

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 Clinical Immunogenetics lab
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 Lab at Evergreen Health
12040 NE 128th St
Kirkland, WA 98034

Fred Hutchinson Cancer Center Peninsula Laboratory
19917 7th Ave NE Suite 100
Poulsbo, WA 98370

Fred Hutchinson Cancer Center MRI at Valley Street
1209 Valley St
Seattle, WA 98109

SPECIMEN COLLECTION & HANDLING MANUAL 34TH EDITION

TABLE OF CONTENTS

[Introduction](#)

[Lab Locations and Hours of Service](#)

[After Hours/Special Instructions](#)

[FRED HUTCHINSON CANCER CENTER/RESEARCH/AFFILIATED LABORATORY LOCATIONS](#)

[Compliance Policies](#)

[Specimen Handling Guidelines](#)

[Patient instruction for Urine and Stool Collection](#)

[Alliance Lab Testing Menu and Turnaround Times](#)

[Critical Values](#)

[Alliance Lab Reference Ranges](#)

Tests Listed by Laboratory/Departments

Cellular Therapy

[CD34 Assay](#)

Chemistry - Alliance Lab

Panels

[Blood Gas, Arterial](#)

[Basic Metabolic Panel](#)

[Comprehensive Metabolic Panel](#)

[Electrolytes](#)

[Hepatic Function Panel](#)

[Lipid Panel](#)

[Renal Function Panel](#)

[Renal/Hepatic Function Panel](#)

[TSH with Reflexive Free T4](#)

[Urinalysis](#)

Single Tests

[Alanine Aminotransferase](#)

[Albumin](#)

[Alkaline Phosphatase](#)

[Ammonia](#)

[Amylase](#)

[Aspartate Aminotransferase](#)
[Urea Nitrogen](#)
[Calcium](#)
[Cancer Antigen 19-9](#)
[Carcinoembryonic Antigen](#)
[Cerebral Spinal Fluid Glucose](#)
[Cerebral Spinal Fluid Protein](#)
[Chloride](#)
[Cholesterol](#)
[Bicarbonate, CO2](#)
[Cortisol](#)
[Creatine Kinase](#)
[Creatinine](#)
[Direct Bilirubin](#)
[Gamma Glutamyl Transferase](#)
[Glucose](#)
[HDL Cholesterol](#)
[Ionized Calcium, Whole Blood](#)
[Lactate Dehydrogenase](#)
[LDL Cholesterol](#)
[Lipase](#)
[Magnesium](#)
[Phosphorus](#)
[Potassium](#)
[Pregnancy, Urine](#)
[Pregnancy, Serum](#)
[Prostate Specific Antigen](#)
[Sodium](#)
[Emergency Bleed, Stool](#)
[Thyroid Stimulating Hormone](#)
[Thyroxine \(Free T4\)](#)
[Total Bilirubin](#)
[Total Protein](#)
[Urine Total Protein, Quantitative](#)
[Urine Total Protein, Semi Quantitative](#)
[Triglycerides](#)
[Troponin I \(High Sensitivity\)](#)
[Uric Acid](#)
[Urine Creatinine/ Creatinine Clearance](#)
[Urine Protein/Urine Creatinine Ratio](#)

Clinical Immunogenetics

[HLA Typing](#)
[Chimerism Testing](#)
[CIL Turnaround Times](#)

Coagulation - Alliance Lab

[D-Dimer](#)
[Fibrinogen](#)
[Partial Thromboplastin Time](#)
[Prothrombin Time](#)

Cancer Genomics (fka Cytogenetics)

[Cytogenetics Studies, Chromosome Analysis and FISH](#)
[Cytogenetics Studies, Genomic Array](#)
[Cytogenetics Studies, NGS Targeted RNA Sequencing](#)
[Cytogenetics Studies, Skin Fibroblast Expansion](#)
[Cytogenetics Turnaround Times](#)

Hematology - Alliance Lab

[Cerebral Spinal Fluid Cell Count](#)
[Complete Blood Count](#)
[Erythrocyte Sedimentation Rate](#)
[Hematocrit/Hemoglobin](#)
[Immature Platelet Fraction](#)
[Platelet Count](#)
[Reticulocyte Count](#)

Molecular – Alliance Lab

[COVID/FLU/RSV Respiratory Panel, Rapid PCR](#)
[SARS-CoV-2 \(COVID-19\) Qualitative Rapid PCR](#)

Pathology

[Bone Marrow Aspirate/Biopsy](#)
[Bronchoalveolar Lavage](#)
[Endoscopy](#)
[Fine Needle Aspirations](#)
[Lip or Skin Biopsy](#)
[Liver Biopsy; Liver](#)
[Lung Biopsy](#)
[Lymph Node Biopsy](#)
[ThinPrep® Pap Test Collection](#)
[Sinus Biopsy or Aspirate](#)
[Surgical Specimens](#)
[Other Fluid Specimens](#)
[Surgical Specimens Collected at FHCC Ambulatory Clinic](#)

Pharmacokinetics

[Therapeutic Drug Monitoring and Busulfan Testing](#)
[Pharmacogenetic testing](#)

Point of Care Testing

[Creatinine \(POCT\)](#)

[Glucose \(POCT\)](#)

[Ionized Calcium, Whole Blood \(POCT\)](#)

[Potassium \(POCT\)](#)

[KOH Prep \(POCT\)](#)

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

Gana Balgansuren, MD, PhD
Director of Clinical Immunogenetics Lab
Fred Hutchinson Cancer Center

*Note: All contact numbers listed throughout this manual assume a 206-area code unless otherwise specified.

LAB LOCATIONS AND HOURS OF SERVICE

Laboratory	Building	Room	Phone	Pager	Service Hours
Alliance Lab - Blood Draw	SLU	1500	Blood Draw: 606-1214 Reception: 606- 6201		M-F 6am – 6pm <i>Weekends & Holidays</i> 8am – 4:30pm
Alliance Lab – EVG	12040 NE 128 th St Kirkland, WA 98034	EV-100	425-441-2640		M-F 8am – 5:30pm
Alliance Lab - PEN	19917 7 th Ave NE Poulsbo, WA 98370	STE 100	360-842-5116		M-F 8am – 5:30pm
Alliance Lab - Specimen Processing	SLU	1500	606-1088		M-F 6am – 10pm <i>Weekends & Holidays</i> 7:30am – 5:30pm
Alliance Lab - Testing	SLU	1500	Main: 606-1088 Chem: 606-1094 Coag: 606-1094 Heme: 606-1084		M-F 6am – 10pm <i>Weekends & Holidays</i> 8am – 6pm
Cellular Therapy Lab	1100 Eastlake	E1-419	606-1200	<i>Weekends & Holidays</i> 540-2851	M-F 7am – 8pm <i>Weekends & Holidays</i> 9am – 5pm; leave a message on voicemail; on-call tech will respond
CIL	188 E Blaine	STE 250	Lab Coordinator Office (LABCO): 606-7700		M-F 8:30am – 5pm
Cancer Genomics (fka Cytogenetics)	188 E Blaine	STE 250	Main Line: 206-606-1390	206-340- 7207	M-F 8am-5pm <i>Weekends & Holidays</i> on call 9am-5pm
6th Floor Bldg 1 Satellite Lab	SLU	66097	606-6049		M-F 6:30am – 2:30pm <i>After hours:</i> contact Alliance Lab
3rd Floor Bldg 2 Satellite Lab	SLU	H3317	206-606-8700		M-F 8am – 3pm <i>After hours:</i> Contact Alliance Lab
4th Floor Bldg 2 Satellite Lab	SLU	H4317	206-606-8731		M-F 8am – 3pm <i>After hours:</i> Contact Alliance Lab

Pathology	SLU	7910	606-1355 Pathologist: 606-1343	Technologist 573-0892 Pathologist 498-7956	Monday 9:00am – 6:30pm Tues-Fri 6:00am – 6:30pm Sat 6:00am – 2:30pm <i>Sun and all other times contact Path Technologist</i> <i>Pathology is on call: 24 hours 7 days a week, including Weekends & Holidays</i>
Pharmacokinetics	188 E Blaine	STE 250	606-7389	Pager 994-5942	Tues – Sat 8am – 5pm <i>Sundays, Mondays and Holidays: on call</i>
Point of Care Testing	SLU	Procedure Suite, Imaging, Infusion/AC E/CTU, Apheresis, GI Care Neighborhood, Skin Oncology, Gynecology	POCT Office: 206-606-7635		Clinic hours varies by POCT unit. POCT Office: Monday – Friday 6:30am to 6:30pm
Transfusion Service Support	SLU	1500	606-1095		M-F 7am – 10pm <i>Weekends and Holidays 7:30am – 5:30pm</i>

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

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

Alliance Lab Peninsula:

After hours: samples routed directly from Peninsula 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 CIL at 8am on the next business day.

Cancer Genomics (fka 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 or NaHep for Genomic Array, TRS). Store skin biopsies for fibroblast expansion in media. Store all 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
Saturday: 6am – 2:30pm
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

Lab Name	Type of Lab	Lab Location	Phone Number
Bloodworks Northwest	Transfusion Medicine	921 Terry Seattle WA	292-6525
Transfusion Support Office- Fred Hutchinson Cancer Center	Transfusion Support	CE2-128	606-1014
UW Laboratory Client Support Services	Clinical Labs	UW Montlake	520-4600 commserv@uw.edu
UW Hematopathology	Flow Cytometry & Molecular Studies	G7-800	606-7060

For information on Seattle Children's Laboratories visit <https://www.seattlechildrens.org/healthcare-professionals/access-services/diagnostic-services/laboratories/>

For information on UW Laboratories visit <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>

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.

Order Authorization

All tests collected by Fred Hutchinson Cancer Center are ordered through CPOE (computerized order entry) by authorized providers with granted EPIC Access. Verbal test orders are not accepted by any Fred Hutchinson Cancer Center Laboratories.

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) 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.

Note: Specimens (including secondary containers) will be labeled at all times while being processed by Fred Hutch Clinical Laboratories.

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.

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.

(Continued)

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
15. QuantiFERON Kit– (1. Grey 2. Lavender 3. Green 4. Yellow)
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>

Fred Hutchinson Cancer Center

GUIDELINES FOR TIMED URINE AND STOOL COLLECTIONS

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:

Bence Jones Quantitation	<ul style="list-style-type: none"> • <i>No Restrictions. No additive required. REFRIGERATE DURING COLLECTION.</i>
Catecholamines (Epinephrine, Norepinephrine, Dopamine, Metanephrine)	<ul style="list-style-type: none"> • <i>15 mL HCL must be added to container prior to collection. Please see Alliance Lab staff. REFRIGERATE DURING COLLECTION.</i> (** Note: HCL can cause burns and irritations. Avoid contact with skin or eyes.) • <i>Discontinue one week prior to and during collection: mythyldopa (Aldomet), & related antihypertensives, tetracyclines, quinidine, and quinine.</i>
Creatinine Clearance	<ul style="list-style-type: none"> • <i>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.</i> • <i>No Restrictions. No additive required. REFRIGERATE DURING COLLECTION.</i>
Creatinine, Protein, Protein Electrophoresis	<ul style="list-style-type: none"> • <i>No Restrictions. No additive required. REFRIGERATE DURING COLLECTION.</i>
Cortisol	<ul style="list-style-type: none"> • <i>10 g of boric acid must be added to container at start of collection. REFRIGERATE DURING COLLECTION.</i>
Prophyrins Quantitation (includes porphobilinogen)	<ul style="list-style-type: none"> • <i>5g sodium carbonate (NOT sodium bicarbonate) must be added to container prior to collection. Please see Alliance Lab staff. REFRIGERATE DURING COLLECTION.</i> • <i>Protect from light. Keep collection container in brown paper bag.</i> • <i>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.</i>
VMA	<ul style="list-style-type: none"> • <i>15 mL HCL must be added to container prior to collection. Please see Alliance Lab staff. REFRIGERATE DURING COLLECTION.</i> (** Note: HCL can cause burns and irritations. Avoid contact with skin or eyes.)
5HIAA (5-Hydroxyindolacetic Acid)	<ul style="list-style-type: none"> • <i>15 mL HCL must be added to container prior to collection. Please see Alliance Lab staff. REFRIGERATE DURING COLLECTION.</i> (** Note: HCL can cause burns and irritations. Avoid contact with skin or eyes.) • <i>Discontinue two days before and during collection: acetanilide, aspirin, avocados, bananas, chlorpromazine, cough medicines, eggplant, methamphetamines, nicotine, nortriptyline, nuts, phenothiazine, pineapple, and plums.</i>

Patient Name: _____ **Start Date:** ____/____/____ **Start Time:** _____
Stop Date: ____/____/____ **Stop Time:** _____

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 from the time the sample is received in the initial Alliance Lab location except as noted under Comments. Turnaround times for Community Site testing 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.

