SCCA Clinical Laboratories
825 Eastlake Ave E
PO Box 19023
Seattle, WA 98109-1023

SCCA Specialty Laboratories
188 E Blaine St Ste 250
Seattle, WA 98102-3983

SCCA Cellular Therapy Laboratory
1100 Eastlake Ave E
Seattle, WA 98109-4487

SPECIMEN COLLECTION & HANDLING MANUAL

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CD34 Assay

Chemistry - Alliance Lab
Panels
Blood Gas, Arterial
Basic Metabolic Panel
Comprehensive Metabolic Panel with calc. for Globulin & A/G Ratio
Comprehensive Metabolic Panel with HSCT subgroup
Electrolytes
Hepatic Function Panel
Hepatic Function Panel with Lactate Dehydrogenase
Lipid Panel
Renal Function Panel
Renal Function Panel with Magnesium
Urinalysis

Single Tests
Alanine Aminotransferase
Albumin
Alkaline Phosphatase
Ammonia
Aspartate Aminotransferase
Urea Nitrogen
Calcium
Carcinoembryonic Antigen
Cerebral Spinal Fluid Glucose
Cerebral Spinal Fluid Protein
Chloride
Cholesterol
Bicarbonate, CO2
Creatine Kinase
Creatinine
Direct Bilirubin
Gamma Glutamyl Transferase
Glucose
HDL Cholesterol
Ionized Calcium, Serum & Plasma
Lactate Dehydrogenase
LDL Cholesterol
Magnesium
Phosphorus
Potassium
Pregnancy, Urine
Pregnancy, Serum
Prostate Specific Antigen
Sodium
Stool Occult Blood
Total Bilirubin
Total Protein
Urine Total Protein
Triglycerides
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
- Thrombin Time

Cytogenetics
- Cytogenetics Studies, Chromosome Analysis and FISH
- Cytogenetics Studies, Genomic Array
- Cytogenetics Turnaround Times

Hematology - Alliance Lab
- Cerebral Spinal Fluid Cell Count
- Complete Blood Count
- Erythrocyte Sedimentation Rate
- Hematocrit
- Platelet Count
- Reticulocyte Count

Microbiology Specimens
Additional testing may be performed at the University of Washington, Laboratory Medicine. Follow this link to search their online Lab User's Guide.

Molecular (PCR) Studies
Molecular studies to be performed by UW Molecular Hematopathology. Testing available:

- Lymphoma Associated Abnormalities
  - B-Cell clonality (IgH & IgKappa gene rearrangement)
  - T-Cell clonality
  - t(11;14) (Mantle Cell)
  - t(14;18) (Follicular / Large Cell)

- Leukemia/Myeloproliferative Disorder-Associated Abnormalities
  - BCR/ABL Qualitative, p210 & p190 (CML & Ph+ ALL)
  - BCR/ABL Quantitative, p210
  - BCR/ABL Quantitative, p190
  - FLT3 ITD Mutation, DNA Screen
  - NPM1 Insertion Mutation
  - CEBPA Mutation, DNA Screen
  - JAK2 V617F Mutation

For more detailed information refer to UW Lab Medicine online Lab User's Guide.

Pathology
- Bone Marrow Aspirate/Biopsy
- Bronchoalveolar Lavage
- Endoscopy
- Fine Needle Aspirations
- Lip or Skin Biopsy
- Liver Biopsy: Liver
- Liver Biopsy: Wedge Biopsy Only
- Lung Biopsy
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ThinPrep® Pap Test Collection
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Pharmacokinetics
Therapeutic Drug Monitoring and Busulfan Testing

Virology Specimens
Additional testing may be performed at the University of Washington, Laboratory Medicine. Follow this link to search their online Lab User's Guide.
Introduction

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

The directors, supervisors and technicians of the respective laboratories, and the QA 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 the QA Manager, Clinical Labs at 606-7360.

Brent L. Wood, MD, PhD
Director of Clinical Laboratories
Seattle Cancer Care Alliance
# LAB LOCATIONS AND HOURS OF SERVICE

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<th>Laboratory</th>
<th>Building</th>
<th>Room</th>
<th>Phone</th>
<th>Pager</th>
<th>Service Hours</th>
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| **Alliance Lab - Blood Draw**      | SCCA     | 1500 | Blood Draw: 606-1214  |                | M-F 6am – 6pm (with nurses available), 6pm – 8pm (VP only)  
|                                    |          |      | Reception: 606-6201   |                | **Weekends & Holidays** 8am – 4:30pm                                                             |
| **Alliance Lab - Specimen Processing** | SCCA     | 1500 | 606-1088               |                | M-F 6am – 10pm  
|                                    |          |      |                        |                | **Weekends & Holidays** 7:30am – 5:30pm                                                           |
| **Alliance Lab - Testing**         | SCCA     | 1500 | Main: 606-1088         |                | M-F 6am – 10pm  
|                                    |          |      | Chem: 606-1094         |                | **Weekends & Holidays** 8am – 6pm                                                                |
|                                    |          |      | Coag: 606-1094         |                |                                                            |
|                                    |          |      | Heme: 606-1084         |                |                                                            |
| **Cellular Therapy Lab**           | 1100 Eastlake | E1-419 | 606-1200 | Weekends & Holidays 540-2851 | M-F 7am – 8pm  
|                                    |          |      |                        |                | **Weekends & Holidays** 9am – 5pm; leave 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                                                                                   |
| **Cytogenetics**                   | 188 E Blaine | STE 250 | Main Line: 206-606-1390 | 206-340-7207 | M-F 8am-5pm  
|                                    |          |      |                        |                | **Weekends & Holidays** on call 9am-5pm                                                            |
| **Immunotherapy Lab**              | SCCA     | 6100 | 606-6049               |                | 6:30am – 4:00pm  
|                                    |          |      |                        |                | **After hours:** contact Alliance Lab                                                               |
| **Immunotherapy Biomarker Lab**    | SCCA     | 6100 | 606-6053               |                |                                                            |
| **Pathology**                      | SCCA     | 7910 | 606-1355               | Technologist 573-0892 | Monday 8:00am – 6:30pm  
|                                    |          |      |                        | Pathologist 498-7956 | Tues-Fri 6:00am – 6:30pm  
|                                    |          |      |                        | Pathologist 606-1343 | Sat 6:00am – 2:30pm  
|                                    |          |      |                        |                  | **Sun and all other times** contact Path Technologist                                              |
|                                    |          |      |                        |                  |                                                            |
| **Pharmacokinetics**               | 188 E Blaine | STE 250 | 606-7389 | Pager 994-5942 | Tues – Sat 8am – 5pm  
|                                    |          |      |                        |                | **Sundays, Mondays and Holidays: on call**                                                        |
| **Transfusion Service Support**    | SCCA     | 1500 | 606-1095               |                | M-F 7am – 10pm  
|                                    |          |      |                        |                | **Weekends and Holidays** 7:30am – 5:30pm                                                          |

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

**Alliance Lab Specimen Processing:** SCCA 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

**Cellular Therapy:** CD34 Assay
- Location: 1100 Eastlake E, Room E1-419, Telephone: 606-1200
- Routine hours: M – F 7am – 8pm, Processing 7am – 4pm
- 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 lab at 8am the next working day.

**Cytogenetics Lab:** Chromosome analysis, (FISH), and Genomic Array
- 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 appropriate anticoagulant (sodium heparin for chromosome analysis and FISH; EDTA for Genomic Array). Store at room temperature until delivery to 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: SCCA Room 7-910, Telephone: 606-1355
Routine hours: Monday 8am – 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 procedure, notify the SCCA Pathology on-call technologist at cell number 206-573-0892. When specimen is available, notify the on-call technologist at 206-573-0892

Pharmacokinetics: **Performs Therapeutic Drug Monitoring and Busulfan 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:**
Sent by Specimen Processing to UW Virology lab at 1616 Eastlake; 685-8037
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<tr>
<th>Lab Name</th>
<th>Type of Lab</th>
<th>Lab Location</th>
<th>Phone Number</th>
<th>Primary Contact</th>
<th>Alternate Contact</th>
<th>Specific Protocol Link</th>
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<tr>
<td>Alliance Lab Specimen Collection</td>
<td>Specimen Collection</td>
<td>G1-500</td>
<td>606-1214 Reception 606-6201</td>
<td>Jennifer Garcia</td>
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<td>Leah Perkins</td>
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<td>Elizabeth Means Ziemianski Doug Howlett Kirk Johnsen Mary Rose Valencia</td>
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<td>Bernstein Lab</td>
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<td>667-4886</td>
<td>Sommer Castro</td>
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<td>Bleakley Lab</td>
<td>Program in Immunology</td>
<td>D3-245</td>
<td>667-4751</td>
<td>Tanya Cunningham</td>
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<td>Bloodworks Northwest</td>
<td>Tranfusion Medicine</td>
<td>921 Terry Seattle WA</td>
<td>292-6525</td>
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<td>Boeckh Lab</td>
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<td>E4-340</td>
<td>667-4337</td>
<td>Terry Stevens-Ayers</td>
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<td>Cellular Therapy (SCCA)</td>
<td>Cell Processing/ Peripheral Blood CD34 Assay</td>
<td>E1-419</td>
<td>606-1200</td>
<td>Grace Randhawa</td>
<td>Andrew Mackie Melissa Dela Pena Aviva Ventura</td>
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<td>Cytogenetics Lab (SCCA)</td>
<td>ChromosomesFIS H, and CGAT</td>
<td>188 E Blaine</td>
<td>206-606-1390</td>
<td>Kate Kroeger</td>
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<td>Frenkel Lab</td>
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<td>Seattle Children’s</td>
<td>884-3440</td>
<td>Ingrid Beck</td>
<td>Sheila Strychak 884-7201</td>
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**LOCATIONS RESOURCE GUIDE**
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<th>Lab Name</th>
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<th>Phone Number</th>
<th>Primary Contact</th>
<th>Alternate Contact</th>
<th>Specific Protocol Link</th>
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<td>Hansen Lab / Research Cell Bank</td>
<td>Human Immunogenetics Program (HIP)</td>
<td>D2-345 or D2-346</td>
<td>667-3756 or 667-1450</td>
<td>Jenna Gravley 667-1450</td>
<td>Laura Tabellini 667-4449</td>
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<td>Hans Ochs/Troy Torgerson Lab</td>
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<td>987-7442</td>
<td>Mary Hackett</td>
<td>Dawn Marie Pares 884-7418</td>
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<td>Immunotherapy Lab</td>
<td>General Lab</td>
<td>G6-097</td>
<td>606-6049 or 606-6050</td>
<td>Nga Luong</td>
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<td>Kiem Lab</td>
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<td>667-6981</td>
<td>Christina Ironside 667-2591</td>
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<td>Robert Coombs, MD, PhD 897-5202</td>
<td>Geoffrey Baird, MD, PhD 744-9787</td>
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<td>Barbara Pender 667-4260</td>
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<td>McElrath Lab</td>
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<td>1100 Eastlake</td>
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<td>David Chambliss</td>
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<td>McElrath Lab</td>
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<td>1100 Eastlake</td>
<td>667-6995</td>
<td>John McNevin 667-5706</td>
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<td>Molecular Oncology</td>
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<td>D2-281</td>
<td>667-2592</td>
<td>Jill Harrell 667-2592</td>
<td>Cathy Spurgeon 667-5067</td>
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<td>Virology Research</td>
<td>Molecular Virology</td>
<td>1616 Eastlake Suite 320</td>
<td>206-685-7720</td>
<td>Meei-Li Huang 685-7104</td>
<td>Jane Kuypers</td>
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<td>Lee Nelson Lab</td>
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<td>667-6840</td>
<td>Hilary Gammill 667-4053</td>
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<td>Pharmacokinetics Lab (SCCA)</td>
<td>Busulfan</td>
<td>188 E Blaine</td>
<td>606-7389</td>
<td>Hung Nguyen 606-7319</td>
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<td>Pathology Lab</td>
<td>G7-910</td>
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<td>Amanda Moklebust 606-1357</td>
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<td>Jon Digel 667-4434</td>
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<td>Leonor Busuego 667-4545</td>
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<td>Sue Carbonneau 667-6839</td>
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<td>Gretchen Johnson 667-4545</td>
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<td>Transfusion Support Office-</td>
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<td>K-231</td>
<td>606-1014</td>
<td>Renee LeBlanc 667-4545</td>
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<td>Kristina Young 667-4545</td>
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<td>Joanne Estergreen 598-6233</td>
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<td>Julie Sako 606-7117</td>
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<td>598-6224</td>
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<td>UW Microbiology</td>
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<td>Sarah Jensen 598-6147</td>
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<td>UW Special Chemistry</td>
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<td>NW-225C</td>
<td>598-4563</td>
<td>Lisa Lawrence 598-4563</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Anne Cent 987-2088</td>
<td></td>
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</tr>
</tbody>
</table>

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SEATTLE CANCER CARE ALLIANCE
Policies

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

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

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

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

Reporting
Results that have been entered into the Pathology LIS (Powerpath), the Alliance Lab LIS (SunQuest) or LabWare LIMS (Pharmacokinetics, Cytogenetics) are available for viewing in ORCA and MINDscape. Labvision, used by the Clinical Immunogenetics Lab (CIL), is not interfaced to ORCA or MINDscape. CIL and Cellular Therapy scan reports into MINDscape and ORCA. In addition, reports not available in ORCA or MINDscape are faxed or printed to Health Information Management (HIM) and the patient care areas.

Referral to Another Lab
Testing not provided by the Seattle Cancer Care Alliance Laboratories 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).

SCCA has established a reference laboratory policy in cooperation with UW Laboratory Medicine to ensure appropriate and adequate organizational oversight, to safeguard the SCCA conflict of interest policies and to ensure standard processes for laboratory testing outside the SCCA 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 Laboratory Medicine 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 Laboratory Medicine 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 SCCA 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 SCCA or UW Laboratory Medicine or at other reference laboratories should be directed to the SCCA Clinical Laboratory Medical Director or the SCCA Associate Director of Clinical Laboratories.
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. Date and time the sample was collected
5. Specimen source when applicable, i.e. throat, urine
6. Initials of person drawing specimen

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

Note: Specimens collected for T&C and HLA Typing require two staff members to verbally verify the spelling of the patient name, the MRN, and date of birth. Both staff members will initial the specimen tube.

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

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

1. Patient last name, first name, middle initial or middle name
2. Patient date of birth
3. Patient Medical Record Number (MRN)
4. Patient location
5. Specimen and site, if applicable
6. Date sample collected/to be collected
7. Time sample collected/to be collected
8. Location where 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 SCCA Labs
Orders defined in Sunquest or PowerPath will be interfaced to these lab systems from ORCA. Specialty labs will receive requisitions printed from ORCA and will continue to log in specimens in Labvision or LabWare.
IV. Packaging and Transport of Specimens Not Processed in the SCCA Labs

Specimens sent to testing laboratories at FHCRC and the SCCA 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 SCCA Clinic tube system will be double bagged in sealed zip-lock biohazard marked bags.

Specimens transported outside of the SCCA Clinic or FHCRC 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 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 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 the SCCA intranet at Departments & Clinics >Clinical Laboratories >Libraries Lab Admin Policies & Procedures.

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 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:

- Blue top tubes (Na Citrate)
- Green top tubes (Heparin)
- 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:

- Syringe for blood cultures
- Glass Red Top
- Blue Top or Black Top
- Royal Blue Top No Additive
- Gold or Red Gray Tiger Top or Orange Top
- Plastic Red Top Tube

(Continued)
Lime Green Top
Green Top
Lavender (Purple) Top
Royal Blue Top with EDTA
Purple and Yellow Top (CellSave tube)
Gray Top
Yellow Top
HLA Syringe
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 are 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 SCCA Cellular Therapy, Clinical Immunogenetics, Cytogenetics, Pathology, Pharmacokinetics and Alliance Laboratories are specified in this manual: see entry for each test.

Minimal specimen collection requirements for tests performed at UW Laboratory Medicine labs can be located in the UW Laboratory Medicine online test guide http://menu.labmed.washington.edu/oltg
Seattle Cancer Care Alliance
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)

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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.

