
<td>Cerebral spinal fluid</td>
</tr>
<tr>
<td>Volume</td>
<td>1 mL</td>
</tr>
<tr>
<td>Minimum Volume</td>
<td>0.4 mL</td>
</tr>
<tr>
<td>Container</td>
<td>Plastic tube with tight-fitting lid</td>
</tr>
<tr>
<td>Collection</td>
<td>Lumbar Puncture</td>
</tr>
<tr>
<td>Causes for Rejection</td>
<td>Insufficient quantity, misidentified specimens, and requisitions.</td>
</tr>
<tr>
<td>Reference Ranges</td>
<td>15-45 mg/dL</td>
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</tbody>
</table>
CHLORIDE

Related Terms

Test included in these panels:

- Electrolytes
- Basic Metabolic Panel
- Comprehensive Metabolic Panel
- Renal Function Panel
- Renal/Hepatic Function Panel

Lab

Alliance Lab, Room G1-500
Satellite Labs, South Lake Union
Community Site Labs

Request Form

Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.
CPOE orders will be interfaced to Sunquest upon order activation in Epic.

Phone

SLU 606-1088
EVG 425-441-2640

Testing Frequency

Throughout service hours

Availability

STAT or routine

Specimen

Plasma or Serum

Volume

0.5 mL

Pediatric Volume

Pediatric capillary collection: 200µL (0.2mL) serum collected in microtube or "bullet" tube.

Container

5 mL lime top PST, green top, red top, gold top SST or orange top RST

Collection

Routine venipuncture or line draw

Special Handling

Centrifuge the specimen to separate serum from red cells within 2 hours of collection. Store refrigerated at 2–8°C.

Causes for Rejection

Gross hemolysis, misidentified specimens, and requisitions, specimen QNS.

Reference Ranges

98 – 108 mEq/L
# CHOLESTEROL

## Test included in this panel:
Lipid panel.

### Lab
- Alliance Lab, Room G1-500
- Satellite Labs, South Lake Union
- Community Site Labs

### Request Form
Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes. CPOE orders will be interfaced to Sunquest upon order activation in Epic.

### Phone
- SLU 606-1088
- EVG 425-441-2640

### Testing Frequency
Throughout service hours

### Availability
Routine

### Specimen
Plasma or Serum

### Volume
1 mL

### Pediatric Volume
Pediatric capillary collection: 500µL(0.5mL) serum collected in microtube or “bullet tube.”

### Container
5 mL lime top PST, green top, red top, gold top SST or orange top RST

### Collection
Routine venipuncture or line draw

### Causes for Rejection
- Misidentified specimens and requisitions, specimen QNS, improperly stored specimen, gross hemolysis.

### Reference Ranges
- **Desirable** < 200 mg/dL
- **Acceptable** 200-239 mg/dL
- **High** > 239 mg/dL
CO₂ (BICARBONATE)

**Related Terms**  TCO₂, Total CO₂, CO₂, HCO₃⁻  
**Test included in these panels:**  
- Electrolytes  
- Basic Metabolic Panel  
- Comprehensive Metabolic Panel  
- Renal Function Panel  
- Renal/Hepatic Function Panel

**Lab**  
Alliance Lab, Room G1-500  
Satellite Labs, South Lake Union  
Community Site Labs

**Request Form**  
Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.  
CPOE orders will be interfaced to Sunquest upon order activation in Epic.

**Phone**  
SLU 606-1088  
E VG 425-441-2640

**Testing Frequency**  Throughout service hours

**Availability**  STAT or routine

**Specimen**  Plasma or Serum

**Volume**  0.5 mL

**Pediatric volume**  Pediatric capillary collection: 200µL (0.2mL) serum collected in microtube or "bullet" tube.

**Container**  5 mL lime top PST, green top, red top, gold top SST or orange top RST; NO EDTA, oxalate, or citrate

**Collection**  Routine venipuncture or line draw

**Causes for Rejection**  Gross hemolysis, misidentified specimens and requisitions, specimen QNS.

**Reference Ranges**  22 – 32 mEq/L

**Critical Values**  <10 mEq/L or >40 mEq/L
CORTISOL

**Related Terms**
ACTH Stimulation Test, Cortrosyn Stimulation Test, Cosyntropin, Hydrocortisone

**Lab**
Alliance Lab, Room G1-500
Satellite Labs, South Lake Union
Community Site Labs

**Request Form**
Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.
CPOE orders will be interfaced to Sunquest upon order activation in Epic.

**Phone**
SLU 606-1088
EVG 425-441-2640

**Testing Frequency**
Throughout service hours

**Availability**
STAT or routine

**Specimen**
Serum or plasma

**Volume**
2.0 mL, minimum 0.8 mL

**Container**
5 mL lime top PST preferred or gold top, SST, red top tube SST, or orange top tube.

**Collection**
Routine venipuncture or line draw

**Causes for Rejection**
Gross hemolysis, lipemia or bilirubin, misidentified specimens and requisitions, specimen QNS

**Reference Ranges**
7am – 9am: 5.0 – 22.6 µg/dL, PM: approximately half of the AM values
## CREATINE KINASE

**Related terms**
- CK, CK-Total, CPK

**Lab**
- Alliance Lab, Room G1-500
- Satellite Labs, South Lake Union
- Community Site Labs

**Request Form**
- Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.
- CPOE orders will be interfaced to Sunquest upon order activation in Epic.

**Phone**
- SLU 606-1088
- EVG 425-441-2640

**Testing Frequency**
- Throughout service hours

**Availability**
- STAT or routine

**Specimen**
- Plasma or Serum

**Volume**
- 0.5 mL

**Pediatric volume**
- Pediatric capillary collection: 200μL (0.2mL) serum collected in microtube or "bullet" tube.

**Container**
- 5 mL lime top PST, green top, red top, gold top SST or orange top RST; NO EDTA, citrate, or oxalate.

**Collection**
- Routine venipuncture or line draw

**Special handling**
- Separated serum or plasma should not remain at room temp longer than 4 hours. If assays are not completed within 4 hours, serum or plasma should be stored at 2°C to 8°C for up to one week.

**Cause for rejection**
- Misidentified specimens and requisitions, specimen QNS

**Reference Ranges**

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>62-325 U/L</td>
<td>43-274 U/L</td>
</tr>
</tbody>
</table>

- Return to Table of Contents
CREATININE

Test included in these panels:
- Basic Metabolic Panel
- Comprehensive Metabolic Panel
- Renal Function Panel
- Renal/Hepatic Function Panel

Test includes
Creatinine, calculated glomerular filtration rate.

Glomerular filtration rate (GFR) is calculated by the Modification of Diet in Renal Disease (MDRD) Study equation, which is reasonably accurate in non-hospitalized patients with chronic kidney disease but tends to underestimate GFR in other populations. It is inaccurate in patients with rapidly changing renal function. See NEJM 2006; 354:2473

Lab
Alliance Lab, Room G1-500
Satellite Labs, South Lake Union
Community Site Labs

Request Form
FHCC Clinical Lab Request: fill out completely, including ICD codes.
CPOE orders will be interfaced to Sunquest upon order activation in Epic.

Phone
SLU 606-1088
E VG 425-441-2640

Testing Frequency
Throughout service hours

Availability
STAT or routine

Specimen
Plasma or Serum

Volume
0.5 mL

Pediatric volume
Pediatric capillary collection: 200µL (0.2mL) serum collected in microtube or “bullet” tube.

Collection
Routine venipuncture or line draw

Causes for Rejection
Hemolysis, misidentified specimens and requisitions, specimen QNS

Reference Range

<table>
<thead>
<tr>
<th></th>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Range</td>
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</tr>
<tr>
<td>&gt;=18 yrs.</td>
<td>0.38-1.02</td>
<td>&gt;=18 yrs.</td>
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</tbody>
</table>
DIRECT BILIRUBIN

Related Terms
Conjugated Bilirubin

Test included in these panels:
- Hepatic Function Panel
- Renal/Hepatic Function Panel

Lab
Alliance Lab, Room G1-500
Satellite Labs, South Lake Union
Community Site Labs

Request Form
Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.
CPOE orders will be interfaced to Sunquest upon order activation in Epic.

Phone
SLU 606-1088
EVG 425-441-2640

Testing Frequency
Throughout service hours

Availability
STAT or routine

Specimen
Plasma or Serum

Volume
0.5 mL

Pediatric Volume
Pediatric capillary collection: 200µL (0.2mL) serum collected in microtube or "bullet" tube.

Container
5 mL lime top PST, green top, red top, gold top SST or orange top RST

Collection
Routine venipuncture or line draw

Special Handling
Protect specimen from light. Direct exposure can decrease direct bilirubin values in specimens by 50% in one hour.

Causes for Rejection
Hemolysis, misidentified specimens and requisitions, specimen QNS.

Reference Ranges
0.0 – 0.3 mg/dL
GAMMA GLUTAMYL TRANSFERASE

**Related Terms**
- GGT

**Test included in this panel:**
- Comprehensive Metabolic Panel with HSCT subgroup

**Lab**
- Alliance Lab, Room G1-500
- Satellite Labs, South Lake Union
- Community Site Labs

**Request Form**
- Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.
- CPOE orders will be interfaced to Sunquest upon order activation in Epic.

**Phone**
- SLU 606-1088
- EVG 425-441-2640

**Testing Frequency**
- Throughout service hours

**Availability**
- Routine

**Specimen**
- Plasma or Serum

**Volume**
- 1 mL

**Pediatric Volume**
- Pediatric capillary collection: 500µL (0.5mL) serum collected in microtube or “bullet tube.”

**Container**
- 5 ml lime top PST, green top, red top, gold top SST or orange top RST.
- No EDTA, citrate, oxalate, or fluoride.

**Collection**
- Routine venipuncture or line draw

**Interfering Substances**
- Some anti-epileptic drugs (phenytoin, barbiturates), as well as heavy alcohol consumption before specimen collection may result in falsely elevated GGT values.

**Causes for Rejection**
- Misidentified specimens and requisitions, specimen QNS, improperly stored specimen, gross hemolysis

**Reference Ranges**
- 0 – 55 U/L
GLUCOSE

**Related Terms**  
Blood sugar, sugar

**Test included in these panels:**
- Basic Metabolic Panel
- Comprehensive Metabolic Panel
- Renal Function Panel
- Renal/Hepatic Function Panel

**Lab**  
Alliance Lab, Room G1-500  
Satellite Labs, South Lake Union  
Community Site Labs

**Request Form**  
Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.  
CPOE orders will be interfaced to Sunquest upon order activation in Epic.

**Phone**  
SLU 606-1088  
EVG 425-441-2640

**Testing Frequency**  
Throughout service hours

**Availability**  
STAT or routine

**Specimen**  
Plasma or Serum

**Volume**  
0.5 mL

**Pediatric Volume**  
Pediatric capillary collection: 200µL (0.2mL) serum collected in microtube or "bullet" tube.

**Container**  
5 mL lime top PST, green top, red top, gold top SST or orange top RST. EDTA or fluoride acceptable.

**Collection**  
Routine venipuncture or line draw; do not draw specimen from an arm receiving intravenous transfusion.

**Specimen Handling**  
Separate plasma or serum from cells as soon as possible to minimize loss of glucose through glycolysis.

**Causes for Rejection**  
Hemolysis, misidentified specimens and requisitions, specimen QNS

**Reference Ranges**  
Glucose, fasting: 62–125 mg/dL.

**Critical Values**  
<55 mg/dL or >500 mg/dL
# HDL CHOLESTEROL

## Related Terms
- HDL

## Test included in this panel
- Lipid Panel

## Lab
- Alliance Lab, Room G1-500
- Satellite Labs, South Lake Union
- Community Site Labs

## Request Form
- Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.
- CPOE orders will be interfaced to Sunquest upon order activation in Epic.

## Phone
- SLU 606-1088
- EVG 425-441-2640

## Testing Frequency
- Throughout service hours

## Availability
- Routine

## Specimen
- Plasma or Serum

## Volume
- 1 mL

## Pediatric Volume
- Pediatric capillary collection: 500µL (0.5mL) serum collected in microtube or “bullet tube.”

## Container
- 5 mL lime top PST, green top, red top, gold top SST or orange top RST.
- No citrate or oxalate.

## Collection
- Routine venipuncture or line draw

## Causes for Rejection
- Misidentified specimens and requisitions, specimen QNS, improperly stored specimen.

## Reference Ranges
- **Desirable**: >59 mg/dL
- **Acceptable**: 40-59 mg/dL
- **Low**: <40 mg/dL
IONIZED CALCIUM, WHOLE BLOOD

Test includes

**Ionized Calcium**

**Lab**

Alliance Lab, Room G1-500
Satellite Labs, South Lake Union
Community Site Labs

**Request Form**

Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.
CPOE orders will be interfaced to Sunquest upon order activation in Epic.

**Phone**

SLU 606-1088
EVG 425-441-2640

**Testing Frequency**

Throughout service hours

**Availability**

STAT

**Specimen**

Whole Blood

**Volume**

1 mL

**Pediatric Volume**

0.5 mL

**Container**

Blood should be drawn into a balanced heparinized syringe such as the 2 mL Radiometer Pico TM or 3 mL Smiths Portex Pro-Vent syringes. Other tubes or anticoagulants are not acceptable.

**Collection**

Routine venipuncture or line draw

**Storage Instructions**

**DO NOT OPEN SYRINGE.** Samples must remain sealed between the time of collection and sampling for testing. Return syringe to testing lab STAT. Samples at room temperature MUST be tested within 10 mins after blood draw.

**Causes for Rejection**

Misidentified specimens and requisitions, samples other than a heparinized syringe, specimen QNS, any syringe that has been opened and exposed to air, gross hemolysis, sample too old.

**Reference Ranges**

<table>
<thead>
<tr>
<th>Age</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 1 year</td>
<td>1.18 mmol/L - 1.38 mmol/L</td>
</tr>
<tr>
<td>&lt; 1 year</td>
<td>1.16 mmol/L - 1.45 mmol/L</td>
</tr>
</tbody>
</table>

**Critical Values**

< 0.78 mmol/L or > 1.58 mmol/L
LACTATE DEHYDROGENASE

Related Terms
LD, LDH

Lab
Alliance Lab, Room G 1-500
Satellite Labs, South Lake Union
Community Site Labs

Request Form
Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.
CPOE orders will be interfaced to Sunquest upon order activation in Epic.

Phone
SLU 606-1088
EVG 425-441-2640

Testing Frequency
Throughout service hours

Availability
STAT or routine

Specimen
Serum

Volume
0.5 mL

Pediatric Volume
Pediatric capillary collection: 200µL (0.2mL) serum collected in microtube or "bullet" tube.

Container
Orange top RST, gold top SST, or red top

Collection
Routine venipuncture or line draw

Causes for Rejection
Lime PST, green top, citrate tube and oxalate tube.

Reference Range
<210 U/L
LDL CHOLESTEROL

RELATED TERMS

LDL

Test Included in this panel: Lipid Panel

This test is a calculation, and it cannot be ordered as an individual test.

Refer to Lipid Panel

\[
\text{LDL-C} = \frac{\text{TC}}{0.948} - \frac{\text{HDL}}{0.971} - \left( \frac{\text{TG}}{8.56} + \frac{[\text{TG} \times \text{non-HDL-C}]}{2140} \right) - \frac{\text{TG}^2}{16,100} - 9.44
\]

Lab

Alliance Lab, Room G1-500
Satellite Labs, South Lake Union
Community Site Labs

Request Form

Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.
CPOE orders will be interfaced to Sunquest upon order activation in Epic.

Phone

SLU 606-1088
EVG 425-441-2640

Testing Frequency

Throughout service hours

Availability

Routine

Specimen

Plasma or Serum

Volume

1 mL

Pediatric Volume

Pediatric capillary collection: 500µL (0.5mL) serum collected in microtube or “bullet tube.”

Container

5 mL lime top PST, green top, red top, gold top SST or orange top RST.

Collection

Routine venipuncture or line draw

Special Handling

Serum or plasma must be separated from cells within 2 hours.

Causes for Rejection

Misidentified specimens and requisitions, specimen QNS, improperly stored specimen, gross hemolysis.

Reference Ranges

<130
LIPASE

Related Terms
Lipase

Lab
Alliance Lab, Room G1-500
Satellite Labs, South Lake Union
Community Site Labs

Request Form
Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.
CPOE orders will be interfaced to Sunquest upon order activation in Epic.

Phone
SLU 606-1088
EVG 425-441-2640

Testing Frequency
Throughout service hours

Availability
STAT or routine

Specimen
Preferred – lithium heparin plasma, Acceptable – serum.

Volume
0.5 mL

Pediatric Volume
200uL (0.2mL) collected in microtube.

Container
5 mL lime top (lithium heparin) PST, lithium heparin green top, red top, gold top SST or orange top RST

Collection
Routine venipuncture or line draw

Causes for Rejection
Gross hemolysis, misidentified specimens and requisitions, specimen QNS.