CHEMISTRY PANELS

TEST MNEMONIC	DESCRIPTION	TESTS INCLUDED	COMMENTS
BMP	Basic Metabolic Panel	Na, K, Cl, CO ₂ , Glu, BUN, Creat, Ca, calculated glomerular filtration rate	
LYT	Electrolytes	Na, K, Cl, CO ₂	
LIPID	Lipid Panel	Chol, HDL, Trigs, LDL	
HFPA	Hepatic Function Panel	ALT, AST, ALK, Albumin, Bili T/D, Total protein	
RENFP	Renal Function Panel	Albumin, Ca, CO ₂ , Cl, Creat, Glu, Phosphorus, Na, K, BUN, calculated glomerular filtration rate	
RENFHF	Renal/Hepatic Function Panel	Albumin, Na, K, CL, CO ₂ , Glu, BUN, Creat, Bili T/D, Ca, Phos, ALK, AST, ALT, calculated glomerular filtration rate,	
COMP	Comprehensive Metabolic Panel	Na, K, Cl, CO ₂ , Glu, BUN, Creat, Ca, Total Protein, Albumin, ALT, AST, ALK, T Bili, calculated glomerular filtration rate	
TSHRF4	TSH with Reflexive Free T4	TSH, Free T4	90 minutes TAT

CHEMISTRY INDIVIDUAL TESTS

TEST MNEMONIC	DESCRIPTION	TESTS INCLUDED	COMMENTS
ALB	Albumin	Albumin	
ALK	Alkaline Phosphatase	Alkaline Phosphatase	
AY	Amylase	Amylase	
AST	AST	AST	
BIL	Bilirubin, Total	Bilirubin, Total	
BILT/D	Bilirubin, Total/Direct	Bilirubin, Total/Direct	
BUN	BUN	BUN	
CA	Calcium, Total	Calcium, Total	
CA199	CA 19.9	CA 19.9	90 minutes TAT
CEA	Carcinoembryonic Antigen	Carcinoembryonic antigen	90 minutes TAT
CHOL	Cholesterol, Total	Cholesterol, Total	
CK	Creatine Kinase	Creatine Kinase	
CREG	Creatinine	Creatinine, calculated glomerular filtration rate	
CRT	Cortisol	Cortisol	
GGT	GGT	GGT	
GLU	Glucose	Glucose	
GLUF	Glucose, Fasting	Glucose, Fasting	
HDL	HDL cholesterol	HDL cholesterol	
K	Potassium	Potassium	
LD	LD	LD	
LDL	LDL cholesterol	Calculation must be run with Lipid Panel	
LPASE	Lipase	Lipase	
MG	Magnesium	Magnesium	
NA	Sodium	Sodium	
P	Phosphorus	Phosphorus	

PGSTAT	Qualitative Serum Pregnancy		Positive or negative pregnancy test
PLNH3	Ammonia, Plasma	Ammonia	

ALLIANCE LAB - CHEMISTRY INDIVIDUAL TESTS (cont.)

TEST MNEMONIC	DESCRIPTION	TESTS INCLUDED	COMMENTS
PSA	Prostate Specific Antigen	Prostate Specific Antigen, Total	90 minutes TAT
ESB	Stool Occult Blood	Stool occult blood	1 occult blood card assessing current concern of GI bleeding, SFOBG is IA testing for cancer screening, test is transferred to HMC
T4FR	Thyroxine, Free	Free T4	90 minutes TAT
TP	Total Protein	Total Protein	
TRIG	Triglycerides	Triglycerides	
TROPIG	Troponin I (High Sensitivity)	Troponin I (High Sensitivity)	
TSH	Thyroid Stimulating Hormone	Thyroid Stimulating Hormone	90 minutes TAT
URIC	Uric Acid	Uric Acid	
WIC	Calcium, Ionized, Whole Blood	Calcium, Ionized	Must arrive in the Main Lab for testing to begin within 10 minutes of collection

HEMATOLOGY

TEST MNEMONIC	DESCRIPTION	TESTS INCLUDED	COMMENTS
CBC	Hemogram	HCT, HB, WBC, RBC, Platelet & RBC indices	
CBANC	Hemogram and Abs Neutrophil Count	HCT, HB, WBC, RBC, Platelet, RBC indices & Abs Neutrophil count	
CBD	CBC w/ Diff/Smear Eval	HCT, HB, WBC, RBC, Platelets & RBC indices w/ Diff	
CPLTG	Citrated Platelet Count	Platelets	
ESR	Erythrocyte Sedimentation Rate		90 minutes TAT

HBHCT	Hemoglobin and Hematocrit	Hemoglobin, Hematocrit	
IPF	Immature Platelet Fraction	Immature Platelet Fraction	
PLTG	Platelet	Platelet	
RETIC	Reticulocyte	Reticulocyte	

ALLIANCE LAB - COAGULATION

TEST MNEMONIC	DESCRIPTION	TESTS INCLUDED	COMMENTS
PRO	Prothrombin Time	Prothrombin Time	
PTT	Activated Partial Thromboplastin Time	Activated Partial Thromboplastin Time	
FIBCL	Fibrinogen	Fibrinogen	
DDI	D-Dimer	D-Dimer	

ALLIANCE LAB – MOLECULAR

TEST MNEMONIC	DESCRIPTION	TESTS INCLUDED	COMMENTS
FABRCV	COVID/FLU/RSV Respiratory Panel, Rapid PCR	Qualitative COVID, FLU A, FLU B, and RSV by Cepheid PCR	For symptomatic clinical patients only. Testing for research, NWH and OVL, and asymptomatic testing – consider NCVQLT, FLURSV, & REVSQF.
NCVRPD	SARS-CoV-2 (COVID-19) Qualitative Rapid PCR	Qualitative COVID by Cepheid PCR	Requires pre-approval from Fred Hutchinson Cancer Center Infection Prevention

URINES

TEST MNEMONIC	DESCRIPTION	TESTS INCLUDED	COMMENTS
UAWK	Urinalysis, workup	Urine dipstick tests, microscopic performed if macroscopic abnormal	
UAC	Urinalysis, complete	Urine dipstick tests, microscopic	
UCLEAR	Creatinine clearance	Urine creatinine	Serum creatinine level required
UTP	Protein	Urine total protein	
UPG	Urine Pregnancy		Positive or negative pregnancy test

UPCRAT	Protein/Creatinine Ratio, Timed Urine	Urine Protein, Urine Creatinine & Calculated Ratio	24hr urine collection
UPCRTR	Protein/Creatinine Ratio, Random Urine	Urine Protein, Urine Creatinine & Calculated Ratio	Random urine collection

CEREBRAL SPINAL FLUID

TEST MNEMONIC	DESCRIPTION	TESTS INCLUDED	COMMENTS
CCCNT	Cell Count	WBC, RBC	Testing is performed immediately upon receipt but may take up to 2 hours for results to be released.
CGLU	Glucose	Glucose	
CTP	Total Protein	Total Protein	
CCFUGE	CSF Cell evaluation by Hematopathologist		Review may take several days, slides are prepared upon receipt and transferred to UW Hematopathology.

BLOOD GASES

TEST MNEMONIC	DESCRIPTION	TESTS INCLUDED	STAT TAT	COMMENTS
AG	Arterial blood gas	pH, pCO ₂ , pO ₂ , HCO ₃	30 minutes	COOX performed at HMC (Not collected at SLU due to short stability time), sample must be received in the SLU Main Lab within 10 minutes of collection.
VG	Venous blood gas	pH, pCO ₂ , pO ₂ , HCO ₃	30 minutes	COOX performed at HMC (Not collected at SLU due to short stability time), sample must be received in the SLU Main Lab

				within 10 minutes of collection.
--	--	--	--	----------------------------------

FR

Laboratory Critical Results

Serum or Plasma	Less than	Greater than	Units
Na	120	160	mEq/L
K	3.0	6.0	mEq/L
HCO ₃ /CO ₂	10	40	mEq/L
Glucose	55	500	mg/dl
Ca	6.0	13.0	mg/dl
Phosphate	1.0	none	mg/dl
Mg	1.2	4.7	mg/dl
Troponin I (High Sensitivity)	N/A	0.39	ng/mL
CSF glucose	20	N/A	mg/dl

Whole Blood	Less than	Greater than	Units
Ionized Calcium	0.78	1.58	mmol/L

Arterial Blood Gases	Less than	Greater than	Units
pH	7.20	7.58	
pCO ₂	9	65	mmHg
pO ₂	40	N/A	mmHg
HCO ₃	10	40	mEq/L

Hematology	Less than	Greater than	Units
*Absolute neutrophils	0.5	N/A	x 10 ³ /uL
Hematocrit	20	none	%
Hemoglobin	6.0	none	g/dL
Platelet	20	1000	x 10 ³ /uL
Hemoglobin	6.0	none	mg/dl

Coagulation	Less than	Greater than	Units
Prothrombin Time	N/A	5	INR
aPTT	N/A	120	Sec
Fibrinogen	100	N/A	mg/dL

*Critical ANC: 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.

- ❖ 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

RBC		Units: mil/uL		Hemoglobin		Units: g/dL	
Female		Male		Female		Male	
Age	Range	Age	Range	Age	Range	Age	Range
0 – 3d	4.00 – 6.60	0 – 3d	4.00 – 6.60	0 – 3d	14.5 – 22.5	0 – 3d	14.5 – 22.5
3d – 1w	3.90 – 6.30	3d – 1w	3.90 – 6.30	3d – 1w	13.5 – 21.5	3d – 1w	13.5 – 21.5
1w – 2w	3.60 – 6.20	1w – 2w	3.60 – 6.20	1w – 2w	12.5 – 20.5	1w – 2w	12.5 – 20.5
2w – 1m	3.00 – 5.40	2w – 1m	3.00 – 5.40	2w – 1m	10.0 – 18.0	2w – 1m	10.0 – 18.0
1m – 2m	2.70 – 4.90	1m – 2m	2.70 – 4.90	1m – 2m	9.0 – 14.0	1m – 2m	9.0 – 14.0
2m – 6m	3.10 – 4.50	2m – 6m	3.10 – 4.50	2m – 6m	9.5 – 13.5	2m – 6m	9.5 – 13.5
6m – 2y	3.70 – 5.30	6m – 2y	3.70 – 5.30	6m – 2y	10.5 – 13.5	6m – 2y	10.5 – 13.5
2y – 5y	3.90 – 5.30	2y – 6y	3.90 – 5.30	2y – 6y	11.5 – 13.5	2y – 6y	11.5 – 13.5
6y – 12y	4.00 – 5.20	6y – 12y	4.00 – 5.20	6y – 12y	11.5 – 15.5	6y – 12y	11.5 – 15.5
12y – 18y	4.10 – 5.10	12y – 18y	4.50 – 5.30	12y – 18y	12.0 – 16.0	12y – 18y	13.0 – 16.0
18y –	3.80 – 5.00	18y –	4.40 – 5.60	18y –	11.5 – 15.5	18y –	13.0 – 18.0

MCV		Units: fL		MCH		Units: pg		Hematocrit		Units: %	
Female/Male		Female/Male		Female/Male		Female/Male		Female		Male	
Age	Range	Age	Range	Age	Range	Age	Range	Age	Range	Age	Range
0 – 3d	95 – 121	0 – 3d	31.0 – 37.0	0 – 3d	45 – 67	0 – 3d	45 – 67	0 – 3d	45 – 67	0 – 3d	45 – 67
3d – 1w	88 – 126	3d – 1m	28.0 – 37.0	3d – 1w	42 – 66	3d – 1w	42 – 66	3d – 1w	42 – 66	3d – 1w	42 – 66
1w – 2w	86 – 124	1m – 2m	26.0 – 34.0	1w – 2w	39 – 63	1w – 2w	39 – 63	1w – 2w	39 – 63	1w – 2w	39 – 63
2w – 1m	85 – 123	2m – 6m	25.0 – 35.0	2w – 1m	31 – 55	2w – 1m	31 – 55	2w – 1m	31 – 55	2w – 1m	31 – 55
1m – 2m	77 – 115	6m – 2y	23.0 – 31.0	1m – 2m	28 – 42	1m – 2m	28 – 42	1m – 2m	28 – 42	1m – 2m	28 – 42
2m – 6m	74 – 108	2y – 6y	24.0 – 30.0	2m – 6m	29 – 41	2m – 6m	29 – 41	2m – 6m	29 – 41	2m – 6m	29 – 41
6m – 2y	70 – 86	6y – 12y	25.0 – 33.0	6m – 2y	33 – 39	6m – 2y	33 – 39	6m – 2y	33 – 39	6m – 2y	33 – 39
2y – 6y	75 – 87	12y – 18y	25.0 – 35.0	2y – 6y	34 – 40	2y – 6y	34 – 40	2y – 6y	34 – 40	2y – 6y	34 – 40
6y – 12y	77 – 95	18y –	27.3 – 33.6	6y – 12y	35 – 45	6y – 12y	35 – 45	6y – 12y	35 – 45	6y – 12y	35 – 45
12y –	81 – 98			12y – 18y	37 – 46	12y – 18y	37 – 46	12y – 18y	37 – 49	12y – 18y	37 – 49
				18y –	36 – 45	18y –	36 – 45	18y –	38 – 50	18y –	38 – 50

MCHC		Units: g/dL		RDW-CV		Units: %		Retic PCT		Units: %		Retic ABS		Units: bil/uL	
Female/Male		Female/Male		Female/Male		Female/Male		Female/Male		Female/Male		Female/Male		Female/Male	
Age	Range	Age	Range	Age	Range	Age	Range	Age	Range	Age	Range	Age	Range	Age	Range
0 – 3d	29.0 – 37.0	0 – 1w	11.0 – 18.0	0 – 3d	0.5 – 2.5	0 – 3d	0.5 – 2.5	15y –	25 – 125						
3d – 2w	28.0 – 37.0	1w – 1m	11.0 – 17.0												
2w – 2m	29.0 – 37.0	1m – 6m	11.0 – 16.5												
2m – 2y	30.0 – 36.0	6m –	11.6 – 14.4												

