

Technical Support

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At PAML we are committed to delivering the best possible support to you. Part of our commitment to you includes efficient, ready access to information whenever a client calls.

Call Client Services

PAML's Client Services department is staffed by experienced personnel who answer inquiries regarding test information, specimen requirements, turnaround times, test additions and results – as well as those more difficult inquiries requiring more in-depth research. For higher-

level technical consultation, Client Services personnel typically function as the main liaison to other staff members.

As a matter of policy, PAML Client Services staff members always exhaust every available research avenue when responding to an inquiry – we will not simply refer you to an outside resource. We also try whenever possible to ensure that the team member fielding your call will respond to you *directly*, minimizing the frustration of transferred calls.

PAML has developed several contact teams that function at the local level; to ensure the fastest response, please phone the appropriate department near you.

Helpful Telephone Numbers

	Spokane and other areas	Yakima	Tri-Cities
Client Services or technical inquiries	509.927.6299 800.349.8586	509.248.1653 800.575.7854	509.736.1111 800.213.6372
Courier Questions	509.927.6253 800.541.7891	509.248.1653 800.575.7854	509.736.1111 800.213.6372
Supply Ordering	509.927.6265 800.541.7891	509.927.6265 800.541.7891	509.927.6265 800.541.7891
Billing Inquiries	509.927.6250 800.433.1583	509.927.6250 800.433.1583	509.927.6250 800.433.1583

Compliance & Regulatory

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Custom Profile Policy

It is the policy of Pathology Associates Medical Laboratories (PAML) to offer standard organ or disease-specific profiles or CPT-recognized profiles that are defined by an independent group and are endorsed by HCFA. However, a client representative will work with physician clients, when requested by the physician, to construct custom profiles to meet the specific testing needs of the patients he or she treats.

At the time of implementation of any custom profile(s), and annually thereafter, the physician will be required, as a condition for creating the custom profile, to sign a *Physician Acknowledgment* form. The physician would affirm that:

- 1. The physician has requested the creation of a custom profile that includes the tests listed on the acknowledgment;**
- 2. The physician has been informed of the reimbursement amount that Medicare (and where appropriate, Medicaid) will pay for each test included in each custom profile;**
- 3. The physician understands that when ordering tests for which Medicare reimbursement will be sought, the physician should only order those tests that he or she believes are medically necessary for each patient and he or she must provide the appropriate ICD-9 Diagnostic Code for each test ordered;**
- 4. The physician knows that using a custom profile may result in the ordering of tests for which Medicare or other federally funded health care programs may deny payment;**
- 5. The physician will order individual tests or a less inclusive profile when not all of the tests included in the custom profile are medically necessary for an individual patient;**
- 6. The physician is aware that the laboratory has available a medical director as well as technical directors in each specialty to assist the physician, if he or she requests, to ensure that appropriate tests are ordered.**

Before implementation of any custom profiles, contents of the profiles will be reviewed by the Billing Department to ensure that no duplicate testing is included and to assure that billing programs are designed to accommodate these profiles.

Compliance with this policy will be monitored by an annual review to verify that all physician clients who have established custom profiles have on file a current Physician Acknowledgment form.

Diagnostic Information Requirement

The Balanced Budget Act (BBA) of 1996 amended the Social Security Act to require that, where diagnostic or other information may be required for payment to be made to an entity (e.g., laboratory, radiology), *“The physician or practitioner will be required to provide diagnostic information to the entity at the time the service is ordered by the physician or practitioner.”* The most accurate way of providing this information is the use of ICD-9-CM coding at the highest level of specificity.

When the physician or practitioner orders multiple tests or services, the appropriate diagnosis (or diagnoses) should be linked to the tests being ordered for that diagnosis (or diagnoses).

If the test or service requested is subject to the limitation of liability provisions and may be denied due to lack of medical necessity, Medicare recommends that the physician or practitioner obtain a signed waiver of liability from the patient to protect the billing entity from liability.

General Health Panel

Please take a moment to review the following important information about the General Health Panel, CPT code 80050.

The General Health Panel includes the following:

Comprehensive Metabolic Panel	80054
Complete Blood Count (CBC)	85025
TSH	84443

Medicare and some insurance carriers exclude the General Health Panel 80050 from payment provision, deeming it to be a routine screening procedure. In fact, you will not find CPT code 80050 on Medicare’s laboratory fee schedule.