Reference Ranges
<70 U/L
MAGNESIUM

Related Terms

Mg++

Lab

Alliance Lab, Room G1-500
Satellite Labs, South Lake Union
Community Site Labs

Request Form

Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.
CPOE orders will be interfaced to Sunquest upon order activation in Epic.

Phone

SLU 606-1088
EVG 425-441-2640

Testing Frequency

Throughout service hours

Availability

STAT or routine

Specimen

Plasma or Serum

Volume

0.5 mL

Pediatric volume

Pediatric capillary collection: 200µL (0.2mL) serum collected in microtube or “bullet” tube.

Container

5 mL lime top PST, green top, red top, gold top SST or orange top RST. No EDTA, citrate or oxalate.

Collection Note

Routine venipuncture or line draw

Erythrocytes contain 3x the magnesium concentration of serum.

Special Handling

Draw without venous stasis.

Causes for Rejection

Hemolysis, misidentified specimens, and requisitions, specimen QNS.

Reference Ranges

1.8 – 2.4 mg/dL

Critical Values

<1.2 or >4.7 mg/dL
PHOSPHORUS

**Related Terms**  Phos, PO₄, Inorganic phosphorus

**Test included in these panels:**
- Renal Function Panel
- Renal/Hepatic Function Panel

**Lab**
- Alliance Lab, Room G1-500
- Satellite Labs, South Lake Union
- Community Site Labs

**Request Form**
- Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.
- CPOE orders will be interfaced to Sunquest upon order activation in Epic.

**Phone**
- SLU 606-1088
- EVG 425-441-2640

**Testing Frequency**
- Throughout service hours

**Availability**
- STAT or routine

**Specimen**
- Plasma or Serum

**Volume**
- 0.5 mL

**Pediatric Volume**
- Pediatric capillary collection: 200µL (0.2mL) serum collected in microtube or "bullet" tube.

**Container**
- 5 mL lime top PST, green top, red top, gold top SST or orange top RST. No EDTA, citrate or oxalate.

**Collection**
- Routine venipuncture or line draw

**Special Handling**
- Hemolysis must be avoided, as phosphate may be split off from labile esters in the erythrocytes.

**Causes for Rejection**
- Hemolysis, misidentified specimens, and requisitions, specimen QNS.

**Reference Ranges**
- Adult  2.5 – 4.5 mg/dL
- Child <12 years  4.5 – 6.0 mg/dL

**Critical Values**
- < 1.0 mg/dL
POTASSIUM

**Related Terms**  K+, K, Serum Potassium

**Test included in these panels:**
- Electrolytes
- Basic Metabolic Panel
- Comprehensive Metabolic Panel
- Renal Function Panel
- Renal/Hepatic Function Panel

**Lab**  Alliance Lab, Room G1-500
Satellite Labs, South Lake Union
Community Site Labs

**Request Form**  Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.
CPOE orders will be interfaced to Sunquest upon order activation in Epic.

**Phone**  SLU 606-1088
EVG 425-441-2640

**Testing Frequency**  Throughout service hours

**Availability**  STAT or routine

**Specimen**  Plasma or Serum

**Volume**  0.5 mL

**Pediatric Volume**  Pediatric capillary collection: 200µL (0.2mL) serum collected in microtube or "bullet" tube.

**Container**  5 mL lime top PST, green top, red top, gold top SST or orange top RST

**Collection**  Routine venipuncture or line draw do not draw specimen from an arm receiving intravenous transfusion. Avoid hemolysis, as it can lead to falsely elevated K+ levels.

**Causes for Rejection**  Hemolysis, misidentified specimens, and requisitions, specimen QNS.

**Reference Ranges**  3.6 – 5.2 mEq/L

**Critical Values**  <3.0 mEq/L or > 6.0 mEq/L
URINE PREGNANCY TEST

**Lab**
- Alliance Lab, Room G1-500
- Satellite Labs, South Lake Union
- Community Site Labs

**Request Form**
- Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.
- CPOE orders will be interfaced to Sunquest upon order activation in Epic.

**Phone**
- SLU 606-1088
- EVG 425-441-2640

**Testing Frequency**
- Throughout service hours

**Availability**
- STAT or routine

**Specimen**
- Random Urine, first morning specimen preferred for best results.

**Volume**
- 10 mL

**Container**
- Plastic urine container

**Collection**
- Freshly voided random urine.

**Storage Instructions**
- Specimen can be refrigerated (2-8°C).

**Causes for Rejection**
- Specimens contaminated with feces, less than 1 mL of urine or specimens in fresh urine cups >2 hours old, yellow/red or gray top urine collection kit tubes.

**Reporting**
- Qualitative results, positive or negative

**Reference Ranges**
- Negative, positive results will be called to the ordering provider.
SERUM PREGNANCY TEST (QUALITATIVE)

Lab
Alliance Lab, Room G1-500
Satellite Labs, South Lake Union
Community Site Labs

Request Form
Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.
CPOE orders will be interfaced to Sunquest upon order activation in Epic.

Phone
SLU 606-1088
EVG 425-441-2640

Testing Frequency
Throughout service hours

Availability
STAT or routine

Specimen
Serum

Volume
5 mL

Container
4ml orange top RST, gold top SST, red top tube
Not acceptable: lime or green top tube

Collection
Routine venipuncture or line draw

Causes for Rejection
Collected in tube with anticoagulant, QNS, misidentified specimens and requisitions.

Reporting
Qualitative results, positive or negative

Reference Ranges
Negative, positive results will be called to the ordering provider.
PROSTATE SPECIFIC ANTIGEN

**Related Terms**  
PSA, PSA monitor, PSA screen, ultrasensitive PSA

**Lab**  
Alliance Lab, Room G1-500  
Satellite Labs, South Lake Union  
Community Site Labs

**Request Form**  
Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.  
CPOE orders will be interfaced to Sunquest upon order activation in Epic.

**Phone**  
SLU 606-1088  
EVG 425-441-2640

**Testing Frequency**  
Throughout service hours

**Availability**  
STAT or routine

**Specimen**  
Serum

**Volume**  
2.0 mL, minimum 0.8

**Container**  
5 mL orange top tube preferred: or gold top SST, red top tube, SST.

**Collection**  
Routine venipuncture or line draw

**Interfering Substances**  
Gross hemolysis, lipemia, or bilirubin; misidentified specimens and requisitions; specimen QNS

**Reference Ranges**  
0.00-4.00 ng/mL
SODIUM

**Related Terms**  
Na+

**Test included in these panels:**
- Electrolytes
- Basic Metabolic Panel
- Comprehensive Metabolic Panel
- Renal Function Panel
- Renal/Hepatic Function Panel

**Lab**  
Alliance Lab, Room G1-500  
Satellite Labs, South Lake Union  
Community Site Labs

**Request Form**  
Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.  
CPOE orders will be interfaced to Sunquest upon order activation in Epic.

**Phone**  
SLU 606-1088  
EVG 425-441-2640

**Testing Frequency**  
Throughout service hours

**Availability**  
STAT or routine

**Specimen**  
Plasma or Serum

**Volume**  
0.5 mL

**Pediatric Volume**  
Pediatric capillary collection: 200µL (0.2mL) serum collected in microtube or "bullet" tube.

**Container**  
5 mL lime top PST, green top, red top, gold top SST or orange top RST

**Collection**  
Routine venipuncture or line draw; do not draw specimen from an arm receiving intravenous transfusion.

**Causes for Rejection**  
Gross hemolysis, misidentified specimens, and requisitions, specimen QNS.

**Reference Ranges**  
135 – 145 mEq/L

**Critical Values**  
<120 mEq/L or >160 mEq/L
# STOOL OCCULT BLOOD

<table>
<thead>
<tr>
<th>Related Terms</th>
<th>Fecal Occult Blood, Stool Guiac, Occult Blood</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lab</strong></td>
<td>Alliance Lab, Room G1-500</td>
</tr>
<tr>
<td></td>
<td>Satellite Labs, South Lake Union</td>
</tr>
<tr>
<td></td>
<td>Community Site Labs</td>
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<tr>
<td><strong>Request Form</strong></td>
<td>Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes; include date and time of specimen collection. CPOE orders will be interfaced to Sunquest upon order activation in Epic.</td>
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<tr>
<td><strong>Phone</strong></td>
<td>SLU 606-1088</td>
</tr>
<tr>
<td></td>
<td>EVG 425-441-2640</td>
</tr>
<tr>
<td><strong>Testing Frequency</strong></td>
<td>Throughout service hours</td>
</tr>
<tr>
<td><strong>Specimen</strong></td>
<td>Send Hemoccult® card with stool specimen already applied, up to three cards can be sent at one time; three cards or a card with 3 samples are the same charge as one card.</td>
</tr>
<tr>
<td><strong>Causes for Rejection</strong></td>
<td>Misidentified specimens and requisitions, specimen QNS, improperly prepared Hemoccult® card, refrigerated Hemoccult® cards.</td>
</tr>
<tr>
<td><strong>Reference Range</strong></td>
<td>Negative</td>
</tr>
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</table>
THYROID STIMULATING HORMONE

**Related Terms**  Sensitive TSH, TSH, TSH-Sensitive, Thyrotropin

**Test included in these panels:**
- TSH with Reflexive Free T4

**Lab**
- Alliance Lab, Room G1-500
- Satellite Labs, South Lake Union
- Community Site Labs

**Request Form**
- Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.
- CPOE orders will be interfaced to Sunquest upon order activation in Epic.

**Phone**
- SLU 606-1088
- EVG 425-441-2640

**Testing Frequency**  Throughout service hours

**Availability**  STAT or routine

**Specimen**  Serum

**Volume**  2.0 mL, minimum 0.8 mL

**Container**  5 mL orange top tube preferred or gold top, SST, or red top tube SST.

**Collection**  Routine venipuncture or line draw

**Causes for Rejection**
- Gross hemolysis, lipemia or bilirubin, misidentified specimens and requisitions, specimen QNS, wrong tube type

**Reference Ranges**
- 0.400 – 5.000 µIU/mL
THYROXINE (FREE)

Related Terms  FT4, Free T4, Free Thyroxine, T4-Free, thyroid function
Test included in these panels:
  •  TSH with Reflexive Free T4

Lab
  Alliance Lab, Room G1-500
  Satellite Labs, South Lake Union
  Community Site Labs

Request Form
  Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.
  CPOE orders will be interfaced to Sunquest upon order activation in Epic.

Phone
  SLU 606-1088
  EVG 425-441-2640

Testing Frequency
  Throughout service hours

Availability
  STAT or routine

Specimen
  Serum or plasma

Volume
  2.0 mL, minimum 0.8 mL

Container
  5 mL orange top tube preferred or gold top, SST, red top tube SST, or lime top PST.

Collection
  Routine venipuncture or line draw

Causes for Rejection
  Gross hemolysis, lipemia or bilirubin, misidentified specimens and requisitions, specimen QNS

Reference Ranges
  0.6 – 1.2 ng/dL
TOTAL BILIRUBIN

**Related Terms**  Bilirubin

**Test included in these panels:**
- Comprehensive Metabolic Panel
- Hepatic Function Panel
- Renal/Hepatic Function Panel

**Lab**  Alliance Lab, Room G1-500
Satellite Labs, South Lake Union
Community Site Labs

**Request Form**  Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.
CPOE orders will be interfaced to Sunquest upon order activation in Epic.

**Phone**  SLU 606-1088
EVG 425-441-2640

**Testing Frequency**  Throughout service hours

**Availability**  STAT or routine

**Specimen**  Plasma or Serum

**Volume**  0.5 mL

**Pediatric Volume**  Pediatric capillary collection: 200 µL serum collected in microtube or "bullet" tube.

**Container**  5 mL lime top PST, green top, red top, gold top SST or orange top RST

**Collection**  Routine venipuncture or line draw

**Special Handling**  Protect specimen from light; direct exposure can decrease bilirubin values in specimens by 50% in 1 hour.

**Causes for Rejection**  Hemolysis, misidentified specimens, and requisitions, specimen QNS.

**Reference Ranges**  0.2 – 1.3 mg/dL
TOTAL PROTEIN

**Related Terms**  
Protein

**Test included in these panels:**

- Comprehensive Metabolic Screen
- Hepatic Function Panel
- Renal/Hepatic Function Panel

**Lab**  
Alliance Lab, Room G1-500  
Satellite Labs, South Lake Union  
Community Site Labs

**Request Form**  
Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.  
CPOE orders will be interfaced to Sunquest upon order activation in Epic.

**Phone**  
SLU 606-1088  
EVG 425-441-2640

**Testing Frequency**  
Throughout service hours

**Availability**  
STAT or routine

**Specimen**  
Plasma or serum. Plasma samples will exhibit slightly higher total protein levels due to the presence of fibrinogen. Heparin is the recommended anticoagulant for plasma samples.

**Volume**  
0.5 mL

**Pediatric Volume**  
Pediatric capillary collection: 200 µL (0.2mL) serum collected in microtube or "bullet" tube.

**Container**  
5 mL lime top PST, green top, red top, gold top SST or orange top RST

**Collection**  
Routine venipuncture or line draw

**Interfering Substances**  
Gross hemolysis, lipemia, or bilirubin

**Causes for Rejection**  
Misidentified specimens and requisitions, specimen QNS.

**Reference Ranges**  
6.0 – 8.2 g/dL
URINE TOTAL PROTEIN, QUANTITATIVE

**Related Terms**
- Urine protein
- Urine total protein

**Lab**
- Alliance Lab, Room G1-500
- Satellite Labs, South Lake Union
- Community Site Labs

**Request Form**
- Fred Hutchinson Cancer Center Clinical Lab Request: write UPCRAT in the OTHER REQUEST section. Fill out completely, including ICD codes. CPOE orders will be interfaced to Sunquest upon order activation in Epic.

**Phone**
- SLU 606-1088
- EVG 425-441-2640

**Testing Frequency**
- Throughout service hours

**Availability**
- STAT or routine

**Specimen**
- 24-hour urine collection, random specimen also acceptable

**Volume**
- 1 mL

**Minimum Volume**
- 0.4 mL

**Container**
- 24-hour urine collection container, or plastic urine cup w/ tight-fitting lid

**Causes for Rejection**
- Insufficient quantity, misidentified specimens and requisitions.

**Reference Ranges**
- 0-14 mg/dL (random specimen)
- 0.05-0.08 g/24 hours (24-hour collection)
## URINE TOTAL PROTEIN, SEMI QUANTITATIVE

<table>
<thead>
<tr>
<th>Related Terms</th>
<th>Urine protein, Urine total protein</th>
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</thead>
<tbody>
<tr>
<td><strong>Lab</strong></td>
<td>Alliance Lab, Room G1-500</td>
</tr>
<tr>
<td></td>
<td>Satellite Labs, South Lake Union</td>
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<tr>
<td></td>
<td>Community Site Labs</td>
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<tr>
<td><strong>Request Form</strong></td>
<td>Fred Hutchinson Cancer Center Clinical Lab Request: write UTPQL in the OTHER REQUEST section. Fill out completely, including ICD codes. CPOE orders will be interfaced to Sunquest upon order activation in Epic.</td>
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<tr>
<td><strong>Phone</strong></td>
<td>SLU 606-1088</td>
</tr>
<tr>
<td></td>
<td>EVG 425-441-2640</td>
</tr>
<tr>
<td><strong>Testing Frequency</strong></td>
<td>Throughout service hours</td>
</tr>
<tr>
<td><strong>Availability</strong></td>
<td>STAT or routine</td>
</tr>
<tr>
<td><strong>Specimen</strong></td>
<td>Random urine specimen</td>
</tr>
<tr>
<td><strong>Volume</strong></td>
<td>1 mL</td>
</tr>
<tr>
<td><strong>Minimum Volume</strong></td>
<td>0.4 mL</td>
</tr>
<tr>
<td><strong>Container</strong></td>
<td>Plastic urine cup w/ tight-fitting lid</td>
</tr>
<tr>
<td><strong>Causes for Rejection</strong></td>
<td>Insufficient quantity, misidentified specimens and requisitions, 24-hour urine specimens</td>
</tr>
<tr>
<td><strong>Reference Ranges</strong></td>
<td>No reference range.</td>
</tr>
</tbody>
</table>
TRIGLYCERIDES

Related Terms
Trigs

Test included in this panel
Lipid panel

Lab
Alliance Lab, Room G1-500
Satellite Labs, South Lake Union
Community Site Labs

Request Form
Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.
CPOE orders will be interfaced to Sunquest upon order activation in Epic.

Phone
SLU 606-1088
EVG 425-441-2640

Testing Frequency
Throughout service hours

Availability
Routine

Specimen
Plasma or Serum

Volume
1 mL

Pediatric Volume
Pediatric capillary collection: 500µL (0.5mL) serum collected in microtube or “bullet tube.”