2y -	32.2 - 36.5
------	-------------

Platelet Count Units: thou/uL

Female/Male	
0 - 3d	250 - 450
3d - 9d	200 - 400
9d - 1m	250 - 450
1m - 6m	300 - 750
6m - 2y	250 - 600
2y - 8y	250 - 550
8y - 12y	200 - 450
12y -	150 - 400

IPF PCT Units: %

Female/Male	
0 -	1.2 - 8.6

IPF ABS Units: thou/uL

Female/Male	
0 -	3.6 - 20.0

Erythrocyte Sedimentation Rate (ESR) Units: mm/hr

Female		Male	
Age	Range	Age	Range
≤50y	0 - 20	≤50y	0 - 15
≥50y	0 - 30	≥50y	0 - 20

MPV Units: fL

Female		Male	
Age	Range	Age	Range
	9.4 - 12.3		9.4 - 12.4

WBC Units: thou/uL

Female/Male	
Age	Range
0 - 1d	9.0 - 30.0
1d - 1w	5.0 - 21.0
1w - 1m	5.0 - 19.5
1m - 1y	6.0 - 17.5
1y - 2y	5.0 - 15.5
2y - 4y	6.0 - 15.5
4y - 6y	5.0 - 13.5
6y - 10y	4.5 - 13.5
10y - 14y	5.0 - 11.0
14y -	4.3 - 10.0

Absolutes

Neutrophils Units: thou/uL %

Female/Male		Female /Male
Age	Range	
0 - 1d	3.00 - 12.00	33 - 70
1d - 1w	2.00 - 6.00	15 - 50
1w - 1y	1.50 - 5.00	15 - 45
1y - 4y	1.50 - 7.00	15 - 70
4y - 10y	1.80 - 7.00	25 - 70

Monocytes Units: thou/uL %

Female/Male		
Age	Range	
0 - 1m	0.00 - 1.10	0-10
1m - 1y	0.00 - 0.90	0-10
1y -	0.00 - 0.80	0-10

Basophils Units: thou/uL %

Female/Male		Female /Male
Age	Range	
0 - 1w	0 - 0.10	0 - 1
1w - 6m	0 - 0.05	0 - 1
6m -	0 - 0.20	0 - 1

10y – 12y	1.50 – 7.00	30 – 70
12y –	1.80 – 7.00	40 – 75

Units:
Lymphocytes thou/uL %

Female/Male		
Age	Range	
0 – 1d	2.00 – 11.00	10 – 35
1d – 1w	2.00 – 7.00	15 – 70
1w – 4y	3.00 – 7.00	30 – 70
4y – 6y	1.50 – 8.50	20 – 70
6y – 10y	1.50 – 5.00	20 – 50
10y – 12y	1.10 – 4.50	20 – 40
12y –	1.00 – 4.80	20 – 40

Units:
Eosinophils thou/uL %

Female/Male		
Age	Range	
0 – 24hr	0.00 – 0.40	0 – 4
1d – 1w	0.00 – 0.50	0 – 4
1w – 1y	0.00 – 0.30	0 – 4
1y –	0.00 – 0.50	0 – 4

Units:
Immature Grans thou/uL %

Female/Male		
Age	Range	
0 –	0.00 – 0.05	0 – 0.7

CSF Cell Count Units: cell/uL

Female/Male	
Cell	Range
Red Blood Cell	0
Mononuclear Cell	0 - 5

CSF Differential Units: %

Female/Male	
Cell	Range
Neutrophils	2 ± 4
Lymphocytes	60 ± 20
Monocytes	30 ± 15

COAGULATION

TEST	Reference Range	Units
Prothrombin time (PT)	10.7-15.6	Seconds
INR	0.8 - 1.3	
Activated Partial Thromboplastin Time (APTT)	22-35	Seconds
Fibrinogen	150-400	mg/dL
D-Dimer	0-0.59	µg/mL FEU

CHEMISTRY

Analyte	Reference Range	Units
Na (Sodium)	135-145	mEq/L
K (Potassium)	3.6-5.2	mEq/L
Cl (Chloride)	98-108	mEq/L
CO ₂ (Bicarbonate)	22-32	mEq/L
Ion Gap	4-12	

Creatine Kinase	Male 62-325 Female 43-274	U/L
Creatinine	Female ≥ 18 yrs 0.38-1.02 Male ≥ 18 yrs. 0.51-1.18 Male or Female <18 yrs. 0.20-1.10	mg/dL
BUN	8-21	mg/dL
Glucose	62-125	mg/dL
Ca (Calcium)	8.9-10.2	mg/dL
P (Phosphorus)	2.5-4.5 Child <12 years: 4.5-6.0	mg/dL
Albumin	3.5-5.2	g/dL
Mg (Magnesium)	1.8-2.4	mg/dL
Total Bilirubin	0.2-1.3	mg/dL
Direct Bilirubin	0.0-0.3	mg/dL
AST	9-38	U/L
ALT	Male Age 0-49 10-64 Age ≥ 50 10-48 Female 7-33	U/L
CK (total)	Male: 62-325 Female: 43-274	U/L
GGT	0-55	U/L
LD	<210	U/L
Total Protein	6.0-8.2	g/dL
Uric Acid	Male 3.9-7.6 Female 2.6-6.8	mg/dL
Cholesterol	Desirable <200 Borderline 200-239 High >239	mg/dL
HDL-Cholesterol	>39 Desirable >59 Acceptable 40-59 Low <40	mg/dL
Triglyceride	Desirable <150 Borderline 150-199 High 200-499 Very High >499	mg/dL
Ammonia	1-13d M/F: 110-180 14-29d M/F: 95-155 1m-11y M/F: 35-85 12-150y M/F: 0-65	μ g/dL
Amylase	27-106	U/L
Lipase	<70	U/L
Ionized Calcium (Whole Blood)	≥ 1 year 1.18-1.38 < 1 year 1.16-1.45	mmol/L
Prostate Specific Antigen	Male: 0.00-5.00	ng/mL
CEA	0.0-5.0	ng/mL
Troponin I (High Sensitivity)	<0.04 Normal 0.04 - 0.39 Elevated above the 99 th percentile of a healthy population	ng/mL
CSF Glucose	40-80	mg/dL

CSF Protein	15-45	mg/dL
-------------	-------	-------

ALLIANCE LAB REFERENCE RANGES**ALKALINE PHOSPHATASE**

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

BLOOD GASES

Blood gas, Arterial (Adult)	Reference Range	Units
pH	7.35-7.45	
pCO ₂	33-48	mmHg
pO ₂	1-39y: 80-104 40-59y: 70-95 60-150y: 63-87	mmHg
Bicarbonate	22-26	mEq/L
O ₂ Saturation	95-99	%

Blood gas, Venous (Adult)	Reference Range	Units
pH	7.32-7.40	
pCO ₂	42-50	mmHg
pO ₂	35-40	mmHg
Bicarbonate	23-27	mEq/L
O ₂ Saturation	70-75	%

MOLECULAR

Qualitative COVID/FLU/RSV by Cepheid PCR	Reference Range	Units
SARS-CoV-2 (COVID-19)	Negative	
FLU A	Negative	
FLU B	Negative	
RSV	Negative	

ALLIANCE LAB REFERENCE RANGES**URINALYSIS**

Test (Dipstick)	Reference Range
pH	5.0-8.0
Specific Gravity	1.002-1.027
Protein	negative
Glucose	negative
Ketone	negative
Bilirubin	negative
Blood	negative
Nitrite	negative
Urobilinogen	0.1-1.9 Ehrlich units
Leucocyte esterase	negative

Test (Microscopic)	Reference Range
WBC/hpf	0-5
RBC/hpf	0-2
Casts/lpf	0
Crystals/lpf	0
Bacteria/hpf	0
Squamous epithelial cells/lpf	0-5 (neg)
Renal/transitional epithelial cells/hpf	<3 (neg)

Analyte	Reference Range	Units
Urine Total Protein	0-14 (random specimen) 0.050-0.080 (24-hour specimen)	mg/dL g/24hour
Urine Creatinine	Child 0-9 years 700 - 1800 Male > 9 years 1000 - 2000 Female > 9 Years 700 - 1800	mg/24 hours
Creatinine Clearance	Newborn 40-60 Male 75-120 Female 65-105	mL/min/m ² mL/min mL/min

CD34 ASSAY

<u>Lab</u>	Cellular Therapy, 1100 Eastlake Avenue E, E1-419
<u>Request Form</u>	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.
<u>Phone</u>	606-1200
<u>Availability</u>	M – F Lab Hours 7am – 8pm Processing Hours 7am – 5pm Weekends & Holidays Lab Hours 9am – 5pm Processing Hours 9am – 3pm
<u>Turnaround Time</u>	Three hours after sample received or lab start-up
<u>Specimen</u>	Peripheral Blood
<u>Volume</u>	2 - 4 mL
<u>Pediatric Volume</u>	2 - 4 mL
<u>Container</u>	EDTA (2.0 mL purple top)
<u>Collection</u>	Routine venipuncture or line draw
<u>Special Handling</u>	Room temperature, label as STAT
<u>Causes for Rejection</u>	Misidentified specimens and requisitions, specimen QNS, improperly stored specimen, specimen clotted.
<u>Reference Ranges</u>	No normal values established for mobilized specimens.
<u>After Hours</u>	Draw a fresh specimen in the morning (no after-hours specimen handling).

BLOOD GAS, ARTERIAL

<u>Related Terms</u>	Arterial blood gas, Blood gas, ABG, Gases	
<u>Panel includes</u>	Measured parameters include pH, pCO ₂ and pO ₂ ; Calculated parameters include HCO ₃ , base excess, and oxygen saturation.	
<u>Lab</u>	Alliance Lab, Room G1-500	<u>Request Form</u> 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.	
<u>Phone</u>	SLU 206-606-1088	
	<u>Testing Frequency</u>	Throughout service hours
<u>Availability</u>	STAT or routine	
<u>Specimen</u>	Arterial Blood	
<u>Volume</u>	3mL; minimum volume is 300 µL (0.3mL) in a tuberculin syringe.	
<u>Pediatric Volume</u>	See Capillary Blood Gases	
<u>Container</u>	Blood should be drawn into gas-tight plastic syringe using 1000-units sodium or lithium heparin. Other anticoagulants are not acceptable.	
<u>Patient Preparation</u>	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.	
<u>Collection</u>	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), FiO₂ and ventilatory 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

	Reference Range	Critical Values
pH	7.35 – 7.45	<7.20 or >7.58
pCO ₂	33 – 48 mm Hg	<9 or >65 mm Hg
pO ₂	80 – 104 mm Hg	<40 mm Hg (<20 mm Hg venous)
HCO ₃	24-31 mEq/L	<10 or >40mEq/L
O ₂ Saturation	95-99%	

BASIC METABOLIC PANEL

<u>Related Terms</u>	BMP
<u>Panel includes</u>	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. <i>See NEJM 2006; 354:2473.</i>
<u>Lab</u>	Alliance Lab, Room G1-500 Satellite Labs, South Lake Union Community Site Labs
<u>Request Form</u>	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.
<u>Phone</u>	SLU 206-606-1088 EVG 425-441-2640 PEN 360-842-5116
<u>Testing Frequency</u>	Throughout service hours
<u>Availability</u>	STAT or routine
<u>Specimen</u>	Plasma or Serum
<u>Volume</u>	2 mL
<u>Pediatric Volume</u>	Pediatric capillary collection: 500 μL (0.5 mL) serum collected in microtube or "bullet" tube.
<u>Container</u>	5 mL lime top PST, green top, red top, gold top SST or orange top RST
<u>Collection</u>	Routine venipuncture or line draw
<u>Causes for Rejection</u>	See individual tests.
<u>Reference Range</u>	See individual tests.
<u>Critical Values</u>	See individual tests.

COMPREHENSIVE METABOLIC PANEL

<u>Related Terms</u>	COMP
<u>Panel includes</u>	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 + 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 <i>NEJM</i> 2006; 354:2473
<u>Lab</u>	Alliance Lab, Room G1-500 Satellite Labs, South Lake Union Community Site Labs
<u>Request Form</u>	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.
<u>Phone</u>	SLU 206-606-1088 EVG 425-441-2640 PEN 360-842-5116
<u>Testing Frequency</u>	Throughout service hours
<u>Availability</u>	STAT or routine
<u>Specimen</u>	Plasma or Serum
<u>Volume</u>	1 mL
<u>Pediatric Volume</u>	Pediatric capillary collection: 500 µL serum collected in microtube or "bullet" tube.
<u>Container</u>	5 mL lime top PST, green top, red top, gold top SST or orange top RST tube
<u>Collection</u>	Routine venipuncture or line draw
<u>Causes for Rejection</u>	See individual tests.
<u>Reference Ranges</u>	See individual tests.
<u>Critical Values</u>	See individual tests

ELECTROLYTES

<u>Related Terms</u>	Lutes
<u>Panel includes</u>	Sodium, potassium, chloride, CO ₂
Ion Gap is calculated:	Gap = Na – (Cl + CO ₂)
<u>Lab</u>	Alliance Lab, Room G1-500 Satellite Labs, South Lake Union Community Site Labs
<u>Request Form</u>	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.
<u>Phone</u>	SLU 206-606-1088 EVG 425-441-2640 PEN 360-842-5116
<u>Testing Frequency</u>	Throughout service hours
<u>Availability</u>	STAT or routine
<u>Specimen</u>	Plasma or Serum
<u>Volume</u>	2 mL
<u>Pediatric Volume</u>	Pediatric capillary collection: 500 µL (0.5 mL) serum collected in microtube or "bullet" tube.
<u>Container</u>	5 mL lime top PST, green top, red top, gold top SST or orange top RST tube
<u>Collection</u>	Routine venipuncture or line draw
<u>Causes for Rejection</u>	See individual tests.
<u>Reference Ranges</u>	See individual tests.
<u>Critical Values</u>	See individual tests.