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

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

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: ________________________________
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 insure 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 insure 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: 7am – 8pm
- Saturday & Sunday: 8am – 4:30pm
- Holidays: 8am – 4:30pm
This table provides additional information for tests performed in the SCCA Alliance Laboratory. *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: [http://menu.labmed.washington.edu/oltg](http://menu.labmed.washington.edu/oltg)*

**Turnaround times are 60 minutes except as noted under Comments.** Turnaround time is defined as the time from specimen draw 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

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<tr>
<th>TEST MNEMONIC</th>
<th>DESCRIPTION</th>
<th>TESTS INCLUDED</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMP</td>
<td>Basic Metabolic Panel</td>
<td>Na, K, Cl, CO₂, Glu, BUN, Creat, Ca, calculated glomerular filtration rate</td>
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</tr>
<tr>
<td>LYT</td>
<td>Electrolytes</td>
<td>Na, K, Cl, CO₂</td>
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<tr>
<td>LIPID</td>
<td>Lipid Panel</td>
<td>Chol, HDL, Trigs, LDL</td>
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<tr>
<td>HFPA</td>
<td>Hepatic Function Panel</td>
<td>ALT, AST, ALK, Albumin, Bili T/D, Total protein</td>
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<tr>
<td>SHFL</td>
<td>Hepatic Function Panel + LD</td>
<td>ALT, AST, ALK, Albumin, Bili T/D, Total protein, LD</td>
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<tr>
<td>RENFP</td>
<td>Renal Function Panel</td>
<td>Albumin, Ca, CO₂, Cl, Creat, Glu, Phosphorus, Na, K, BUN, calculated glomerular filtration rate</td>
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<tr>
<td>SRFM</td>
<td>Renal Function Panel + Mg</td>
<td>Albumin, Ca, CO₂, Cl, Creat, Glu, Phosphorus, Na, K, BUN, Mg, calculated glomerular filtration rate</td>
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<tr>
<td>SCOMP</td>
<td>SCCA Comprehensive Metabolic Panel with calc. for globulin and A/G ratio</td>
<td>Na, K, Cl, CO₂, Glu, BUN, Creat, Ca, Total Protein, Albumin, ALT, AST, ALK, Albumin, T Bili, Globulin, A/G ratio, calculated glomerular filtration rate</td>
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<tr>
<td>SCOMP with HSCT subgroup</td>
<td>SCOMP with D Bili, GGT, Mg, Phosphorus, Uric Acid, Cholesterol, Triglycerides</td>
<td>Na, K, Cl, CO₂, Glu, BUN, Creat, Ca, Total Protein, Albumin, ALT, AST, ALK, Albumin, T Bili, Globulin, A/G ratio, D Bili, GGT, Mg, Phosphorus, Uric Acid, Cholesterol, Trigs, calculated glomerular filtration rate</td>
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## CHEMISTRY INDIVIDUAL TESTS

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<td>AST</td>
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<td>SRIC</td>
<td>Calcium, Ionized, Serum</td>
<td>Calcium, Ionized, Serum</td>
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<td>CEA</td>
<td>Carcinoembryonic Antigen</td>
<td>Carcinoembryonic antigen</td>
<td>90 minutes TAT</td>
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<td>Creatine Kinase</td>
<td>Creatine Kinase</td>
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<tr>
<td>CREG</td>
<td>Creatinine</td>
<td>Creatinine, calculated glomerular filtration rate</td>
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<td>HDL</td>
<td>HDL cholesterol</td>
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<td>PGSTAT</td>
<td>Qualitative Serum Pregnancy</td>
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<td>Positive or negative pregnancy test</td>
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<td>LDL</td>
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<td>Magnesium</td>
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### ALLIANCE LAB - CHEMISTRY INDIVIDUAL TESTS (cont.)

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<td>SOCULT</td>
<td>Stool Occult Blood</td>
<td>Stool occult blood</td>
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<td>TRIG</td>
<td>Triglycerides</td>
<td>Triglycerides</td>
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<tr>
<td>URIC</td>
<td>Uric Acid</td>
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### HEMATOLOGY

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

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

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<tbody>
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<td>UAWK</td>
<td>Urinalysis, workup</td>
<td>Urinalysis, workup</td>
<td>Urine dipstick tests, microscopic abnormal</td>
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<tr>
<td>UAC</td>
<td>Urinalysis, complete</td>
<td>Urinalysis, complete</td>
<td>Urine dipstick tests, microscopic</td>
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<tr>
<td>UCLEAR</td>
<td>Creatinine clearance</td>
<td>Urine creatinine</td>
<td>Serum creatinine level required</td>
</tr>
<tr>
<td>UTP</td>
<td>Protein</td>
<td>Urine total protein</td>
<td></td>
</tr>
<tr>
<td>UPG</td>
<td>Urine Pregnancy</td>
<td>Urine Protein, Urine Creatinine &amp; Calculated Ratio</td>
<td>Positive or negative pregnancy test</td>
</tr>
<tr>
<td>UPCRAT</td>
<td>Protein/Creatinine Ratio</td>
<td>Urine Protein, Urine Creatinine &amp; Calculated Ratio</td>
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### CEREBRAL SPINAL FLUID

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<th>COMMENTS</th>
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</thead>
<tbody>
<tr>
<td>CCCNT</td>
<td>Cell Count</td>
<td>WBC, RBC</td>
<td></td>
</tr>
<tr>
<td>CGLU</td>
<td>Glucose</td>
<td>Glucose</td>
<td></td>
</tr>
<tr>
<td>CTP</td>
<td>Total Protein</td>
<td>Total Protein</td>
<td></td>
</tr>
<tr>
<td>CCFUGE</td>
<td>CSF Cell evaluation by Hematopathologist</td>
<td>CSF Cell evaluation by Hematopathologist</td>
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# BLOOD GASES

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<th>COMMENTS</th>
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</thead>
<tbody>
<tr>
<td>AG</td>
<td>Arterial blood gas</td>
<td>pH, pCO₂, pO₂, HCO₃</td>
<td>30 minutes</td>
<td>COOX performed at HMC</td>
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<tr>
<td>VG</td>
<td>Venous blood gas</td>
<td>pH, pCO₂, pO₂, HCO₃</td>
<td>30 minutes</td>
<td>COOX performed at HMC</td>
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[Return to Table of Contents]
Seattle Cancer Care Alliance
Laboratory Administrative Policies and Procedures

Laboratory Critical Results
Rev Effective 04/10/2019

<table>
<thead>
<tr>
<th>Serum or Plasma</th>
<th>Less than</th>
<th>Greater than</th>
<th>Units</th>
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<tbody>
<tr>
<td>Na</td>
<td>120</td>
<td>160</td>
<td>mEq/L</td>
</tr>
<tr>
<td>K</td>
<td>3.0</td>
<td>6.0</td>
<td>mEq/L</td>
</tr>
<tr>
<td>HCO₃/CO₂</td>
<td>10</td>
<td>40</td>
<td>mEq/L</td>
</tr>
<tr>
<td>Glucose</td>
<td>50</td>
<td>500</td>
<td>mg/dl</td>
</tr>
<tr>
<td>Ca</td>
<td>6.0</td>
<td>13.0</td>
<td>mg/dl</td>
</tr>
<tr>
<td>Phosphate</td>
<td>1.0</td>
<td>none</td>
<td>mg/dl</td>
</tr>
<tr>
<td>Mg</td>
<td>1.2</td>
<td>4.7</td>
<td>mg/dl</td>
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<tr>
<td>Ionized Calcium, Serum &amp; Plasma</td>
<td>0.78</td>
<td>1.58</td>
<td>mmol/L</td>
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<tr>
<td>CSF glucose</td>
<td>20</td>
<td>N/A</td>
<td>mg/dl</td>
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<table>
<thead>
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<th>Arterial Blood Gases</th>
<th>Less than</th>
<th>Greater than</th>
<th>Units</th>
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<tbody>
<tr>
<td>pH</td>
<td>7.20</td>
<td>7.58</td>
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</tr>
<tr>
<td>pCO₂</td>
<td>9</td>
<td>65</td>
<td>mmHg</td>
</tr>
<tr>
<td>pO₂</td>
<td>40</td>
<td>N/A</td>
<td>mmHg</td>
</tr>
<tr>
<td>HCO₃</td>
<td>10</td>
<td>40</td>
<td>mEq/L</td>
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</table>

<table>
<thead>
<tr>
<th>Hematology</th>
<th>Less than</th>
<th>Greater than</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Absolute neutrophils</td>
<td>0.5</td>
<td>N/A</td>
<td>x 10³ /uL</td>
</tr>
<tr>
<td>Hematocrit</td>
<td>20</td>
<td>none</td>
<td>%</td>
</tr>
<tr>
<td>Platelet</td>
<td>20</td>
<td>1000</td>
<td>x 10³ /uL</td>
</tr>
<tr>
<td>Hemoglobin</td>
<td>6.0</td>
<td>none</td>
<td>mg/dl</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Coagulation</th>
<th>Less than</th>
<th>Greater than</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prothrombin Time</td>
<td>N/A</td>
<td>5</td>
<td>INR</td>
</tr>
<tr>
<td>aPTTT</td>
<td>N/A</td>
<td>120</td>
<td>Sec</td>
</tr>
<tr>
<td>Fibrinogen</td>
<td>100</td>
<td>N/A</td>
<td>mg/dL</td>
</tr>
</tbody>
</table>

*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 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.

❖ If a patient’s ANC has remained stable but is at or below the critical value (0.5 x10⁹/uL) the result does not need to be called.
### ALLIANCE LAB REFERENCE RANGES

#### HEMATOLOGY
updated January 23, 2014

**WBC** Units: THOU / uL

<table>
<thead>
<tr>
<th>Female/Male</th>
<th>Age</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>6m – 1y</td>
<td>6.0 – 17.0</td>
<td></td>
</tr>
<tr>
<td>2y – 3y</td>
<td>6.0 – 15.5</td>
<td></td>
</tr>
<tr>
<td>4y – 5y</td>
<td>5.5 – 14.5</td>
<td></td>
</tr>
<tr>
<td>6y – 13y</td>
<td>4.5 – 13.5</td>
<td></td>
</tr>
<tr>
<td>14y –</td>
<td>4.3 – 10.0</td>
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**MCH** Units: pg

<table>
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<th>Age</th>
<th>Range</th>
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</thead>
<tbody>
<tr>
<td>6m – 1y</td>
<td>23.0 – 31.0</td>
<td></td>
</tr>
<tr>
<td>2y – 5y</td>
<td>24.0 – 30.0</td>
<td></td>
</tr>
<tr>
<td>6y – 11y</td>
<td>25.0 – 33.0</td>
<td></td>
</tr>
<tr>
<td>12y – 17y</td>
<td>25.0 – 35.0</td>
<td></td>
</tr>
<tr>
<td>18y –</td>
<td>27.3 – 33.6</td>
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</table>

**RBC** Units: mil / uL

<table>
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<tr>
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<th>Age</th>
<th>Range</th>
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<tbody>
<tr>
<td>6m – 1y</td>
<td>3.70 – 5.30</td>
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</tr>
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<td>2y – 5y</td>
<td>3.90 – 5.30</td>
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<tr>
<td>6y – 11y</td>
<td>4.00 – 5.20</td>
<td></td>
</tr>
<tr>
<td>12y – 17y</td>
<td>4.10 – 5.10</td>
<td></td>
</tr>
<tr>
<td>18y –</td>
<td>3.80 – 5.00</td>
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**MCHC** Units: g / dL

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<th>Age</th>
<th>Range</th>
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<tbody>
<tr>
<td>6m – 1y</td>
<td>30.0 – 36.0</td>
<td></td>
</tr>
<tr>
<td>2y –</td>
<td>32.2 – 36.5</td>
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**Hemoglobin** Units: g / dL

<table>
<thead>
<tr>
<th>Female/Male</th>
<th>Age</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>6m – 1y</td>
<td>10.5 – 15.5</td>
<td></td>
</tr>
<tr>
<td>2y – 5y</td>
<td>11.5 – 15.5</td>
<td></td>
</tr>
<tr>
<td>6y – 11y</td>
<td>12.0 – 15.5</td>
<td></td>
</tr>
<tr>
<td>12y – 17y</td>
<td>12.0 – 15.5</td>
<td></td>
</tr>
<tr>
<td>18y –</td>
<td>11.5 – 15.5</td>
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**Retic** Units: %

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<thead>
<tr>
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<th>Age</th>
<th>Range</th>
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</thead>
<tbody>
<tr>
<td>6 mos-</td>
<td>0.5 – 1.7</td>
<td></td>
</tr>
<tr>
<td>6 mos-</td>
<td>0.5 – 2.0</td>
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**Retic Absolute** Units: bil / L

<table>
<thead>
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<th>Age</th>
<th>Range</th>
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</thead>
<tbody>
<tr>
<td>15y –</td>
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<td>15y –</td>
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**Hematocrit** Units: %

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<th>Range</th>
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</thead>
<tbody>
<tr>
<td>6m – 1y</td>
<td>33 – 39</td>
<td></td>
</tr>
<tr>
<td>2y – 5y</td>
<td>34 – 40</td>
<td></td>
</tr>
<tr>
<td>6y – 11y</td>
<td>35 – 45</td>
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</tr>
<tr>
<td>12y – 17y</td>
<td>36 – 45</td>
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<tr>
<td>18y –</td>
<td>36 – 45</td>
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**Platelet Count** Units: THOU / uL

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<th>Range</th>
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</thead>
<tbody>
<tr>
<td>0 – 1m</td>
<td>250 – 450</td>
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</tr>
<tr>
<td>1m – 3y</td>
<td>300 – 450</td>
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</tr>
<tr>
<td>1y – 2y</td>
<td>250 – 550</td>
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<tr>
<td>3y – 6y</td>
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<td>12y –</td>
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**MCV** Units: fL

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</thead>
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<tr>
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<td>70 – 86</td>
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</tr>
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<td>2y – 5y</td>
<td>75 – 87</td>
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<td>6y – 11y</td>
<td>77 – 95</td>
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<td>12y –</td>
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**RDW-CV** Units: %

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</tr>
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<td>11.6 – 14.4</td>
<td></td>
</tr>
<tr>
<td>≥ 6m</td>
<td>11.6 – 14.4</td>
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**MPV** Units: fL

<table>
<thead>
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<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.4 – 12.3</td>
<td>9.4 – 12.4</td>
<td></td>
</tr>
</tbody>
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(Return to Table of Contents)
### Neutrophils
**Units:** THOU / µL

<table>
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<th>Age Range</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6m – 11m</td>
<td>1.50 – 5.00</td>
</tr>
<tr>
<td></td>
<td>1y – 3y</td>
<td>1.50 – 5.00</td>
</tr>
<tr>
<td></td>
<td>4y – 9y</td>
<td>1.50 – 7.50</td>
</tr>
<tr>
<td></td>
<td>10y – 11y</td>
<td>1.80 – 7.00</td>
</tr>
<tr>
<td></td>
<td>12y –</td>
<td>1.80 – 7.00</td>
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### Eosinophils
**Units:** THOU / µL

<table>
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<th>Age Range</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6m – 11m</td>
<td>0 – 0.80</td>
</tr>
<tr>
<td></td>
<td>1y – 3y</td>
<td>0 – 0.50</td>
</tr>
<tr>
<td></td>
<td>4y – 9y</td>
<td>0 – 0.50</td>
</tr>
<tr>
<td></td>
<td>10y – 11y</td>
<td>0 – 0.50</td>
</tr>
<tr>
<td></td>
<td>12y –</td>
<td>0 – 0.50</td>
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### Lymphocytes
**Units:** THOU / µL

<table>
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<th>Age Range</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6m – 11m</td>
<td>3.00 – 7.00</td>
</tr>
<tr>
<td></td>
<td>1y – 3y</td>
<td>1.50 – 8.00</td>
</tr>
<tr>
<td></td>
<td>4y – 9y</td>
<td>1.50 – 5.00</td>
</tr>
<tr>
<td></td>
<td>10y – 11y</td>
<td>1.20 – 5.00</td>
</tr>
<tr>
<td></td>
<td>12y –</td>
<td>1.00 – 4.80</td>
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### Basophils
**Units:** THOU / µL