Container
5 mL lime top PST, green top, red top, gold top SST or orange top RST

Collection
Routine venipuncture or line draw

Causes for Rejection
Misidentified specimens and requisitions, specimen QNS, improperly stored specimen, hemolysis, not fasting for at least 12 hours.

Reference Ranges
Desirable <150 mg/dL
Borderline 150-199 mg/dL
High 200-499 mg/dL
Very High >500 mg/dL
TROPONIN I (HIGH SENSITIVITY)

Related Terms: High Sensitivity Troponin I, hsTnI, TROPIG, Troponin-I, Troponin I

Test included in these panels: TROPIG

Lab:
- Alliance Lab, Room G1-500
- Satellite Labs, South Lake Union
- Community Site Labs

Request Form:
Fred Hutchinson Cancer Center Clinical Lab. Request: fill out completely, including ICD codes. CPOE orders will be interfaced to Sunquest upon order activation in Epic.

Phone:
- SLU 606-1088
- EVG 425-441-2640

Testing Frequency:
Throughout service hours

Availability:
STAT

Specimen:
Serum

Volume:
4 mL

Pediatric Volume:
2 full GOLD MICROTAINER

Container:
4 mL blood in GOLD SST or RED TOP tube

Collection:
Routine venipuncture or line draw

Causes for Rejection:
Collection in LIME GREEN PST or GREEN TOP tube, misidentified specimens and requisitions, specimen QNS, sample type other than serum, sample not separated from the cells, sample not stored at the appropriate temperature, sample too old (>4 hours at room temperature, >48 hours refrigerated)

Reference Ranges:
<0.04 ng/mL

Critical Values:
≥0.4 ng/mL
URIC ACID

**Lab**
Alliance Lab, Room G1-500
Satellite Labs, South Lake Union
Community Site Labs

**Request Form**
Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.
CPOE orders will be interfaced to Sunquest upon order activation in Epic.

**Phone**
SLU 606-1088
EVE 425-441-2640

**Testing Frequency**
Throughout service hours

**Availability**
STAT or routine

**Specimen**
Plasma or Serum

**Volume**
0.5 mL

**Pediatric Volume**
Pediatric capillary collection: 200µL (0.2mL) serum collected in microtube or "bullet" tube.

**Container**
5 mL lime top PST, green top, red top, gold top SST or orange top RSTNO EDTA

**Collection**
Routine venipuncture or line draw

**Causes for Rejection**
Missed identified specimens and requisitions, specimen QNS.

**Reference Ranges**

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3.9 – 7.6 mg/dL</td>
<td>2.6-6.8 mg/dL</td>
</tr>
</tbody>
</table>
URINE CREATININE
CREATININE CLEARANCE

Test included in:
- Urine Creatinine
- Creatinine clearance
- Urine Protein/Creatinine ratio

Lab
Alliance Lab, Room G1-500
Satellite Labs, South Lake Union
Community Site Labs

Request Form
Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.
CPOE orders will be interfaced to Sunquest upon order activation in Epic.

Phone
SLU 606-1088
EVG 425-441-2640

Testing Frequency
Throughout service hours

Availability
STAT or routine

Specimen: Urine for Urine Creatinine
Aliquot of 4, 12 or 24-hour urine and a serum creatinine level within 48 hours of urine collection for a Creatinine Clearance

Volume
0.5 mL min.

Container
Clean, leakproof container.

Collection
No preservative needed, but if needed for other analytes, only Thymol or Toluene should be used.

Creatinine Clearance Patient Preparation
- Hydrate the patient by administering a minimum of 600 ml water. Withhold tea, coffee, and drugs on the day of collection.
- Have the patient void and discard that specimen. Note the time and begin the urine collection period.
- Save all urine from this time on.

(Continued)
Urine Creatinine, Creatinine Clearance, continued

- Collect a 4, 12, or 24-hour specimen and record exact times of starting and completion of collection. A precisely timed specimen is required. At the end of the collection period, the patient is to empty their bladder and add the urine to the collection container. Do not add any additional urine to the container after the collection period.
- Refrigerate the sample during collection.

Causes for Rejection

Incomplete collections for timed periods.

Reference Ranges

<table>
<thead>
<tr>
<th>Test</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urine Creatinine</td>
<td>Child 0-9 yrs. 700-1800 mg/24 hrs</td>
</tr>
<tr>
<td></td>
<td>Male &gt; 9 yrs. 1000-2000 mg/24 hrs</td>
</tr>
<tr>
<td></td>
<td>Female &gt; 9 yrs. 700-1800 mg/24 hrs</td>
</tr>
<tr>
<td>Creatinine Clearance</td>
<td>Newborn 40 – 60 mL/min/m2</td>
</tr>
<tr>
<td></td>
<td>Male 75-120 mL/min</td>
</tr>
<tr>
<td></td>
<td>Female 65-105 mL/min</td>
</tr>
</tbody>
</table>
URINE PROTEIN/URINE CREATININE RATIO

Related Terms
Urine Total Protein, Urine Creatinine

Test included
Urine Total Protein, Urine Creatinine, calculated ratio.

Lab
Alliance Lab, Room G1-500
Satellite Labs, South Lake Union
Community Site Labs

Request Form
Fred Hutchinson Cancer Center Clinical Lab Request; write UPCRAT in the OTHER REQUEST section. Fill out completely, including ICD codes. CPOE orders will be interfaced to Sunquest upon order activation in Epic.

Phone
SLU 606-1088
EVG 425-441-2640

Testing Frequency
Throughout service hours

Availability
STAT or routine

Specimen
Random urine sample

Volume
1.0 mL

Container
Urine specimen cup

Causes for Rejection
Misidentified specimens and requisitions, specimen QNS.

Calculation
\[
\frac{\text{Urine Protein value}}{\text{Urine Creatinine value}} = \text{Ratio}
\]
HLA TYPING

Related Terms
Histocompatibility Testing, HLA testing, Serology, PRA testing

Lab
Clinical Immunogenetics Lab, 188 E. Blaine, Suite 250

Request Form
Epic generated HLA Typing requisition and Epic generated Progress Notes for Fred Hutchinson Cancer Center ambulatory clinics.

Fill out completely, including name, second identifier, sample source and collection date and time.

Sample Label
Label and request must have the sample name and a second identifier.

Phone
(206)606-7700 Lab Coordinator’s Office
FAX (206)606-1169

Availability
M – F 8:30am – 5pm. Please call the Lab Coordinator’s Office and CIL will complete progress notes with sample type and volume needed for testing. Specimens must arrive in CIL before 2:30 pm for same day processing.

Turnaround Time
See ‘CIL Turn Around Time Chart’

Specimen
Peripheral Blood. CIL requests saliva and buccal samples in some clinical cases. CIL will send a kit and instructions when a buccal or saliva is required.

Volume/Container
Adults: 10 mL blood in red top tube and 30 mL blood in green top tubes (sodium heparin)  
Pediatrics: minimum of 2mL blood in red top and 2 mL blood in green top (sodium heparin) depending on age (lithium heparin and ACD are acceptable if sodium heparin is not available)

Collection
Peripheral Blood: Routine venipuncture or line draw
Saliva and Buccal samples: call CIL for collection kits and instructions.

Special Handling
Room temperature, deliver to CIL immediately.

Causes for Rejection
Misidentified specimens and requisitions, unlabeled specimens, specimen QNS, improperly stored specimen or broken tubes, specimens received without requisitions.

After hours
Draw sample and keep specimen at room temperature. Deliver to lab the next working day.
CHIMERISM TESTING

**Related Terms**
AMP-FLP (Amplified Fragment Length Polymorphism, Engraftment and Monitoring), STR (Short Tandem Repeat); VNTR (Variable Number Tandem Repeat).

**Lab Request Form**
Clinical Immunogenetics Lab, 188 E. Blaine, Suite 250, Room 2120
Label and request must have two patient or donor identifiers.

All samples must be accompanied by a paper requisition.

<table>
<thead>
<tr>
<th>Collection Center</th>
<th>Lab Request Forms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fred Hutchinson Cancer Center’s Ambulatory Clinics and UW Medicine</td>
<td>Epic generated requisition form.</td>
</tr>
<tr>
<td>Mailed-in Specimens (LTFU, Peds LTFU, Mini-Transplant, etc.)</td>
<td>Long Term Follow Up/ Multiple Lab Requisition</td>
</tr>
<tr>
<td>Seattle Children’s Hospital</td>
<td>Multiple Lab Requisition (for blood specimens)</td>
</tr>
<tr>
<td></td>
<td>Ambulatory Offsite Laboratory Requisition (for bone marrow specimens)</td>
</tr>
</tbody>
</table>

**Phone Availability**
(206)606-1139 or (206)606-7700, FAX 606-1169
M – F 8:00am – 5pm. Specimens must arrive in CIL before 2:30 pm for same day processing.

**Turnaround Time**
See ‘CIL Turnaround Time Chart’

**Specimen**
Peripheral Blood, Bone Marrow or Sorted Cell subsets, biopsy samples, hair follicles.

**Cell Sorting**
Send specimens to the Hematopathology Laboratory, using the appropriate request form listed above, when testing of lineage specific cell subsets (such as CD3+ and CD33+) is required. The Hematopathology Laboratory will isolate the requested cell fractions and
forward them to the Clinical Immunogenetics Laboratory for chimerism testing.

**Volume**

Adults: For peripheral blood 10mL; for bone marrow 1-2mL

Pediatric: Peripheral blood 5mL

**Container**

Sodium Heparin (green top) – 20 units/mL of blood or bone marrow

**Collection**

Routine venipuncture, line draw or bone marrow aspiration

**Special Handling**

Room temperature, deliver to CIL immediately.

**Causes for Rejection**

Misidentified specimens and requisitions, unlabeled specimens, Specimens without a second identifier, QNS specimens, specimens received without requisitions.

**After Hours**

Draw sample and keep at room temperature.

Deliver to lab the next working day.
CIL TURNAROUND TIMES
FOR HLA ADMIT WORKUPS AND CHIMERISM TESTING

<table>
<thead>
<tr>
<th>Patient/Donor Status</th>
<th>Specimen Rec'd by 2:30 pm:</th>
<th>Results available in EPIC or faxed to ordering provider by EOD*:</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT</td>
<td>Monday-Friday</td>
<td>Within 3 working days</td>
</tr>
<tr>
<td>Urgent Clinical</td>
<td>Monday-Friday</td>
<td>Within 5 working days</td>
</tr>
<tr>
<td>Non-Urgent Clinical/Research</td>
<td>Monday-Friday</td>
<td>Within 10 working days</td>
</tr>
</tbody>
</table>

*Turnaround time starts when sample, requisition and order are received by CIL.

Chimerism Testing

Results available in EPIC or faxed to the source of test request and current attending in 1-3 days of sample receipt.
# D-DIMER

<table>
<thead>
<tr>
<th>Related Terms</th>
<th>DDI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab</td>
<td>Alliance Lab, Room G1-500</td>
</tr>
<tr>
<td></td>
<td>Satellite Labs, South Lake Union</td>
</tr>
<tr>
<td></td>
<td>Community Site Labs</td>
</tr>
<tr>
<td>Request Form</td>
<td>Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.</td>
</tr>
<tr>
<td></td>
<td>CPOE orders will be interfaced to Sunquest upon order activation in Epic.</td>
</tr>
<tr>
<td>Phone</td>
<td>SLU 606-1088</td>
</tr>
<tr>
<td></td>
<td>EVG 425-441-2640</td>
</tr>
<tr>
<td>Testing Frequency</td>
<td>Throughout service hours</td>
</tr>
<tr>
<td>Availability</td>
<td>STAT or routine</td>
</tr>
<tr>
<td>Specimen</td>
<td>Blood</td>
</tr>
<tr>
<td>Volume</td>
<td>4.5 mL</td>
</tr>
<tr>
<td>Pediatric volume</td>
<td>2.7 mL</td>
</tr>
<tr>
<td>Container</td>
<td>Blue top 3.2 % (sodium citrate) tube</td>
</tr>
<tr>
<td>Collection</td>
<td>If multiple tests are being drawn, draw coagulation studies second.</td>
</tr>
<tr>
<td></td>
<td>If only a fibrinogen is being drawn, draw 1-2 mL into another Vacutainer®, discard, and then collect the fibrinogen tube. This procedure avoids contamination of the specimen with tissue thromboplastin. When it is necessary to obtain blood from indwelling arterial or venous catheters, the heparinized fluid infusion should be stopped, and the first 15 mL blood obtained through the indwelling catheter should not be utilized for any coagulation studies. The appropriate volume of blood for the needed coagulation studies should be withdrawn from the catheter and the heparin infusion resumed after obtaining the sample. Samples obtained from a catheter should be so indicated. It should be understood that all coagulation specimens should be obtained without heparin contamination. All coagulation tests are, to some extent, sensitive to heparin contamination. Transport to the laboratory as soon as possible. Specimen MUST be processed by Lab within 24 hrs of blood collection.</td>
</tr>
<tr>
<td>Causes for Rejection</td>
<td>Specimen clotted, hemolyzed, contaminated with heparin, specimen received more than 2 hours after collection, tubes under-filled or overfilled, misidentified specimens and requisitions.</td>
</tr>
<tr>
<td>Reference Ranges</td>
<td>0-0.59 ug/mL FEU</td>
</tr>
<tr>
<td>Critical Values</td>
<td>none</td>
</tr>
<tr>
<td>After Hours</td>
<td>For preparation to send to UW: Centrifuge for 10 minutes. Remove plasma and re-spin plasma for 10 minutes. Decant and freeze. Send frozen on dry ice.</td>
</tr>
</tbody>
</table>
# FIBRINOGEN

<table>
<thead>
<tr>
<th>Related Terms</th>
<th>FIBCL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab</td>
<td>Alliance Lab, Room G1-500</td>
</tr>
<tr>
<td></td>
<td>Satellite Labs, South Lake Union</td>
</tr>
<tr>
<td></td>
<td>Community Site Labs</td>
</tr>
<tr>
<td>Request Form</td>
<td>Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.</td>
</tr>
<tr>
<td></td>
<td>CPOE orders will be interfaced to Sunquest upon order activation in Epic.</td>
</tr>
<tr>
<td>Phone</td>
<td>SLU 606-1088</td>
</tr>
<tr>
<td></td>
<td>EVG 425-441-2640</td>
</tr>
<tr>
<td>Testing Frequency</td>
<td>Throughout service hours</td>
</tr>
<tr>
<td>Availability</td>
<td>STAT or routine</td>
</tr>
<tr>
<td>Specimen</td>
<td>Blood</td>
</tr>
<tr>
<td>Volume</td>
<td>4.5 mL</td>
</tr>
<tr>
<td>Pediatric volume</td>
<td>2.7 mL</td>
</tr>
<tr>
<td>Container</td>
<td>Blue top 3.2 % (sodium citrate) tube</td>
</tr>
<tr>
<td>Collection</td>
<td>If multiple tests are being drawn, draw coagulation studies second.</td>
</tr>
<tr>
<td></td>
<td>If only a fibrinogen is being drawn, draw 1-2 mL into another Vacutainer®, discard, and then collect the fibrinogen tube. This procedure avoids contamination of the specimen with tissue thromboplastin. When it is necessary to obtain blood from indwelling arterial or venous catheters, the heparinized fluid infusion should be stopped, and the first 15 mL blood obtained through the indwelling catheter should not be utilized for any coagulation studies. The appropriate volume of blood for the needed coagulation studies should be withdrawn from the catheter and the heparin infusion resumed after obtaining the sample. Samples obtained from a catheter should be so indicated. It should be understood that all coagulation specimens should be obtained without heparin contamination. All coagulation tests are, to some extent, sensitive to heparin contamination. Transport to the laboratory as soon as possible. Specimen MUST be processed by Lab within 24 hrs of blood collection.</td>
</tr>
</tbody>
</table>

(Continued)
Fibrinogen, continued

**Causes for Rejection** Specimen clotted, hemolyzed, contaminated with heparin, specimen received more than 2 hours after collection, tubes under-filled or overfilled, misidentified specimens and requisitions.