HEPATIC FUNCTION PANEL

<u>Related Terms</u>	Liver Panel, Liver Studies, Hepatic Function, LFT, Liver Function Tests, Hepatic Profile
<u>Panel includes</u>	Alanine aminotransferase (ALT), alkaline phosphatase (ALP), aspartate aminotransferase (AST), bilirubin (total & direct), total protein, albumin.
<u>Lab</u>	Alliance Lab, Room G1-500 Satellite Labs, South Lake Union Community Site Labs
<u>Request Form</u>	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.
<u>Phone</u>	SLU 206-606-1088 EVG 425-441-2640 PEN 360-842-5116
<u>Testing Frequency</u>	Throughout service hours
<u>Availability</u>	STAT or routine
<u>Specimen</u>	Plasma or Serum
<u>Volume</u>	1 mL
<u>Pediatric Volume</u>	Pediatric capillary collection: 500 µL (0.5 mL) serum collected in microtube or "bullet" tube.
<u>Container</u>	5 mL lime top PST, green top, red top, gold top SST or orange top RST tube
<u>Collection</u>	Routine venipuncture or line draw
<u>Causes for Rejection</u>	See individual tests.
<u>Reference Ranges</u>	See individual tests.
<u>Critical Values</u>	See individual tests.

LIPID PANEL

<u>Related Terms</u>	Lipid Profile
<u>Panel includes</u>	Cholesterol, triglycerides, HDL cholesterol, calculated LDL cholesterol, non-HDL Cholesterol, Cholesterol/HLC Ratio $LDL = Chol - (Trig/5) - HDL$ $Non-HDL\ Cholesterol = Cholesterol - HDL$ $Cholesterol/HDL\ Ratio = Cholesterol/HDL$
<u>Lab</u>	Alliance Lab, Room G1-500
	<u>Request Form</u> 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.
<u>Phone</u>	SLU 206-606-1088 EVG 425-441-2640 PEN 360-842-5116
<u>Testing Frequency</u>	Throughout service hours
<u>Availability</u>	Routine
<u>Specimen</u>	Plasma or Serum
<u>Volume</u>	1 mL
<u>Pediatric Volume</u>	Pediatric capillary collection; 500µL (0.5mL) serum collected in microtube or "bullet" tube.
<u>Container</u>	5mL lime top PST, green top, red top, gold top SST or orange top RST tube
<u>Collection</u>	Routine venipuncture or line draw
<u>Causes for</u>	See individual tests.
<u>Rejection</u>	
<u>Reference Ranges</u>	See individual tests.
<u>Critical Values</u>	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 206-606 -1088
EVG 425-441-2640
PEN 360-842-5116

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 See individual tests.

Rejection

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 206-606-1088
EVG 425-441-2640
PEN 360-842-5116

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 See individual tests.

Rejection

Reference Ranges See individual tests.

Critical Values See individual tests.

TSH WITH REFLEXIVE FREE T4

<u>Related Terms</u>	TSHRF4
<u>Panel includes</u>	TSH, Free T4
<u>Lab</u>	Alliance Lab, Room G1-500 <u>Request Form</u> 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.
<u>Phone</u>	SLU 206-606-1088
<u>Availability</u>	<u>Testing Frequency</u> Throughout service hours
<u>Specimen</u>	STAT or routine
<u>Volume</u>	Serum
<u>Container</u>	2.0 mL, minimum 0.8 mL
<u>Collection</u>	5 mL orange top tube preferred or gold top, SST, or red top tube SST.
<u>Causes for Rejection</u>	Routine venipuncture or line draw
<u>Reference Range</u>	See individual tests.

URINALYSIS

<u>Related Terms</u>	UA
<u>Panel includes</u>	Color, appearance, bilirubin, leukocyte esterase, nitrite, specific gravity, pH, protein, glucose, ketones, blood, and microscopic analysis if ordered or indicated by chemistries.
<u>Lab</u>	Alliance Lab, Room G1-500
<u>Request Form</u>	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.
<u>Phone</u>	SLU 206-606-1088
<u>Testing Frequency</u>	Throughout service hours
<u>Availability</u>	STAT or routine
<u>Specimen</u>	Random Urine
<u>Volume</u>	12 mL can be done on <12 mL in extenuating instances such as infants.
<u>Container</u>	Sterile plastic urine container, approved BD collection kit with cup, red/yellow tube, and gray tube at community sites
<u>Collection</u>	Freshly voided clean-catch random urine or catheterized specimen.
<u>Storage Instructions</u>	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.
<u>Causes for Rejection</u>	Specimens contaminated with feces, less than 1 mL of urine or specimens in fresh urine cups >2 hours old.
<u>Reference Ranges</u>	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 206-606-1088
EVG 425-441-2640
PEN 360-842-5116

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

Age	Male	Female
0 - 49	10 - 64 U/L	7-33U/L
≥ 50	10 - 48 U/L	7-33U/L

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 206-606-1088
EVG 425-441-2640
PEN 360-842-5116

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 206-606-1088
EVG 425-441-2640
PEN 360-842-5116

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**

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

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 206-606-1088
EVG 425-441-2640
PEN 360-842-5116

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

<u>Related Terms</u>	Ammonia, PLNH3
<u>Lab</u>	Alliance Lab, Room G1-500 <u>Request Form</u> 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.
<u>Phone</u>	SLU 206-606-1088
<u>Availability</u>	STAT or routine
<u>Specimen</u>	Plasma ON ICE
<u>Volume</u>	2 mL plasma, minimum 0.2mL plasma. Ideal to have tube completely filled.
<u>Pediatric Volume</u>	Same as above
<u>Container</u>	Lime or Green top refrigerated or on ice
<u>Collection</u>	Routine venipuncture or line draw
<u>Causes for Rejection</u>	Samples older than 3 hours old at 2-4 degrees C or 24 hours at -20 C, QNS, Hemolysis, misidentified specimens
<u>Reference Ranges</u>	

	Female		Male	
Age	Range	Age	Range	
1d-13d	110-180	1d-13d	110-180	
14d-29d	95-155	14d-29d	95-155	
1m-11y	35-85	1m-11y	35-85	
12y-	0-65	12y-	0-65	

AMYLASE

<u>Related Terms</u>	Amylase
<u>Lab</u>	Alliance Lab, Room G1-500
	<u>Request Form</u> 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.
<u>Phone</u>	SLU 206-606-1088
	<u>Testing Frequency</u> Throughout service hours
<u>Availability</u>	STAT or routine
<u>Specimen</u>	Preferred – lithium heparin plasma, Acceptable – serum.
<u>Volume</u>	0.5 mL
<u>Pediatric Volume</u>	200uL (0.2mL) collected in microtube.
<u>Container</u>	5 mL lime top (lithium heparin) PST, lithium heparin green top, red top, gold top SST or orange top RST
<u>Collection</u>	Routine venipuncture or line draw
<u>Causes for Rejection</u>	Gross hemolysis, misidentified specimens and requisitions, specimen
QNS	
<u>Reference Ranges</u>	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 206-606-1088
EVG 425-441-2640
PEN 360-842-5116

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 206-606-1088
EVG 425-441-2640
PEN 360-842-5116

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, 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

<u>Related Terms</u>	Cancer Antigen 19-9, Carbohydrate Antigen 19-9
<u>Lab</u>	Alliance Lab, Room G1-500
	<u>Request Form</u> 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.	
<u>Phone</u>	SLU 206-606-1088
	<u>Testing Frequency</u> Throughout service hours
<u>Availability</u>	STAT or routine
<u>Specimen</u>	Serum or plasma
<u>Volume</u>	2.0 mL, minimum 0.8 mL
<u>Container</u>	5 mL orange top tube preferred or gold top, SST, red top tube SST, or lime top PST.
<u>Collection</u>	Routine venipuncture or line draw
<u>Causes for Rejection</u>	Gross hemolysis, lipemia or bilirubin, misidentified specimens and requisitions, specimen QNS
<u>Reference Ranges</u>	0 – 54 U/mL

CARCINOEMBRYONIC ANTIGEN

<u>Related Terms</u>	CEA
<u>Lab</u>	Alliance Lab, Room G1-500 <u>Request Form</u> 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.
<u>Phone</u>	SLU 206-606-1088
<u>Availability</u>	<u>Testing Frequency</u> Throughout service hours
<u>Specimen</u>	STAT or routine
<u>Volume</u>	Serum
<u>Container</u>	2.0 mL, minimum 0.8
<u>Collection</u>	5 mL orange top tube preferred: or gold top or SST or red top tube SST.
<u>Interfering Substances</u>	Routine venipuncture or line draw
	Gross hemolysis, lipemia or bilirubin, misidentified specimens and requisitions, specimen QNS
<u>Reference Ranges</u>	0.0-5.0 ng/mL

CEREBRAL SPINAL FLUID GLUCOSE

<u>Related Terms</u>	CSF glucose
<u>Lab</u>	Alliance Lab, Room G1-500
	<u>Request Form</u> 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.	
<u>Phone</u>	SLU 206-606-1088
	<u>Testing Frequency</u> Throughout service hours
<u>Availability</u>	STAT or routine
<u>Specimen</u>	Cerebral spinal fluid
<u>Volume</u>	1 mL
<u>Minimum Volume</u>	0.4 mL
<u>Container</u>	Plastic tube with tight-fitting lid, orange top tube
<u>Collection</u>	Lumbar Puncture
<u>Causes for Rejection</u>	
	Insufficient quantity, misidentified specimens, and requisitions.
<u>Reference Ranges</u>	40-80 mg/dL
<u>Critical Values</u>	Less than 20 mg/dL

CEREBRAL SPINAL FLUID PROTEIN

<u>Related Terms</u>	CSF protein
<u>Lab</u>	Alliance Lab, Room G1-500
	<u>Request Form</u> 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.	
<u>Phone</u>	SLU 206-606-1088
	<u>Testing Frequency</u> Throughout service hours
<u>Availability</u>	STAT or routine
<u>Specimen</u>	Cerebral spinal fluid
<u>Volume</u>	1 mL
<u>Minimum Volume</u>	0.4 mL
<u>Container</u>	Plastic tube with tight-fitting lid
<u>Collection</u>	Lumbar Puncture
<u>Causes for Rejection</u>	
Insufficient quantity, misidentified specimens, and requisitions.	
<u>Reference Ranges</u>	15-45 mg/dL

CHLORIDE

Related Terms Cl-

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 206-606-1088
EVG 425-441-2640
PEN 360-842-5116

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

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 206-606-1088

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 206-606-1088
EVG 425-441-2640
PEN 360-842-5116

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

<u>Related Terms</u>	ACTH Stimulation Test, Cortrosyn Stimulation Test, Cosyntropin, Hydrocortisone
<u>Lab</u>	Alliance Lab, Room G1-500
	<u>Request Form</u> 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.
<u>Phone</u>	SLU 206-606-1088
	<u>Testing Frequency</u> Throughout service hours
<u>Availability</u>	STAT or routine
<u>Specimen</u>	Serum or plasma
<u>Volume</u>	2.0 mL, minimum 0.8 mL
<u>Container</u>	5 mL lime top PST preferred or gold top, SST, red top tube SST, or orange top tube.
<u>Collection</u>	Routine venipuncture or line draw
<u>Causes for Rejection</u>	Gross hemolysis, lipemia or bilirubin, misidentified specimens and requisitions, specimen QNS
<u>Reference Ranges</u>	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

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 206-606-1088

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

Male	Female
62-325 U/L	43-274 U/L

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 206-606-1088
EVG 425-441-2640
PEN 360-842-5116

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 Hemolysis, misidentified specimens and requisitions, specimen QNS

Reference Range

Female		Male	
Age	Range	Age	Range
>=18 yrs.	0.38-1.02	>=18 yrs.	0.51-1.18

DIRECT BILIRUBIN

Related Terms Conjugated Bilirubin

Test included in these panels:

- Hepatic Function Panel
- Renal/Hepatic Function Panel

<u>Lab</u>	Alliance Lab, Room G1-500
	<u>Request Form</u> 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.	
<u>Phone</u>	SLU 206-606-1088
<u>Testing Frequency</u>	Throughout service hours
<u>Availability</u>	STAT or routine
<u>Specimen</u>	Plasma or Serum
<u>Volume</u>	0.5 mL
<u>Pediatric Volume</u>	Pediatric capillary collection: 200µL (0.2mL) serum
	collected in microtube or "bullet" tube.
<u>Container</u>	5 mL lime top PST, green top, red top, gold top SST or orange top RST
<u>Collection</u>	Routine venipuncture or line draw
<u>Special Handling</u>	Protect specimen from light. Direct exposure can decrease direct bilirubin values in specimens by 50% in one hour.
<u>Causes for Rejection</u>	
	Hemolysis, misidentified specimens and requisitions, specimen QNS.
<u>Reference Ranges</u>	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