<table>
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<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6m – 11m</td>
<td>0 – 0.20</td>
</tr>
<tr>
<td></td>
<td>1y – 3y</td>
<td>0 – 0.20</td>
</tr>
<tr>
<td></td>
<td>4y – 9y</td>
<td>0 – 0.20</td>
</tr>
<tr>
<td></td>
<td>10y – 11y</td>
<td>0 – 0.20</td>
</tr>
<tr>
<td></td>
<td>12y –</td>
<td>0 – 0.20</td>
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</tbody>
</table>

### Monocytes
**Units:** THOU / µL

<table>
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<th>Age Range</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6m – 11m</td>
<td>0 – 0.60</td>
</tr>
<tr>
<td></td>
<td>1y – 3y</td>
<td>0 – 0.80</td>
</tr>
<tr>
<td></td>
<td>4y – 9y</td>
<td>0 – 0.80</td>
</tr>
<tr>
<td></td>
<td>10y – 11y</td>
<td>0 – 0.80</td>
</tr>
<tr>
<td></td>
<td>12y –</td>
<td>0 – 0.80</td>
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</tbody>
</table>

### Erythrocyte Sedimentation Rate (ESR)
**Units:** mm / hr

<table>
<thead>
<tr>
<th>Female</th>
<th>Age Range</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6m – 11y</td>
<td>0 – 10</td>
</tr>
<tr>
<td></td>
<td>12y –</td>
<td>0 – 20</td>
</tr>
</tbody>
</table>

### CSF Cell Count
**Units:** /µL

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Red Blood Cells</td>
<td>0</td>
</tr>
<tr>
<td>Mononuclear Cells</td>
<td>0 - 5</td>
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### CSF Differential
**Units:** %

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Neutrophils</td>
<td>2 ± 4</td>
</tr>
<tr>
<td>Lymphocytes</td>
<td>60 ± 20</td>
</tr>
<tr>
<td>Monocytes</td>
<td>30 ± 15</td>
</tr>
</tbody>
</table>

### COAGULATION

<table>
<thead>
<tr>
<th>TEST</th>
<th>Reference Range</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prothrombin time (PT)</td>
<td>10.7 - 15.6</td>
<td>Seconds</td>
</tr>
<tr>
<td>INR</td>
<td>0.8 - 1.3</td>
<td></td>
</tr>
<tr>
<td>Activated Partial Thromboplastin Time (APTT)</td>
<td>22 - 35</td>
<td>Seconds</td>
</tr>
<tr>
<td>Fibrinogen</td>
<td>150 - 450</td>
<td>mg/dL</td>
</tr>
<tr>
<td>Thrombin Time</td>
<td>16 - 25</td>
<td>Seconds</td>
</tr>
<tr>
<td>D-Dimer</td>
<td>0 - 0.59</td>
<td>µg/mL FEU</td>
</tr>
</tbody>
</table>

Return to Table of Contents
### ALLIANCE LAB REFERENCE RANGES: CHEMISTRY

<table>
<thead>
<tr>
<th>Analyte</th>
<th>Reference Range</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Na (Sodium)</td>
<td>135-145</td>
<td>mEq/L</td>
</tr>
<tr>
<td>K (Potassium)</td>
<td>3.6-5.2</td>
<td>mEq/L</td>
</tr>
<tr>
<td>Cl (Chloride)</td>
<td>98-108</td>
<td>mEq/L</td>
</tr>
<tr>
<td>CO₂ (Bicarbonate)</td>
<td>22-32</td>
<td>mEq/L</td>
</tr>
<tr>
<td>Ion Gap</td>
<td>4-12</td>
<td></td>
</tr>
<tr>
<td>Creatine Kinase</td>
<td>Male 62-325</td>
<td>U/L</td>
</tr>
<tr>
<td></td>
<td>Female 43-274</td>
<td></td>
</tr>
<tr>
<td>Creatinine</td>
<td>Female ≥18yrs 0.38-1.02</td>
<td>mg/dL</td>
</tr>
<tr>
<td></td>
<td>Male ≥18 yrs 0.51-1.18</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Male or Female &lt;18 yrs 0.20-1.10</td>
<td></td>
</tr>
<tr>
<td>BUN</td>
<td>8-21</td>
<td>mg/dL</td>
</tr>
<tr>
<td>Glucose</td>
<td>62-125</td>
<td>mg/dL</td>
</tr>
<tr>
<td>Ca (Calcium)</td>
<td>8.9-10.2</td>
<td>mg/dL</td>
</tr>
<tr>
<td>P (Phosphorus)</td>
<td>2.5-4.5</td>
<td>mg/dL</td>
</tr>
<tr>
<td></td>
<td>Child &lt;12 years: 4.5-6.0</td>
<td></td>
</tr>
<tr>
<td>Albumin</td>
<td>3.5-5.2</td>
<td>g/dL</td>
</tr>
<tr>
<td>Mg (Magnesium)</td>
<td>1.8-2.4</td>
<td>mg/dL</td>
</tr>
<tr>
<td>Total Bilirubin</td>
<td>0.2-1.3</td>
<td>mg/dL</td>
</tr>
<tr>
<td>Direct Bilirubin</td>
<td>0.0-0.3</td>
<td>mg/dL</td>
</tr>
<tr>
<td>AST</td>
<td>9-38</td>
<td>U/L</td>
</tr>
<tr>
<td>ALT</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Male: Age 0-49 10-64</td>
<td>U/L</td>
</tr>
<tr>
<td></td>
<td>Age ≥ 50 10-48</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Female: 7-33</td>
<td></td>
</tr>
<tr>
<td>CK (total)</td>
<td>Male: 62-325</td>
<td>U/L</td>
</tr>
<tr>
<td></td>
<td>Female: 43-274</td>
<td></td>
</tr>
<tr>
<td>GGT</td>
<td>0-55</td>
<td>U/L</td>
</tr>
<tr>
<td>LD</td>
<td>&lt;210</td>
<td>U/L</td>
</tr>
<tr>
<td>Total Protein</td>
<td>6.0-8.2</td>
<td>g/dL</td>
</tr>
<tr>
<td>Uric Acid</td>
<td>Male: 3.9-7.6</td>
<td>mg/dL</td>
</tr>
<tr>
<td></td>
<td>Female: 2.6-6.8</td>
<td></td>
</tr>
<tr>
<td>Cholesterol</td>
<td>Desirable &lt;200</td>
<td>mg/dL</td>
</tr>
<tr>
<td></td>
<td>Borderline 200-239</td>
<td></td>
</tr>
<tr>
<td></td>
<td>High &gt;239</td>
<td></td>
</tr>
<tr>
<td>HDL-Cholesterol</td>
<td>&gt;39</td>
<td>mg/dL</td>
</tr>
<tr>
<td></td>
<td>Desirable &gt;59</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Acceptable 40-59</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low &lt;40</td>
<td></td>
</tr>
<tr>
<td>Triglyceride</td>
<td>Desirable &lt;150</td>
<td>mg/dL</td>
</tr>
<tr>
<td></td>
<td>Borderline 150-199</td>
<td></td>
</tr>
<tr>
<td></td>
<td>High 200-499</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Very High &gt;500</td>
<td></td>
</tr>
<tr>
<td>Ammonia</td>
<td>27-90</td>
<td>µg/dL</td>
</tr>
<tr>
<td>Ionized Calcium, Serum &amp; Plasma</td>
<td>≥ 1 year 1.18-1.38</td>
<td>mmol/L</td>
</tr>
<tr>
<td></td>
<td>&lt; 1 year 1.16-1.45</td>
<td></td>
</tr>
<tr>
<td>Prostate Specific Antigen</td>
<td>Male: 0.00-4.00</td>
<td>ng/mL</td>
</tr>
<tr>
<td>CEA</td>
<td>0.0-5.0</td>
<td>ng/mL</td>
</tr>
<tr>
<td>CSF Glucose</td>
<td>40-80</td>
<td>mg/dL</td>
</tr>
<tr>
<td>CSF Protein</td>
<td>15-45</td>
<td>mg/dL</td>
</tr>
</tbody>
</table>
### BLOOD GASES

**Blood gas, Arterial (Adult)**

<table>
<thead>
<tr>
<th>Blood gas</th>
<th>Reference Range</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>7.35-7.45</td>
<td></td>
</tr>
<tr>
<td>pCO₂</td>
<td>33-48</td>
<td>mmHg</td>
</tr>
<tr>
<td>pO₂</td>
<td>80-104</td>
<td>mmHg</td>
</tr>
<tr>
<td>Bicarbonate</td>
<td>24-31</td>
<td>mEq/L</td>
</tr>
<tr>
<td>O₂ Saturation</td>
<td>95-99</td>
<td>%</td>
</tr>
</tbody>
</table>

**Blood gas, Venous (Adult)**

<table>
<thead>
<tr>
<th>Blood gas</th>
<th>Reference Range</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>7.32-7.40</td>
<td></td>
</tr>
<tr>
<td>pCO₂</td>
<td>42-50</td>
<td>mmHg</td>
</tr>
<tr>
<td>pO₂</td>
<td>35-40</td>
<td>mmHg</td>
</tr>
<tr>
<td>Bicarbonate</td>
<td>23-27</td>
<td>mEq/L</td>
</tr>
<tr>
<td>O₂ Saturation</td>
<td>70-75</td>
<td>%</td>
</tr>
</tbody>
</table>
### ALLIANCE LAB REFERENCE RANGES

**URINALYSIS**

<table>
<thead>
<tr>
<th>Test (Dipstick)</th>
<th>Reference Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>5.0-8.0</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.005-1.030</td>
</tr>
<tr>
<td>Protein</td>
<td>negative</td>
</tr>
<tr>
<td>Glucose</td>
<td>negative</td>
</tr>
<tr>
<td>Ketone</td>
<td>negative</td>
</tr>
<tr>
<td>Bilirubin</td>
<td>negative</td>
</tr>
<tr>
<td>Blood</td>
<td>negative</td>
</tr>
<tr>
<td>Nitrite</td>
<td>negative</td>
</tr>
<tr>
<td>Urobilinogen</td>
<td>0.1-1.9 Ehrlich units</td>
</tr>
<tr>
<td>Leucocyte esterase</td>
<td>negative</td>
</tr>
</tbody>
</table>

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

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

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## CD34 ASSAY

<table>
<thead>
<tr>
<th>Lab Request Form</th>
<th>Cellular Therapy, 1100 Eastlake Avenue E, E1-419</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCCA CTL Test Requisition/Billing form – for Peripheral Blood Leucocytes (PBL)</td>
<td></td>
</tr>
<tr>
<td>For SCCA Ambulatory Clinic, CPOE requisition will be generated for those lab tests requiring a requisition form.</td>
<td></td>
</tr>
<tr>
<td><strong>Phone</strong></td>
<td>606-1200</td>
</tr>
<tr>
<td><strong>Availability</strong></td>
<td>M – F Lab Hours 7am – 8pm</td>
</tr>
<tr>
<td></td>
<td>Processing Hours 7am – 5pm</td>
</tr>
<tr>
<td></td>
<td>Weekends &amp; Holidays Lab Hours 9am – 6pm</td>
</tr>
<tr>
<td></td>
<td>Processing Hours 9am – 3pm</td>
</tr>
<tr>
<td><strong>Turnaround Time</strong></td>
<td>Three hours after sample received or lab start-up</td>
</tr>
<tr>
<td><strong>Specimen</strong></td>
<td>Peripheral Blood</td>
</tr>
<tr>
<td><strong>Volume</strong></td>
<td>2 - 4 mL</td>
</tr>
<tr>
<td><strong>Pediatric Volume</strong></td>
<td>2 - 4 mL</td>
</tr>
<tr>
<td><strong>Container</strong></td>
<td>EDTA (2.0 mL purple top)</td>
</tr>
<tr>
<td><strong>Collection</strong></td>
<td>Routine venipuncture or line draw</td>
</tr>
<tr>
<td><strong>Special Handling</strong></td>
<td>Room temperature, label as STAT</td>
</tr>
<tr>
<td><strong>Causes for Rejection</strong></td>
<td>Misidentified specimens and requisitions, specimen QNS, improperly stored specimen, specimen clotted</td>
</tr>
<tr>
<td><strong>Reference Ranges</strong></td>
<td>No normal values established for mobilized specimens</td>
</tr>
<tr>
<td><strong>After Hours</strong></td>
<td>Draw a fresh specimen in the morning (no after-hours specimen handling).</td>
</tr>
</tbody>
</table>
# BLOOD GAS, ARTERIAL

**Related Terms**  
Arterial blood gas, Blood gas, ABG, Gases

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

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

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

**Phone**  
606-1088

**Testing Frequency**  
M – F  6am – 10pm  
Weekends and Holidays 8am – 6pm

**Availability**  
STAT or routine

**Specimen**  
Arterial Blood

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

**Pediatric Volume**  
See Capillary Blood Gases

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

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

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

(Continued)
(Blood Gas, Arterial, continued)

**Special Instructions**
Requisition must indicate time drawn, type of sample (arterial, venous, or capillary), FiO$_2$ and 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 determined by the size of the air bubble, sample and sample air bubble interface, length of time bubble was in contact with sample before analysis and the gradient between sample gas tensions and room air gas tensions. Small bubbles, if immediately expelled, will generally not cause any significant error. Samples with large (more than 0.2 mL) bubbles should be discarded and a new, anaerobic sample obtained. Needle attached, sample clotted, specimen received more than 1 hour after collection.

**Reference Ranges/Critical Values**

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

Related Terms
BMP

Panel includes
Sodium, potassium, chloride, carbon dioxide, glucose, urea nitrogen (BUN), creatinine, calcium, calculated glomerular filtration rate

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

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

Lab
Alliance Lab, Room G1-500
Immunotherapy Lab, Room G6-097

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

Phone
606-1088

Testing Frequency
Alliance Lab: M – F 6am – 10pm
Weekends and Holidays 8am – 6pm
Immunotherapy Lab: M-F 7am-4pm

Availability
STAT or routine

Specimen
Plasma or Serum

Volume
2 mL

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

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

Collection
Routine venipuncture or line draw

Causes for Rejection
See individual tests

Reference Range
See individual tests

Critical Values
See individual tests

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# COMPREHENSIVE METABOLIC PANEL WITH HSCT SUBGROUP

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

Ion Gap = Na – (Cl + CO₂)

Globulin = TP – Alb

Albumin/Globulin Ratio = Alb/Globulin

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.