**Reference Ranges**

- Critical Values <100 mg/dL, possible effect, hemorrhage

**After Hours** Centrifuge for 10 minutes. Remove plasma and re-spin plasma for 10 minutes. Decant and freeze. Send frozen on dry ice.
# PARTIAL THROMBOPLASTIN TIME

<table>
<thead>
<tr>
<th>Related Terms</th>
<th>Activated Partial Thromboplastin Time, aPTT, PTT.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab</td>
<td>Alliance Lab, Room G1-500</td>
</tr>
<tr>
<td></td>
<td>Satellite Labs, South Lake Union</td>
</tr>
<tr>
<td></td>
<td>Community Site Labs</td>
</tr>
<tr>
<td>Request Form</td>
<td>Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.</td>
</tr>
<tr>
<td></td>
<td>CPOE orders will be interfaced to Sunquest upon order activation in Epic.</td>
</tr>
<tr>
<td>Phone</td>
<td>SLU 606-1088</td>
</tr>
<tr>
<td></td>
<td>EVG 425-441-2640</td>
</tr>
<tr>
<td>Testing Frequency</td>
<td>Throughout service hours</td>
</tr>
<tr>
<td>Availability</td>
<td>STAT or routine</td>
</tr>
<tr>
<td>Specimen</td>
<td>Blood</td>
</tr>
<tr>
<td>Volume</td>
<td>4.5 mL</td>
</tr>
<tr>
<td>Pediatric Volume</td>
<td>2.7 mL</td>
</tr>
<tr>
<td>Container</td>
<td>Blue top (3.2 % sodium citrate) tube</td>
</tr>
</tbody>
</table>
| Collection    | Routine venipuncture or line draw. If multiple tests are being drawn, draw coagulation studies second. If only a partial thromboplastin time (PTT) is being drawn, draw 1-2 mL into another Vacutainer®, discard, and then collect the PTT. This collection procedure avoids contamination of the specimen with tissue thromboplastins or heparin. Must be processed within 6 hrs.  
  Note: For Heparin monitoring, MUST DRAW 5 mL BLUE TOP and process in 1hr. |
| Causes for Rejection | Specimen clotted, gross hemolysis, received more than 2 hours after collection, tubes under-filled or overfilled, misidentified specimens and requisitions. |
| Reference Ranges  | 22 – 35 seconds                                 |
| Therapeutic Range | 60 –100 seconds for patient on heparin therapy. |
| Critical Value   | >120 seconds                                    |
| After Hours      | Centrifuge for 10 minutes. Remove plasma and re-spin plasma for 10 minutes. Decant and freeze. Send frozen on dry ice. |
PROTHROMBIN TIME

Related Terms
- Protime, PT, PRO, ACCINR*

Test includes
- Prothrombin Time and International Normalization Ratio (INR)
  (*ACCINR includes INR result, only)

Lab
- Alliance Lab, Room G1-500
- Satellite Labs, South Lake Union
- Community Site Labs

Request Form
- Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes.
- CPOE orders will be interfaced to Sunquest upon order activation in Epic.

Phone
- SLU 606-1088
- EVG 425-441-2640

Testing Frequency
- Throughout service hours

Availability
- STAT or routine

Specimen
- Blood

Volume
- 4.5 mL

Pediatric Volume
- 2.7 mL

Container
- Blue top (3.2% sodium citrate) tube

Collection
- Routine venipuncture or line draw. If multiple tests are being drawn, draw coagulation studies second. If only a Prothrombin Time is being drawn, draw 1-2 mL into another Vacutainer®, discard, and then collect the Prothrombin Time. This collection procedure avoids contamination of the specimen with tissue thromboplastins or heparin. Specimen MUST be processed by Lab within 24 hrs of blood collection.

Causes for Rejection
- Specimen clotted, gross hemolysis, tubes under-filled or overfilled, misidentified specimens and requisitions.

Reference Range
- INR 0.8 – 1.3
- PRO 10.7 – 15.6 secs

Therapeutic Range
- INR 2.0 – 3.5; INR is applicable only to patients on stable coumadin therapy.

(Continued)
ProthrombinTime, continued

Critical Values

Non-anticoagulated patient, more than 44 seconds, possible effect is hemorrhage.
Anticoagulated patient, more than three times normal mean, possible effect is hemorrhage.
Critical Prothrombin Time is the PT that generates >5.0 INR.

After Hours

Centrifuge for 10 minutes. Remove plasma and re-spin plasma for 10 minutes. Decant and freeze. Send frozen on dry ice.
CYTOGENETICS STUDIES – CHROMOSOME ANALYSIS AND FISH

**Related Terms**
- Molecular Cytogenetics, Chromosome Analysis,
- FISH (fluorescence in situ hybridization): Karyotype

**Test includes**
- Chromosome analysis or fluorescence in situ hybridization (FISH)

**Lab**
- Cytogenetics Lab, Blaine, BL-103

**Request Form**
- Epic generated order OR Bone Marrow Procedure Order/Multiple Lab Requisition OR For Long Term Follow Up/Multiple Lab Request Form (for mail-in specimens)
- Fill out completely, including date, time, and ICD codes.
- Label and request must have two patient/donor identifiers.

For Fred Hutchinson Cancer Center Ambulatory Clinic, a CPOE requisition will be generated for those lab tests requiring a requisition form.

See [https://testguide.labmed.uw.edu/public/view/EVALHD](https://testguide.labmed.uw.edu/public/view/EVALHD) for additional information on ordering HDP testing.

**Phone**
- 206-606-1390 main line
- Availability
  - M – F 8am – 5pm
  - *After hours:* on call 9am – 5pm weekends and holidays,
  - Pager 206-340-7207

**Turnaround Time**
- See ‘Cytogenetics Turnaround Time Table’

**Specimen**
- Bone Marrow, Peripheral Blood, or Flow Cytometry Sorted White Cell subsets.
- Cell Sorting: Send specimens to the UW Hematopathology Laboratory, using the appropriate request form listed above, when testing of lineage specific white blood cell subsets (such as CD3+ and CD33+) is required. The Hematopathology Laboratory will isolate the requested cell fractions and forward them to the Cytogenetics Laboratory for FISH testing.

**Volume**
- For bone marrow 1-2mL; peripheral blood 5mL

**Pediatric volume**
- For blood, infants 1-2mL.

**Container**
- Sodium heparin (green top tube)

(Continued)
Cytogenetics Studies – Chromosome Analysis and FISH, continued

**Collection**

Routine venipuncture line draw, or bone marrow aspiration.

**Special Handling**

Room temperature; deliver promptly to Cytogenetics Lab.

For cell sorting, then FISH testing, send to Alliance Lab for delivery to University of Washington Hematopathology Lab.

**Causes for Rejection**

Misidentified specimens and requisitions, improperly stored specimens, severely clotted specimens, leaking specimens that pose a risk to technologist, specimens of questionable integrity.

**After Hours**

Store specimens at room temperature until delivery to lab during day shift or on-call hours.

DO NOT HOLD SPECIMENS OVER THE WEEKEND - CONTACT PAGER. Pager: 206-340-7207

(On call weekends and holidays 9am – 5pm: Pager: 206-340-7207)
# CYTOGENETICS STUDIES – GENOMIC ARRAY

<table>
<thead>
<tr>
<th>Related Terms</th>
<th>CGAT, Array CGH, SNP array, DNA Microarray</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test includes</td>
<td>Genomic Array (CGAT)</td>
</tr>
<tr>
<td>Lab</td>
<td>Cytogenetics Lab, Blaine, BL-103</td>
</tr>
<tr>
<td>Request Form</td>
<td>Epic generated order or</td>
</tr>
<tr>
<td></td>
<td>Bone Marrow Procedure Order/Multiple Lab Requisition or</td>
</tr>
<tr>
<td></td>
<td>Long Term Follow Up/Multiple Lab Request Form (for mail-in specimens). Fill out completely, including date, time, and ICD codes. Label and request must have two patient/donor identifiers. For Fred Hutchinson Cancer Center Ambulatory Clinic, a CPOE requisition will be generated for those lab tests requiring a requisition form.</td>
</tr>
</tbody>
</table>

See https://testguide.labmed.uw.edu/public/view/EVALHD for additional information on ordering HDP testing.

<table>
<thead>
<tr>
<th>Phone Availability</th>
<th>206-606-1390 main line</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M – F 8am – 5pm</td>
</tr>
<tr>
<td></td>
<td>After hours: on call 9am – 5pm weekends and holidays, Pager: 206-340-7207</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Turnaround Time</th>
<th>See ‘Cytogenetics Turnaround Time Table’</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specimen</td>
<td>Bone Marrow, Peripheral Blood, Tissue (fresh, frozen, or FFPE)</td>
</tr>
<tr>
<td>Volume</td>
<td>For bone marrow 1-2mL; peripheral blood 3-5mL, tissue (contact lab)</td>
</tr>
<tr>
<td>Container</td>
<td>Marrow and Blood: Put in an EDTA (purple top) tube. Sodium heparin (green top), Sodium citrate (blue top) and Acid citrate dextrose (yellow top) are also acceptable. After marrow is put into tubes, the tubes must be mixed well to prevent clotting. Tissue: contact lab</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Collection</th>
<th>Routine venipuncture, line draw or bone marrow aspiration; surgical excision for tissue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Special Handling</td>
<td>Deliver immediately to Cytogenetics Lab. Keep refrigerated if delivery delayed. Room temperature OK if delivered within a few hours of draw.</td>
</tr>
</tbody>
</table>

| Causes for Rejection | Misidentified specimens and requisitions, frozen or heated marrow or blood, severely clotted specimens, any specimen possibly exposed to contaminating DNA or RNA, leaking specimens that pose a risk to technologist, and specimens of questionable integrity. |

_(Continued)_
Cytogenetics Studies-Genomic Array, continued

**After Hours**

Store specimens refrigerated or at 2-8°C until delivery to lab during day shift or on-call hours.

DO NOT HOLD SPECIMENS OVER THE WEEKEND - CONTACT PAGER. Pager: 206-340-7207

(On call weekends and holidays 9am – 5pm: Pager: 206-340-7207)
# CYTOGENETICS STUDIES – NGS TARGETED RNA SEQUENCING

<table>
<thead>
<tr>
<th>Related Terms</th>
<th>Targeted RNA Sequencing (TRS); FusionPlex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test includes</td>
<td>Targeted RNA Sequencing (TRS); FusionPlex</td>
</tr>
<tr>
<td>Lab</td>
<td>Cytogenetics Lab, Blaine, BL-103</td>
</tr>
<tr>
<td>Request Form</td>
<td>Epic generated order or Bone Marrow Procedure Order/Multiple Lab Requisition or</td>
</tr>
<tr>
<td></td>
<td>Long Term Follow Up/Multiple Lab Request Form (for mail-in specimens). Fill out completely, including date, time, and ICD codes. Label and request must have two patient/donor identifiers. For Fred Hutchinson Cancer Center Ambulatory Clinic, a CPOE requisition will be generated for those lab tests requiring a requisition form. See <a href="https://testguide.labmed.uw.edu/public/view/EVALHD">https://testguide.labmed.uw.edu/public/view/EVALHD</a> for additional information on ordering HDP testing.</td>
</tr>
<tr>
<td>Phone</td>
<td>206-606-1390 main line</td>
</tr>
<tr>
<td>Availability</td>
<td>M – F 8am – 5pm</td>
</tr>
<tr>
<td></td>
<td>After hours: on call 9am – 5pm weekends and holidays, Pager: 206-340-7207</td>
</tr>
<tr>
<td>Turnaround Time</td>
<td>See ‘Cytogenetics Turnaround Time Table’</td>
</tr>
<tr>
<td>Specimen</td>
<td>Bone Marrow, Peripheral Blood (fresh; &lt;48 hrs). Methanol/acetic acid pellet cytogenetic prep also acceptable.</td>
</tr>
<tr>
<td>Volume</td>
<td>For bone marrow 1-2mL; peripheral blood 3-5mL, fixed pellet (contact lab)</td>
</tr>
<tr>
<td>Container</td>
<td>Marrow and Blood: Put in an EDTA (purple top) tube. Sodium heparin (green top) is also acceptable. After marrow is put into tubes, the tubes must be mixed well to prevent clotting. Fixed pellet: contact lab</td>
</tr>
<tr>
<td>Collection</td>
<td>Routine venipuncture, line draw or bone marrow aspiration</td>
</tr>
<tr>
<td>Special Handling</td>
<td>Deliver immediately to Cytogenetics Lab. Keep refrigerated if delivery delayed. Room temperature OK if delivered within a few hours of draw.</td>
</tr>
<tr>
<td>Causes for Rejection</td>
<td>Misidentified specimens and requisitions, frozen or heated marrow or blood, severely clotted specimens, any specimen possibly exposed to contaminating DNA or RNA, leaking specimens that pose a risk to technologist, and specimens of questionable integrity.</td>
</tr>
<tr>
<td>After Hours</td>
<td>Store specimens refrigerated or at 2-8°C until delivery to lab during day shift or on-call hours.</td>
</tr>
</tbody>
</table>

DO NOT HOLD SPECIMENS OVER THE WEEKEND - CONTACT PAGER. Pager: 206-340-7207

(On call weekends and holidays 9am – 5pm: Pager: 206-340-7207)
TURNAROUND TIMES  CYTOGENETICS

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Results by:***</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chromosome Analysis and FISH</td>
<td>5–10 working days with day 1 as day of receipt. Pretransplant and new diagnosis samples are prioritized for day 5 completion or sooner. Samples requiring mitogen stimulation and or cultures longer than 24 hours may not be completed by day 5.</td>
</tr>
<tr>
<td>Genomic Array</td>
<td>5–10 working days with day 1 as day of receipt; up to 15 days for FFPE samples.</td>
</tr>
<tr>
<td>NGS Targeted RNA Sequencing</td>
<td>15-20 working days with day 1 as day of receipt</td>
</tr>
</tbody>
</table>

Please indicate special circumstances on requisition form and/or call 206-606-1390.

Unusual circumstances may cause a delay in availability of results. During times of heavy workload, samples will be prioritized according to known clinical urgency. If results are needed sooner than the above stated time, please indicate this on requisition form and/or call 206-606-1390.

*** Unexpected abnormal results are reported to the attending physician or primary provider. All reports are uploaded to Epic. Reports are also faxed to patient locations without Epic access.
CEREBRAL SPINAL FLUID CELL COUNT

Related Terms
  CSF cell count

Test Includes
  White blood cell count, red blood cell count, white blood cell differential (includes all nucleated cells observed on concentrated smear). Smears also sent to UWMC Hematopathology for microscopic examination.

Lab
  Alliance Lab, Room G1-500
  Satellite Labs, South Lake Union
  Community Site Labs

Request Form
  Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes
  CPOE orders will be interfaced to Sunquest upon order activation in Epic.

Phone
  SLU 606-1088
  EVG 425-441-2640

Testing Frequency
  Throughout service hours

Availability
  STAT or routine

Specimen
  Cerebral spinal fluid

Volume
  1 mL

Minimum Volume
  0.5 mL

Container
  Sterile Tube; EDTA (lavender-top tube) if bloody

Collection
  Lumbar puncture

Causes for Rejection
  Insufficient quantity, misidentified specimens and requisitions

Reference Ranges
  0 rbc/μL
  0-5 mononuclear (lymphocytes and/or monocytes) cells/μL
  Differential Neutrophils 2% +/- 4%
  Lymphocytes 60% +/- 20%
  Monocytes 30% +/- 15%
## COMPLETE BLOOD COUNT AND DIFFERENTIAL

### Related Terms
- CBC, Complete CBC

### Panels Available
- CBC (Hemogram) = WBC, RBC, Hgb, HCT, MCV, MCH, MCHC & platelets
- CBANC = CBC & Absolute Neutrophil Count
- CBD = CBC & differential

### Panels Include
- **Measured Parameters:** Hemoglobin (Hgb), platelets (PLT), red blood cells (RBC), white blood cells (WBC), and hematocrit (HCT).
- **Calculated Parameters:** Mean corpuscular volume (MCV), mean corpuscular hemoglobin (MCH), mean corpuscular hemoglobin concentration (MCHC), red blood cell distribution width (RDW), and mean platelet volume (MPV).
- **Auto Differential:** Lymphocytes, Neutrophils, Monocytes, Eosinophils, and Basophils expressed as Absolute Number and % of total WBC.
- **Manual Differential:** Cells in auto diff plus metamyelocytes, myelocytes, promyelocytes, blasts, plasma cells, hairy cells, unclassified cells (description provided) and nRBCs.

### Lab
- Alliance Lab, Room G1-500
- Satellite Labs, South Lake Union
- Community Site Labs

### Request Form
- Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes
- CPOE orders will be interfaced to Sunquest upon order activation in Epic.

### Phone
- SLU 606-1088
- EVG 425-441-2640

### Testing Frequency
- Daily

### Availability
- STAT or routine

### Specimen
- Blood

### Volume
- 2 – 3 mL

### Pediatric Volume
- One properly filled Microtainer™ (EDTA) tube for pediatric capillary collection.

*(Continued)*
**Complete Blood Count and Differential, continued**

**Storage Instructions**  For best results, deliver to lab within 1 hour. Accepted if <24 hours from time of draw and sample was refrigerated or if less than 8 hours from the time of draw and sample not refrigerated.