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 206-606-1088

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

<u>Related Terms</u>	Blood sugar, sugar
<u>Test included in these panels:</u>	
	<ul style="list-style-type: none"> • Basic Metabolic Panel • Comprehensive Metabolic Panel • Renal Function Panel • Renal/Hepatic Function Panel
<u>Lab</u>	Alliance Lab, Room G1-500 Satellite Labs, South Lake Union Community Site Labs
<u>Request Form</u>	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.
<u>Phone</u>	SLU 206-606-1088 EVG 425-441-2640 PEN 360-842-5116
<u>Testing Frequency</u>	Throughout service hours
<u>Availability</u>	STAT or routine
<u>Specimen</u>	Plasma or Serum
<u>Volume</u>	0.5 mL
<u>Pediatric Volume</u>	Pediatric capillary collection: 200µL (0.2mL) serum collected in microtube or "bullet" tube.
<u>Container</u>	5 mL lime top PST, green top, red top, gold top SST or orange top RST. EDTA or fluoride acceptable.
<u>Collection</u>	Routine venipuncture or line draw; do not draw specimen from an arm receiving intravenous transfusion.
<u>Specimen Handling</u>	Separate plasma or serum from cells as soon as possible to minimize loss of glucose through glycolysis.
<u>Causes for Rejection</u>	Hemolysis, misidentified specimens and requisitions, specimen QNS
<u>Reference Ranges</u>	Glucose, fasting: 62–125 mg/dL.
<u>Critical Values</u>	<55 mg/dL or >500 mg/dL

HDL CHOLESTEROL

<u>Related Terms</u>	HDL
<u>Test included in this panel</u>	Lipid Panel
<u>Lab</u>	Alliance Lab, Room G1-500
	<u>Request Form</u> 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.
<u>Phone</u>	SLU 206-606-1088
<u>Testing Frequency</u>	Throughout service hours
<u>Availability</u>	Routine
<u>Specimen</u>	Plasma or Serum
<u>Volume</u>	1 mL
<u>Pediatric Volume</u>	Pediatric capillary collection: 500µL (0.5mL) serum collected in microtube or "bullet tube."
<u>Container</u>	5 mL lime top PST, green top, red top, gold top SST or orange top RST. No citrate or oxalate.
<u>Collection</u>	Routine venipuncture or line draw
<u>Causes for Rejection</u>	Misidentified specimens and requisitions, specimen QNS, improperly stored specimen.
<u>Reference Ranges</u>	>39
Desirable	>59 mg/dL
Acceptable	40-59 mg/dL
Low	<40 mg/dL

IONIZED CALCIUM, WHOLE BLOOD

<u>Test includes</u>	Ionized Calcium
<u>Lab</u>	Alliance Lab, Room G1-500
	<u>Request Form</u> 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.
<u>Phone</u>	SLU 206-606-1088
<u>Testing Frequency</u>	Throughout service hours
<u>Availability</u>	STAT
<u>Specimen</u>	Whole Blood
<u>Volume</u>	1 mL
<u>Pediatric Volume</u>	0.5 mL
<u>Container</u>	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.
<u>Collection</u>	Routine venipuncture or line draw
<u>Storage Instructions</u>	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.
<u>Causes for Rejection</u>	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.
<u>Reference Ranges</u>	≥ 1 year 1.18 mmol/L - 1.38 mmol/L < 1 year 1.16 mmol/L - 1.45 mmol/L
<u>Critical Values</u>	< 0.78 mmol/L or > 1.58 mmol/L

LACTATE DEHYDROGENASE

<u>Related Terms</u>	LD, LDH
<u>Lab</u>	Alliance Lab, Room G 1-500 Satellite Labs, South Lake Union Community Site Labs
<u>Request Form</u>	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.
<u>Phone</u>	SLU 206-606-1088 EVG 425-441-2640 PEN 360-842-5116
<u>Testing Frequency</u>	Throughout service hours
<u>Availability</u>	STAT or routine
<u>Specimen</u>	Serum
<u>Volume</u>	0.5 mL
<u>Pediatric Volume</u>	Pediatric capillary collection: 200µL (0.2mL) serum collected in microtube or "bullet" tube.
<u>Container</u>	Orange top RST, gold top SST, or red top
<u>Collection</u>	Routine venipuncture or line draw
<u>Causes for Rejection</u>	Lime PST, green top, citrate tube and oxalate tube.
<u>Reference Range</u>	<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

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

Lab

Alliance Lab, Room G1-500

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 206-606-1088

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

<u>Related Terms</u>	Lipase
<u>Lab</u>	Alliance Lab, Room G1-500 <u>Request Form</u> 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.
<u>Phone</u>	SLU 206-606-1088
<u>Testing Frequency</u>	Throughout service hours
<u>Availability</u>	STAT or routine
<u>Specimen</u>	Preferred – lithium heparin plasma, Acceptable – serum.
<u>Volume</u>	0.5 mL
<u>Pediatric Volume</u>	200uL (0.2mL) collected in microtube.
<u>Container</u>	5 mL lime top (lithium heparin) PST, lithium heparin green top, red top, gold top SST or orange top RST
<u>Collection</u>	Routine venipuncture or line draw
<u>Causes for Rejection</u>	Gross hemolysis, misidentified specimens and requisitions, specimen QNS.
<u>Reference Ranges</u>	<70 U/L

MAGNESIUM

<u>Related Terms</u>	Mg ⁺⁺
<u>Lab</u>	Alliance Lab, Room G1-500 Satellite Labs, South Lake Union Community Site Labs
<u>Request Form</u>	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.
<u>Phone</u>	SLU 206-606-1088 EVG 425-441-2640 PEN 360-842-5116
<u>Testing Frequency</u>	Throughout service hours
<u>Availability</u>	STAT or routine
<u>Specimen</u>	Plasma or Serum
<u>Volume</u>	0.5 mL
<u>Pediatric volume</u>	Pediatric capillary collection: 200µL (0.2mL) serum collected in microtube or "bullet" tube.
<u>Container</u>	5 mL lime top PST, green top, red top, gold top SST or orange top RST. No EDTA, citrate or oxalate.
<u>Collection</u>	Routine venipuncture or line draw
<u>Note</u>	Erythrocytes contain 3x the magnesium concentration of serum.
<u>Special Handling</u>	Draw without venous stasis.
<u>Causes for Rejection</u>	Hemolysis, misidentified specimens, and requisitions, specimen QNS.
<u>Reference Ranges</u>	1.8 – 2.4 mg/dL
<u>Critical Values</u>	<1.2 or >4.7 mg/dL

PHOSPHORUS

<u>Related Terms</u>	Phos, PO ₄ , Inorganic phosphorus
<u>Test included in these panels:</u>	
	<ul style="list-style-type: none"> • Renal Function Panel • Renal/Hepatic Function Panel
<u>Lab</u>	Alliance Lab, Room G1-500 Satellite Labs, South Lake Union Community Site Labs
<u>Request Form</u>	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.
<u>Phone</u>	SLU 206-606-1088 EVG 425-441-2640 PEN 360-842-5116
<u>Testing Frequency</u>	Throughout service hours
<u>Availability</u>	STAT or routine
<u>Specimen</u>	Plasma or Serum
<u>Volume</u>	0.5 mL
<u>Pediatric Volume</u>	Pediatric capillary collection: 200µL (0.2mL) serum collected in microtube or "bullet" tube.
<u>Container</u>	5 mL lime top PST, green top, red top, gold top SST or orange top RST. No EDTA, citrate or oxalate.
<u>Collection</u>	Routine venipuncture or line draw
<u>Special Handling</u>	Hemolysis must be avoided, as phosphate may be split off from labile esters in the erythrocytes.
<u>Causes for Rejection</u>	Hemolysis, misidentified specimens, and requisitions, specimen QNS.
<u>Reference Ranges</u>	Adult 2.5 – 4.5 mg/dL Child <12 years 4.5 – 6.0 mg/dL
<u>Critical Values</u>	< 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 206-606-1088
EVG 425-441-2640
PEN 360-842-5116

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

<u>Lab</u>	Alliance Lab, Room G1-500 Satellite Labs, South Lake Union Community Site Labs
<u>Request Form</u>	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.
<u>Phone</u>	SLU 206-606-1088 EVG 425-441-2640 PEN 360-842-5116
<u>Testing Frequency</u>	Throughout service hours
<u>Availability</u>	STAT or routine
<u>Specimen</u>	Random Urine, first morning specimen preferred for best results.
<u>Volume</u>	10 mL
<u>Container</u>	Plastic urine container
<u>Collection</u>	Freshly voided random urine.
<u>Storage Instructions</u>	Specimen can be refrigerated (2-8°C).
<u>Causes for Rejection</u>	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.
<u>Reporting</u>	Qualitative results, positive or negative
<u>Reference Ranges</u>	Negative, positive results will be called to the ordering provider.

SERUM PREGNANCY TEST (QUALITATIVE)

<u>Lab</u>	Alliance Lab, Room G1-500 Satellite Labs, South Lake Union Community Site Labs
<u>Request Form</u>	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.
<u>Phone</u>	SLU 206-606-1088 EVG 425-441-2640 PEN 360-842-5116
<u>Testing Frequency</u>	Throughout service hours
<u>Availability</u>	STAT or routine
<u>Specimen</u>	Serum
<u>Volume</u>	5 mL
<u>Container</u>	4ml orange top RST, gold top SST, red top tube <i>Not acceptable:</i> lime or green top tube
<u>Collection</u>	Routine venipuncture or line draw
<u>Causes for Rejection</u>	Collected in tube with anticoagulant, QNS, misidentified specimens and requisitions.
<u>Reporting</u>	Qualitative results, positive or negative
<u>Reference Ranges</u>	Negative, positive results will be called to the ordering provider.

PROSTATE SPECIFIC ANTIGEN

<u>Related Terms</u>	PSA, PSA monitor, PSA screen, ultrasensitive PSA
<u>Lab</u>	Alliance Lab, Room G1-500
	<u>Request Form</u> 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.
<u>Phone</u>	SLU 206-606-1088
<u>Testing Frequency</u>	Throughout service hours
<u>Availability</u>	STAT or routine
<u>Specimen</u>	Serum
<u>Volume</u>	2.0 mL, minimum 0.8
<u>Container</u>	5 mL orange top tube preferred: or gold top SST, red top tube, SST.
<u>Collection</u>	Routine venipuncture or line draw
<u>Interfering Substances</u>	Gross hemolysis, lipemia, or bilirubin; misidentified specimens and requisitions; specimen QNS
<u>Reference Ranges</u>	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 206-606-1088
EVG 425-441-2640
PEN 360-842-5116

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

EMERGENCY BLEED, STOOL

**Related Terms
Lab**

Fecal Occult Blood, FOBT, Stool (GI Bleeding Screen), ESB
Alliance Lab, Room G1-500

Request Form

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.

Phone

SLU 206-606-1088

Testing Frequency

Throughout service hours

Availability

STAT or routine

Specimen

Stool sample must be applied to the card prior to being sent to the lab. The lab will not accept stool samples in specimen containers. Do not send stool directly to lab. Note: The Alliance Lab does not supply cards, these are stocked by our Storeroom team in each clinic space. Connect with the Storeroom to acquire more cards.

Causes for Rejection

Misidentified specimens and requisitions, specimen QNS, improperly prepared card, card stored outside of room temperature

Reference Range

Negative [NRN]

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

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 206-606-1088

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 μ IU/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

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 206-606-1088

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 206-606-1088
EVG 425-441-2640
PEN 360-842-5116

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 206-606-1088
EVG 425-441-2640
PEN 360-842-5116

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

<u>Related Terms</u>	Urine protein, Urine total protein
<u>Lab</u>	Alliance Lab, Room G1-500
	<u>Request Form</u> 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.
<u>Phone</u>	SLU 206-606-1088
<u>Testing Frequency</u>	Throughout service hours
<u>Availability</u>	STAT or routine
<u>Specimen</u>	24-hour urine collection, random specimen also acceptable
<u>Volume</u>	1 mL
<u>Minimum Volume</u>	0.4 mL
<u>Container</u>	24-hour urine collection container, or plastic urine cup w/ tight-fitting lid
<u>Causes for Rejection</u>	Insufficient quantity, misidentified specimens and requisitions.
<u>Reference Ranges</u>	0-14 mg/dL (random specimen) 0.05-0.08 g/24 hours (24-hour collection)

URINE TOTAL PROTEIN, SEMI QUANTITATIVE

<u>Related Terms</u>	Urine protein, Urine total protein
<u>Lab</u>	Satellite Labs, South Lake Union Community Site Labs
<u>Request Form</u>	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.
<u>Phone</u>	EVG 425-441-2640 PEN 360-842-5116
<u>Testing Frequency</u>	Throughout service hours
<u>Availability</u>	STAT or routine
<u>Specimen</u>	Random urine specimen
<u>Volume</u>	1 mL
<u>Minimum Volume</u>	0.4 mL
<u>Container</u>	Plastic urine cup w/ tight-fitting lid
<u>Causes for Rejection</u>	Insufficient quantity, misidentified specimens and requisitions, 24-hour urine specimens
<u>Reference Ranges</u>	No reference range.