## HSCT subgroup
*(Can be ordered individually or as group)*
Magnesium, phosphorus, uric acid, bilirubin (direct), gamma glutamyl transferase (GGT), lactate dehydrogenase (LD), cholesterol, triglycerides

**Lab**
Alliance Lab, Room G1-500  Immunotherapy Lab, Room G6-097

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

**Phone**
606-1088

**Testing Frequency**
Alliance Lab: M – F 6am – 10pm  Weekends and Holidays 8am – 6pm
Immunotherapy Lab: M-F 7am-4pm

**Availability**
Routine

**Specimen**
Plasma or Serum

**Volume**
2 mL

**Pediatric volume**
Pediatric capillary collection: 500 µL serum collected in microtube or "bullet" tube

(Continued)
### Comprehensive Metabolic Panel with HSCT Subgroup, continued

<table>
<thead>
<tr>
<th><strong>Container</strong></th>
<th>5 mL lime top PST, green top, red top, gold top SST or orange top RST tube</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Collection</strong></td>
<td>Routine venipuncture or line draw</td>
</tr>
<tr>
<td><strong>Causes for Rejection</strong></td>
<td>See individual tests</td>
</tr>
<tr>
<td><strong>Reference Ranges</strong></td>
<td>See individual tests</td>
</tr>
<tr>
<td><strong>Critical Values</strong></td>
<td>See individual tests</td>
</tr>
</tbody>
</table>

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SCCA COMPREHENSIVE METABOLIC PANEL
With Calculations for Globulin and Albumin/Globulin Ratio

Related Terms
Panel includes

SCOMP
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, calculation for globulin and albumin/globulin ratio, calculated glomerular filtration rate

Ion Gap = Na – (Cl + CO₂)
Globulin = TP – Alb
Albumin/Globulin Ratio = Alb/Globulin

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
Immunotherapy Lab, Room G6-097

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

Phone
606-1088

Testing Frequency
Alliance Lab: M – F 6am – 10pm
Weekends and Holidays 8am – 6pm
Immunotherapy Lab: M-F 7am-4pm

Availability
STAT or routine

Specimen
Plasma or Serum

Volume
1 mL

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

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

Collection
Routine venipuncture or line draw

Causes for Rejection
See individual tests

Reference Ranges
See individual tests

Critical Values
See individual tests

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ELECTROLYTES

Related Terms
Lytes

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

Lab
Alliance Lab, Room G1-500
Immunotherpay Lab, Room G6-097

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

Phone
606-1088

Testing Frequency
Alliance Lab: M – F 6am – 10pm
Weekends and Holidays 8am – 6pm
Immunotherapy Lab: M-F 7am-4pm

Availability
STAT or routine

Specimen
Plasma or Serum

Volume
2 mL

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

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

Collection
Routine venipuncture or line draw

Causes for Rejection
See individual tests

Reference Ranges
See individual tests

Critical Values
See individual tests

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# HEPATIC FUNCTION PANEL

**Related Terms**
Liver Panel, Liver Studies, Hepatic Function, LFT, Liver Function Tests, Hepatic Profile

**Panel includes**
Alanine aminotransferase (ALT), alkaline phosphatase (ALP), aspartate aminotransferase (AST), bilirubin (total & direct), total protein, albumin

**Lab**
- Alliance Lab, Room G1-500
- Immunotherapy Lab, Room G6-097

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

**Phone**
606-1088

**Testing Frequency**
- Alliance Lab: M – F 6am – 10pm
- Weekends and Holidays 8am – 6pm
- Immunotherapy Lab: M-F 7am-4pm

**Availability**
STAT or routine

**Specimen**
Plasma or Serum

**Volume**
1 mL

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

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

**Collection**
Routine venipuncture or line draw

**Causes for Rejection**
See individual tests

**Reference Ranges**
See individual tests

**Critical Values**
See individual tests
HEPATIC FUNCTION PANEL
WITH LACTATE DEHYDROGENASE

Related Terms  Liver Panel, Liver Studies, Hepatic Function, LFT, Liver Function Tests, Hepatic Profile
Panel includes  Alanine aminotransferase (ALT), alkaline phosphatase (ALP), aspartate aminotransferase (AST), bilirubin (total & direct), total protein, albumin, lactate dehydrogenase (LD)
Lab  Alliance Lab, Room G1-500
       Immunotherapy Lab, G6-097
Request Form  SCCA Clinical Lab Request: fill out completely, including ICD codes
             CPOE orders will be interfaced to Sunquest upon order activation in ORCA.
Phone  606-1088
Testing Frequency  Alliance Lab: M – F  6am – 10pm
       Weekends and Holidays 8am – 6pm
       Immunotherapy Lab: M-F 7am-4pm
Availability  STAT or routine
Specimen  Plasma or Serum
Volume  1 mL
Pediatric Volume  Pediatric capillary collection: 500 µL(0.5 mL) serum collected in microtube or "bullet" tube
Container  5 mL lime top PST, green top, red top, gold top SST or orange top RST tube
Collection  Routine venipuncture or line draw
Causes for Rejection  See individual tests
Reference Ranges  See individual tests
Critical Values  See individual tests

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# LIPID PANEL

## Related Terms
- Lipid Profile

## Panel includes
- 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

## Lab
- Alliance Lab, Room G1-500
- Immunotherapy Lab, Room G6-097

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

## Phone
- 606-1088

## Testing Frequency
- Alliance Lab: M – F 6am – 10pm
- Weekends and Holidays 8am – 6pm
- Immunotherapy Lab: M-F 7am-4pm

## Availability
- Routine

## Specimen
- Plasma or Serum

## Volume
- 1 mL

## Pediatric Volume
- Pediatric capillary collection; 500µL (0.5mL) serum

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

## Collection
- Routine venipuncture or line draw

## Causes for Rejection
- See individual tests

## Reference Ranges
- See individual tests

## Critical Values
- See individual tests

[Return to Table of Contents]
RENAAL 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
Immunotherapy Lab, Room G6-097

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

Phone  606-1088

Testing Frequency  Alliance Lab: M – F 6am – 10pm
Weekends and Holidays 8am – 6pm
Immunotherapy Lab: M-F 7am-4pm

Availability  Stat or Routine

Specimen  Plasma or Serum

Volume  1 mL

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

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

Collection  Routine venipuncture or line draw

Causes for Rejection  See individual tests

Reference Ranges  See individual tests

Critical Values  See individual tests
## RENAL FUNCTION PANEL WITH MAGNESIUM

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

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

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;354:2437

### Lab
- Alliance Lab, Room G1-500
- Immunotherapy Lab, Room G6-097

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

### Phone
606-1088

### Testing Frequency
- **Alliance Lab:** M – F 6am – 10pm  
  Weekends and Holidays 8am – 6pm
- **Immunotherapy Lab:** M-F 7am-4pm

### Availability
- Stat or Routine

### Specimen
- Plasma or Serum

### Volume
- 1 mL

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

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

### Collection
- Routine venipuncture or line draw

### Causes for Rejection
- See individual tests

### Reference Ranges
- See individual tests

### Critical Values
- See individual tests

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# URINALYSIS

**Related Terms**
- UA

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

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

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

**Phone**
- 606-1088

**Testing Frequency**
- M – F 6am – 10pm
- Weekends and Holidays 8am – 6pm

**Availability**
- STAT or routine

**Specimen**
- Random Urine

**Volume**
- 12 mL, can be done on <12 mL in extenuating instances such as infants

**Container**
- Plastic urine container

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

**Storage Instructions**
- A fresh voiding should be examined within 1 hour, or it should be refrigerated (2-8°C).

**Causes for Rejection**
- Specimens contaminated with feces, less than 1 mL of urine or specimens that are >1 hour old and have not been refrigerated.

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

**Critical Values**
- Urine Glucose > 1000 mg/dL

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ALANINE AMINOTRANSFERASE (ALT)

Related Terms
ALT, SGPT

Test included in these panels
- Hepatic Function Panel, Hepatic Function Panel with LD
- Comprehensive Metabolic Panel with HSCT subgroup
- Comprehensive Metabolic Panel with calc. for albumin and A/G ratio

Lab
Alliance Lab, Room G1-500
Immunotherapy Lab, Room G6-097

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

Phone
606-1088

Testing Frequency
Alliance Lab: M – F 6am – 10pm
Weekends and Holidays 8am – 6pm
Immunotherapy Lab: M-F 7am-4pm

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

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

Reference Ranges

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

Test is included in these panels:
- Hepatic Function Panel, Hepatic Function Panel with LD
- Renal Function Panel
- Renal Function Panel with Mg
- Comprehensive Metabolic Panel with calc. for globulin and A/G ratio
- Comprehensive Metabolic Panel with HSCT subgroup

Lab
- Alliance Lab, Room G1-500
- Immunotherapy Lab, Room G6-097

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

Phone
- 606-1088

Testing Frequency
- Alliance Lab: M – F  6am – 10pm
- Weekends and Holidays 8am – 6pm
- Immunotherapy Lab: M-F 7am-4pm

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

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ALKALINE PHOSPHATASE (ALK)

Related Terms
ALK, Alk Phos, ALP, Phosphatase, Alkaline

Test included in these panels:
- Hepatic Function Panel
- Hepatic Function Panel with LD
- Comprehensive Metabolic Panel with calc. for globulin and A/G ratio
- Comprehensive Metabolic Panel with HSCT subgroup

Lab
Alliance Lab, Room G1-500
Immunotherapy Lab, G6-097

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

Phone
606-1088

Testing Frequency
Alliance Lab: M – F 6am – 10pm
Weekends and Holidays 8am – 6pm
Immunotherapy Lab: M-F 7am-4pm

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**

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

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

Test included in these panels
- Hepatic Function Panel
- Hepatic Function Panel with LD
- Comprehensive Metabolic Panel with calc. for globulin and A/G ratio
- Comprehensive Metabolic Panel with HSCT subgroup

Lab
Alliance Lab, Room G1-500
Immunotherapy, Room G6-097

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

Phone
606-1088

Testing Frequency
Alliance Lab: M – F 6am – 10pm
Weekends and Holidays 8am – 6pm
Immunotherapy Lab: M-F 7am-4pm

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

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AMMONIA, PLASMA

Related Terms
Ammonia, PLNH3

Lab
Alliance Lab, Room G1-500

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

Phone
606-1088

Testing Frequency
Alliance Lab: M – F 6am – 10pm
Weekends and Holidays 8am – 6pm

Availability
STAT or routine

Specimen
Plasma ON ICE

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

Pediatric Volume
Same as above

Container
Lime or Green top refrigerated or on ice

Collection
Routine venipuncture or line draw

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

Reference Ranges

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

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UREA NITROGEN

Related Terms
Blood Urea Nitrogen, BUN

Test included in these panels
- Basic Metabolic Panel
- Comprehensive Metabolic Panel with calc. for globulin and A/G ratio
- Comprehensive Metabolic Panel with HSCT subgroup
- Renal Function Panel
- Renal Function Panel with Mg

Lab
Alliance Lab, Room G1-500
Immunotherapy Lab, G6-097

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

Phone
606-1088

Testing Frequency
Alliance Lab: M – F 6am – 10pm
Weekends and Holidays 8am – 6pm
Immunotherapy Lab: M-F 7am-4pm

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

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CALCIUM

Related Terms  Ca++
Test included in these panels
- Basic Metabolic Panel
- Comprehensive Metabolic Panel with calc. for globulin and A/G ratio
- Comprehensive Metabolic Panel with HSCT subgroup
- Renal Function Panel
- Renal Function Panel with Mg

Lab  Alliance Lab, Room G1-500
     Immunotherapy Lab, Room G6-097
Request Form  SCCA Clinical Lab Request: fill out completely, including ICD codes
              CPOE orders will be interfaced to Sunquest upon order activation in ORCA.
Phone  606-1088
Testing Frequency  Alliance Lab: M – F 6am – 10pm
                  Weekends and Holidays 8am – 6pm
                  Immunotherapy Lab: M-F 7am-4pm
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

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CARCINOEMBRYONIC ANTIGEN

Related Terms        CEA
Lab                Alliance Lab, Room G1-500
Request Form      SCCA Clinical Lab Request: fill out completely, including ICD codes
                  CPOE orders will be interfaced to Sunquest upon order activation in
                  ORCA.
Phone             606-1088
Testing Frequency M – F 6am – 10pm,
                  Weekends/Holidays 8am – 6pm
Availability      STAT or routine
Specimen         Serum
Volume            2.0 mL, minimum 0.8
Container        5 mL orange top tube preferred; or gold top or SST or red top tube SST
Collection      Routine venipuncture or line draw
Interfering Substances Gross hemolysis, lipemia or bilirubin, misidentified specimens and
                  requisitions, specimen QNS
Reference Ranges  0.0-5.0 ng/mL

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CEREBRAL SPINAL FLUID GLUCOSE

Related Terms
- CSF glucose

Lab
- Alliance Lab, Room G1-500

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

Phone
- 606-1088

Testing Frequency
- M – F 6am – 10pm
- Weekends and Holidays 8am – 6pm

Availability
- STAT or routine

Specimen
- Cerebral spinal fluid

Volume
- 1 mL

Minimum Volume
- 0.4 mL

Container
- Plastic tube with tight-fitting lid, orange top tube

Collection
- Lumbar Puncture

Causes for Rejection
- Insufficient quantity, misidentified specimens and requisitions

Reference Ranges
- 40-80 mg/dL

Critical Values
- Less than 20 mg/dL
CEREBRAL SPINAL FLUID PROTEIN

Related Terms: CSF protein
Lab: Alliance Lab, Room G1-500
Request Form: SCCA Clinical Lab Request: fill out completely, including ICD codes
CPOE orders will be interfaced to Sunquest upon order activation in ORCA.
Phone: 606-1088
Testing Frequency: M – F 6am – 10pm
Weekends and Holidays 8am – 6pm
Availability: STAT or routine
Specimen: Cerebral spinal fluid
Volume: 1 mL
Minimum Volume: 0.4 mL
Container: Plastic tube with tight-fitting lid
Collection: Lumbar Puncture
Causes for Rejection: Insufficient quantity, misidentified specimens and requisitions
Reference Ranges: 15-45 mg/dL

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CHLORIDE

Related Terms

Test included in these panels:

- Electrolytes
- Basic Metabolic Panel
- Comprehensive Metabolic Panel with calc. for globulin and A/G ratio
- Comprehensive Metabolic Panel with HSCT subgroup
- Renal Function Panel.
- Renal Function Panel with Mg

Lab

- Alliance Lab, Room G1-500
- Immunotherapy Lab, G6-097

Request Form

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

Phone

606-1088

Testing Frequency

- Alliance Lab: M – F 6am – 10pm
- Weekends and Holidays 8am – 6pm
- Immunotherapy Lab: M-F 7am-4pm

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

<table>
<thead>
<tr>
<th>Test included in this panel</th>
<th>Lipid panel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab</td>
<td>Alliance Lab, Room G1-500</td>
</tr>
<tr>
<td></td>
<td>Immunotherapy Lab, Room G6-097</td>
</tr>
<tr>
<td>Request Form</td>
<td>SCCA Clinical Lab Request: fill out completely, including ICD codes</td>
</tr>
<tr>
<td></td>
<td>CPOE orders will be interfaced to Sunquest upon order activation in ORCA.</td>
</tr>
<tr>
<td>Phone</td>
<td>606-1088</td>
</tr>
<tr>
<td>Testing Frequency</td>
<td>Alliance Lab: M – F 6am – 10pm</td>
</tr>
<tr>
<td></td>
<td>Weekends and Holidays 8am – 6pm</td>
</tr>
<tr>
<td></td>
<td>Immunotherapy Lab: M-F 7am-4pm</td>
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<tr>
<td>Availability</td>
<td>Routine</td>
</tr>
<tr>
<td>Specimen</td>
<td>Plasma or Serum</td>
</tr>
<tr>
<td>Volume</td>
<td>1 mL</td>
</tr>
<tr>
<td>Pediatric Volume</td>
<td>Pediatric capillary collection: 500µL (0.5mL) serum collected in microtube or “bullet tube”</td>
</tr>
<tr>
<td>Container</td>
<td>5 mL lime top PST, green top, red top, gold top SST or orange top RST</td>
</tr>
<tr>
<td>Collection</td>
<td>Routine venipuncture or line draw</td>
</tr>
<tr>
<td>Causes for Rejection</td>
<td>Misidentified specimens and requisitions, specimen QNS, improperly stored specimen, gross hemolysis</td>
</tr>
<tr>
<td>Reference Ranges</td>
<td><strong>Desirable</strong> (&lt;200) mg/dL</td>
</tr>
<tr>
<td></td>
<td><strong>Acceptable</strong> (200-239) mg/dL</td>
</tr>
<tr>
<td></td>
<td><strong>High</strong> (&gt;239) mg/dL</td>
</tr>
</tbody>
</table>

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## CO₂ (BICARBONATE)

### Related Terms
- TCO₂, Total CO₂, CO₂, HCO₃⁻

### Test included in these panels
- Electrolytes
- Basic Metabolic Panel
- Comprehensive Metabolic Panel with calc. for globulin and A/G ratio
- Comprehensive Metabolic Panel with HSCT subgroup

### Lab
- Alliance Lab, Room G1-500
- Immunotherapy Lab, Room G-6-097

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

### Phone
- 606-1088

### Testing Frequency
- Alliance Lab: M – F 6am – 10pm
- Weekends and Holidays 8am – 6pm
- Immunotherapy Lab: M-F 7am-4pm

### 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

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CREATINE KINASE

Related terms  CK, CK-Total, CPK
Lab  Alliance Lab, Room G1-500
Request Form  SCCA Clinical Lab Request: fill out completely, including ICD codes
CPOE orders will be interfaced to Sunquest upon order activation in ORCA.
Phone  606-1088
Testing Frequency  M – F 6am – 10pm Weekends and Holidays 8am – 6pm
Availability  STAT or routine
Specimen  Plasma or Serum
Volume  0.5 mL
Pediatric volume  Pediatric capillary collection: 200μL (0.2mL) serum collected in microtube or "bullet" tube
Container  5 mL lime top PST, green top, red top, gold top SST or orange top RST; NO EDTA, citrate, or oxalate.
Collection  Routine venipuncture or line draw
Special handling  Separated serum or plasma should not remain at room temp longer than 4 hours. If assays are not completed within 4 hours, serum or plasma should be stored at 2°C to 8°C for up to one week.
Cause for rejection  Misidentified specimens and requisitions, specimen QNS
Reference Ranges