**Container**  EDTA Vacutainer® tube

**Collection**  Routine venipuncture or line draw

**Causes for Rejection**  Clotted specimen, insufficient quantity, old specimen, hemolysis, and misidentified specimens and requisitions

**Reference Ranges**  [Click here](#)

**Critical Values**  See table below

<table>
<thead>
<tr>
<th>Critical Values</th>
<th>Less than</th>
<th>Greater than</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absolute neutrophils</td>
<td>0.5</td>
<td>N/A</td>
<td>x 10^3 /µL</td>
</tr>
<tr>
<td>Hematocrit</td>
<td>20</td>
<td>None</td>
<td>%</td>
</tr>
<tr>
<td>Platelet</td>
<td>20</td>
<td>1000</td>
<td>x 10^3 /µL</td>
</tr>
</tbody>
</table>

**Interfering Substances**  High WBC counts, sickle cells, RBC fragments, cold agglutinins, elevated lipids, elevated chylomicrons, elevated bilirubin, nucleated red blood cells, circulating micro-megakaryocytes, elevated serum urea nitrogen, clumped platelets, and inappropriate anticoagulant.
ERYTHROCYTE SEDIMENTATION RATE

**Related Terms**
ESR, Sed Rate

**Lab**
Alliance Lab, Room G1-500

**Satellite Labs, South Lake Union**
Community Site Labs

**Request Form**
Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes
CPOE orders will be interfaced to Sunquest upon order activation in Epic.

**Phone**
SLU 606-1088
EVG 425-441-2640

**Testing Frequency**
Throughout service hours

**Availability**
STAT or routine

**Specimen**
Blood

**Volume**
2mL

**Container**
2.4 mL lavender top Vacutainer® tube

Unacceptable: any Microtainer tube

**Storage Instructions**
Lavender top (EDTA) at room temperature within 4 hours
Lavender top (EDTA) refrigerated within 12 hours

**Collection**
Routine venipuncture or line draw

**Causes for Rejection**
Clotted specimen, insufficient quantity, misidentified specimens, and requisitions

**Reference Ranges**

<table>
<thead>
<tr>
<th>Age</th>
<th>Range</th>
<th>Age</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤50y</td>
<td>0 – 20</td>
<td>≤50y</td>
<td>0 – 15</td>
</tr>
<tr>
<td>&gt;50y</td>
<td>0 – 30</td>
<td>&gt;50y</td>
<td>0 – 20</td>
</tr>
</tbody>
</table>

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HEMATOCRIT

Related Terms  Hct, Crit
Test included in these panels
- CBC
- CBANC
- CBD
- HBHCT

Lab  Alliance Lab, Room G1-500
     Satellite Labs, South Lake Union
     Community Site Labs
Request Form  Fred Hutchinson Cancer Center Clinical Lab Request: fill out
               completely, including ICD codes
               CPOE orders will be interfaced to Sunquest upon order activation in
               Epic.
Phone  SLU 606-1088
        EVG 425-441-2640
Testing Frequency  Throughout service hours
Availability  STAT or routine
Specimen  Blood
Volume  2 mL
Pediatric Volume  One properly filled Microtainer™ (EDTA) tube for
                  pediatric capillary collection.
Container  Lavender top (EDTA) tube
Collection  Routine venipuncture or line draw
Causes for Rejection  Clotted specimen, insufficient quantity, old specimen, hemolysis,
                      misidentified specimens, and requisitions
Reference Ranges  see Complete Blood Count
Critical Values  see Complete Blood Count
IMMATURE PLATELET FRACTION

Related Terms
IPF, Reticulated platelet

Test Includes
Immature platelet percentage, absolute immature platelet count

Lab
Alliance Lab, Room G1-500
Satellite Labs, South Lake Union
Community Site Labs

Request Form
Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes
CPOE orders will be interfaced to Sunquest upon order activation in Epic.

Phone
SLU 606-1088
EVG 425-441-2640

Testing Frequency
Throughout service hours

Availability
STAT or routine

Specimen
Blood

Volume
3 mL

Pediatric Volume
One properly filled Microtainer™ (EDTA) tube for pediatric capillary collection

Container
Lavender top (EDTA) tube

Collection
Routine venipuncture or line draw

Causes for Rejection
Clotted specimen, insufficient quantity, old specimen, hemolysis, misidentified specimens, and requisitions

Reference Ranges

<table>
<thead>
<tr>
<th>Immature Platelet</th>
<th>Units: %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Female</td>
</tr>
<tr>
<td>Age</td>
<td>Range</td>
</tr>
<tr>
<td>0 mos. -</td>
<td>1.2 – 8.6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Immature Platelet</th>
<th>Units: thou/uL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Female</td>
</tr>
<tr>
<td>Age</td>
<td>Range</td>
</tr>
<tr>
<td>0 mos. –</td>
<td>3.6 – 20.0</td>
</tr>
</tbody>
</table>
PLATELET COUNT

Related Terms Platelets, Thrombocyte Count

Test included in these panels
- CBC
- CBANC
- CBD

Lab
- Alliance Lab, Room G1-500
- Satellite Labs, South Lake Union
- Community Site Labs

Request Form
Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes
CPOE orders will be interfaced to Sunquest upon order activation in Epic.

Phone
- SLU 606-1088
- EVG 425-441-2640

Testing Frequency
Throughout service hours

Availability
STAT or routine

Specimen
Blood

Volume
2 mL

Pediatric Volume
One properly filled Microtainer™ (EDTA) tube for pediatric capillary collection.

Container
Lavender top (EDTA) tube.
May also be drawn in blue top (citrate) if platelet clumps are present (Platelet values will be corrected for the dilution factor).

Collection
Routine venipuncture or line draw

Causes for Rejection
Clotted specimen, insufficient quantity, old specimen, hemolysis, misidentified specimens, and requisitions

Reference Ranges
see Complete Blood Count

Critical Values
see Complete Blood Count
RETICULOCYTE COUNT

Related Terms
Retic Count

Test Includes
An Absolute Reticulocyte count and Reticulocytes expressed as a percentage in a total of 1000 RBCs

Lab
Alliance Lab, Room G1-500
Satellite Labs, South Lake Union
Community Site Labs

Request Form
Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes
CPOE orders will be interfaced to Sunquest upon order activation in Epic.

Phone
SLU 606-1088
EVG 425-441-2640

Testing Frequency
Throughout service hours

Availability
STAT or routine

Specimen
Blood

Volume
2mL

Pediatric Volume
One properly filled Microtainer™ (EDTA) tube for pediatric capillary collection

Container
Lavender top (EDTA) tube

Collection
Routine venipuncture or line draw

Causes for Rejection
Clotted specimen, insufficient quantity, old specimen, hemolysis, misidentified specimens, and requisitions

Reference Ranges

<table>
<thead>
<tr>
<th>Retic</th>
<th>Units: %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Female</td>
</tr>
<tr>
<td>Age</td>
<td>Range</td>
</tr>
<tr>
<td>6 mos.-</td>
<td>0.5 – 2.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Retic Absolute</th>
<th>Units: bil / L</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Female</td>
</tr>
<tr>
<td>Age</td>
<td>Range</td>
</tr>
</tbody>
</table>

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# COVID/FLU/RSV RESPIRATORY PANEL, RAPID PCR

## Related Terms
COVID-19, Influenza, RSV, Rapid PCR

## Test Includes
Qualitative PCR by Cepheid GeneXpert Plus for SARS-CoV-2, FLU A & B, and RSV

## Lab
- Alliance Lab, Room G1-500
- Satellite Labs, South Lake Union
- Community Site Labs

## Request Form
Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes

CPOE orders will be interfaced to Sunquest upon order activation in Epic.

## Phone
SLU 606-1088
EVG 425-441-2640

## Testing Frequency
Throughout service hours (M-F 6a-9p, S/S/Holidays 7:30a-4:30p, remaining orders will be canceled and reordered for transport to and testing by UW Virology)

## Availability
In order of receipt only

## Specimen
Nasopharyngeal or Nasal Swab in 3mL approved viral transport media

## Volume
3mL

## Pediatric Volume
n/a

## Container
Swab in viral transport media

## Collection
Nasopharyngeal swab: Insert the swab into either nostril, passing it into the posterior nasopharynx. Rotate swab by firmly brushing against the nasopharynx several times. Remove and place the swab into the tube containing 3 mL of viral transport medium or saline. Break swab at the indicated break line and cap the specimen collection tube tightly.

Nasal swab: Insert a nasal swab 1 to 1.5 cm into a nostril. Rotate the swab against the inside of the nostril for 3 seconds while applying pressure with a finger to the outside of the nostril. Repeat on the other nostril with the same swab, using external pressure on the outside of the other nostril. To avoid specimen contamination, do not touch the swab tip to anything other than the inside of the nostril. Remove and place the swab into the tube containing 3 mL of viral transport medium or saline. Break swab at the indicated break line and cap the specimen collection tube tightly.

## Causes for Rejection
- Swab collected from other body sites (throat, etc.)
- Transport media other than viral transport media or saline
- Specimens with less than 3 mL viral transport media/saline

## Reference Ranges
Negative
## SARS-COV-2 (COVID-19) QUALITATIVE RAPID PCR

### Related Terms
COVID-19, 2019-nCoV, COVID, COVID19, nCoV, PUI nCoV, SARS, SARS-CoV-2, Wuhan Coronavirus

### Test Includes
Qualitative PCR by Cepheid GeneXpert Plus for SARS-CoV-2

### Lab
Alliance Lab, Room G1-500
Satellite Labs, South Lake Union
Community Site Labs

### Request Form
Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes
CPOE orders will be interfaced to Sunquest upon order activation in Epic.

*NOTE – This test is only available with pre-approval by Fred Hutchinson Cancer Center Infection Prevention.

### Phone
SLU 606-1088
EVG 425-441-2640

### Testing Frequency
Throughout service hours (M-F 6a-9p, S/S/Holidays 7:30a-4:30p, remaining orders will be canceled and reordered for transport to and testing by UW Virology)

### Availability
In order of receipt only

### Specimen
Nasopharyngeal or Nasal Swab in 3mL approved viral transport media

### Volume
3mL

### Pediatric Volume
n/a

### Container
Swab in viral transport media

### Collection
Nasopharyngeal swab: Insert the swab into either nostril, passing it into the posterior nasopharynx. Rotate swab by firmly brushing against the nasopharynx several times. Remove and place the swab into the tube containing 3 mL of viral transport medium or saline. Break swab at the indicated break line and cap the specimen collection tube tightly.

Nasal swab: Insert a nasal swab 1 to 1.5 cm into a nostril. Rotate the swab against the inside of the nostril for 3 seconds while applying pressure with a finger to the outside of the nostril. Repeat on the other nostril with the same swab, using external pressure on the outside of the other nostril. To avoid specimen contamination, do not touch the swab tip to anything other than the inside of the nostril. Remove and place the swab into the tube containing 3 mL of viral transport medium or saline. Break swab at the indicated break line and cap the specimen collection tube tightly.

### Causes for Rejection
Swab collected from other body sites (throat, etc.)
Transport media other than viral transport media or saline
Specimens with less than 3 mL viral transport media/saline

### Reference Ranges
Negative
BONE MARROW ASPIRATE / BIOPSY

Related Terms
Bone marrow, iliac crest, bone marrow core

Test Includes
Gross and microscopic examination with diagnosis, other laboratory tests as ordered

Lab
Alliance Lab staff assists with Bone Marrow procedures and distributes specimens to other laboratories including Hematology, Pathology, UW Hematopathology, Microbiology and Virology.

Request Form
Fred Hutchinson Cancer Center Requisition(s) specific for above laboratories
Fill out completely, including ICD codes
For Fred Hutchinson Cancer Center Ambulatory Clinic, a CPOE requisition will be generated for those lab tests requiring a requisition form.

Phone
SLU 606-1088

Availability
M – F 8am – 4:30pm

Turnaround Time
If the specimen is placed in fixative by 1pm and delivered to Pathology by 3pm the same day, results are provided the second business day. If time frames are not met, results are provided the third business day. Holidays may extend result times. Refer to other entries, for turnaround times of other testing.
Pathology hours are:
Monday 9am – 6:30pm,
Tuesday-Friday 6:00am – 6:30pm
Saturday 6am – 2:30pm
Sundays and after hours if STAT processing is required, contact the on-call Fred Hutchinson Cancer Center Pathology Technologist at 573-0892.

Specimen
Approximately 2 cc of bone marrow aspirate collected in syringe with no additive to be placed in a 6mL lavender EDTA tube. Invert tube 8-10 times to coat the walls of the tube to ensure adequate mixing of additive with aspirate. Pour the aspirate into a petri dish or watch glass to make 12 aspirate coverslips. After cover slips are made, place 1cc of aspirate back into the 6mL lavender top tube for Flow Cytometry, the rest of the sample to be sent to Pathology as requested. Place 3cc bone marrow aspirate collected in syringe with no additive into a 4mL lavender top tube for Molecular. Place 3cc bone marrow aspirate collected in Preservative-free Heparin syringe for Cytogenetics in a 4 mL green top tube.

(Continued)
Bone Marrow Aspirate/Biopsy continued

If cultures for bacteria, fungus and/or AFB are requested, 1-3cc of bone marrow aspirate is placed into a SPS or AFB tube.

For viral cultures, 1-3cc of bone marrow aspirate is placed into an EDTA tube. Bone Marrow aspirate (1-2cc) for CMV PCR is placed into an EDTA tube.

If a bone marrow biopsy is obtained, make 3-4 touch preps, and then place the bone marrow core removed for biopsy diagnostic interpretation into 10% buffered formalin.

If there is a special request or special handling is needed, contact the Bone Marrow Lead at 606-1088 or page 206-540-3431.

**Container**

Well-constructed container with 10% buffered formalin with secure lid and sealed plastic bag for the bone biopsy.

**Collection**

Bone marrow aspirate and bone marrow core biopsy

**Causes for Rejection**

Improper handling, misidentified specimens, and requisitions

**After Hours**

To arrange for a bone marrow tech to assist after available hours M – F (8am – 4:30pm) call the Specimen Processing staff at 606-1088. For all testing done at UW, contact UW Hematopathology Lab at 598-6231 to arrange specimen processing.
BRONCHOALVEOLAR LAVAGE

Related Terms
- BAL, Bronchial Aspirate, Bronchial Wash

Test Includes
- Detection of abnormal cells, malignant cells, infectious agents

Lab
- Fred Hutchinson Cancer Center Pathology, Room G7-910

Request Form
- Surgical Pathology Order or Anatomic Pathology Specimen Request Form.

Complete a Lab Medicine Microbiology and/or Virology Request if ordered. Fill out completely, including ICD codes.

For Fred Hutchinson Cancer Center Ambulatory Clinic, a CPOE requisition will be generated for those lab tests requiring a requisition form.

Phone
- 606-1355

Availability
- Monday 9am – 6:30pm
- Tuesday – Friday 6:00am – 6:30pm
- Saturday 6:00am – 2:30pm
- Sundays and all other times; if STAT processing is required, contact the on-call Pathology Technologist at 573-0892.

Turnaround Time
- Preliminary results are available within 3.5 hours of specimen receipt at Fred Hutchinson Cancer Center Pathology; final report is provided the next business day.

Specimen
- Bronchial wash fluid or bronchoalveolar lavage fluid

Specimen Collection: Bronchial Washings
- Pass the bronchoscope transnasally or transorally in nonintubated patients or via the endotracheal tube in intubated patients. Wedge the tip of the bronchoscope in a segmental bronchus. Inject sterile nonbacteriostatic saline (generally 5- to 20-ml aliquots) from a syringe through a biopsy channel of the bronchoscope. Gently suction the saline into a sterile container before administering the next aliquot. Keep aliquots separate during collection. Send to laboratory immediately. Refrigerate if delay is unavoidable.

(Continued)
Bronchoalveolar Lavage, continued

**Bronchial Brushing**
Pass the bronchoscope transnasally or transorally in nonintubated patients or via the endotracheal tube in intubated patients. Insert a telescoping double catheter plugged with polyethylene glycol at the distal end (to prevent contamination of the bronchial brush) through the biopsy channel of the bronchoscope. Once the brushing is obtained, cut off the brush end and send it to the laboratory in physiological saline. Send to laboratory immediately. Refrigerate if delay is unavoidable.