TRIGLYCERIDES

<u>Related Terms</u>	Trigs
<u>Test included in this panel</u>	Lipid panel
<u>Lab</u>	Alliance Lab, Room G1-500
	<u>Request Form</u> 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.
<u>Phone</u>	SLU 206-606-1088
<u>Testing Frequency</u>	Throughout service hours
<u>Availability</u>	Routine
<u>Specimen</u>	Plasma or Serum
<u>Volume</u>	1 mL
<u>Pediatric Volume</u>	Pediatric capillary collection: 500µL (0.5mL) serum collected in microtube or "bullet tube."
<u>Container</u>	5 mL lime top PST, green top, red top, gold top SST or orange top RST
<u>Collection</u>	Routine venipuncture or line draw
<u>Causes for Rejection</u>	Misidentified specimens and requisitions, specimen QNS, improperly stored specimen, hemolysis, not fasting for at least 12 hours.
<u>Reference Ranges</u>	Desirable <150 mg/dL
	Borderline 150-199 mg/dL
	High 200-499 mg/dL
	Very High >500 mg/dL

TROPONIN I (HIGH SENSITIVITY)

<u>Related Terms</u>	High Sensitivity Troponin I, hsTnI, TROPIG, Troponin-I, Troponin I
<u>Test included in these panels</u>	TROPIG
<u>Lab</u>	Alliance Lab, Room G1-500
	<u>Request Form</u> 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.
<u>Phone</u>	SLU 206-606-1088
<u>Testing Frequency</u>	Throughout service hours
<u>Availability</u>	STAT
<u>Specimen</u>	Serum
<u>Volume</u>	4 mL
<u>Pediatric Volume</u>	2 full GOLD MICROTAINER
<u>Container</u>	4 mL blood in GOLD SST or RED TOP tube
<u>Collection</u>	Routine venipuncture or line draw
<u>Causes for Rejection</u>	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)
<u>Reference Ranges</u>	<0.04 ng/mL
<u>Critical Values</u>	≥0.4 ng/mL

URIC ACID

<u>Lab</u>	Alliance Lab, Room G1-500 Satellite Labs, South Lake Union Community Site Labs
<u>Request Form</u>	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.
<u>Phone</u>	SLU 206-606-1088 EVG 425-441-2640 PEN 360-842-5116
<u>Testing Frequency</u>	Throughout service hours
<u>Availability</u>	STAT or routine
<u>Specimen</u>	Plasma or Serum
<u>Volume</u>	0.5 mL
<u>Pediatric Volume</u>	Pediatric capillary collection: 200µL (0.2mL) serum collected in microtube or "bullet" tube.
<u>Container</u>	5 mL lime top PST, green top, red top, gold top SST or orange top RSTNO EDTA
<u>Collection</u>	Routine venipuncture or line draw
<u>Causes for Rejection</u>	Misidentified specimens and requisitions, specimen QNS.
<u>Reference Ranges</u>	

Male	Female
3.9 – 7.6 mg/dL	2.6-6.8 mg/dL

URINE CREATININE CREATININE CLEARANCE

Test included in:

- Urine Creatinine
- Creatinine clearance
- Urine Protein/Creatinine ratio

Lab

Alliance Lab, Room G1-500

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 206-606-1088

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

	Urine Creatinine	Child 0-9 yrs.	700-1800 mg/24 hrs
Male > 9 yrs.		1000-2000 mg/24 hrs	
Female > 9 yrs.		700-1800 mg/24 hrs	
	Creatinine Clearance	Newborn	40 –60 mL/min/m ²
		Male	75-120 mL/min
		Female	65-105 mL/min

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

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 206-606-1088

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

Urine Protein value = Ratio

Urine Creatinine value

HLA TYPING

<u>Related Terms</u>	Histocompatibility Testing, HLA testing, Serology, PRA testing
<u>Lab</u>	Clinical Immunogenetics Lab, 188 E. Blaine, Suite 250
<u>Request Form</u>	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.
<u>Sample Label</u>	Label and request must have the sample name and a second identifier.
<u>Phone</u>	(206)606-7700 Lab Coordinator's Office
	FAX (206)606-1169
<u>Availability</u>	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 5pm or they will not be received until the next business day (See After Hours instructions).
<u>Turnaround Time</u>	See 'CIL Turn Around Time Chart '
<u>Specimen</u>	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.
<u>Volume/ Container</u>	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 <u>and</u> 2 mL blood in green top (sodium heparin) depending on age (lithium heparin and ACD are acceptable if sodium heparin is not available)
<u>Collection</u>	Peripheral Blood: Routine venipuncture or line draw Saliva and Buccal samples: call CIL for collection kits and instructions.
<u>Special Handling</u>	Room temperature, deliver to CIL immediately.
<u>Causes for Rejection</u>	Misidentified specimens and requisitions, unlabeled specimens, specimen QNS, improperly stored specimen or broken tubes, specimens received without requisitions, specimens of questionable integrity.
<u>After hours</u>	Draw sample and keep specimen at room temperature. Deliver to CIL at 8am on the next business day.

CHIMERISM TESTING

Related Terms AMP-FLP (Amplified Fragment Length Polymorphism, Engraftment and Monitoring), STR (Short Tandem Repeat); VNTR (Variable Number Tandem Repeat).
Lab Clinical Immunogenetics Lab, 188 E. Blaine, Suite 250, Room 2120
Request Form Label and request must have two patient or donor identifiers.

All samples must be accompanied by a paper requisition.

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

Phone (206)606-1139 or (206)606-7700, FAX 606-1169
Availability M – F 8:30am – 5pm. Specimens must arrive in CIL before 5pm or they will not be received until the next business day (See After Hours instructions).
Turnaround Time See 'CIL Turnaround Time Chart'
Specimen Peripheral Blood, Bone Marrow or Sorted
 Cell subsets, biopsy samples, hair follicles.
Volume Adults: For peripheral blood 10mL; for bone marrow 1-2mL
 Pediatric: Minimum of 5mL peripheal blood
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, specimens of questionable integrity.
After Hours Draw sample and keep at room temperature.
 Deliver to CIL at 8am on the next business day.

**CIL TURNAROUND TIMES
FOR HLA ADMIT WORKUPS AND CHIMERISM TESTING**

HLA Typing		
Patient/Donor Status	Specimen Rec'd by 2:30 pm**:	Results available in EPIC or faxed to ordering provider by EOD*:
STAT	Monday-Friday	Within 3 working days
Urgent Clinical	Monday-Friday	Within 5 working days
Non-Urgent Clinical/Research	Monday-Friday	Within 10 working days

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

***After 2:30 PM, specimens will be processed the next business day.*

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

<u>Related Terms</u>	DDI
<u>Lab</u>	Alliance Lab, Room G1-500 Satellite Labs, South Lake Union Community Site Labs
<u>Request Form</u>	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.	
<u>Phone</u>	SLU 606-1088 EVG 425-441-2640
<u>Testing Frequency</u>	Throughout service hours
<u>Availability</u>	STAT or routine
<u>Specimen</u>	Blood
<u>Volume</u>	4.5 mL
<u>Pediatric volume</u>	2.7 mL
<u>Container</u>	Blue top 3.2 % (sodium citrate) tube
<u>Collection</u>	If multiple tests are being drawn, draw coagulation studies second.
<p>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.</p>	
<u>Causes for Rejection</u>	Specimen clotted, hemolyzed, contaminated with heparin, specimen received more than 2 hours after collection, tubes under-filled or overfilled, misidentified specimens and requisitions.
<u>Reference Ranges</u>	0-0.59 ug/mL FEU
<u>Critical Values</u>	none
<u>After Hours</u>	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.

FIBRINOGEN

<u>Related Terms</u>	FIBCL
<u>Lab</u>	Alliance Lab, Room G1-500 Satellite Labs, South Lake Union Community Site Labs
<u>Request Form</u>	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.
<u>Phone</u>	SLU 606-1088 EVG 425-441-2640
<u>Testing Frequency</u>	Throughout service hours
<u>Availability</u>	STAT or routine
<u>Specimen</u>	Blood
<u>Volume</u>	4.5 mL
<u>Pediatric volume</u>	2.7 mL
<u>Container</u>	Blue top 3.2 % (sodium citrate) tube
<u>Collection</u>	If multiple tests are being drawn, draw coagulation studies second.

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.

(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 150 – 400 mg/dL

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

<u>Related Terms</u>	Activated Partial Thromboplastin Time, aPTT, PTT.
<u>Lab</u>	Alliance Lab, Room G1-500 Satellite Labs, South Lake Union Community Site Labs
<u>Request Form</u>	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.
<u>Phone</u>	SLU 606-1088 EVG 425-441-2640
<u>Testing Frequency</u>	Throughout service hours
<u>Availability</u>	STAT or routine
<u>Specimen</u>	Blood
<u>Volume</u>	4.5 mL
<u>Pediatric Volume</u>	2.7 mL
<u>Container</u>	Blue top (3.2 % sodium citrate) tube
<u>Collection</u>	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. <i>Note: For Heparin monitoring, MUST DRAW 5 mL BLUE TOP and process in 1hr.</i>
<u>Causes for Rejection</u>	Specimen clotted, gross hemolysis, received more than 2 hours after collection, tubes under-filled or overfilled, misidentified specimens and requisitions.
<u>Reference Ranges</u>	22 – 35 seconds
<u>Therapeutic Range</u>	60 –100 seconds for patient on heparin therapy.
<u>Critical Value</u>	>120 seconds
<u>After Hours</u>	Centrifuge for 10 minutes. Remove plasma and re-spin plasma for 10 minutes. Decant and freeze. Send frozen on dry ice.

PROTHROMBIN TIME

<u>Related Terms</u>	Protime, PT, PRO, ACCINR*
<u>Test includes</u>	Prothrombin Time and International Normalization Ratio (INR) (*ACCINR includes INR result, only)
<u>Lab</u>	Alliance Lab, Room G1-500 Satellite Labs, South Lake Union Community Site Labs
<u>Request Form</u>	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.
<u>Phone</u>	SLU 606-1088 EVG 425-441-2640
<u>Testing Frequency</u>	Throughout service hours
<u>Availability</u>	STAT or routine
<u>Specimen</u>	Blood
<u>Volume</u>	4.5 mL
<u>Pediatric Volume</u>	2.7 mL
<u>Container</u>	Blue top (3.2% sodium citrate) tube
<u>Collection</u>	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.
<u>Causes for Rejection</u>	Specimen clotted, gross hemolysis, tubes under-filled or overfilled, misidentified specimens and requisitions.
<u>Reference Range</u>	INR 0.8 – 1.3 PRO 10.7 – 15.6 secs
<u>Therapeutic Range</u>	INR 2.0 – 3.5; INR is applicable only to patients on stable coumadin therapy.
<u>Critical Values</u>	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.
<u>After Hours</u>	Centrifuge for 10 minutes. Remove plasma and re-spin plasma for 10 minutes. Decant and freeze. Send frozen on dry ice.

CANCER GENOMICS (FKA CYTOGENETICS) STUDIES – CHROMOSOME ANALYSIS AND FISH

<u>Related Terms</u>	Molecular Cytogenetics, Chromosome Analysis, FISH (fluorescence in situ hybridization): Karyotype
<u>Test includes</u> (FISH)	Chromosome analysis or fluorescence in situ hybridization
<u>Lab</u>	Cancer Genomics Lab, Blaine, BL-103
<u>Request Form</u>	

Epic generated order OR

Downtime Blood and Other Samples Physicians Orders OR

- Long Term Follow Up (for mail-in specimens) OR
- VA requisitions

Fill out requisition completely, including date and time of draw, requesting clinician, and ICD codes.

Patient label and request must have two matching patient/donor identifiers.

See <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 Cancer Genomics Turnaround Time Table

Specimen Bone Marrow, Peripheral Blood, or Flow Cytometry Sorted

White Cell subsets.

Cell Sorting: Contact the lab before order placed when possible.

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

Pediatric volume For blood, infants 1-2mL.

Container Sodium heparin (green top tube)

(Continued)

Cancer Genomic Studies – Chromosome Analysis and FISH, continued

Collection Routine venipuncture, line draw, or bone marrow aspiration.

Special Handling Room temperature; deliver promptly to Cancer Genomics Lab.
For cell sorting contact the lab.

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 technologists, and 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)

CANCER GENOMICS (FKA CYTOGENETICS STUDIES – GENOMIC ARRAY

<u>Related Terms</u>	CGAT, Array CGH, SNP array, DNA Microarray
<u>Test includes</u>	Genomic Array (CGAT)
<u>Lab</u>	Cancer Genomics Lab, Blaine, BL-103
<u>Request Form</u>	Epic generated order OR

- Downtime Blood and Other Samples Physicians Orders OR
- Long Term Follow Up (for mail-in specimens) OR
- VA requisitions

Fill out requisition completely, including date and time of draw, requesting clinician, and ICD codes.

Patient label and request must have two matching patient/donor identifiers.

See <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 Cancer Genomics Turnaround Time Table

Specimen Bone Marrow, Peripheral Blood, Tissue (fresh, frozen, or FFPE).
DNA extracted from a CLIA-certified laboratory.

Volume For bone marrow 1-2mL; peripheral blood 3-5mL, tissue (contact lab).

Container 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

Collection Routine venipuncture, line draw or bone marrow aspiration;
surgical excision for tissue

Special Handling Deliver immediately to Cancer Genomics Lab at room temperature; cool pack is desirable if CGAT is the only test needed. If not delivered same day, refrigerate until

delivery possible, though sample will not be immediately rejected if stored/delivered at room temperature.

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 technologists, and specimens of questionable integrity.