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

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CREATININE

Test included in these panels:

- Basic Metabolic Panel
- Comprehensive Metabolic Panel with calc. for globulin and A/G ratio
- Comprehensive Metabolic Panel with HSCT subgroup
- Renal Function Panel
- Renal Function Panel with Mg

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
Immunotherapy Lab, Room G6-097

Request Form

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

Phone

606-1088

Testing Frequency

Alliance Lab: M – F 6am – 10pm
Weekends and Holidays 8am – 6pm
Immunotherapy Lab: M-F 7am-4pm

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

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<th></th>
<th>Female</th>
<th></th>
<th>Male</th>
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<tr>
<td>Age</td>
<td>Range</td>
<td>Age</td>
<td>Range</td>
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</tr>
<tr>
<td>&gt;=18 yrs</td>
<td>0.38-1.02</td>
<td>&gt;=18 yrs</td>
<td>0.51-1.18</td>
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</table>
DIRECT BILIRUBIN

Related Terms
   Conjugated Bilirubin

Test included in these panels
   • Hepatic Function Panel
   • Hepatic Function Panel with LD
   • Comprehensive Metabolic Panel with HSCT subgroup

Lab
   Alliance Lab, Room G1-500
   Immunotherapy, Room G6-097

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

Phone
   606-1088

Testing Frequency
   Alliance Lab: M – F 6am – 10pm
   Weekends and Holidays 8am – 6pm
   Immunotherapy Lab: M-F 7am-4pm

Availability
   STAT or routine

Specimen
   Plasma or Serum

Volume
   0.5 mL

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

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

Collection
   Routine venipuncture or line draw

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

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

Reference Ranges
   0.0 – 0.3 mg/dL
GAMMA GLUTAMYL TRANSFERASE

Related Terms  GGT
Test included in this panel:
- Comprehensive Metabolic Panel with HSCT subgroup

Lab  Alliance Lab, Room G1-500
     Immunotherapy, G6-097
Request Form  SCCA Clinical Lab Request: fill out completely, including ICD codes
              CPOE orders will be interfaced to Sunquest upon order activation in
              ORCA.
Phone  606-1088
Testing Frequency  Alliance Lab: M – F  6am – 10pm
                  Weekends and Holidays 8am – 6pm
                  Immunotherapy Lab: M-F 7am-4pm
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 (phentoin, barbiturates), as well as heavy
                        alcohol consumption before specimen collection may result in falsely
                        elevated GGT values
Causes for Rejection  Misidentified specimens and requisitions, specimen QNS,
                       improperly stored specimen, gross hemolysis

Reference Ranges  0 – 55 U/L
GLUCOSE

Related Terms: Blood sugar, sugar

Test included in these panels:
- Basic Metabolic Panel
- Comprehensive Metabolic Panel with calc. for globulin and A/G ratio
- Comprehensive Metabolic Panel with HSCT subgroup
- Renal Function Panel
- Renal Function Panel with Mg

Lab: Alliance Lab, Room G1-500
Immunotherapy, Room G6-097

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

Phone: 606-1088

Testing Frequency:
- Alliance Lab: M – F 6am – 10pm
  Weekends and Holidays 8am – 6pm
- Immunotherapy Lab: M-F 7am-4pm

Availability: STAT or routine

Specimen: Plasma or Serum

Volume: 0.5 mL

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

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

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

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

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

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

Critical Values: <45 mg/dL or >500 mg/dL

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HDL CHOLESTEROL

Related Terms
HDL

Test included in this panel
Lipid Panel

Lab
Alliance Lab, Room G1-500
Immunotherapy, Room G6-097

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

Phone
606-1088

Testing Frequency
Alliance Lab: M – F 6am – 10pm
Weekends and Holidays 8am – 6pm
Immunotherapy Lab: M-F 7am-4pm

Availability
Routine

Specimen
Plasma or Serum

Volume
1 mL

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

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

Collection
Routine venipuncture or line draw

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

Reference Ranges
>39
Desirable >59 mg/dL
Acceptable 40-59 mg/dL
Low <40 mg/dL

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IONIZED CALCIUM, SERUM & PLASMA

Test includes: Ionized Calcium
Lab: Alliance Lab, Room G1-500
Request Form: SCCA Clinical Lab Request: fill out completely, including ICD codes. CPOE orders will be interfaced to Sunquest upon order activation in ORCA.
Phone: 606-1088
Testing Frequency: M – F 6am – 10pm
Weekends and Holidays 8am – 6pm
Availability: STAT or routine
Specimen: Serum & Plasma
Volume: 1 mL
Pediatric Volume: 0.5 mL
Container: Gold top SST™ tube for serum
Lime green top PST tube for plasma
Collection: Routine venipuncture or line draw
Storage Instructions: DO NOT OPEN TUBE. Use only PST/SST™ (gel barrier) tube if ordering additional tests and specimen cannot reach laboratory within 2 hours of collection. Spin PST/SST™ (gel barrier) tube to separate serum or plasma. Serum or plasma in stoppered and spun PST/SST™ tube is stable 24 hours at 4°C. If stored >24 hours, freeze serum in cryo tube at −20°C or −70°C.

Causes for Rejection: Misidentified specimens and requisitions, specimen QNS, any tube that has been opened and exposed to air, gross hemolysis
Reference Ranges:

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

Critical Values:

< 0.78 mmol/L or > 1.58 mmol/L

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LACTATE DEHYDROGENASE

Related Terms
LD, LDH

Test included in these panels:
- Comprehensive Metabolic Panel with HSCT subgroup
- Hepatic Function Panel with LD

Lab
Alliance Lab, Room G 1-500
Immunotherapy Lab, G6-097

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

Phone
606-1088

Testing Frequency
Alliance Lab: M – F 6am – 10pm
Weekends and Holidays 8am – 6pm
Immunotherapy Lab: M-F 7am-4pm

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 citrate or oxalate.

Collection
Routine venipuncture or line draw

Special Handling
Do not refrigerate specimens

Causes for Rejection
Misidentified specimens and requisitions, specimen QNS

Reference Range
<210 U/L

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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

LDL = Chol – (Trig/5) - HDL

Lab
Alliance Lab, Room G1-500
Immunotherapy Lab, Room G6-097

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

Phone
606-1088

Testing Frequency
Alliance Lab: M – F 6am – 10pm
Weekends and Holidays 8am – 6pm
Immunotherapy Lab: M-F 7am-4pm

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
MAGNESIUM

Related Terms  Mg++
Test included in these panels:
  • Comprehensive Metabolic Panel with HSCT subgroup
  • Renal Function Panel with Mg

Lab  Alliance Lab, Room G1-500
     Immunotherapy Lab, Room G6-097
Request Form  SCCA Clinical Lab Request: fill out completely, including ICD codes
               CPOE orders will be interfaced to Sunquest upon order activation in
               ORCA.
Phone  606-1088
Testing Frequency  Alliance Lab: M – F  6am – 10pm
                 Weekends and Holidays 8am – 6pm
                 Immunotherapy Lab: M-F 7am-4pm
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
Note  Erythrocytes contain 3x the magnesium concentration of serum
       Draw without venous stasis
Special Handling  Causes for Rejection
               Hemolysis, misidentified specimens and requisitions,
               specimen QNS
Reference Ranges  1.8 – 2.4 mg/dL
Critical Values  <1.2 or >4.7 mg/dL
PHOSPHORUS

Related Terms
Phos, PO_4, Inorganic phosphorus

Test included in these panels:
- Comprehensive Metabolic Panel with HSCT subgroup
- Renal Function Panel
- Renal Function Panel with Mg

Lab
Alliance Lab, Room G1-500
Immunotherapy, Room G6-097

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

Phone
606-1088

Testing Frequency
Alliance Lab: M – F 6am – 10pm
Weekends and Holidays 8am – 6pm
Immunotherapy Lab: M-F 7am-4pm

Availability
STAT or routine

Specimen
Plasma or Serum

Volume
0.5 mL

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

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

Collection
Routine venipuncture or line draw

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

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

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

Critical Values
< 1.0 mg/dL

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POTASSIUM

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

**Test included in these panels**
- Electrolytes
- Basic Metabolic Panel
- Comprehensive Metabolic Panel with calc. for globulin and A/G ratio
- Comprehensive Metabolic Panel with HSCT subgroup
- Renal Function Panel; Renal Function Panel with Mg

**Lab**
- Alliance Lab, Room G1-500
- Immunotherapy, Room G6-097

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

**Phone**
- 606-1088

**Testing Frequency**
- Alliance Lab: M – F 6am – 10pm
- Weekends and Holidays 8am – 6pm
- Immunotherapy Lab: M-F 7am-4pm

**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

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URINE PREGNANCY TEST

Lab | Alliance Lab, Room G1-500
Request Form | SCCA Clinical Lab Request: fill out completely, including ICD codes. CPOE orders will be interfaced to Sunquest upon order activation in ORCA.
Phone | 606-1088
Testing Frequency | M – F 6am – 10pm
Weekends and Holidays 8am – 6pm
Availability | STAT or routine
Specimen | Random Urine, first morning specimen preferred for best results
Volume | 10 mL
Container | Plastic urine container
Collection | Freshly voided random urine
Storage Instructions | Specimen can be refrigerated (2-8°C).
Causes for Rejection | Specimens contaminated with feces or less than 1 mL of urine.
Specimens that are >1 hour old and have not been refrigerated.
Reporting | Qualitative results, positive or negative
Reference Ranges | Negative
# SERUM PREGNANCY TEST (QUALITATIVE)

<table>
<thead>
<tr>
<th>Lab Request Form</th>
<th>Alliance Lab, Room G1-500</th>
</tr>
</thead>
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<tr>
<td>SCCA Clinical Lab Request: fill out completely, including ICD codes CPOE orders will be interfaced to Sunquest upon order activation in ORCA.</td>
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<tr>
<td>Phone</td>
<td>606-1088</td>
</tr>
<tr>
<td>Testing Frequency</td>
<td>M – F 6am – 10pm</td>
</tr>
<tr>
<td></td>
<td>Weekends and Holidays 8am – 6pm</td>
</tr>
<tr>
<td>Availability</td>
<td>STAT or routine</td>
</tr>
<tr>
<td>Specimen</td>
<td>Serum</td>
</tr>
<tr>
<td>Volume</td>
<td>5 mL</td>
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<tr>
<td>Container</td>
<td>4ml orange top RST, gold top SST, red top tube</td>
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<tr>
<td></td>
<td><em>Not acceptable:</em> lime or green top tube</td>
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<tr>
<td>Collection</td>
<td>Routine venipuncture or line draw</td>
</tr>
<tr>
<td>Causes for Rejection</td>
<td>Collected in tube with anticoagulant, QNS, misidentified specimens and requisitions</td>
</tr>
<tr>
<td>Reporting</td>
<td>Qualitative results, positive or negative</td>
</tr>
<tr>
<td>Reference Ranges</td>
<td>Negative</td>
</tr>
</tbody>
</table>
PROSTATE SPECIFIC ANTIGEN

Related Terms  PSA, PSA monitor, PSA screen, ultrasensitive PSA
Lab         Alliance Lab, Room G1-500
Request Form SCCA Clinical Lab Request: fill out completely, including ICD codes
            CPOE orders will be interfaced to Sunquest upon order activation in ORCA.
Phone       606-1088
Testing Frequency  M – F 6am – 10pm
                     Weekends and Holidays 8am – 6pm
Availability   STAT or routine
Specimen      Serum
Volume        2.0 mL, minimum 0.8
Container     5 mL orange top tube preferred; or gold top SST, red top tube, SST
Collection    Routine venipuncture or line draw
Interfering Substances  Gross hemolysis, lipemia, or bilirubin; misidentified specimens and requisitions; specimen QNS
Reference Ranges  0.00-4.00 ng/mL
SODIUM

Related Terms  Na+
Test included in these panels:
  - Electrolytes
  - Basic Metabolic Panel
  - Comprehensive Metabolic Panel with calc. for globulin and A/G ratio
  - Comprehensive Metabolic Panel with HSCT subgroup
  - Renal Function Panel; Renal Function Panel with Mg

Lab  Alliance Lab, Room G1-500
     Immunotherapy, Room G6-097
Request Form  SCCA Clinical Lab Request: fill out completely, including ICD codes
     CPOE orders will be interfaced to Sunquest upon order activation in
     ORCA.
Phone  606-1088
Testing Frequency  Alliance Lab: M – F  6am – 10pm
     Weekends and Holidays 8am – 6pm
     Immunotherapy Lab: M-F 7am-4pm
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

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# STOOL OCCULT BLOOD

<table>
<thead>
<tr>
<th>Related Terms</th>
<th>Fecal Occult Blood, Stool Guiac, Occult Blood</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab</td>
<td>Alliance Lab, Room G1-500</td>
</tr>
<tr>
<td>Request Form</td>
<td>SCCA 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 ORCA.</td>
</tr>
<tr>
<td>Phone</td>
<td>606-1088</td>
</tr>
<tr>
<td>Testing Frequency</td>
<td>M – F 6am – 10pm</td>
</tr>
<tr>
<td></td>
<td>Weekends and Holidays 8am – 6pm,</td>
</tr>
<tr>
<td>Specimen</td>
<td>Send Hemoccult® card with stool specimen already applied, up to three cards can be sent at one time; three cards or a card with 3 samples are the same charge as one card</td>
</tr>
<tr>
<td>Causes for Rejection</td>
<td>Misidentified specimens and requisitions, specimen QNS, improperly prepared Hemoccult® card, refrigerated Hemoccult® cards</td>
</tr>
<tr>
<td>Reference Range</td>
<td>Negative</td>
</tr>
</tbody>
</table>

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TOTAL BILIRUBIN

Related Terms  Bilirubin

Test included in these panels
- Comprehensive Metabolic Panel with calc. for globulin and A/G Ratio
- Comprehensive Metabolic Panel with HSCT subgroup
- Hepatic Function Panel
- Hepatic Function Panel with LD

Lab  Alliance Lab, Room G1-500
Immunotherapy, Room G6-097

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

Phone  606-1088

Testing Frequency  Alliance Lab: M – F 6am – 10pm
Weekends and Holidays 8am – 6pm
Immunotherapy Lab: M-F 7am-4pm

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 with calc. for globulin and A/G ratio
- Comprehensive Metabolic Screen with HSCT subgroup
- Hepatic Function Panel
- Hepatic Function Panel with LD

### Lab
- Alliance Lab, Room G1-500
- Immunotherapy Lab, Room G6-097

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

### Phone
- 606-1088

### Testing Frequency
- **Alliance Lab:** M – F 6am – 10pm
- Weekends and Holidays 8am – 6pm
- **Immunotherapy Lab:** M-F 7am-4pm

### 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

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## URINE TOTAL PROTEIN

<table>
<thead>
<tr>
<th>Related Terms</th>
<th>Urine protein, Urine total protein</th>
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</thead>
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<tr>
<td>Lab</td>
<td>Alliance Lab, Room G1-500</td>
</tr>
<tr>
<td>Request Form</td>
<td>SCCA 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 ORCA.</td>
</tr>
<tr>
<td>Phone</td>
<td>606-1088</td>
</tr>
<tr>
<td>Testing Frequency</td>
<td>M – F 6am – 10pm \ Weekends and Holidays 8am – 6pm</td>
</tr>
<tr>
<td>Availability</td>
<td>STAT or routine</td>
</tr>
<tr>
<td>Specimen</td>
<td>24 hour urine collection, random specimen also acceptable</td>
</tr>
<tr>
<td>Volume</td>
<td>1 mL</td>
</tr>
<tr>
<td>Minimum Volume</td>
<td>0.4 mL</td>
</tr>
<tr>
<td>Container</td>
<td>24 hour urine collection container, or plastic urine cup w/ tight-fitting lid</td>
</tr>
<tr>
<td>Causes for Rejection</td>
<td>Insufficient quantity, misidentified specimens and requisitions</td>
</tr>
<tr>
<td>Reference Ranges</td>
<td>0-14 mg/dL (random specimen) \ 0.05-0.08 g/24 hours (24 hour collection)</td>
</tr>
</tbody>
</table>
## TRIGLYCERIDES