**Volume**

**Container**
Well-constructed, sterile container with secure lid and sealed plastic bag

**Specimen Handling**

<table>
<thead>
<tr>
<th>Collection from a Patient at Fred Hutchinson Cancer Center Ambulatory Clinic</th>
</tr>
</thead>
<tbody>
<tr>
<td>▶ Notify Fred Hutchinson Cancer Center Pathology in advance of procedure by calling 606-1355. Outside normal business hours contact the on-call Pathology Technologist at 573-0892.</td>
</tr>
<tr>
<td>▶ Pathology specimens should be sent immediately, unfixed, and at ambient temperature to the Fred Hutchinson Cancer Center Pathology Laboratory.</td>
</tr>
<tr>
<td>▶ Pulmonary physicians will divide the specimen for Microbiology and Virology culture.</td>
</tr>
<tr>
<td>▶ Specimens for culture should be delivered to the Alliance Laboratory for transport to the Microbiology and Virology Labs.</td>
</tr>
<tr>
<td>▶ Specimen delivered by courier to Fred Hutchinson Cancer Center Pathology (G7-910)</td>
</tr>
<tr>
<td>▶ Fred Hutchinson Cancer Center Histology Tech accesses the specimen in the computer immediately. If there is a need to evaluate the specimen for malignancy it will be sent to Harborview Medical Center Cytology.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Collection from a Patient at UWMC for infection</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>7am to 4:30pm Mon – Fri</strong> Business Hours</td>
</tr>
<tr>
<td>▶ Call the Fred Hutchinson Cancer Center Pathology Department <strong>IN ADVANCE</strong> at 606-1355. Call the in-house courier at 598-8603 for a STAT pick-up.</td>
</tr>
</tbody>
</table>
**Bronchoalveolar Lavage, continued**

- BAL specimens are routed to Microbiology for dividing and distributed to Pathology and Virology Labs.
- In ADVANCE contact the Fred Hutchinson Cancer Center Pathology Tech at 573-0892
- BAL specimens are routed to Microbiology for dividing and distributed to Pathology and Virology Labs.
- Transport all Pathology specimens in shipping containers at ambient temperature.
- Send to Fred Hutchinson Cancer Center Pathology Lab, Room G7-910.
- Call Fred Hutchinson Cancer Center Pathology Tech and tell them the specimen is being shipped.
- Specimen delivered by courier to Fred Hutchinson Cancer Center Pathology (G7-910)

---

**Collection on a Patient at UWMC for malignancy**

- Specimen delivered by UWMC courier or Pulmonary staff to UWMC Pathology (EC 239)
- UWMC Histology Tech accessions the specimen in the computer and sends the specimen to Harborview Medical Center for processing.

---

**Causes for Rejection**

Delayed delivery of fresh specimens, misidentified specimens and requisitions, insufficient pertinent clinical history.
ENDOSCOPY

**Test includes**
Gross and microscopic exam with diagnosis

**Lab**
Fred Hutchinson Cancer Center Pathology, Room G7-910

**Request Form**
Surgical Pathology Order or Anatomic Pathology Specimen Request Form
Complete a Lab Medicine Microbiology and/or Virology Request if ordered. Fill out completely, including ICD codes
For Fred Hutchinson Cancer Center Ambulatory Clinic, a CPOE requisition will be generated for those lab tests requiring a requisition form.

**Phone**
606-1355

**Availability**
Monday 9:00am – 6:30pm
Tuesday-Friday 6:00am – 6:30pm
Saturday 6:00am – 2:30pm
Sundays and all other times, if STAT processing is required, contact the on-call Pathology Technologist at 573-0982.

**Turnaround Time**
If specimen is placed in fixative by 1pm and delivered to Fred Hutchinson Cancer Center Pathology by 3pm, results will be provided the second business day.
If the time frame is not met, results are provided on the third business day. Holidays may extend result times.

**Container**
Well-constructed container with 10% buffered formalin fixative with secure lid and sealed plastic bag.

**Specimen Handling**

<table>
<thead>
<tr>
<th>Collection on a Patient at Fred Hutchinson Cancer Center Ambulatory Clinic</th>
</tr>
</thead>
<tbody>
<tr>
<td>▶ Place biopsies for morphology in 10% Buffered formalin, noting on the bottle the date and time of placement in the fixative.</td>
</tr>
<tr>
<td>▶ Deliver to Fred Hutchinson Cancer Center Pathology.</td>
</tr>
<tr>
<td>▶ Biopsies for culture should be placed in transport media and taken to the Alliance Laboratory for transport to the Microbiology and Virology Labs.</td>
</tr>
</tbody>
</table>

(Continued)
### Collection on a HSCT Patient at UWMC

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>7am to 4:30pm Mon – Fri</strong></td>
<td><strong>Business Hours</strong></td>
</tr>
<tr>
<td></td>
<td>▶ Tissue for culture should be sent directly from the procedure room to UWMC Microbiology and/or Virology.</td>
</tr>
<tr>
<td></td>
<td>▶ Place Pathology specimens in 10% buffered formalin fixative.</td>
</tr>
<tr>
<td></td>
<td>▶ Package specimen for transport. Transport all Pathology specimens in shipping containers at ambient temperature.</td>
</tr>
<tr>
<td></td>
<td>▶ Send to Fred Hutchinson Cancer Center Pathology Lab, Room G7-910.</td>
</tr>
<tr>
<td></td>
<td>▶ Use a courier to transport the package to the commodities box.</td>
</tr>
<tr>
<td><strong>4:30pm to 7am Mon – Fri</strong></td>
<td><strong>Weekends &amp; Holidays</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Saturdays</strong> follow the procedure below except between 6am to 2pm**</td>
</tr>
<tr>
<td></td>
<td>During these hours notify the Saturday Tech in the Fred Hutchinson Cancer Center Pathology Department at 606-1355</td>
</tr>
<tr>
<td></td>
<td>▶ In ADVANCE contact the Fred Hutchinson Cancer Center Pathology Tech at 573-0892</td>
</tr>
<tr>
<td></td>
<td>▶ Tissue for culture should be sent directly from the procedure room to UWMC Microbiology and/or Virology.</td>
</tr>
<tr>
<td></td>
<td>▶ Specimens are sent by the floor via Delivery Express to the Pathology Department at the Fred Hutchinson Cancer Center, Room G7-910</td>
</tr>
<tr>
<td></td>
<td><strong>After hours: do not send the specimen to UWMC Pathology Department.</strong></td>
</tr>
</tbody>
</table>

### Collection of Fred Hutchinson Cancer Center GenOnc/Heme or UWMC Patients at UWMC

- Specimen in 10% buffered formalin fixative delivered by UWMC courier or Pulmonary staff to UWMC Pathology (EC 239).

### Causes for Rejection

- Improper handling, misidentified specimens, and requisitions
FINE NEEDLE ASPIRATIONS

Related Terms
FNAs

Test Includes
Gross and microscopic exam with diagnosis

Lab
Harborview Cytology

Request Form
University of Washington Medical Centers/Harborview Medical Center Cytology Request. Fill out completely, including ICD codes. For Fred Hutchinson Cancer Center Ambulatory Clinic, a CPOE requisition will be generated for those lab tests requiring a requisition form.

Phone
Harborview Cytology 744-4279

Availability
Monday – Friday 8am – 5pm

Specimen Collection
Fine Needle Aspirate (FNA)
For deep aspirates, sterile technique is required for cleansing of the skin and local anesthetic is usually required. A quick motion should be used in passing the needle through the skin. The needle is then advanced through the subcutaneous tissue into the mass. With the needle in the mass, the needle tip should be moved in short motions initially to loosen cells within the mass. Negative pressure is then applied by pulling back on the plunger of the syringe. If blood or material appears in the hub of the needle, the aspiration should be stopped. Prior to withdrawing the needle, negative pressure must be released to prevent suction of the material into the barrel of the syringe when the needle exits the skin. The fluid may be used to prepare smears. These slides should be immediately fixed in 95% ethanol. The fluid may also be deposited into the vial of CytoLyt solution.

(Continued)
Fine Needle Aspirations, continued

**Specimen Handling**

<table>
<thead>
<tr>
<th>Collection at Fred Hutchinson Cancer Center Ambulatory Clinic</th>
</tr>
</thead>
<tbody>
<tr>
<td>▶ Deliver the specimen to Fred Hutchinson Cancer Center Pathology.</td>
</tr>
<tr>
<td>▶ Fred Hutchinson Cancer Center Pathology Tech will accession the specimen. It will be sent via courier to Harborview Cytology.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Collection on a HSCT Patient at UWMC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>7am to 4:30pm Mon – Fri</strong>&lt;br&gt;Business Hours</td>
</tr>
<tr>
<td>▶ Immediately deliver Pathology specimens to UWMC Pathology</td>
</tr>
<tr>
<td>▶ All FNAs will be sent to Harborview Cytology for processing.</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

**Causes for Rejection**  Improper handling, misidentified specimens, and requisitions
LIP OR SKIN BIOPSY

**Test Includes**
- Gross and microscopic exam with diagnosis

**Lab**
- Fred Hutchinson Cancer Center Pathology, Room G7-910

**Request Form**
- Surgical Pathology Order or Anatomic Pathology Specimen Request Form
- Complete a Lab Medicine Microbiology and/or Virology Request if ordered
- Fill out completely, including ICD codes
- For Fred Hutchinson Cancer Center Ambulatory Clinic, a CPOE requisition will be generated for those lab tests requiring a requisition form.

**Phone**
- 606-1355

**Availability**
- Monday 9:00am – 6:30pm
- Tuesday – Friday 6:00am – 6:30pm
- Saturday 6:00am – 2:30pm

Sundays and all other times, if STAT processing is required, contact the on-call Pathology Technologist at 573-0892

**Turnaround Time**
- If specimen is placed in fixative by 1pm and delivered to Fred Hutchinson Cancer Center Pathology by 3pm, results will be provided the second business day.
- If the time frame is not met, results are provided on the third business day. Holidays may extend result times.

**Container**
- Container with 10% buffered formalin

**Specimen Handling**

<table>
<thead>
<tr>
<th>Collection at Fred Hutchinson Cancer Center Ambulatory Clinic</th>
</tr>
</thead>
<tbody>
<tr>
<td>▶ If Microbiology and/or Virology culture or fibroblast expansion for genetic testing is requested, place fresh specimen in appropriate transport media: do NOT use formalin.</td>
</tr>
<tr>
<td>▶ Specimens for culture should be delivered to the Alliance Laboratory for transport to the appropriate lab (Microbiology, Virology Labs or Cytogenetics Lab).</td>
</tr>
<tr>
<td>▶ Pathology specimens should be placed immediately to 10% buffered formalin at ambient temperature and sent to the Fred Hutchinson Cancer Center Pathology laboratory.</td>
</tr>
</tbody>
</table>

(Continued)
### Collection on a HSCT Patient at UWMC

<table>
<thead>
<tr>
<th>7am to 4:30pm Mon – Fri</th>
<th>4:30pm to 7am Mon – Fri</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Business Hours</strong></td>
<td><strong>Weekends &amp; Holidays</strong></td>
</tr>
<tr>
<td>▶ If fungal or bacterial infection is suspected, fresh tissue for culture should be sent directly from the procedure room to UWMC Microbiology and/or Virology.</td>
<td><strong>Saturdays</strong> follow the procedure below except between 6am to 2pm</td>
</tr>
<tr>
<td>▶ Place specimens in 10% buffered formalin and deliver to UWMC Pathology (EC 239) for routing to Fred Hutchinson Cancer Center Pathology Lab</td>
<td>During these hours notify the Saturday Tech in the Fred Hutchinson Cancer Center Pathology Department at 606-1355</td>
</tr>
<tr>
<td>▶ Package specimen for transport. Transport all Pathology specimens in shipping containers at ambient temperature.</td>
<td>▶ In ADVANCE contact the Fred Hutchinson Cancer Center Pathology Tech at 573-0892</td>
</tr>
<tr>
<td>▶ Send to Fred Hutchinson Cancer Center Pathology Lab, Room G7-910.</td>
<td>▶ Place tissue in 10% buffered formalin and deliver from the floor via Delivery Express to the Pathology Department at the Fred Hutchinson Cancer Center, Room G7-910.</td>
</tr>
<tr>
<td>▶ Call Fred Hutchinson Cancer Center Pathology Tech and tell them the specimen is being shipped.</td>
<td><strong>After hours: do not send the specimen to UWMC Pathology Department.</strong></td>
</tr>
<tr>
<td>▶ Business hours: Use a courier to transport the package to the commodities box.</td>
<td></td>
</tr>
</tbody>
</table>

### Collection of Fred Hutchinson Cancer Center GenOnc/Heme or UWMC Patients at UWMC

- Specimen in 10% formalin delivered to UWMC Pathology (EC 239)
- UWMC Histology Tech accesses the specimen in the computer for processing at UWMC Anatomic Pathology.

### Causes for Rejection
Improper handling, misidentified specimens, and requisitions
LIVER BIOPSY

Test Includes
Gross and microscopic exam with diagnosis

Lab
Fred Hutchinson Cancer Center Pathology, Room G7-910

Request Form
Surgical Pathology Order or Anatomic Pathology Specimen Request Form
Complete a Lab Medicine Microbiology Request and/or Virology Request if ordered

Fill out completely, including ICD codes
For Fred Hutchinson Cancer Center Ambulatory Clinic, a CPOE requisition will be generated for those lab tests requiring a requisition form.

Phone 606-1355

Availability
Monday 9:00am – 6:30pm
Tuesday- Friday 6:00am – 6:30pm
Saturday 6:00am to 2:30pm

Sundays and all other times, if STAT processing is required, contact the on-call Pathology Technologist at 573-0892.

Turnaround Time
For specimens received in Fred Hutchinson Cancer Center Pathology by 3pm, results will be provided the second business day. If the time frame is not met, results are provided on the third business day.

Container
Submit specimens for culture in a sterile container with secure lid.
Biopsies for morphology are placed in 10% buffered formalin.

(Continued)
Liver Biopsy, continued

**Specimen Handling**

<table>
<thead>
<tr>
<th>Collection on a HSCT Patient at UWMC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>7am to 4:30pm Mon – Fri</strong></td>
</tr>
<tr>
<td><strong>Business Hours</strong></td>
</tr>
<tr>
<td>▶ IN ADVANCE call the Fred Hutchinson</td>
</tr>
<tr>
<td>Cancer Center Pathology Department at</td>
</tr>
<tr>
<td>606-1355. Call the in-house courier at</td>
</tr>
<tr>
<td>598-8603 for a STAT pick-up.</td>
</tr>
<tr>
<td>▶ Place specimens in 10% buffered</td>
</tr>
<tr>
<td>formalin fixative and deliver to</td>
</tr>
<tr>
<td>UWMC Pathology (EC 239) immediately</td>
</tr>
<tr>
<td>for routing to Fred Hutchinson</td>
</tr>
<tr>
<td>Cancer Center Pathology Lab.</td>
</tr>
<tr>
<td>▶ If fulminant viral hepatitis or an</td>
</tr>
<tr>
<td>infectious abscess is suspected,</td>
</tr>
<tr>
<td>tissue for culture should be sent</td>
</tr>
<tr>
<td>directly from the procedure room to</td>
</tr>
<tr>
<td>UWMC Microbiology and/or Virology.</td>
</tr>
<tr>
<td>▶ Package specimen for transport.</td>
</tr>
<tr>
<td>Transport all Pathology specimens in</td>
</tr>
<tr>
<td>shipping containers at ambient</td>
</tr>
<tr>
<td>temperature.</td>
</tr>
<tr>
<td>▶ Send to Fred Hutchinson Cancer</td>
</tr>
<tr>
<td>Center Pathology Lab, Room G7-910.</td>
</tr>
<tr>
<td>▶ Call Fred Hutchinson Cancer</td>
</tr>
<tr>
<td>Center Pathology Tech and tell them</td>
</tr>
<tr>
<td>the specimen is being shipped.</td>
</tr>
<tr>
<td>▶ Have a courier transport the</td>
</tr>
<tr>
<td>package to the commodities box.</td>
</tr>
<tr>
<td><strong>4:30pm to 7am Mon – Fri</strong></td>
</tr>
<tr>
<td><strong>Weekends &amp; Holidays</strong></td>
</tr>
<tr>
<td><strong>Saturdays</strong> follow the procedure</td>
</tr>
<tr>
<td>below except between 7:30am to 6pm</td>
</tr>
<tr>
<td>During these hours notify the</td>
</tr>
<tr>
<td>Saturday Tech in the Fred</td>
</tr>
<tr>
<td>Hutchinson Cancer Center Pathology</td>
</tr>
<tr>
<td>Department at 606-1355.</td>
</tr>
<tr>
<td>▶ In ADVANCE contact the Fred</td>
</tr>
<tr>
<td>Hutchinson Cancer Center Pathology</td>
</tr>
<tr>
<td>Tech at 573-0892.</td>
</tr>
<tr>
<td>▶ Place pathology specimens in 10%</td>
</tr>
<tr>
<td>buffered formalin fixative.</td>
</tr>
<tr>
<td>▶ Specimens are sent from the floor</td>
</tr>
<tr>
<td>via Delivery Express to the Pathology</td>
</tr>
<tr>
<td>Department at the Fred Hutchinson</td>
</tr>
<tr>
<td>Cancer Center, Room G7-910.</td>
</tr>
<tr>
<td>**After hours: do not send the</td>
</tr>
<tr>
<td>specimen to UWMC Pathology Department.</td>
</tr>
</tbody>
</table>

(Continued)
Liver Biopsy, continued

<table>
<thead>
<tr>
<th>Collection of Fred Hutchinson Cancer Center GenOnc/Heme or UWMC Patients at UWMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Specimen prepared as requested by surgeon.</td>
</tr>
<tr>
<td>• If the procedure is done in the Operating Room, place the specimen in the Operating Room Pathology refrigerator. It will be picked up by UWMC Pathology Tech.</td>
</tr>
<tr>
<td>• If done in Interventional Radiology, specimen delivered by Intervention Radiology staff to UWMC Pathology (EC 239)</td>
</tr>
<tr>
<td>• UWMC Histology Tech accessions the specimen in the computer immediately and sets up for processing at UWMC Anatomic Pathology.</td>
</tr>
</tbody>
</table>

**Causes for Rejection**  Improper handling, misidentified specimens, and requisitions
LUNG BIOPSY

Test Includes
Gross and microscopic exam with diagnosis

Lab
Fred Hutchinson Cancer Center Pathology, Room G7-910

Request Form
Surgical Pathology Order or Anatomic Pathology Specimen Request Form
Fill out completely, including ICD codes
For Fred Hutchinson Cancer Center Ambulatory Clinic, a CPOE requisition will be generated for those lab tests requiring a requisition form.