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-Genomic Array, continued

CANCER GENOMICS (FKA CYTOGENETICS) STUDIES – NGS TARGETED RNA SEQUENCING

<u>Related Terms</u>	Targeted RNA Sequencing (TRS); FusionPlex
<u>Test includes</u>	Targeted RNA Sequencing (TRS); FusionPlex
<u>Lab</u>	Cancer Genomics Lab, Blaine, BL-103
<u>Request Form</u>	<p>Epic generated order OR Downtime Blood and Other Samples Physicians Orders OR</p> <ul style="list-style-type: none"> • Long Term Follow Up (for mail-in specimens) OR • VA requisitions <p>Fill out requisition completely, including date and time of draw, requesting clinician, and ICD codes. Patinet label and request must have two matching patient/donor identifiers.</p> <p>See https://testguide.labmed.uw.edu/public/view/EVALHD for additional information on ordering HDP testing.</p>
<u>Phone</u>	206-606-1390 main line
<u>Availability</u>	<p>M – F 8am – 5pm <i>After hours:</i> on call 9am – 5pm weekends and holidays, Pager: 206-340-7207</p>
<u>Turnaround Time</u>	See Cancer Genomics Turnaround Time Table
<u>Specimen</u>	Bone Marrow, Peripheral Blood (fresh; <48 hrs). Methanol/acetic acid pellet cytogenetic prep also acceptable. RNA extracted from a CLIA-certified laboratory.
<u>Volume</u>	For bone marrow 1-2mL; peripheral blood 3-5mL, fixed pellet (contact lab)
<u>Container</u>	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
<u>Collection</u>	Routine venipuncture, line draw or bone marrow aspiration
<u>Special Handling</u>	Deliver immediately to Cancer Genomics Lab. Keep refrigerated if delivery delayed. Room temperature OK if delivered within a few hours of draw.
<u>Causes for Rejection</u>	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.
<u>After Hours</u>	<p>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</p> <p>(On call weekends and holidays 9am – 5pm: Pager: 206-340-7207)</p>

CANCER GENOMICS (FKA CYTOGENETICS) STUDIES – SKIN FIBROBLAST EXPANSION FOR GERMLINE TESTING

Related Terms**Test includes**

Fibroblast expansion

Lab

Cancer Genomics Lab, Blaine, BL-103

Request Form

Epic generated order.

Fill out requisition completely, including date and time of draw, requesting clinician, and ICD codes. Patient label and request must have two matching patient/donor identifiers.

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

N/A; Not a direct test result; genetic counselors are informed when skin is expanded adequately for desired testing; typically, 6-12 weeks

Specimen

Skin punch biopsy.

Volume

2-4 mm square, collected sterile

Container

Place in 1-3 ml of refrigerated, unexpired transport medium supplied by Cancer Genomics lab.

Collection

Routine skin punch biopsy

Special Handling

Deliver immediately to Cancer Genomics Lab; keep at room temperature

Causes for Rejection

Misidentified specimens and requisitions, frozen or heated specimens, any specimen possibly exposed to formaldehyde, formalin, or alcohol, leaking specimens that pose a risk to technologist, and 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

**TURNAROUND TIMES
CANCER GENOMICS (FKA CYTOGENETICS)**

TURNAROUND TIMES Chromosome Analysis, FISH, CGAT, TRS	
Test Type	Results by:***
Chromosome Analysis and FISH	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.
Genomic Array (CGAT)	5–10 working days with day 1 as day of receipt; up to 15 days for FFPE samples.
NGS Targeted RNA Sequencing (TRS)	15-20 working days with day 1 as day of receipt
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

<u>Related Terms</u>	CSF cell count
<u>Test Includes</u>	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.
<u>Lab</u>	Alliance Lab, Room G1-500 Satellite Labs, South Lake Union Community Site Labs
<u>Request Form</u>	Fred Hutchinson Cancer Center Clinical Lab Request: fill out completely, including ICD codes CPOE orders will be interfaced to Sunquest upon order activation
<u>Phone</u>	in Epic. SLU 606-1088 EVG 425-441-2640
<u>Testing Frequency</u>	Throughout service hours
<u>Availability</u>	STAT or routine
<u>Specimen</u>	Cerebral spinal fluid
<u>Volume</u>	1 mL
<u>Minimum Volume</u>	0.5 mL
<u>Container</u>	Sterile Tube; EDTA (lavender-top tube) if bloody
<u>Collection</u>	Lumbar puncture
<u>Causes for Rejection</u>	Insufficient quantity, misidentified specimens
<u>Reference Ranges</u>	and requisitions 0 rbc/uL 0-5 mononuclear (lymphocytes and/or monocytes) cells/uL
	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

<u>Critical Values</u>	Less than	Greater than	Units
Absolute neutrophils	0.5	N/A	x 10 ³ /uL
Hematocrit	20	None	%
Platelet	20	1000	x 10 ³ /uL

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

Female		Male	
Age	Range	Age	Range
≤50y	0 – 20	≤50y	0 – 15
>50y	0 – 30	>50y	0 – 20

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

collection

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

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

Immature Platelet		Units: %	
Female		Male	
Age	Range	Age	Range
0 mos. -	1.2 – 8.6	0 mos.-	1.2 – 8.6

Immature Platelet		Units: thou/uL	
Female		Male	
Age	Range	Age	Range
0 mos. –	3.6 – 20.0	0 mos. –	3.6 – 20.0

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

<i>Retic</i>		Units: %	
Female		Male	
Age	Range	Age	Range
6 mos.-	0.5 – 2.5	6 mos.-	0.5 – 2.5

<i>Retic Absolute</i>		Units: bil / L	
Female		Male	
Age	Range	Age	Range
15y –	25 – 125	15y –	25 – 125

COVID/FLU/RSV RESPIRATORY PANEL, RAPID PCR

<u>Related Terms</u>	COVID-19, Influenza, RSV, Rapid PCR
<u>Test Includes</u>	Qualitative PCR by Cepheid GeneXpert Plus for SARS-CoV-2, FLU A & B, and RSV
<u>Lab</u>	Alliance Lab, Room G1-500 Satellite Labs, South Lake Union Community Site Labs
<u>Request Form</u>	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.
<u>Phone</u>	SLU 606-1088 EVG 425-441-2640
<u>Testing Frequency</u>	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)
<u>Availability</u>	In order of receipt only
<u>Specimen</u>	Nasopharyngeal or Nasal Swab in 3mL approved viral transport media
<u>Volume</u>	3mL
<u>Pediatric Volume</u>	n/a
<u>Container</u>	Swab in viral transport media
<u>Collection</u>	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.
<u>Causes for Rejection</u>	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
<u>Reference Ranges</u>	Negative

SARS-COV-2 (COVID-19) QUALITATIVE RAPID PCR

<u>Related Terms</u>	COVID-19, 2019-nCoV, COVID, COVID19, nCoV, PUI nCoV, SARS, SARS-CoV-2, Wuhan Coronavirus
<u>Test Includes</u>	Qualitative PCR by Cepheid GeneXpert Plus for SARS-CoV-2
<u>Lab</u>	Alliance Lab, Room G1-500 Satellite Labs, South Lake Union Community Site Labs
<u>Request Form</u>	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.
<u>Phone</u>	SLU 606-1088 EVG 425-441-2640
<u>Testing Frequency</u>	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)
<u>Availability</u>	In order of receipt only
<u>Specimen</u>	Nasopharyngeal or Nasal Swab in 3mL approved viral transport media
<u>Volume</u>	3mL
<u>Pediatric Volume</u>	n/a
<u>Container</u>	Swab in viral transport media
<u>Collection</u>	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.
<u>Causes for Rejection</u>	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
<u>Reference Ranges</u>	Negative

BONE MARROW ASPIRATE / BIOPSY

<u>Related Terms</u>	Bone marrow, iliac crest, bone marrow core
<u>Test Includes</u>	Gross and microscopic examination with diagnosis, other laboratory tests as ordered
<u>Lab</u>	Alliance Lab staff assists with Bone Marrow procedures and distributes specimens to other laboratories including Hematology, Pathology, UW Hematopathology, Microbiology and Virology.
<u>Request Form</u>	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.
<u>Phone</u>	SLU 606-1088
<u>Availability</u>	M – F 8am – 4:30pm
<u>Turnaround Time</u>	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.
<u>Specimen</u>	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

<u>Related Terms</u>	BAL, Bronchial Aspirate, Bronchial Wash
<u>Test Includes</u>	Detection of abnormal cells, malignant cells, infectious agents
<u>Lab</u>	Fred Hutchinson Cancer Center Pathology, Room G7-910
<u>Request Form</u>	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.

<u>Phone</u>	606-1355
<u>Availability</u>	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 Minimum volume is 5 mL

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

Specimen Handling

Collection from a Patient at Fred Hutchinson Cancer Center Ambulatory Clinic
<ul style="list-style-type: none"> ▶ 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. ▶ Pathology specimens should be sent immediately, unfixed, and at ambient temperature to the Fred Hutchinson Cancer Center Pathology Laboratory. ▶ Pulmonary physicians will divide the specimen for Microbiology and Virology culture. ▶ Specimens for culture should be delivered to the Alliance Laboratory for transport to the Microbiology and Virology Labs. ▶ Specimen delivered by courier to Fred Hutchinson Cancer Center Pathology (G7-910) ▶ Fred Hutchinson Cancer Center Histology Tech accessions 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.

Collection from a Patient at UWMC for infection	
7am to 4:30pm Mon – Fri Business Hours	4:30pm to 7am Mon – Fri Weekends & Holidays
<ul style="list-style-type: none"> ▶ Call the Fred Hutchinson Cancer Center Pathology Department IN ADVANCE at 606-1355. Call the in-house courier at 598-8603 for a STAT pick-up. 	<p>Saturdays follow the procedure below except between 6:00am to 2pm - during these hours notify the Saturday Tech in the Fred Hutchinson Cancer Center Pathology Department at 606-1355.</p>

Bronchoalveolar Lavage, continued

<ul style="list-style-type: none"> ▶ 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. 	<ul style="list-style-type: none"> ▶ 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. ▶ Specimen delivered by courier to Fred Hutchinson Cancer Center Pathology (G7-910)
--	--

Collection on a Patient at UWMC for malignancy
<ul style="list-style-type: none"> ▶ 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

Collection on a Patient at Fred Hutchinson Cancer Center Ambulatory Clinic

- ▶ Place biopsies for morphology in 10% Buffered formalin, noting on the bottle the date and time of placement in the fixative.
- ▶ Deliver to Fred Hutchinson Cancer Center Pathology.
- ▶ Biopsies for culture should be placed in transport media and taken to the Alliance Laboratory for transport to the Microbiology and Virology Labs.

(Continued)

Endoscopy, continued

Collection on a HSCT Patient at UWMC	
7am to 4:30pm Mon – Fri Business Hours	4:30pm to 7am Mon – Fri Weekends & Holidays
<ul style="list-style-type: none"> ▶ Tissue for culture should be sent directly from the procedure room to UWMC Microbiology and/or Virology. ▶ Place Pathology specimens in 10% buffered formalin fixative. ▶ 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. ▶ Use a courier to transport the package to the commodities box 	<p>Saturdays follow the procedure below except between 6am to 2pm During these hours notify the Saturday Tech in the Fred Hutchinson Cancer Center Pathology Department at 606-1355</p> <ul style="list-style-type: none"> ▶ In ADVANCE contact the Fred Hutchinson Cancer Center Pathology Tech at 573-0892 ▶ Tissue for culture should be sent directly from the procedure room to UWMC Microbiology and/or Virology. ▶ Specimens are sent by the floor via Delivery Express to the Pathology Department at the Fred Hutchinson Cancer Center, Room G7-910 <p style="text-align: center;">After hours: do not send the specimen to UWMC Pathology Department.</p>

Collection of Fred Hutchinson Cancer Center GenOnc/Heme or UWMC Patients at UWMC
<ul style="list-style-type: none"> ▶ 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

<u>Related Terms</u>	FNAs
<u>Test Includes</u>	Gross and microscopic exam with diagnosis
<u>Lab</u>	Harborview Cytology
<u>Request Form</u>	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.
<u>Phone</u>	Harborview Cytology 744-4279
<u>Availability</u>	Monday – Friday 8am – 5pm
<u>Specimen Collection</u>	
	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

Collection at Fred Hutchinson Cancer Center Ambulatory Clinic
<ul style="list-style-type: none"> ▶ Deliver the specimen to Fred Hutchinson Cancer Center Pathology. ▶ Fred Hutchinson Cancer Center Pathology Tech will place the specimen on a packing list. It will be sent via courier to Harborview Cytology.

Collection on a HSCT Patient at UWMC	
7am to 4:30pm Mon – Fri Business Hours	4:30pm to 7am Mon – Fri. Weekends & Holidays
<ul style="list-style-type: none"> ▶ Immediately deliver Pathology specimens to UWMC Pathology ▶ All FNAs will be sent to Harborview Cytology for processing. 	<ul style="list-style-type: none"> ▶ In ADVANCE page UWMC on-call Histology Tech (663-8098) ▶ Immediately deliver Pathology specimens to UWMC Pathology ▶ All FNAs will be sent by UWMC Pathology to Harborview Cytology

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

Collection at Fred Hutchinson Cancer Center Ambulatory Clinic

- ▶ 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.
- ▶ Specimens for culture should be delivered to the Alliance Laboratory for transport to the appropriate lab (Microbiology, Virology Labs or Cytogenetics Lab). [See Cancer Genomics Skin Fibroblast Expansion.](#)
- ▶ Pathology specimens should be placed immediately to 10% buffered formalin at ambient temperature and sent to the Fred Hutchinson Cancer Center Pathology laboratory.