### Related Terms
- Trigs

### Test included in this panel
- Lipid panel

### Lab
- Alliance Lab, Room G1-500
- Immunotherapy, G6-097

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

### Phone
- 606-1088

### Testing Frequency
- **Alliance Lab:** M – F 6am – 10pm
- Weekends and Holidays 8am – 6pm
- **Immunotherapy Lab:** M-F 7am-4pm

### Availability
- Routine

### Specimen
- Plasma or Serum **Volume** 1 mL

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

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

### Collection
- Routine venipuncture or line draw

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

### Reference Ranges
- **Desirable** <150 mg/dL
- Borderline 150-199 mg/dL
- **High** 200-499 mg/dL
- **Very High** >500 mg/dL

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URIC ACID

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

Lab
- Alliance Lab, Room G1-500
- Immunotherapy, Room G6-097

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

Phone
- 606-1088

Testing Frequency
- Alliance Lab: M – F 6am – 10pm
- Weekends and Holidays 8am – 6pm
- Immunotherapy Lab: M-F 7am-4pm

Availability
- STAT or routine

Specimen
- Plasma or Serum

Volume
- 0.5 mL

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

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

Collection
- Routine venipuncture or line draw

Causes for Rejection
- Misidentified specimens and requisitions, specimen QNS

Reference Ranges

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

Test included in:

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

Lab: Alliance Lab, Room G1-500
Request Form: SCCA Clinical Lab Request: fill out completely, including ICD codes
CPOE orders will be interfaced to Sunquest upon order activation in ORCA.
Phone: 606-1088
Testing Frequency: M – F 6am – 10pm
Weekends and Holidays 8am – 6pm
Availability: STAT or routine
Specimen: Urine for Urine Creatinine
Aliquot of 4, 12 or 24-hour urine and a serum creatinine level within 48 hours of urine collection for a Creatinine Clearance
Volume: 0.5 mL min.
Container: Clean, leakproof container.
Collection: No preservative needed, but if needed for other analytes, only Thymol or Toluene should be used.
Creatinine Clearance Patient Preparation
- Hydrate the patient by administering a minimum of 600 ml water. Withhold tea, coffee, and drugs on the day of collection.
- Have the patient void and discard that specimen. Note the time and begin the urine collection period.
- Save all urine from this time on.

(Continued)
Urine Creatinine, Creatinine Clearance, continued

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

Causes for Rejection
Incomplete collections for timed periods

Reference Ranges

<table>
<thead>
<tr>
<th>Urine Creatinine</th>
<th>Reference Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child 0-9 yrs</td>
<td>700-1800 mg/24 hrs</td>
</tr>
<tr>
<td>Male &gt; 9 yrs</td>
<td>1000-2000 mg/24 hrs</td>
</tr>
<tr>
<td>Female &gt; 9 yrs</td>
<td>700-1800 mg/24 hrs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Creatinine Clearance</th>
<th>Reference Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newborn</td>
<td>40 – 60 mL/min/m2</td>
</tr>
<tr>
<td>Male</td>
<td>75-120 mL/min</td>
</tr>
<tr>
<td>Female</td>
<td>65-105 mL/min</td>
</tr>
</tbody>
</table>

Return to Table of Contents
## URINE PROTEIN/URINE CREATININE RATIO

<table>
<thead>
<tr>
<th>Related Terms</th>
<th>Urine Total Protein, Urine Creatinine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test included</td>
<td>Urine Total Protein, Urine Creatinine, calculated ratio</td>
</tr>
<tr>
<td>Lab</td>
<td>Alliance Lab, Room G1-500</td>
</tr>
<tr>
<td>Request Form</td>
<td>SCCA 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 ORCA.</td>
</tr>
<tr>
<td>Phone</td>
<td>606-1088</td>
</tr>
<tr>
<td>Testing Frequency</td>
<td>M – F  6am – 10pm  Weekends and Holidays 8am – 6pm</td>
</tr>
<tr>
<td>Availability</td>
<td>STAT or routine</td>
</tr>
<tr>
<td>Specimen</td>
<td>Random urine sample</td>
</tr>
<tr>
<td>Volume</td>
<td>1.0 mL</td>
</tr>
<tr>
<td>Container</td>
<td>Urine specimen cup</td>
</tr>
<tr>
<td>Causes for Rejection</td>
<td>Misidentified specimens and requisitions, specimen QNS</td>
</tr>
</tbody>
</table>
| Calculation   | \[
\frac{\text{Urine Protein value}}{\text{Urine Creatinine value}} = \text{Ratio}
\] |
HLA TYPING

Related Terms
Histocompatibility Testing, HLA DNA, Serology

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

Request Form
HLA Typing Requisition and New Admit.doc.
Fill out completely, including date, time and ICD codes.
Label and request must have two patient/donor identifiers.
For SCCA Ambulatory Clinic, a CPOE requisition will be generated for those lab tests requiring a requisition form.

Phone
606-7700 Lab Coordinator Office
FAX 606-1169

Availability
M – F 8:30am – 5pm. After 2:30 please call 606-7700 to alert lab of blood draws or late specimens. Specimens must arrive in CIL before 4pm on Friday or the day before a holiday.

Turnaround Time
See ‘CIL Turn Around Time Chart’

Specimen
Peripheral Blood

Volume/ Container
5 mL blood in red top tube and 30 mL blood in green top tubes (sodium heparin) (lithium heparin unacceptable)

Collection
Routine venipuncture or line draw

Special Handling
Room temperature, deliver to CIL immediately

Causes for Rejection
Misidentified specimens and requisitions, specimen QNS, improperly stored specimen or broken tubes.

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

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

**Lab Request Form**
Clinical Immunogenetics Lab, 188 E. Blaine, Suite 250
Bone Marrow Procedure Order/Multiple Lab Requisition or Blood & Other Samples Physician’s Order/Multiple Lab Requisition or Long Term Follow Up/Multiple Lab Request Form (for mail-in specimens)

Fill out completely, including date, time and ICD codes. Label and request must have two patient/donor identifiers.

For SCCA Ambulatory Clinic, a CPOE requisition will be generated for those lab tests requiring a requisition form.

**Phone Availability**
606-1139 or 606-7700, FAX 606-1169
M – F 8:30am – 5pm. After 2:30 please call 606-7700 to alert lab of blood draws or late specimens. Specimens must arrive in CIL before 4pm on Friday or the day before a holiday.

**Turnaround Time Specimen**
See ‘CIL Turnaround Time Chart’
Peripheral Blood, Bone Marrow or Flow Cytometry Sorted White Cell subsets

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

**Volume**
For peripheral blood 10mL; for bone marrow 1-2mL

**Pediatric Volume**
Peripheral blood 5mL

**Container**
Heparin – 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, specimen QNS, improperly stored specimen

**After Hours**
Draw sample and keep at room temperature. Deliver to lab the next working day.
HLA Typing

<table>
<thead>
<tr>
<th>Patient/Donor Status</th>
<th>Specimen Rec’d by 2pm on:</th>
<th>Results faxed to Ambulatory Clinics and/or Unit by:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Matched family donor w/previous SCCA typing</td>
<td>Monday</td>
<td>5pm on: Within 4-10 working days</td>
</tr>
<tr>
<td></td>
<td>Tuesday</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wednesday</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Thursday</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Friday</td>
<td></td>
</tr>
<tr>
<td>URD or Mismatched family donor w/previous SCCA typing</td>
<td>Monday</td>
<td>10am on: Within 4-10 working days</td>
</tr>
<tr>
<td></td>
<td>Tuesday</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wednesday</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Thursday</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Friday</td>
<td></td>
</tr>
<tr>
<td>Matched/Mismatched No previous SCCA typing</td>
<td>Monday</td>
<td>Within 6-10 working days</td>
</tr>
<tr>
<td></td>
<td>Tuesday</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wednesday</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Thursday</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Friday</td>
<td></td>
</tr>
</tbody>
</table>

Chimerism Testing

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

## Related Terms
- **Lab**: Alliance Lab, Room G1-500
- **Request Form**: SCCA Clinical Lab Request: fill out completely, including ICD codes
- **CPOE orders will be interfaced to Sunquest upon order activation in ORCA.**

## Phone
- 606-1088

## Testing Frequency
- **M – F**: 6am – 10pm
- **Weekends and Holidays**: 8am – 6pm

## Availability
- STAT or routine

## Specimen
- **Volume**: 4.5 mL
- **Pediatric volume**: 2.7 mL
- **Container**: Blue top 3.2 % (sodium citrate) tube

## Collection
- 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.

## 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
- 0-0.59 ug/mL FEU

## Critical Values
- none

## After Hours
- 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

Related Terms
Lab
Request Form
Phone
Testing Frequency
Availability
Specimen
Volume
Pediatric volume
Container
Collection

FIBCL
Alliance Lab, Room G1-500
SCCA Clinical Lab Request: fill out completely, including ICD codes
CPOE orders will be interfaced to Sunquest upon order activation in ORCA.
606-1088
M – F 6am – 10pm
Weekends and Holidays 8am – 6pm
STAT or routine
Blood
4.5 mL
2.7 mL
Blue top 3.2 % (sodium citrate) tube
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**

**Critical Values**

150 – 400 mg/dL

<100 mg/dL, possible effect, hemorrhage

**After Hours**

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

<table>
<thead>
<tr>
<th>Related Terms</th>
<th>Activated Partial Thromboplastin Time, aPTT, PTT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab</td>
<td>Alliance Lab, Room G1-500</td>
</tr>
<tr>
<td>Request Form</td>
<td>SCCA Clinical Lab Request: fill out completely, including ICD codes</td>
</tr>
<tr>
<td></td>
<td>CPOE orders will be interfaced to Sunquest upon order activation in ORCA.</td>
</tr>
<tr>
<td>Phone</td>
<td>606-1088</td>
</tr>
<tr>
<td>Testing Frequency</td>
<td>M – F 6am – 10pm</td>
</tr>
<tr>
<td></td>
<td>Weekends and Holidays 8am – 6pm</td>
</tr>
<tr>
<td>Availability</td>
<td>STAT or routine</td>
</tr>
<tr>
<td>Specimen</td>
<td>Blood</td>
</tr>
<tr>
<td>Volume</td>
<td>4.5 mL</td>
</tr>
<tr>
<td>Pediatric Volume</td>
<td>2.7 mL</td>
</tr>
<tr>
<td>Container</td>
<td>Blue top (3.2 % sodium citrate) tube</td>
</tr>
<tr>
<td>Collection</td>
<td>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.</td>
</tr>
<tr>
<td>Note:</td>
<td>For Heparin monitoring, MUST DRAW 5 mL BLUE TOP and process in 1hr.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Causes for Rejection</th>
<th>Specimen clotted, gross hemolysis, received more than 2 hours after collection, tubes under-filled or overfilled, misidentified specimens and requisitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference Ranges</td>
<td>22 – 35 seconds</td>
</tr>
<tr>
<td>Therapeutic Range</td>
<td>60 –100 seconds for patient on heparin therapy.</td>
</tr>
<tr>
<td>Critical Value</td>
<td>&gt;120 seconds</td>
</tr>
<tr>
<td>After Hours</td>
<td>Centrifuge for 10 minutes. Remove plasma and re-spin plasma for 10 minutes. Decant and freeze. Send frozen on dry ice.</td>
</tr>
</tbody>
</table>
PROTHROMBIN TIME

Related Terms  Protime, PT, PRO, ACCINR*
Test includes  Prothrombin Time and International Normalization Ratio (INR)
               (*ACCINR includes INR result, only)
Lab  Alliance Lab, Room G1-500
Request Form  SCCA Clinical Lab Request: fill out completely, including ICD codes
               CPOE orders will be interfaced to Sunquest upon order activation in
               ORCA.
Phone  606-1088
Testing Frequency  M – F  6am – 10pm
                    Weekends and Holidays 8am – 6pm
Availability  STAT or routine
Specimen  Blood
Volume  4.5 mL
Pediatric Volume  2.7 mL
Container  Blue top (3.2% sodium citrate) tube
Collection  Routine venipuncture or line draw. If multiple tests are being drawn,
            draw coagulation studies second. If only a Prothrombin Time is being
            drawn, draw 1-2 mL into another Vacutainer®, discard, and then collect
            the Prothrombin Time. This collection procedure avoids contamination
            of the specimen with tissue thromboplastins or heparin. Specimen
            MUST be processed by Lab within 24 hrs of blood collection.

Causes for Rejection  Specimen clotted, gross hemolysis, tubes under-filled or overfilled,
                      misidentified specimens and requisitions.
Reference Range  INR   0.8 – 1.3
                 PRO 10.7 – 15.6 secs
Therapeutic Range  INR   2.0 – 3.5; INR is applicable only to patients
                   on stable coumadin therapy.
Prothrombin Time, continued

**Critical Values**

Non-anticoagulated patient, more than 44 seconds, possible effect is hemorrhage.

Anticoagulated patient, more than three times normal mean, possible effect is hemorrhage.

**After Hours**

Critical Prothrombin Time is the PT that generates >5.0 INR. Centrifuge for 10 minutes. Remove plasma and re-spin plasma for 10 minutes. Decant and freeze. Send frozen on dry ice.

[Return to Table of Contents]
# THROMBIN TIME

<table>
<thead>
<tr>
<th>Test includes</th>
<th>Thrombin time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab</td>
<td>Alliance Lab, Room G1-500</td>
</tr>
<tr>
<td>Request Form</td>
<td>SCCA Clinical Lab Request: fill out completely, including ICD codes CPOE orders will be interfaced to Sunquest upon order activation in ORCA.</td>
</tr>
<tr>
<td>Phone</td>
<td>606-1088</td>
</tr>
<tr>
<td>Testing Frequency</td>
<td>M – F 6am – 10pm&lt;br&gt;Weekends and Holidays 8am – 6pm</td>
</tr>
<tr>
<td>Availability</td>
<td>STAT or routine</td>
</tr>
<tr>
<td>Specimen</td>
<td>Blood</td>
</tr>
<tr>
<td>Volume</td>
<td>4.5 mL</td>
</tr>
<tr>
<td>Pediatric Volume</td>
<td>2.7 mL</td>
</tr>
<tr>
<td>Container</td>
<td>Blue top (3.2% sodium citrate) tube</td>
</tr>
<tr>
<td>Collection</td>
<td>Routine venipuncture or line draw. If multiple tests are being drawn, draw coagulation studies second. If only a Thrombin Time is being drawn, draw 1-2 mL into another Vacutainer®, discard, and then collect the Thrombin Time. This collection procedure avoids contamination of the specimen with tissue thromboplastins or heparin. Specimen MUST be processed by Lab within 6 hrs of blood collection.</td>
</tr>
<tr>
<td>Causes for Rejection</td>
<td>Specimen clotted, severely hemolyzed specimens, tubes under-filled or overfilled, misidentified specimens and requisitions.</td>
</tr>
<tr>
<td>Reference Range</td>
<td>16-25 seconds</td>
</tr>
</tbody>
</table>
## CYTOGENETICS STUDIES – CHROMOSOME ANALYSIS AND FISH

### Related Terms
Molecular Cytogenetics, Chromosome Analysis, FISH (fluorescence in situ hybridization)

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

### Lab
Cytogenetics Lab, Blaine, BL-103

### Request Form
Bone Marrow Procedure Order/Multiple Lab Requisition or Long Term Follow Up/Multiple Lab Request Form (for mail-in specimens)

Fill out completely, including date, time and ICD codes. Label and request must have two patient/donor identifiers.

For SCCA Ambulatory Clinic, a CPOE requisition will be generated for those lab tests requiring a requisition form. See [http://menu.labmed.washington.edu/oltg?action=search&search_type=text&search_text=evaluate&search_as_component=yes&search_cross_reference=yes&search_include_non_orderables](http://menu.labmed.washington.edu/oltg?action=search&search_type=text&search_text=evaluate&search_as_component=yes&search_cross_reference=yes&search_include_non_orderables) for additional information on ordering EVALHD testing.