Phone
606-1355

Availability
Monday 9:00am – 6:30pm
Tuesday – Friday 6:00am – 6:30pm
Saturday 6:00am to 2:30pm

Sundays and all other times, if STAT processing is required, contact the on call Pathology Technologist at 573-0982.

Turnaround Time
If specimen is delivered to Fred Hutchinson Cancer Center Pathology by 3pm, results will be provided the second business day. If the time frame is not met, results are provided the third business day. Holidays may extend result times.

Final results are provided the following business day. Routine and special stains for malignancies and microorganisms will be performed on frozen sections and touch preps.

If intra-operative frozen sections are required for any reason, the entire specimen will be retained by the institution of origin for culture and diagnosis.

Container
Well-constructed sterile container with secure lid and sealed plastic bag

Specimen Handling
Collection on a HSCT Patient at UWMC

<table>
<thead>
<tr>
<th>7am to 4:30pm Mon – Fri Business Hours</th>
<th>4:30pm to 7am Mon – Fri Weekends &amp; Holidays</th>
</tr>
</thead>
<tbody>
<tr>
<td>▶ IN ADVANCE call the Fred Hutchinson Cancer Center Pathology Department at 606-1355. Call the in-house courier at 598-8603 for a STAT pick-up.</td>
<td>Saturdays follow the procedure below except between 6 am to 2pm</td>
</tr>
<tr>
<td>During these hours notify the Saturday Tech in the Fred Hutchinson Cancer Center Pathology Department at 606-1355.</td>
<td></td>
</tr>
</tbody>
</table>

(Continued)
Lung Biopsy, continued

- The entire unfixed and undissected biopsy is placed in a sterile container and brought immediately to the UWMC Pathology lab (EC 239NW) for routing to Fred Hutchinson Cancer Center Pathology Lab.
- Appropriate instructions for specimens to be submitted for culture must accompany the specimen.
- Package specimen for transport. Transport all Pathology specimens in shipping containers at ambient temperature.
- Send to Fred Hutchinson Cancer Center Pathology Lab, Room G7-910.
- Call Fred Hutchinson Cancer Center Pathology Tech and tell them the specimen is being shipped.
- Have a courier transport the package to the commodities box.
- Specimens for culture will be divided and distributed by the Fred Hutchinson Cancer Center Pathology Lab. The Fred Hutchinson Cancer Center Tech will be responsible for completing the correct Lab Requisitions to be sent with the specimens to be submitted for culture.

- In ADVANCE contact the Fred Hutchinson Cancer Center Pathology Tech at 573-0892
- The entire unfixed and undissected biopsy is placed in a sterile container and sent by the floor via Delivery Express to the Pathology Department at the Fred Hutchinson Cancer Center, Room G7-910.
- Appropriate instructions for specimens to be submitted for culture must accompany the specimen.
- Specimens for culture will be divided and distributed by the Fred Hutchinson Cancer Center Pathology Lab. The Fred Hutchinson Cancer Center Tech will be responsible for filling out the correct Lab Requisitions to be sent with the specimens to be submitted for culture.

After hours: do not send the specimen to UWMC Pathology Department.

Collection of Fred Hutchinson Cancer Center GenOnc/Heme or UWMC Patients at UWMC

- Place the specimen in the Operating Room Pathology refrigerator. It will be picked up by UWMC Pathology Tech.
- UWMC Histology Tech accessions the specimen in the computer for processing at UWMC Anatomic Pathology.

Causes for Rejection  Improper handling, misidentified specimens, and requisitions
LYMPH NODE BIOPSY

**Test Includes**
- Gross and microscopic exam with diagnosis

**Lab**
- Fred Hutchinson Cancer Center Pathology, Room G7-910

**Request Form**
- Surgical Pathology Order or Anatomic Pathology Specimen Request Form
- Fill out completely, including ICD codes
- For Fred Hutchinson Cancer Center Ambulatory Clinic, a CPOE requisition will be generated for those lab tests requiring a requisition form.

**Phone**
- 606-1355

**Availability**
- Monday 9:00am – 6:30pm
- Tuesday – Friday 6:00am – 6:30pm
- Saturday 6:00am – 2:30pm

Sundays and all other times, if STAT processing is required, contact the on-call Pathology Technologist at 573-0892.

**Turnaround Time**
- Specimens received in Fred Hutchinson Cancer Center Pathology by 3pm will have results provided the second business day. If time frame is not met results are provided on the third business day. Holidays may extend result times.

**Container**
- Well-constructed, sterile container with secure lid and sealed plastic bag

**Specimen Handling**
- In advance of procedure, notify Fred Hutchinson Cancer Center Pathology

<table>
<thead>
<tr>
<th>7am to 4:30pm Mon – Fri</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Business Hours</strong></td>
</tr>
<tr>
<td>▶ IN ADVANCE call the Fred Hutchinson Cancer Center Pathology Department at 606-1355. Call the in-house courier at 598-8603 for a STAT pick-up.</td>
</tr>
</tbody>
</table>

(Continued)
**Lymph Node Biopsy, continued**

- Place **entire biopsy** in a sterile container and keep moist with a sterile gauze pad soaked with sterile, non-bacteriostatic saline. Transport specimen container **immediately** to UWMC Pathology (EC 239NW) for routing to Fred Hutchinson Cancer Center Pathology.
- Specimens for lymphoma or LN Adenopathy will have touch preps made and portions of the tissue placed in RPMI for flow cytometry by UWMC Pathology.
- Transport all Pathology specimens in shipping containers at ambient temperature.
- Send to Fred Hutchinson Cancer Center Pathology Lab, Room G7-910.
- Call Fred Hutchinson Cancer Center Pathology Tech and tell them the specimen is being shipped.
- Have a courier transport the package to the commodities box.

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**Collection at Fred Hutchinson Cancer Center Ambulatory Clinic**

- If Microbiology and/or Virology culture is requested, place fresh specimen in appropriate transport media and deliver to the Alliance Laboratory.
- Specimens for flow cytometry should be placed in RPMI and sent to UWMC Hematopathology.
- Pathology specimens should be placed immediately in 10% buffered formalin at ambient temperature and sent to the Fred Hutchinson Cancer Center Pathology Laboratory.

**Causes for Rejection** Improper handling, misidentified specimens, and requisitions
THINPREP® PAP TEST COLLECTION

Test includes
Microscopic exam with diagnosis
Lab
HMC Cytology
Request Form
Cytology Request Form
Fill out completely, including ICD codes
Post CPOE go-live for Fred Hutchinson Cancer Center Ambulatory Clinic, for those lab tests requiring a requisition form, a CPOE requisition will be generated.

Phone
744-2166
Availability
Monday – Friday 8am – 5pm
Turnaround Time
If specimen is delivered to Fred Hutchinson Cancer Center Pathology by 10am, it is sent to HMC Cytology the same day. If it is not received by 10am, it is sent to HMC Cytology the next business day. Samples are screened the next business day after receipt.

Container
Vial containing PreservCyt® Solution.
Specimen Collection
Label a PreservCyt® vial with patient’s name and medical record number.

With patient in lithotomy position, expose cervix using a vaginal speculum moistened with warm water. Visually examine vaginal mucosa and cervix for lesions, ulceration, or discharge. Document findings of the examination on patient’s record and note the relevant clinical findings on the requisition for optimum cytological interpretation.

To collect a specimen from the ectocervix, select contoured end of plastic spatula and rotate it 360° around the entire ectocervical surface. Remove spatula.

Rinse the contoured end of plastic spatula in a vial of PreservCyt® Solution by swirling vigorously ten (10) times. Discard plastic spatula. Place cap on vial.

(Continued)
Thinprep PAP Test, continued

Insert Cytobrush® Plus GT device into the endocervix until only the bottom-most bristles are exposed. Slowly rotate ¼ to ½ turn in one direction. Remove device. Do not over-rotate. Additional rotating may cause bleeding and contaminate the specimen.

Rinse the Cytobrush® Plus GT device in the vial of PreservCyt® Solution by rotating the device in the solution ten (10) times while pushing it against the wall of the vial. Swirl the device vigorously to further release the material. Discard device.

Tighten the PreservCyt® vial cap so that the torque line on the cap passes the torque line on the vial.

Specimen Handling

<table>
<thead>
<tr>
<th>Collection at Fred Hutchinson Cancer Center Ambulatory Clinic</th>
</tr>
</thead>
<tbody>
<tr>
<td>▶ Deliver the specimen to Fred Hutchinson Cancer Center Pathology by 10am for delivery to HMC Cytology the same day</td>
</tr>
<tr>
<td>▶ Fred Hutchinson Cancer Center pathology Laboratory will package and transport to HMC Cytology department.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Collection at UWMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>▶ Deliver the specimen to UWMC Anatomic Pathology</td>
</tr>
<tr>
<td>▶ UWMC Anatomic Pathology will accession and transport to HMC Cytology department.</td>
</tr>
</tbody>
</table>

Causes for Rejection  Improper handling, misidentified specimens, and requisitions
# SINUS BIOPSY OR ASPIRATE

**Test Includes**
Gross and microscopic exam with diagnosis.

**Lab**
Fred Hutchinson Cancer Center Pathology, Room G7-910

**Request Form**
Surgical Pathology Order or Anatomic Pathology Specimen Request Form
Fill out completely, including ICD codes
For Fred Hutchinson Cancer Center Ambulatory Clinic, a CPOE requisition will be generated for those lab tests requiring a requisition form.

**Phone**
606-1355

**Availability**
Monday 9:00am – 6:30pm
Tuesday – Friday 6:00am – 6:30pm
Saturday 6:00am – 2:30pm

Sundays and all other times, if STAT processing is required, contact the on-call Pathology Technologist at 573-0892.

**Turnaround Time**
If specimen is delivered to Fred Hutchinson Cancer Center Pathology by 3pm, results will be provided the second business day. If the time frame is not met, results are provided the third business day. Holidays may extend result times.

**Specimen Container**
Sinus biopsy or sinus aspirate removed for diagnostic interpretation
Well-constructed sterile container with secure lid and sealed plastic bag

**Specimen Handling**

<table>
<thead>
<tr>
<th>Collection on a HSCT Patient at UWMC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>7am to 4:30pm Mon – Fri</strong></td>
</tr>
<tr>
<td><strong>Business Hours</strong></td>
</tr>
</tbody>
</table>

▶ IN ADVANCE call the Fred Hutchinson Cancer Center Pathology Department at 606-1355. Call the in-house courier at 598-8603 for a STAT pick-up.

**Saturdays** follow the procedure below except between 6am to 2 pm

During these hours notify the Saturday Tech in the Fred Hutchinson Cancer Center Pathology Department at 606-1355.
Sinus Biopsy, continued

- Place entire biopsy in a sterile container and keep moist with a sterile gauze pad soaked with sterile, non-bacteriostatic saline.
- Place entire aspirate in a sterile container.
- Specimen will be divided in Fred Hutchinson Cancer Center Pathology and distributed to appropriate labs. The Fred Hutchinson Cancer Center Tech will be responsible for completing the correct Lab Requisitions sent with the specimens to be submitted for culture.
- Deliver Pathology specimens to UWMC Pathology (EC 239) for routing of specimens to Fred Hutchinson Cancer Center Pathology Lab.
- Package specimen for transport.
- Transport all Pathology specimens in shipping containers at ambient temperature.
- Send to Fred Hutchinson Cancer Center Pathology Lab, Room G7-910.
- Call Fred Hutchinson Cancer Center Pathology Tech and tell them the specimen is being sent.
- Use a courier to transport the package to the commodities box.

- In ADVANCE contact the Fred Hutchinson Cancer Center Pathology Tech at 573-0892
- Place entire biopsy in a sterile container and keep moist with a sterile gauze pad soaked with sterile, non-bacteriostatic saline.
- Place entire aspirate in a sterile container.

After hours: do not send the specimen to UWMC Pathology Department.

Collection of Fred Hutchinson Cancer Center GenOnc/Heme or UWMC Patients at UWMC

- Operating Room delivers specimen to Operating Room Pathology refrigerator.
- UWMC Histology Tech accesses the specimen in the computer immediately and sets up for processing at UWMC Anatomic Pathology.

Causes for Rejection

Delayed delivery of fresh specimens, misidentified specimens and requisitions, insufficient pertinent clinical history
SURGICAL SPECIMENS

Surgical Specimens: Specimens not specifically described in the Specimen Handling Procedure Manual, e.g., spleen, kidney, thoracentesis, laparoscopy.

Test Includes: Gross and microscopic exam with diagnosis

Lab: Fred Hutchinson Cancer Center Pathology, Room G7-910

Request Form: Surgical Pathology Order or Anatomic Pathology Specimen Request Form

Fill out completely, including ICD codes

For Fred Hutchinson Cancer Center Ambulatory Clinic, a CPOE requisition will be generated for those lab tests requiring a requisition form.

Phone: 606-1355

Availability:
- Monday 9:00am – 6:30pm
- Tuesday – Friday 6:00am – 6:30pm
- Saturday 6:00am – 2:30pm
- Sundays and all other times if STAT processing is required, contact the on-call Pathology Technologist at 573-0892.

Turnaround Time: For specimens received in Fred Hutchinson Cancer Center Pathology by 3pm, results will be provided the second business day. If the timeframe is not met, results are provided on the third business day. Holidays may extend result times. If intra-operative frozen sections are required for any reason, the entire specimen will be retained by the institution of origin for culture and diagnosis.

Container: See below.

Specimen Handling: The type of container, transport temperature, appropriate transport media, fixative, or other handling details should be determined prior to specimen collection by consulting the appropriate Pathology Laboratory, the on-call Path Tech, or Pathologist.

(Continued)
### Collection on a HSCT Patient at UWMC

<table>
<thead>
<tr>
<th>7am to 4:30pm Mon – Fri</th>
<th>4:30pm to 7am Mon – Fri</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Business Hours</strong></td>
<td><strong>Weekends &amp; Holidays</strong></td>
</tr>
<tr>
<td>▶ IN ADVANCE call the Fred Hutchinson Cancer Center Pathology Department at 606-1355 Call the in-house courier at 598-8603 for a STAT pick-up.</td>
<td>Saturdays follow the procedure below except between 6am to 2pm</td>
</tr>
<tr>
<td>▶ Deliver Specimens to UWMC Pathology (EC 239NW) for routing of specimens to Fred Hutchinson Cancer Center Pathology.</td>
<td>During these hours notify the Saturday Tech in the Fred Hutchinson Cancer Center Pathology Department at 606-1355</td>
</tr>
<tr>
<td>▶ Fred Hutchinson Cancer Center Pathology will divide and route specimens to appropriate labs per protocol.</td>
<td>▶ In ADVANCE contact the Fred Hutchinson Cancer Center Pathology Tech at 573-0892</td>
</tr>
<tr>
<td>▶ The Fred Hutchinson Cancer Center Tech will be responsible for completing the appropriate Lab Requisitions sent with the specimens to be submitted for culture.</td>
<td>▶ Fred Hutchinson Cancer Center Pathology will divide and route specimens to appropriate labs per protocol.</td>
</tr>
<tr>
<td>▶ Transport all Pathology specimens in shipping containers at ambient temperature.</td>
<td>▶ The Fred Hutchinson Cancer Center Tech will be responsible for completing the appropriate Lab Requisitions sent with the specimens to be submitted for culture.</td>
</tr>
<tr>
<td>▶ Send to Fred Hutchinson Cancer Center Pathology Lab, Room G7-910.</td>
<td>▶ Specimens are sent by the floor via cab to the Pathology Department at the Fred Hutchinson Cancer Center, Room G7-910.</td>
</tr>
<tr>
<td>▶ Call Fred Hutchinson Cancer Center Pathology Tech and tell them the specimen is being shipped.</td>
<td>After hours: do not send the specimen to UWMC Pathology Department.</td>
</tr>
<tr>
<td>▶ Have a courier transport the package to the commodities box.</td>
<td></td>
</tr>
</tbody>
</table>

### Collection of Fred Hutchinson Cancer Center GenOnc/Heme or UWMC Patients at UWMC

- Place the specimen in the Operating Room Pathology refrigerator. It will be picked up by UWMC Pathology Tech.
- UWMC Histology Tech accesses the specimen in the computer for processing at UWMC Anatomic Pathology.