You will notice the laboratory ordering requisition contains the General Health Panel in a section that is *not* for Medicare use.

Medicare beneficiaries will be responsible for payment in full on the laboratory test General Health Panel. As a courtesy, please notify your patient that Medicare will deny payment for this procedure.

When the patient’s condition indicates the need to order the components of a General Health Panel, physicians are encouraged to order the testing on an individual basis and supply the appropriate diagnosis code information to support medical necessity on each procedure.

The laboratory is unable to change the physician order by either billing the General Health Panel 80050 as components, or ‘combining’ the components into the General Health Panel.

Investigational Services

Why does PAML perform laboratory tests that are designated by the Food and Drug Administration as “Research Use Only”? The answer to this question will not be news to anyone who has followed media accounts of the time-consuming FDA approval process. For example, new therapeutic drugs are often in routine use in Europe long before they are approved by the FDA in the United States. The same is true for laboratory tests. The FDA goes through a complex and lengthy process to evaluate new drugs and new diagnostic tests. Its mission is to ensure public safety, but its process can sometimes hinder innovative medicine. In recognition of this dilemma, the FDA allows new tests to be performed before approval if they are labeled as “Research Use Only.”

At PAML, we are dedicated to offering physicians the laboratory tests they need to practice medicine. Some of those tests have not yet made it through the FDA approval process. PAML’s Research and Development Department validates all new tests by strict analytical criteria before we offer them in our test directory. Any unapproved test will be reported with the comment “Research Use Only” until the approval process is complete.

Lawrence M. Killingsworth,
Ph.D., DABCC
Chief Science & Technical Officer

Services that are considered investigational or experimental are excluded from Medicare. This exclusion from coverage is based on section 1862(a)(1)(A) of the Social Security Act that excludes items or services not reasonable and necessary for the diagnosis or treatment of illness or injury or to improve the functioning of a malformed body member. Consequently, beneficiaries are protected from liability for these services unless a valid waiver is obtained from the patient before the service.

The following laboratory procedures are considered investigational:

DESCRIPTION	ORDER CODE
CA 19-9	CA19-9
CA72-4	CA72.4
Fibronectin	Fibron
Free PSA	FPASA
Histamine, Urine	HIST-U
Histamine	HIST
Homocysteine	HOMCY
HCV Genotyping by PCR & Sequencing	HCVGAR
HIV-1 Ultrasensitive RNA Quant by BDNA	HIVBDNA
HIV-1 Ultrasensitive Quant PCR	HIV1US
Leishmania AB Panel	LEISAB
Parvovirus (B19) AB Panel	B19PAN
Polymyositis	POLYMY
Thyroglobulin & Thyroglobulin Antibody	TGNICH
Vitamin D (1,25-Dihydroxy)	VIT D

Please advise the patient of non-coverage and submit an Advance Beneficiary Notice or Notice of Noncoverage with your laboratory order.

Medical Necessity

HCFA and the Office of the Inspector General (OIG) recognize that physicians and other authorized individuals must be able to order any tests that they believe are appropriate for the treatment or diagnosis of their patients. However, claims submitted for tests or services will only be paid if the service is covered, reasonable, and necessary for an individual patient given his or her clinical condition.

Medicare Secondary Payer

Medicare Secondary Payer (MSP) refers to those instances in which Medicare does not have the primary responsibility for paying the medical expenses for a Medicare beneficiary.

All providers and practitioners should screen Medicare patients to obtain correct health insurance information before submitting a primary claim to Medicare. Listed below are some questions that you may ask your patients during your confidential screening that will help you recognize circumstances where Medicare may be the secondary payer:

- **Are you currently employed?**
- **Is your spouse currently employed?**
- **Are you covered under an employer or union health plan that should be primary to Medicare?**
- **Did you sustain an injury/illness while at work?**
- **Are your injuries accident related?**

By using the above questions to initially screen your Medicare patients, you will help reduce costs to the Medicare Program as well as administrative costs to your practice.

Requisitions provided to the laboratory should reflect accurate patient insurance information, including screening for Medicare Secondary Payer. Laboratory Patient Service Center employees will provide Medicare Secondary Payer screening when performing phlebotomy on Medicare beneficiaries. Physician offices that are unable to provide Medicare Secondary Payer screening are encouraged to direct their patients to our Patient Service Centers for this vital requirement of the Medicare Program.