### Phone
206-606-1390 main line

### Availability
M – F 8am – 5pm

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

### Turnaround Time
See ‘Cytogenetics Turnaround Time Table’

### Specimen
Bone Marrow, Peripheral Blood, or Flow Cytometry Sorted White Cell subsets

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

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

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

### Container
Sodium heparin (green top tube)

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

Collection
Routine venipuncture line draw, or bone marrow aspiration.

Special Handling
Room temperature; deliver promptly to Cytogenetics Lab.
For cell sorting, then FISH testing, send to Alliance Lab for delivery to University of Washington Hematopathology Lab.

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

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

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

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

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

See [http://menu.labmed.washington.edu/oltg?action=search&search_type=text&search_text=evaluate&search_as_component=yes&search_cross_reference=yes&search_include_non_orderables](http://menu.labmed.washington.edu/oltg?action=search&search_type=text&search_text=evaluate&search_as_component=yes&search_cross_reference=yes&search_include_non_orderables) for additional information on ordering EVALHD testing.

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

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

| Collection | Routine venipuncture, line draw or bone marrow aspiration; surgical excision for tissue |
| Special Handling | Deliver immediately to Cytogenetics Lab. Keep refrigerated if delivery delayed. Room temperature OK if delivered within a few hours of draw. |
| Causes for Rejection | Misidentified specimens and requisitions, frozen or heated marrow or blood, severely clotted specimens, any specimen possibly exposed to contaminating DNA or RNA, leaking specimens that pose a risk to technologist, and specimens of questionable integrity. |

(Continued)
Cytogenetics Studies-Genomic Array, continued

**After Hours**

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

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

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

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Results by:***</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chromosome Analysis</td>
<td>5–10 working days with day 1 as day of receipt. Pretransplant samples are prioritized for day 5 completion. Samples requiring mitogen stimulation and or cultures longer than 24 hours may not be completed by day 5.</td>
</tr>
</tbody>
</table>

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

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

### TURNAROUND TIMES  Genomic Array

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Results by:***</th>
</tr>
</thead>
<tbody>
<tr>
<td>Genomic Array</td>
<td>5–10 working days with day 1 as day of receipt; up to 15 days for FFPE samples.</td>
</tr>
</tbody>
</table>

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

Unusual circumstances may cause a delay in availability of results. During times of heavy workload, samples will be prioritized according to known clinical urgency. If results are needed sooner than the above stated time frame, 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 Mindscape/ORCA. Reports are also faxed to patient locations without Mindscape/ORCA access.
# CEREBRAL SPINAL FLUID CELL COUNT

## Related Terms
- CSF cell count

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

## Lab
- Alliance Lab, Room G1-500

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

## Phone
- 606-1088

## Testing Frequency
- M – F 6am – 10pm
- Weekends and Holidays 8am – 6pm

## Availability
- STAT or routine

## Specimen
- Cerebral spinal fluid

## Volume
- 1 mL

## Minimum Volume
- 0.5 mL

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

## Collection
- Lumbar puncture

## Causes for Rejection
- Insufficient quantity, misidentified specimens and requisitions

## Reference Ranges
- 0 rbc/uL
- 0-5 mononuclear (lymphocytes and/or monocytes) cells/uL

<table>
<thead>
<tr>
<th>Differential</th>
<th>Neutrophils</th>
<th>2% +/- 4%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lymphocytes</td>
<td>60% +/- 20%</td>
<td></td>
</tr>
<tr>
<td>Monocytes</td>
<td>30% +/- 15%</td>
<td></td>
</tr>
</tbody>
</table>

[Return to Table of Contents]
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
Immunotherapy, G6-097

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

Phone
606-1088

Testing Frequency
Alliance Lab: M – F 6am – 10pm
Weekends and Holidays 8am – 6pm
Immunotherapy Lab: M-F 7am-4pm

Availability
STAT or routine

Specimen
Blood

Volume
2 – 3 mL

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

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

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

**Container**  EDTA Vacutainer® tube

**Collection**  Routine venipuncture or line draw

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

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

**Critical Values**  See table below

<table>
<thead>
<tr>
<th>Critical Values</th>
<th>Less than</th>
<th>Greater than</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absolute neutrophils</td>
<td>0.5</td>
<td>N/A</td>
<td>x 10⁳ /µL</td>
</tr>
<tr>
<td>Hematocrit</td>
<td>20</td>
<td>None</td>
<td>%</td>
</tr>
<tr>
<td>Platelet</td>
<td>20 - 1000</td>
<td>1000</td>
<td>x 10⁹ /µL</td>
</tr>
</tbody>
</table>

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

[Return to Table of Contents](#)
ERYTHROCYTE SEDIMENTATION RATE

Related Terms
ESR, Sed Rate

Lab
Alliance Lab, Room G1-500

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

Phone
606-1088

Testing Frequency
M – F 6am – 10pm
Weekends and Holidays 8am – 6pm

Availability
STAT or routine

Specimen
Blood

Volume
2mL

Container
2.4 mL black top Vacutainer® tube
2.4 mL lavender top Vacutainer® tube
Unacceptable: any Microtainer tube

Storage Instructions
Black top (citrate) within 2 hours
Lavender top (EDTA) at room temperature within 4 hours
Lavender top (EDTA) refrigerated within 12 hours

Collection
Routine venipuncture or line draw

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

Reference Ranges

<table>
<thead>
<tr>
<th>Age</th>
<th>Range</th>
<th>Age</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>6m - 11y</td>
<td>0-10 mm/hr</td>
<td>6m - 11y</td>
<td>0-10 mm/hr</td>
</tr>
<tr>
<td>12y-</td>
<td>0-20 mm/hr</td>
<td>12y-</td>
<td>0-15 mm/hr</td>
</tr>
</tbody>
</table>

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HEMATOCRIT

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

Lab  Alliance Lab, Room G1-500
     Immunotherapy, Room G6-097
Request Form  SCCA Clinical Lab Request: fill out completely, including ICD codes
               CPOE orders will be interfaced to Sunquest upon order activation in
               ORCA.
Phone  606-1088
Testing Frequency  Alliance Lab: M – F 6am – 10pm
                   Weekends and Holidays 8am – 6pm
                   Immunotherapy Lab: M-F 7am-4pm
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

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PLATELET COUNT

Related Terms
Platelets, Thrombocyte Count

Test included in these panels
- CBC
- CBANC
- CBD

Lab
Alliance Lab, Room G1-500
Immunotherapy, Room G6-097

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

Phone
606-1088

Testing Frequency
Alliance Lab: M – F 6am – 10pm
Weekends and Holidays 8am – 6pm
Immunotherapy Lab: M-F 7am-4pm

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

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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
Immunotherapy, Room G6-097

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

Phone
606-1088

Testing Frequency
Alliance Lab: M – F 6am – 10pm
Weekends and Holidays 8am – 6pm
Immunotherapy Lab: M-F 7am-4pm

Availability
STAT or routine

Specimen
Blood

Volume
2mL

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

Container
Lavender top (EDTA) tube

Collection
Routine venipuncture or line draw

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

Reference Ranges

<table>
<thead>
<tr>
<th></th>
<th>Units: %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retic Female</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>Range</td>
</tr>
<tr>
<td>6 mos-</td>
<td>0.5 – 1.7</td>
</tr>
<tr>
<td>Retic Male</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>Range</td>
</tr>
<tr>
<td>6 mos-</td>
<td>0.5 – 2.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Units: bil / L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retic Absolute Female</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>Range</td>
</tr>
<tr>
<td>15y –</td>
<td>20 – 65</td>
</tr>
<tr>
<td>Retic Absolute Male</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>Range</td>
</tr>
<tr>
<td>15y –</td>
<td>20 – 100</td>
</tr>
</tbody>
</table>

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BONE MARROW ASPIRATE / BIOPSY

Related Terms
- Bone marrow, iliac crest, bone marrow core

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

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

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

Phone
- 606-1088

Availability
- M – F 8am – 4:30pm

Turnaround Time
- If the specimen is placed in fixative by 1pm and delivered to Pathology by 3pm the same day, results are provided the next business day. If time frames are not met, results are provided the second business day. Holidays may extend result times. Refer to other entries, for turnaround times of other testing.

Pathology hours are:
- Monday 8am – 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 SCCA Pathology Technologist at 573-0892.

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

(Continued)
Bone Marrow Aspirate/Biopsy, continued

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

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

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

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

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

Collection
Bone marrow aspirate and bone marrow core biopsy

Causes for Rejection
Improper handling, misidentified specimens and requisitions

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

Related Terms  BAL, Bronchial Aspirate, Bronchial Wash
Test Includes  Detection of abnormal cells, malignant cells, infectious agents
Lab  SCCA Pathology, Room G7-910
Request Form  Anatomic Pathology Specimen Request Form. Complete a Lab Medicine Microbiology and/or Virology Request if ordered. Fill out completely, including ICD codes
For SCCA Ambulatory Clinic, a CPOE requisition will be generated for those lab tests requiring a requisition form.
Phone  606-1355
Availability  Monday  8am – 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 SCCA 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

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

<table>
<thead>
<tr>
<th>Collection from a Patient at UWMC for infection</th>
</tr>
</thead>
<tbody>
<tr>
<td>7am to 4:30pm Mon – Fri  Business Hours</td>
</tr>
<tr>
<td>▶ Call the SCCA Pathology Department IN ADVANCE at 606-1355. Call the in house courier at 598-8603 for a STAT pick-up.</td>
</tr>
<tr>
<td>4:30pm to 7am Mon – Fri  Weekends &amp; Holidays</td>
</tr>
<tr>
<td>▶ Saturdays follow the procedure below except between 6:00am to 2pm - during these hours notify the Saturday Tech in the SCCA Pathology Department at 606-1355.</td>
</tr>
</tbody>
</table>

(Continued)
Bronchoalveolar Lavage, continued

- BAL specimens are routed to Microbiology for dividing and distributed to Pathology and Virology Labs.
- In ADVANCE contact the SCCA 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 SCCA Pathology (G7-910)

- Transport all Pathology specimens in shipping containers at ambient temperature.
- Send to SCCA Pathology Lab, Room G7-910.
- Call SCCA Pathology Tech and tell them the specimen is being shipped.

<table>
<thead>
<tr>
<th>Collection on a Patient at UWMC for malignancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>➤ Specimen delivered by UWMC courier or Pulmonary staff to UWMC Pathology (EC 239)</td>
</tr>
<tr>
<td>➤ UWMC Histology Tech accessions the specimen in the computer and sends the specimen to Harborview Medical Center for processing.</td>
</tr>
</tbody>
</table>

**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
SCCA Pathology, Room G7-910

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

Phone
606-1355

Availability
Monday 8am – 6:30pm
Tuesday-Friday 6:00am – 6:30pm
Saturday 6am – 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 SCCA Pathology by 3pm, results will be provided the next business day.
If the time frame is not met, results are provided on the second business day. Holidays may extend result times.

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

Specimen Handling

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

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

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

- 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 and deliver to UWMC Pathology (EC 239) immediately for routing to SCCA Pathology Lab.
- Accession specimen

### 4:30pm to 7am Mon – Fri Weekends & Holidays

**Saturdays** follow the procedure below except between 6am to 2pm.
During these hours notify the Saturday Tech in the SCCA Pathology Department at 606-1355.
- In ADVANCE contact the SCCA 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 cab to the Pathology Department at the SCCA, Room G7-910

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

### Collection of SCCA GenOnc/Heme or UWMC Patients at UWMC

- Specimen in 10% buffered formalin fixative delivered directly to Rubin’s GI Lab (RR-106, phone numbers 543-4402 or 543-4403).

## Causes for Rejection

Improper handling, misidentified specimens and requisitions
# FINE NEEDLE ASPIRATIONS

<table>
<thead>
<tr>
<th>Related Terms</th>
<th>FNAs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Includes</td>
<td>Gross and microscopic exam with diagnosis</td>
</tr>
<tr>
<td>Lab</td>
<td>Harborview Cytology</td>
</tr>
<tr>
<td>Request Form</td>
<td>University of Washington Medical Centers/Harborview Medical Center Cytology Request. Fill out completely, including ICD codes. For SCCA Ambulatory Clinic, a CPOE requisition will be generated for those lab tests requiring a requisition form.</td>
</tr>
<tr>
<td>Phone</td>
<td>Harborview Cytology 744-4279</td>
</tr>
<tr>
<td>Availability</td>
<td>Monday – Friday 8am – 5pm</td>
</tr>
<tr>
<td>Specimen Collection</td>
<td>Fine Needle Aspirate (FNA)</td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
</tbody>
</table>

(Continued)
Fine Needle Aspirations, continued

Specimen Handling

### Collection at SCCA Ambulatory Clinic

- Deliver the specimen to SCCA Pathology.
- SCCA Pathology Tech will accession the specimen. It will be sent via cab to Harborview Cytology.

### Collection on a HSCT Patient at UWMC

<table>
<thead>
<tr>
<th>7am to 4:30pm Mon – Fri Business Hours</th>
<th>4:30pm to 7am Mon – Fri. Weekends &amp; Holidays</th>
</tr>
</thead>
<tbody>
<tr>
<td>▶ Immediately deliver Pathology specimens to UWMC Pathology</td>
<td></td>
</tr>
<tr>
<td>▶ All FNAs will be sent to Harborview Cytology for processing.</td>
<td></td>
</tr>
<tr>
<td>▶ In ADVANCE page UWMC on-call Histology Tech (663-8098)</td>
<td></td>
</tr>
<tr>
<td>▶ Immediately deliver Pathology specimens to UWMC Pathology</td>
<td></td>
</tr>
<tr>
<td>▶ All FNAs will be sent by UWMC Pathology to Harborview Cytology</td>
<td></td>
</tr>
</tbody>
</table>

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

Test Includes
Gross and microscopic exam with diagnosis

Lab
SCCA Pathology, Room G7-910

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

Phone
606-1355

Availability
Monday 8am – 6:30pm
Tuesday – Friday 6:00am – 6:30pm
Saturday 6am – 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 SCCA Pathology by 3pm, results will be provided the next business day. If the time frame is not met, results are provided on the second business day. Holidays may extend result times.

Container
Specimen Handling
Container with 10% buffered formalin

Collection at SCCA Ambulatory Clinic

- If Microbiology and/or Virology culture is requested, place fresh specimen in appropriate transport media.
- Specimens for culture should be delivered to the Alliance Laboratory for transport to the Microbiology and/or Virology Labs.
- Pathology specimens should be placed immediately to 10% buffered formalin at ambient temperature and sent to the SCCA Pathology laboratory.

(Continued)
Lip or Skin Biopsy, continued

### Collection on a HSCT Patient at UWMC

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

### Collection of SCCA GenOnc/Heme or UWMC Patients at UWMC

▸ Specimen in 10% formalin delivered to UWMC Pathology (EC 239)

▸ UWMC Histology Tech accesses the specimen in the computer for processing at UWMC Anatomical Pathology.