### Causes for Rejection

Improper handling, misidentified specimens, and requisitions
OTHER FLUID SPECIMENS

**Other Fluids**
Specimens not specifically described in the Specimen Handling Procedure Manual, e.g., CSF, Urine.

**Test Includes**
Gross and microscopic exam with diagnosis

**Lab**
Specimens processed by Harborview Cytology

**Request Form**
University of Washington Medical Centers/Harborview Medical Center Cytology Request. Fill out completely, including ICD codes. For Fred Hutchinson Cancer Center Ambulatory Clinic, a CPOE requisition will be generated for those lab tests requiring a requisition form.

**Phone**
Harborview Cytology 744-2166

**Availability**
Monday – Friday 8am – 5pm

**Specimen Collection**
All specimen containers must be labeled with patient name and medical record number or birthdate. They must be accompanied by a completed requisition.

Please note that the following collection procedures are a suggested guideline. Techniques vary based on personal preference, and specific clinical circumstances must be taken into account when deciding on the collection method utilized.

**Cerebrospinal Fluid (CSF)**
A lumbar puncture is performed with the patient either lying down with knees bent or sitting. After the back is cleaned, an anesthetic is injected into the lower spine. Once the spinal needle is inserted, spinal fluid pressure is measured, and fluid collected. The fresh fluid is highly perishable. Minimum volume needed is 1 ml. Send to laboratory immediately. Refrigerate if delay is unavoidable.

**Sputum**
Have the patient cough deeply to expectorate sputum directly into the sterile container. Do not contaminate the rim of the container with sputum. Do NOT include any saliva or postnasal discharge. Three consecutive early morning specimens increase the yield of cells. Send to laboratory immediately. Refrigerate if delay is unavoidable.

(Continued)
Other Fluid Specimens, continued

Body Cavity Fluids

Clean and disinfect the needle puncture site to prevent introduction of infection. The physician will aseptically perform percutaneous aspiration to obtain pleural, pericardial, peritoneal, or synovial fluids. Expel any air bubbles from the syringe, and immediately inject the specimen into sterile container. Add 0.5 ml EDTA to the container for each 100 ml collected.

Urine (voided)

First morning urine specimen should not be sent for cytological studies (since the first morning urine is usually made up of degenerative exfoliated cell materials and concentrated urine waste products, which obscure the cellular detail). At least 100 ml of “clean catch” urine is required for cytology. In cases with residual urine problems or with severe urethritis or vaginitis, the urine should be obtained by catheterization. Send to laboratory immediately. Refrigerate if delay is unavoidable.

Urine (catheterized)

This specimen is collected under sterile conditions by passing a hollow tube through the urethra into the bladder. Send to laboratory immediately. Refrigerate if delay is unavoidable.

Bladder Washing

Bladder washing samples are taken by placing a balanced salt solution into the bladder through a catheter (tube) and then removing the solution for microscopic testing. Collect into a sterile container. Send to laboratory immediately. Refrigerate if delay is unavoidable. If delay is more than 24 hours, add an equal volume of 50% ethanol.

Specimen Handling

<table>
<thead>
<tr>
<th>Collection on a HSCT Patient at Fred Hutchinson Cancer Center Ambulatory Clinic</th>
</tr>
</thead>
<tbody>
<tr>
<td>▶ Deliver the specimen to Fred Hutchinson Cancer Center Pathology.</td>
</tr>
<tr>
<td>▶ A Fred Hutchinson Cancer Center Pathology Technician will accession all of these specimens. They will be sent via cab to Harborview Cytology</td>
</tr>
</tbody>
</table>

(Continued)
Other Fluid Specimens, continued

Collection on a HSCT Patient at UWMC

<table>
<thead>
<tr>
<th>7am to 4:30pm Mon – Fri Business Hours</th>
<th>4:30pm to 7am Mon – Fri Saturdays, Sundays, and Holidays</th>
</tr>
</thead>
<tbody>
<tr>
<td>Follow collection guidelines above.</td>
<td>In ADVANCE page UWMC on-call Histology Tech (663-8098).</td>
</tr>
<tr>
<td>Immediately deliver Pathology specimens to UWMC Pathology.</td>
<td>Follow collection guidelines above.</td>
</tr>
<tr>
<td>Fluid specimens will be sent to Harborview Cytology for processing.</td>
<td>Immediately deliver Pathology specimens to UWMC Pathology.</td>
</tr>
<tr>
<td></td>
<td>Fluid specimens will be sent by UWMC Pathology to Harborview Cytology</td>
</tr>
</tbody>
</table>

Causes for Rejection  Improper handling, misidentified specimens, and requisitions.
SURGICAL SPECIMENS
Collected at FHCC Ambulatory Clinic

**Surgical Specimens**
Specimens collected at Fred Hutchinson Cancer Center Ambulatory Clinic not specifically described in the Specimen Collection and Handling Manual

**Test Includes**
Gross and microscopic exam with diagnosis

**Lab**
Fred Hutchinson Cancer Center Pathology, Room G7-910

**Request Form**
Surgical Pathology Order or Anatomic Pathology Specimen Request Form
Fill out completely, including ICD codes
For Fred Hutchinson Cancer Center Ambulatory Clinic, a CPOE requisition will be generated for those lab tests requiring a requisition form.

**Phone**
606-1355

**Availability**
Monday 9:00 am – 6:30 pm
Tuesday – Friday 6:00 am – 6:30 pm
Saturday 6:00 am – 2:30 pm
Sundays and all other times, if STAT processing is required, contact the on-call Pathology Technologist at 573-0892.

**Turnaround Time**
For specimens received in Fred Hutchinson Cancer Center Pathology by 3pm, results will be provided the second business day. If the time frame is not met, results are provided on the third business day. Holidays may extend result times.

**Container**
See below

**Specimen Handling**
The type of container, transport temperature, appropriate transport media, fixative, or other handling details should be determined prior to specimen collection by consulting the appropriate Pathology Laboratory, the on-call Path Tech, or Pathologist.

<table>
<thead>
<tr>
<th>Collection at Fred Hutchinson Cancer Center Ambulatory Clinic</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>7am to 4:30pm Mon – Fri</strong></td>
</tr>
<tr>
<td><strong>Business Hours</strong></td>
</tr>
<tr>
<td>▶ Internal courier delivers the specimen to Fred Hutchinson Cancer Center Pathology</td>
</tr>
<tr>
<td>▶ If the specimen is from a HSCT or Heme-Onc patient, Fred Hutchinson Cancer Center Path Tech accession the specimen in the computer for processing at Fred Hutchinson Cancer Center Pathology</td>
</tr>
<tr>
<td>▶ If the specimen is from a solid tumor patient, the Fred Hutchinson Cancer Center Path Tech accession the specimen in the computer for transport to UWMC Pathology Lab, Room EC 239NW.</td>
</tr>
</tbody>
</table>
Business hours – Use courier to transport package to commodities box.

**Causes for Rejection**  Improper handling, misidentified specimens, and requisitions
## THERAPEUTIC DRUG MONITORING OF BUSULFAN

**Test includes**
- AUC (mg x h/L) result and dose recommendations
  - (mg every 6, 8, 12 or every 24 hours)

**Lab Request Form**
- Pharmacokinetics, 188 E. Blaine, Suite 250
- Busulfan Requisition Form *(available on UWMC-7NE, 8NE, and Fred Hutchinson Cancer Center outpatient blood draw area)*
- Fill out completely, including ICD codes, actual time of the draw, infusion start and stop time, date of dose, dose amount given, and time given.
- For Fred Hutchinson Cancer Center Ambulatory Clinic, a CPOE requisition will be generated for those lab tests requiring a requisition form.

**Phone**
- 206-606-7389

**Availability**
- Tuesday – Saturday, 8am – 5pm
- Sundays, Mondays, and Holidays: ON CALL

**Turnaround Time**
- If the dose is given before or at the standard time of 8am, results available between 4pm and 5pm on the same day
- Blood (only plasma is analyzed)
- 1-3 mL oral, 1-4 mL IV formulation

**Specimen**
- Green Top 4 mL sodium heparin Vacutainer® tube

**Collection**
- The following patient information must be recorded on the requisition form: busulfan dose given (mg), and the date and time it was given.
- Label tubes with patient name, U#, date, the actual time of blood draw, initials of the person drawing the blood, and record this information on the requisition form. Place samples on wet ice within 10 minutes and deliver immediately to Alliance Laboratory (G1-500) for pick-up.
- Note: Special contracted courier service will pick up samples on 7 or 8 NE if the patient is an inpatient at the UW Medical Center.

*(Continued)*
Therapeutic Drug Monitoring of Busulfan, continued

Oral Busulfan every 6 hours

Collect 1-3 mL of whole blood at the following post dose times in minutes for **dose 1:** 15 (suspension only), 30, 60, 90, 120, 180, 240, 300, 360.

Collect 1-3 mL of whole blood at the following times for **doses 5 and 9:** 0 (immediately prior to dose), 30, 60, 120, 240, 360.

Note: If there was emesis during the dose or previous doses, have the amount of busulfan given as a redose.

IV Busulfan every 6 hours

Collect 1-4 mL of whole blood at the following post-dose times in minutes for **dose 1:** End of infusion (120), 135, 150, 240, 300, 360.

Collect 1-4 mL of whole blood at the following times for **doses 5 and 9:** 0 (immediately prior to dose), end of infusion (120), 135, 240, 300, 360.

Be sure the entire drug has been delivered, and the lines have been flushed thoroughly of busulfan before drawing the post-infusion sample.

IV Busulfan every 24 hours

Collect 1-4 mL of whole blood at the following post-dose times in minutes for **dose 1:** End of infusion (180), 195, 240, 300, 360, 480.

Collect 1-4 mL of whole blood at the following times for **doses 2 and 3:** 0 (immediately prior to dose), end of infusion (180), 195, 240, 360, 480.

Be sure the entire drug has been delivered, and the lines have been flushed thoroughly of busulfan before drawing the post-infusion sample.

**Causes for Rejection**

Misidentified specimens and requisitions, improper storage, gross hemolysis, or clotting, and/or insufficient sample volume will be rejected, and the appropriate personnel at the patient care facility will be notified.

Additional requirement for specimens delivered to us by post courier: specimen must arrive frozen.

**After Hours**

Page Pharmacokinetics Laboratory staff at (206) 994-5942 to schedule
PHARMACOGENETIC TESTING

Test includes
CYP2C19 genotyping assay and dosing guidance for voriconazole and clopidogrel.

Lab
Pharmacokinetics, 188 E. Blaine, Suite 250

Request Form
Requisition form will be generated upon ordering the CYP2C19 genotype test on EPIC. Requisition should include patient identification information, ICD codes, date and time of specimen collection, specimen type, and which drug the test is being ordered for.

Phone
206-606-7389

Availability
Tuesday – Saturday, 8am – 5pm
Sundays, Mondays, and Holidays: ON CALL

Turnaround Time
Results will be available 96 hours from sample receipt.

Specimen
Blood

Volume
1-3 mL

Container
Lavender/Purple Top 4 mL potassium EDTA Vacutainer® tube

Collection
Specimens must be accompanied by a paper requisition printed from an electronic ordering system or a confirmed verifiable EPIC test order explicitly requesting/ordering the test. The requisition form must be signed by a medical provider. Label tubes with patient name, U#, date, and the actual time of blood draw. In a biohazardous transport bag, place the sample in front pocket and insert the requisition into the rear pocket. Samples are stable at room temperature and should be delivered to the Pharmacokinetics Lab.

Causes for Rejection
Misidentified specimens and requisitions, improper storage, gross hemolysis, or clotting, and/or insufficient sample volume will be rejected, and the appropriate personnel at the patient care facility will be notified.

After Hours
Page Pharmacokinetics Laboratory staff at (206) 994-5942 to schedule
CREATININE (POCT)

Related Terms
Creatinine, Crea

Test includes
Creatinine

Lab
POCT – Imaging Unit

Phone
POCT Office: 606-7635
MRI: 606-6988
MRI @ Valley: 606-2997
OBS: 606-7184

Testing Frequency
Monday – Saturday, testing time is dependent on care plan. Specimens may be sent to Alliance Lab for confirmation or as needed.

Availability
STAT

Specimen
Whole Blood

Volume
0.5 mL

Container
1-3mL sterile syringe. If specimen is sent to Alliance Lab for testing, collect plasma or serum in 5 mL lime top PST, green top, red top, gold top SST or orange top RST

Collection
Routine venipuncture or line draw

Causes for Rejection
Misidentified specimens and requisitions, specimen QNS

Reference

<table>
<thead>
<tr>
<th></th>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Range</td>
<td>Age</td>
</tr>
<tr>
<td>&gt;=18 yrs.</td>
<td>0.38-1.02</td>
<td>&gt;=18 yrs.</td>
</tr>
</tbody>
</table>
GLUCOSE (POCT)

**Related Terms**
- Blood sugar
- POCT – Procedure Suite, Imaging Unit, Infusion/ACE/CTU, Radiology Oncology

**Phone**
- POCT Office: 606-7635
- Procedure Suite: 606-1329
- Imaging: 606-7184
- Infusion/ACE/CTU: 606-2157
- Radiation Oncology: 606-7318

**Testing Frequency**
Monday – Sunday, testing time is dependent on care plan or rapid response code. Specimens may be sent to Alliance Lab for confirmation or as needed.

**Availability**
- STAT

**Specimen**
- Whole Blood

**Volume**
- 0.5 mL

**Container**
For capillary specimen collection, use auto-disabling single-use lancing device. If specimen is sent to Alliance Lab for testing, see Glucose for container type.

**Collection**
- Capillary fingerstick, routine venipuncture or line draw.

**Specimen Handling**
- Separate plasma or serum from cells as soon as possible to minimize loss of glucose through glycolysis

**Causes for Rejection**
- Misidentified specimens and requisitions, specimen QNS

**Reference Ranges**
- Glucose, fasting: 62–125 mg/dL

**Critical Values**
- <55 mg/dL or >500 mg/dL
IONIZED CALCIUM, WHOLE BLOOD (POCT)

Related terms
- iCA, Ionized Calcium

Lab
- POCT – Apheresis Unit

Phone
- POCT Office: 606-7635
- Apheresis: 606-2120

Testing Frequency
- Monday – Sunday, testing time is dependent on care plan. Specimens may be sent to Alliance Lab for confirmation or as needed.

Availability
- STAT

Specimen
- Whole Blood

Volume
- 1 mL

Container
- 1-3 mL balanced heparin syringe. If specimen is sent to Alliance Lab for testing, see Calcium for container type.

Collection
- Routine venipuncture or line draw

Causes for Rejection
- Misidentified specimens and requisitions, specimen QNS, clotted specimen

Reference Ranges
- > 1 year 1.18 mmol/L - 1.38 mmol/L
- < 1 year 1.16 mmol/L - 1.45 mmol/L

Critical Values
- < 0.78 mmol/L or > 1.58 mmol/L
# POTASSIUM (POCT)

| **Related Terms** | K+, K, Potassium |
| **Lab** | POCT – Apheresis Unit |
| **Phone** | POCT Office: 606-7635  
Apheresis: 606-2120 |
| **Testing Frequency** | Monday – Sunday, testing time is dependent on care plan.  
Specimens may be sent to Alliance Lab for confirmation or as needed. |
| **Availability** | STAT |
| **Specimen** | Whole blood |
| **Volume** | 1 mL |
| **Container** | 1-3 mL balanced heparin syringe. If specimen is sent to Alliance Lab for testing, see Potassium for container type. |
| **Collection** | Routine venipuncture or line draw do not draw specimen from an arm receiving intravenous transfusion. Avoid hemolysis, as it can lead to falsely elevated K+ levels. |
| **Causes for Rejection** | Misidentified specimens and requisitions, specimen QNS, clotted specimen |
| **Reference Ranges** | 3.6 – 5.2 mEq/L |
| **Critical Values** | <3.0 mEq/L or >6.0 mEq/L |
KOH PREP (POCT/PPT)

Related Terms
Skin KOH, Skin Fungal with Direct Exam

Test included in these panels
- Fungal elements seen on skin or other keratinized specimens

Lab
3rd floor, Skin Oncology

Phone
POCT Office: 606-7635
Skin Oncology: 606-2201

Testing Frequency
Clinic hours 8am to 5pm. Testing is dependent on care plan.

Availability
Performed at patient’s bedside

Specimen
Skin and other keratinized specimens

Volume
N/A

Container
Glass slide with one drop of 10% (or 20%) KOH to the slide and mix well with the specimen.

Collection
Skin scrapings with sterile blade, clipper, or scissor

Causes for Rejection
Specimen QNS. Specimens will be rejected if received > 24 hours after collection. Viability of organisms is significantly reduced after 24 hours.

Reference Ranges
Yeast/Fungi are absent