(Continued)

Lip or Skin Biopsy, continued

Collection on a HSCT Patient at UWMC	
7am to 4:30pm Mon – Fri Business Hours	4:30pm to 7am Mon – Fri Weekends & Holidays
<ul style="list-style-type: none"> ▶ 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. ▶ Place specimens in 10% buffered formalin and deliver to UWMC Pathology (EC 239) for routing 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 shipped. ▶ Business hours: Use a courier to transport the package to the commodities box. 	<p>Saturdays follow the procedure below except between 6am to 2pm</p> <p>During these hours notify the Saturday Tech in the Fred Hutchinson Cancer Center Pathology Department at 606-1355</p> <ul style="list-style-type: none"> ▶ In ADVANCE contact the Fred Hutchinson Cancer Center Pathology Tech at 573-0892 ▶ 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. <p style="text-align: center; margin-top: 20px;">After hours: do not send the specimen to UWMC Pathology Department.</p>

Collection of Fred Hutchinson Cancer Center GenOnc/Heme or UWMC Patients at UWMC
<ul style="list-style-type: none"> ▶ Specimen in 10% formalin delivered to UWMC Pathology (EC 239) ▶ UWMC Histology Tech accessions 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. Holidays may extend result times.

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

Collection on a HSCT Patient at UWMC	
7am to 4:30pm Mon – Fri Business Hours	4:30pm to 7am Mon – Fri Weekends & Holidays
<ul style="list-style-type: none"> ▶ 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. ▶ Place specimens in 10% buffered formalin fixative and deliver to UWMC Pathology (EC 239) immediately for routing to Fred Hutchinson Cancer Center Pathology Lab. ▶ If fulminant viral hepatitis or an infectious abscess is suspected, tissue for culture should be sent directly from the procedure room to UWMC Microbiology and/or Virology. ▶ 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. 	<p>Saturdays follow the procedure below except between 7:30am to 6pm</p> <p>During these hours notify the Saturday Tech in the Fred Hutchinson Cancer Center Pathology Department at 606-1355</p> <ul style="list-style-type: none"> ▶ In ADVANCE contact the Fred Hutchinson Cancer Center Pathology Tech at 573-0892 ▶ Place pathology specimens in 10% buffered formalin fixative. ▶ Specimens are sent from the floor via Delivery Express to the Pathology Department at the Fred Hutchinson Cancer Center, Room G7-910. <p style="text-align: center;">After hours: do not send the specimen to UWMC Pathology Department.</p>

(Continued)

Liver Biopsy, continued

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

- Specimen prepared as requested by surgeon.
- 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.
- If done in Interventional Radiology, specimen delivered by Intervention Radiology staff to UWMC Pathology (EC 239)
- UWMC Histology Tech accessions the specimen in the computer immediately and sets up for processing at UWMC Anatomic Pathology.

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	
7am to 4:30pm Mon – Fri Business Hours	4:30pm to 7am Mon – Fri Weekends & Holidays
<p>▶ 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.</p>	<p style="text-align: center;">Saturdays follow the procedure below except between 6 am to 2pm</p> <p>During these hours notify the Saturday Tech in the Fred Hutchinson Cancer Center Pathology Department at 606-1355.</p>

(Continued)

Lung Biopsy, continued

<ul style="list-style-type: none"> ▶ 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. 	<ul style="list-style-type: none"> ▶ 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
<ul style="list-style-type: none"> ▶ 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

**7am to 4:30pm Mon – Fri
Business Hours**

- ▶ 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.

(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.

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

<u>Test includes</u>	Microscopic exam with diagnosis	
<u>Lab</u>	HMC Cytology	
<u>Request Form</u>	Cytology 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
<u>Phone</u>	744-2166	
<u>Availability</u>	Monday – Friday 8am – 5pm	
<u>Turnaround Time</u>	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.	
<u>Container</u>	Vial containing PreservCyt® Solution.	
<u>Specimen Collection</u>	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 $\frac{1}{4}$ to $\frac{1}{2}$ 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**Collection at Fred Hutchinson Cancer Center Ambulatory Clinic**

- ▶ Deliver the specimen to Fred Hutchinson Cancer Center Pathology by 10am for delivery to HMC Cytology the same day
- ▶ Fred Hutchinson Cancer Center pathology Laboratory will package and transport to HMC Cytology department.

Collection at UWMC

- ▶ Deliver the specimen to UWMC Anatomic Pathology
- ▶ UWMC Anatomic Pathology will accession and transport to HMC Cytology department.

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 Sinus biopsy or sinus aspirate removed for diagnostic interpretation

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

Specimen Handling

Collection on a HSCT Patient at UWMC	
7am to 4:30pm Mon – Fri Business Hours	4:30pm to 7am Mon – Fri Weekends & Holidays
<p>▶ 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.</p>	<p>Saturdays follow the procedure below except between 6am to 2 pm</p> <p>During these hours notify the Saturday Tech in the Fred Hutchinson Cancer Center Pathology Department at 606-1355.</p>

(Continued)

Sinus Biopsy, continued

<ul style="list-style-type: none"> ▶ 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. 	<ul style="list-style-type: none"> ▶ 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. <p style="text-align: center;">After hours: do not send the specimen to UWMC Pathology Department.</p>
---	---

Collection of Fred Hutchinson Cancer Center GenOnc/Heme or UWMC Patients at UWMC
<ul style="list-style-type: none"> ▶ Operating Room delivers specimen to Operating Room Pathology refrigerator. ▶ UWMC Histology Tech accessions 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 time frame 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)

Surgical Specimens, continued

Collection on a HSCT Patient at UWMC	
7am to 4:30pm Mon – Fri Business Hours	4:30pm to 7am Mon – Fri Weekends & Holidays
<ul style="list-style-type: none"> ▶ 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. ▶ Deliver Specimens to UWMC Pathology (EC 239NW) for routing of specimens to Fred Hutchinson Cancer Center Pathology. ▶ Fred Hutchinson Cancer Center Pathology will divide and route specimens to appropriate labs per protocol. ▶ The Fred Hutchinson Cancer Center Tech will be responsible for completing the appropriate Lab Requisitions sent with the specimens to be submitted for culture. ▶ 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. 	<p style="text-align: center;">Saturdays follow the procedure below except between 6am to 2pm</p> <p>During these hours notify the Saturday Tech in the Fred Hutchinson Cancer Center Pathology Department at 606-1355</p> <ul style="list-style-type: none"> ▶ In ADVANCE contact the Fred Hutchinson Cancer Center Pathology Tech at 573-0892 ▶ Fred Hutchinson Cancer Center Pathology will divide and route specimens to appropriate labs per protocol. ▶ The Fred Hutchinson Cancer Center Tech will be responsible for completing the appropriate Lab Requisitions sent with the specimens to be submitted for culture. ▶ Specimens are sent by the floor via cab to the Pathology Department at the Fred Hutchinson Cancer Center, Room G7-910. <p style="text-align: center;">After hours: do not send the specimen to UWMC Pathology Department.</p>

Collection of Fred Hutchinson Cancer Center GenOnc/Heme or UWMC Patients at UWMC
<ul style="list-style-type: none"> ▶ 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

[Return to Table of Contents](#)

OTHER FLUID SPECIMENS

<u>Other Fluids</u>	Specimens not specifically described in the Specimen Handling Procedure Manual, e.g., CSF, Urine.
<u>Test Includes</u>	Gross and microscopic exam with diagnosis
<u>Lab</u>	Specimens processed by Harborview Cytology
<u>Request Form</u>	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.
<u>Phone</u>	Harborview Cytology 744-2166
<u>Availability</u>	Monday – Friday 8am – 5pm
<u>Specimen Collection</u>	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**Collection on a HSCT Patient at Fred Hutchinson Cancer Center Ambulatory Clinic**

- ▶ Deliver the specimen to Fred Hutchinson Cancer Center Pathology.
- ▶ A Fred Hutchinson Cancer Center Pathology Technician will accession all of these specimens. They will be sent via cab to Harborview Cytology

(Continued)

Other Fluid Specimens, continued

Collection on a HSCT Patient at UWMC	
7am to 4:30pm Mon – Fri Business Hours	4:30pm to 7am Mon – Fri Saturdays, Sundays, and Holidays
<ul style="list-style-type: none"> ▶ Follow collection guidelines above. ▶ Immediately deliver Pathology specimens to UWMC Pathology. ▶ Fluid specimens will be sent to Harborview Cytology for processing. 	<ul style="list-style-type: none"> ▶ In ADVANCE page UWMC on-call Histology Tech (663-8098). ▶ Follow collection guidelines above. ▶ Immediately deliver Pathology specimens to UWMC Pathology. ▶ Fluid specimens will be sent by UWMC Pathology to Harborview Cytology

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 9:00am – 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 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.

Collection at Fred Hutchinson Cancer Center Ambulatory Clinic

7am to 4:30pm Mon – Fri
Business Hours

- ▶ Internal courier delivers the specimen to Fred Hutchinson Cancer Center Pathology
- ▶ If the specimen is from a HSCT or Heme-Onc patient, Fred Hutchinson Cancer Center Path Tech accessions the specimen in the computer for processing at Fred Hutchinson Cancer Center Pathology
- ▶ If the specimen is from a solid tumor patient, the Fred Hutchinson Cancer Center Path Tech places the specimen on a packing list and transports it to UWMC Pathology Lab, Room EC 239NW.

Causes for Rejection Improper handling, misidentified specimens, and requisitions

[Return to Table of Contents](#)

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 Pharmacokinetics, 188 E. Blaine, Suite 250

Request Form 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

Specimen Blood (only plasma is analyzed)

Volume 1-3 mL oral, 1-4 mL IV formulation

Container 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 Ranges

Female		Male	
Age	Range	Age	Range
>=18 yrs.	0.38-1.02	>=18 yrs.	0.51-1.18

GLUCOSE (POCT)

<u>Related Terms</u>	Blood sugar
<u>Lab</u>	POCT – Procedure Suite, Imaging Unit, Infusion/ACE/CTU,
	Radiology Oncology
<u>Phone</u>	POCT Office:606-7635 Procedure Suite: 606-1329 Imaging: 606-7184 Infusion/ACE/CTU: 606-2157 Radiation Oncology: 606-7318
<u>Testing Frequency</u>	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.
<u>Availability</u>	STAT
<u>Specimen</u>	Whole Blood
<u>Volume</u>	0.5 mL
<u>Container</u>	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.
<u>Collection</u>	Capillary fingerstick, routine venipuncture or line draw.
<u>Specimen Handling</u>	Separate plasma or serum from cells as soon as possible to minimize loss of glucose through glycolysis
<u>Causes for Rejection</u>	Misidentified specimens and requisitions, specimen QNS
<u>Reference Ranges</u>	Glucose, fasting: 62–125 mg/dL
<u>Critical Values</u>	<55 mg/dL or >500 mg/dL

IONIZED CALCIUM, WHOLE BLOOD (POCT)

<u>Related terms</u>	iCA, Ionized Calcium
<u>Lab</u>	POCT – Apheresis Unit
<u>Phone</u>	POCT Office: 606-7635 Apheresis: 606-2120
<u>Testing Frequency</u>	Monday – Sunday, testing time is dependent on care plan. Specimens may be sent to Alliance Lab for confirmation or as needed.
<u>Availability</u>	STAT
<u>Specimen</u>	Whole Blood
<u>Volume</u>	1 mL
<u>Container</u>	1-3 mL balanced heparin syringe. If specimen is sent to Alliance Lab for testing, see Calcium for container type.
<u>Collection</u>	Routine venipuncture or line draw
<u>Causes for Rejection</u>	Misidentified specimens and requisitions, specimen QNS, clotted specimen
<u>Reference Ranges</u>	≥ 1 year 1.18 mmol/L - 1.38 mmol/L < 1 year 1.16 mmol/L - 1.45 mmol/L
<u>Critical Values</u>	< 0.78 mmol/L or > 1.58 mmol/L

POTASSIUM (POCT)

<u>Related Terms</u>	K+, K, Potassium
<u>Lab</u>	POCT – Apheresis Unit
<u>Phone</u>	POCT Office: 606-7635 Apheresis: 606-2120
<u>Testing Frequency</u>	Monday – Sunday, testing time is dependent on care plan. Specimens may be sent to Alliance Lab for confirmation or as needed.
<u>Availability</u>	STAT
<u>Specimen</u>	Whole blood
<u>Volume</u>	1 mL
<u>Container</u>	1-3 mL balanced heparin syringe. If specimen is sent to Alliance Lab for testing, see Potassium for container type.
<u>Collection</u>	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.
<u>Causes for Rejection</u>	Misidentified specimens and requisitions, specimen QNS, clotted specimen
<u>Reference Ranges</u>	3.6 – 5.2 mEq/L
<u>Critical Values</u>	<3.0 mEq/L or >6.0 mEq/L

KOH PREP(POCT/PPT)

<u>Related Terms</u>	Skin KOH, Skin Fungal with Direct Exam
<u>Test included in these panels</u>	Fungal elements seen on skin or other keratinized specimens
<u>Lab</u>	3 rd floor, Skin Oncology
<u>Phone</u>	POCT Office: 606-7635 Skin Oncology: 606-2201
<u>Testing Frequency</u>	Clinic hours 8am to 5pm. Testing is dependent on care plan.
<u>Availability</u>	Performed at patient's bedside
<u>Specimen</u>	Skin and other keratinized specimens
<u>Volume</u>	N/A
<u>Container</u>	Glass slide with one drop of 10% (or 20%) KOH to the slide and mix well with the specimen.
<u>Collection</u>	Skin scrapings with sterile blade, clipper, or scissor
<u>Causes for Rejection</u>	Specimen QNS, Specimens will be rejected if received > 24 hours after collection. Viability of organisms is significantly reduced after 24 hours.
<u>Reference Ranges</u>	Yeast/Fungi are absent