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

(Percutaneous and Transvenous)

<table>
<thead>
<tr>
<th>Test Includes</th>
<th>Gross and microscopic exam with diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab</td>
<td>SCCA Pathology, Room G7-910</td>
</tr>
<tr>
<td>Request Form</td>
<td>Anatomic Pathology Specimen Request Form</td>
</tr>
<tr>
<td></td>
<td>Complete a Lab Medicine Microbiology Request</td>
</tr>
<tr>
<td></td>
<td>and/or Virology Request if ordered</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Phone Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday 8am – 6:30pm</td>
</tr>
<tr>
<td>Tuesday- Friday 6:00am – 6:30pm</td>
</tr>
<tr>
<td>Saturday 6am to 2:30pm</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Turnaround Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>For specimens received in SCCA Pathology by 3pm, results will be provided the next business day. If the time frame is not met, results are provided on the second business day. Holidays may extend result times.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Container</th>
</tr>
</thead>
<tbody>
<tr>
<td>Submit specimens for culture in a sterile container with secure lid. Biopsies for morphology are placed in 10% buffered formalin.</td>
</tr>
</tbody>
</table>

(Continued)
Liver Biopsy, continued

Specimen Handling

<table>
<thead>
<tr>
<th>Collection on a HSCT Patient at UWMC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>7am to 4:30pm Mon – Fri</strong>&lt;br&gt;<strong>Business Hours</strong></td>
</tr>
<tr>
<td>▶ IN ADVANCE call the SCCA Pathology Department at 606-1355. Call the in-house courier at 598-8603 for a STAT pick-up.</td>
</tr>
<tr>
<td>▶ Place specimens in 10% buffered formalin fixative and deliver to UWMC Pathology (EC 239) immediately for routing to SCCA Pathology Lab.</td>
</tr>
<tr>
<td>▶ 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.</td>
</tr>
<tr>
<td>▶ Accession specimen</td>
</tr>
<tr>
<td>▶ Package specimen for transport. Transport all Pathology specimens in shipping containers at ambient temperature.</td>
</tr>
<tr>
<td>▶ Send to SCCA Pathology Lab, Room G7-910.</td>
</tr>
<tr>
<td>▶ Call SCCA Pathology Tech and tell them the specimen is being shipped.</td>
</tr>
<tr>
<td>▶ Have a courier transport the package to the commodities box.</td>
</tr>
</tbody>
</table>

(Continued)
Collection of SCCA 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 (NW-211)
- UWMC Histology Tech accesses the specimen in the computer immediately and sets up for processing at UWMC Anatomical Pathology.

Causes for Rejection  Improper handling, misidentified specimens and requisitions
LIVER BIOPSY
(Wedge Biopsy Only)

Related Terms
Liver biopsy, liver wedge biopsy

Test Includes
Gross and microscopic exam with diagnosis

Lab
SCCA Pathology, Room G7-910

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

Phone
606-1355

Availability
Monday 8am – 6:30pm
Tuesday-Friday 6:00am – 6:30pm
Saturday 6am 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 SCCA Pathology by 3pm, results will be provided the next business day. If the time frame is not met, results are provided on the second business day. Holidays may extend result times.

Container
Well-constructed container suitable for the type of specimen contained, with secure lid and sealed plastic bag

Specimen Handling

Collection on a HSCT Patient at UWMC

<table>
<thead>
<tr>
<th>7am to 4:30pm Mon – Fri Business Hours</th>
<th>4:30pm to 7am Mon – Fri Weekends &amp; Holidays</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NOTE:</strong> The type of container, the temperature, appropriate transport media, or other handling details should be determined <strong>prior to shipment</strong> by consulting the SCCA Pathology Technologist and the attending Pathologist.</td>
<td><strong>Saturdays</strong> follow the procedure below except between 6am to 2pm During these hours notify the Saturday Tech in the SCCA Pathology Department at 606-1355</td>
</tr>
</tbody>
</table>

(Continued)
Liver Biopsy (Wedge), continued

- **IN ADVANCE** call the SCCA Pathology Department at 606-1355. Call the in-house courier at 598-8603 for a STAT pick-up.
- **The entire, unfixed specimen** should be sent directly to UW Pathology Lab (NW-211) for immediate routing to SCCA Pathology Lab. Cultures or any additional testing and distribution will be handled by SCCA Pathology. The SCCA tech will be responsible for filling out the correct Lab Requisitions to be sent with the specimens submitted for culture.
- Accession specimen
- Package specimen for transport. Transport all Pathology specimens in shipping containers at ambient temperature.
- Send to SCCA Pathology Lab, Room G7-910.
- Call SCCA Pathology Tech and tell them the specimen is being shipped.
- Have a courier transport the package to the commodities box.
- **In ADVANCE contact the SCCA Pathology Tech at 573-0892**
- **The entire unfixed and undissected biopsy is placed in a sterile container.**
- Cultures or any additional testing and distribution will be handled by SCCA Pathology. The SCCA Tech will be responsible for filling out the correct Lab Requisitions to be sent with the specimens submitted for culture.
- Specimens are sent by the floor via cab to the Pathology Department at the SCCA, Room G7-910.
- If cultures were obtained, notify UWMC Lab Medicine Microbiology and/or Virology.

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

**Collection of SCCA 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.
- UWMC Histology Tech accessions the specimen in the computer for processing at UWMC Anatomical Pathology.

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

Test Includes
Gross and microscopic exam with diagnosis

Lab
SCCA Pathology, Room G7-910

Request Form
Anatomic Pathology Specimen Request Form
Fill out completely, including ICD codes
For SCCA Ambulatory Clinic, a CPOE requisition will be generated for those lab tests requiring a requisition form.

Phone
606-1355

Availability
Monday  8am – 6:30pm
Tuesday – Friday  6:00am – 6:30pm
Saturday  6am 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 SCCA Pathology by 3pm, results will be provided the next business day. If the time frame is not met, results are provided the next 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

<table>
<thead>
<tr>
<th>Collection on a HSCT Patient at UWMC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>7am to 4:30pm Mon – Fri</strong></td>
</tr>
<tr>
<td><strong>Business Hours</strong></td>
</tr>
<tr>
<td>› IN ADVANCE call the SCCA Pathology Department at 606-1355. Call the in-house courier at 598-8603 for a STAT pick-up.</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

(Continued)
### Lung Biopsy, continued

- The entire unfixed and undissected biopsy is placed in a sterile container and brought immediately to the UWMC Pathology lab (NW-211) for routing to SCCA Pathology Lab.
- Appropriate instructions for specimens to be submitted for culture must accompany the specimen.
- Accession specimen
- Package specimen for transport. Transport all Pathology specimens in shipping containers at ambient temperature.
- Send to SCCA Pathology Lab, Room G7-910.
- Call SCCA 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 SCCA Pathology Lab. The SCCA Tech will be responsible for completing the correct Lab Requisitions to be sent with the specimens to be submitted for culture.

**In ADVANCE contact the SCCA Pathology Tech at 573-0892**

- The entire unfixed and undissected biopsy is placed in a sterile container and sent by the floor via cab to the Pathology Department at the SCCA, 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 SCCA Pathology Lab. The SCCA 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 SCCA GenOnc/Heme or UWMC Patients at UWMC

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

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

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

**Lab**
- SCCA Pathology, Room G7-910

**Request Form**
- Anatomic Pathology Specimen Request Form
  - Fill out completely, including ICD codes
  - For SCCA Ambulatory Clinic, a CPOE requisition will be generated for those lab tests requiring a requisition form.

**Phone Availability**
- Monday 8am – 6:30pm
- Tuesday – Friday 6:00am – 6:30pm
- Saturday 6am – 2:30pm

**Turnaround Time**
- Specimens received in SCCA Pathology by 3pm will have results provided the following business day. If time frame is not met results are provided on the second 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 SCCA Pathology

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<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Business Hours</td>
</tr>
</tbody>
</table>

- IN ADVANCE call the SCCA 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 (NW-211) for routing to SCCA 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.
- Accession specimen
- Transport all Pathology specimens in shipping containers at ambient temperature.
- Send to SCCA Pathology Lab, Room G7-910.
- Call SCCA Pathology Tech and tell them the specimen is being shipped.
- Have a courier transport the package to the commodities box.

---

### Collection at SCCA 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 SCCA Pathology Laboratory.

---

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

[Return to Table of Contents]
THINPREP® PAP TEST COLLECTION

Test includes  
Microscopic exam with diagnosis

Lab  
HMC Cytology

Request Form  
Cytology Request Form
Fill out completely, including ICD codes
Post CPOE go-live for SCCA Ambulatory Clinic, for those lab tests requiring a requisition form, a CPOE requisition will be generated.

Phone  
744-2166

Availability  
Monday – Friday  8am – 5pm

Turnaround Time  
If specimen is delivered to SCCA Pathology by 10am, it is sent to HMC Cytology the same day. If it is not received by 10am, it is sent to HMC Cytology the next business day. Samples are screened the next business day after receipt.

Container  
Vial containing PreservCyt® Solution.

Specimen Collection  
Label a PreservCyt® vial with patient's name and medical record number.

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

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

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

(Continued)
Thinprep PAP Test, continued

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

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

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

**Specimen Handling**

**Collection at SCCA Ambulatory Clinic**

- Deliver the specimen to SCCA Pathology by 10am for delivery to HMC Cytology the same day
- SCCA pathology Laboratory will accession 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**
SCCA Pathology, Room G7-910

**Request Form**
Anatomic Pathology Specimen Request Form
Fill out completely, including ICD codes
For SCCA Ambulatory Clinic, a CPOE requisition will be generated for those lab tests requiring a requisition form.

**Phone**
606-1355

**Availability**
- Monday 8am – 6:30pm
- Tuesday – Friday 6:00am – 6:30pm
- Saturday 6am – 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 SCCA Pathology by 3pm, results will be provided the next business day. If the time frame is not met, results are provided the next 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

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

(Continued)
Sinus Biopsy, continued

- Place entire biopsy in a sterile container and keep moist with a sterile gauze pad soaked with sterile, non-bacteriostatic saline.
- Place entire aspirate in a sterile container.
- Specimen will be divided in SCCA Pathology and distributed to appropriate labs. The SCCA 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 SCCA Pathology Lab.
- Accession specimen.
- Package specimen for transport.
- Transport all Pathology specimens in shipping containers at ambient temperature.
- Send to SCCA Pathology Lab, Room G7-910.
- Call SCCA Pathology Tech and tell them the specimen is being sent.
- Use a courier to transport the package to the commodities box.

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

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

Collection of SCCA GenOnc/Heme or UWMC Patients at UWMC

- Operating Room delivers specimen to Operating Room Pathology refrigerator.
- UWMC Histology Tech accesses the specimen in the computer immediately and sets up for processing at UWMC Anatomical 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**
SCCA Pathology, Room G7-910

**Request Form**
Anatomic Pathology Specimen Request Form
Fill out completely, including ICD codes
For SCCA Ambulatory Clinic, a CPOE requisition will be generated for those lab tests requiring a requisition form.

**Phone**
606-1355

**Availability**
Monday 8am – 6:30pm
Tuesday – Friday 6:00am – 6:30pm
Saturday 6am – 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 SCCA Pathology by 3pm, results will be provided the next business day. If the time frame is not met, results are provided on the second 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

<table>
<thead>
<tr>
<th>7am to 4:30pm Mon – Fri</th>
<th>4:30pm to 7am Mon – Fri</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Business Hours</strong></td>
<td><strong>Weekends &amp; Holidays</strong></td>
</tr>
<tr>
<td>▶ IN ADVANCE call the SCCA Pathology Department at 606-1355 Call the in-house courier at 598-8603 for a STAT pick-up.</td>
<td>Saturdays follow the procedure below except between 6am to 2pm</td>
</tr>
<tr>
<td>▶ Deliver Specimens to UWMC Pathology (NW-211) for routing of specimens to SCCA Pathology.</td>
<td>During these hours notify the Saturday Tech in the SCCA Pathology Department at 606-1355</td>
</tr>
<tr>
<td>▶ SCCA Pathology will divide and route specimens to appropriate labs per protocol.</td>
<td>▶ In ADVANCE contact the SCCA Pathology Tech at 573-0892</td>
</tr>
<tr>
<td>▶ The SCCA Tech will be responsible for completing the appropriate Lab Requisitions sent with the specimens to be submitted for culture.</td>
<td>▶ SCCA Pathology will divide and route specimens to appropriate labs per protocol.</td>
</tr>
<tr>
<td>▶ Accession specimen</td>
<td>▶ The SCCA Tech will be responsible for completing the appropriate Lab Requisitions sent with the specimens to be submitted for culture.</td>
</tr>
<tr>
<td>▶ Transport all Pathology specimens in shipping containers at ambient temperature.</td>
<td>▶ Specimens are sent by the floor via cab to the Pathology Department at the SCCA, Room G7-910.</td>
</tr>
<tr>
<td>▶ Send to SCCA Pathology Lab, Room G7-910.</td>
<td>After hours: do not send the specimen to UWMC Pathology Department.</td>
</tr>
<tr>
<td>▶ Call SCCA Pathology Tech and tell them the specimen is being shipped.</td>
<td></td>
</tr>
<tr>
<td>▶ Have a courier transport the package to the commodities box.</td>
<td></td>
</tr>
</tbody>
</table>

### Collection of SCCA GenOnc/Heme or UWMC Patients at UWMC

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

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

[Return to Table of Contents]
## OTHER FLUID SPECIMENS

| Other Fluids | Specimens not specifically described in the Specimen Handling Procedure Manual; e.g., CSF, Urine. |
| Test Includes | Gross and microscopic exam with diagnosis |
| Lab | Specimens processed by Harborview Cytology |
| Request Form | University of Washington Medical Centers/Harborview Medical Center Cytology Request. Fill out completely, including ICD codes. For SCCA Ambulatory Clinic, a CPOE requisition will be generated for those lab tests requiring a requisition form. |
| Phone | Harborview Cytology 744-2166 |
| Availability | Monday – Friday 8am – 5pm |
| Specimen Collection | All specimen containers must be labeled with patient name and medical record number or birthdate. They must be accompanied by a completed requisition. Please note that the following collection procedures are a suggested guideline. Techniques vary based on personal preference, and specific clinical circumstances must be taken into account when deciding on the collection method utilized. |

### Cerebrospinal Fluid (CSF)

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

### Sputum

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

(Continued)
Other Fluid Specimens, continued

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

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

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

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

Specimen Handling

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

(Continued)
Other Fluid Specimens, continued

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

**Causes for Rejection**  Improper handling, misidentified specimens and requisitions.

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# SURGICAL SPECIMENS

## Collected at SCCA Ambulatory Clinic

### Surgical Specimens
Specimens collected at SCCA Ambulatory Clinic not specifically described in the Specimen Collection and Handling Manual

### Test Includes
Gross and microscopic exam with diagnosis

### Lab
SCCA Pathology, Room G7-910

### Request Form
Anatomic Pathology Specimen Request Form
Fill out completely, including ICD codes

For SCCA Ambulatory Clinic, a CPOE requisition will be generated for those lab tests requiring a requisition form.

### Phone
606-1355

### Availability
- Monday 8am – 6:30pm
- Tuesday – Friday 6:00am – 6:30pm
- Saturday 6am – 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 SCCA Pathology by 3pm, results will be provided the next business day. If the time frame is not met, results are provided on the second business day. Holidays may extend result times.

### Container
See below

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

<table>
<thead>
<tr>
<th>Collection at SCCA Ambulatory Clinic</th>
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</thead>
<tbody>
<tr>
<td><strong>7am to 4:30pm Mon – Fri</strong></td>
</tr>
<tr>
<td><strong>Business Hours</strong></td>
</tr>
<tr>
<td>▶ Internal courier delivers the specimen to SCCA Pathology</td>
</tr>
<tr>
<td>▶ If the specimen is from a HSCT or Heme-Onc patient, SCCA Path Tech accesses the specimen in the computer for processing at SCCA Pathology</td>
</tr>
<tr>
<td>▶ If the specimen is from a solid tumor patient, the SCCA Path Tech accesses the specimen in the computer for transport to UWMC Pathology Lab, Room NW-211.</td>
</tr>
<tr>
<td>▶ Business hours – Use courier to transport package to commodities box.</td>
</tr>
</tbody>
</table>

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

[Return to Table of Contents]
THERAPEUTIC DRUG MONITORING OF BUSULFAN

Test includes

- Css (ng/mL) result and dose recommendations
  (mg every 6 or every 24 hours)

Lab

- Pharmacokinetics, 188 E. Blaine, Suite 250

Request Form

- Busulfan Requisition Form (available on UWMC-7NE, 8NE, and SCCA outpatient blood draw area)

  Fill out completely, including ICD codes, time of draw, dose amount, and time given

  For SCCA Ambulatory Clinic, a CPOE requisition will be generated for those lab tests requiring a requisition form.

Phone

- 606-7389

Availability

- Tuesday – Saturday, 8am – 5pm
- Sundays, Mondays and Holidays: on call

Turnaround Time

- If dose is given before or at the standard time of 8am, results available between 4pm and 5pm 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, actual time of blood draw, initials of 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), 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, 180, 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, 150, 240, 360.

Be sure the entire drug has been delivered and the lines have been flushed thoroughly of busulfan before drawing 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, 270, 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, 270, 360, 480.

Be sure the entire drug has been delivered and the lines have been flushed thoroughly of busulfan before drawing 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