References

Medicare Part B 1999 Basic Billing Manual.

Medicare B New, Issue 167 “Medicare Secondary Payer”

<http://www.noridian.com/medweb>

Waivers: ABNs and Notices of Noncoverage

The Omnibus Budget Reconciliation Act of 1986 (OBRA) included a limitation of liability (or waiver of liability) provision that provides beneficiaries with protection from liability when they, in good faith, receive services from a Medicare provider for which Medicare payment is subsequently denied as not “reasonable and necessary.”

The beneficiary is not responsible for services that are not covered by Medicare until he or she has been notified in writing that the services are noncovered services. When an item or service is not covered, the Medicare beneficiary, or his or her representative, must be advised in writing prior to furnishing the item or service.

Reasons for Noncoverage include:

- **Laboratory tests that will be denied according to the Fiscal Intermediary Local Medical Review Policies.**
- **Laboratory tests that are not yet FDA approved (investigational tests).**
- **Laboratory tests that are specifically excluded by the Medicare program. (General Health Panels, Cross-Linked N-Telopeptides)**
- **Routine or Screening Services. As a courtesy, please inform your patient these services are not covered by Medicare.**

Please provide the laboratory with a Notice of Noncoverage or an Advance Beneficiary Notice (ABN) when you have reason to believe Medicare may deny a procedure as ‘medically unnecessary.’

Reflex Testing Policy

To ensure regulatory compliance, PAML is pleased to provide the following information.

All tests contained in this section (both single tests and profiles) may, depending on the result, “reflex” into additional testing – *at additional charge*.

Please Note: For your convenience, such “reflexive” tests are also identified under each test’s listing in the main test directory. This list is subject to modification. (See Reflex Testing Policy below).

Reflex Testing Policy

It is the policy of Pathology Associates Medical Laboratories (PAML) to carefully evaluate all reflexive testing using the following criteria:

- **Is the reflexive test required by accrediting agencies (e.g., CAP) or by federal or state mandates (e.g. CLIA, Medical Test Site)?**
- **Is the reflexive test considered “good laboratory practice,” providing accurate clinical information to the physician?**
- **Does the reflexive test incur an additional charge, or is it included in the standard test charge?**
- **Is the ordering physician clearly given the option to order a test with – as well as without – the reflexive test being performed?**
- **Has the ordering physician been informed through the design of the requisition form, information in the PAML Test Directory, and Test Alerts and Updates?**

All tests preprinted on the requisition(s) that might have reflexive tests available clearly offer the option to order with or without reflex testing.

For your convenience, all tests that may reflex are clearly identified within the test information section of the directory. The statement, “This test may reflex to additional tests depending upon the results of this test. An additional fee may be added.” appears within each of these listings. See following page for current list.

Compliance with this policy will be monitored by an annual audit to include:

- **Review by the Technical Operations Group of the current reflexive testing practices as well as any new clinical laboratory industry recommendations regarding reflexive testing for appropriateness and compliance.**
- **Review of all current requisition forms for compliance.**
- **Review of the PAML Test Directory, Test Updates, and Test Alerts for compliance.**

Reflexive Tests*

which may incur additional charges

HAMM	Acid Hemolysis (HAMM Test)
ANA	ANA Screen
AB ID	Antibody Identification
CHEMR	Chemistry Reflex Profile
ABS	Coombs, Indirect (Antibody Screen)
CSF	CSF, Profile
CYSTICERCUS.AB	Cysticercus
DNA	DNA Antibody Double Stranded
DNA.DS-ELISA	DNA Antibody Double Stranded, IgG
DNAA	DNA Analysis by Flow Cytometry
FIBRINOGEN	Fibrinogen
GHPANR	General Health Panel (Reflex)
HGB.THAL.PANEL	Hemoglobinopathy / Thalessemia Panel
HAT	Heparin Associated Thrombocytopenia
HAV	Hepatitis A Virus (Total)
HBCORE	Hepatitis B Core Antibody, IgG
HBSAG	Hepatitis B Surface Antigen
HEP-C	Hepatitis C Antibody
HEP-ACUTE	Hepatitis Screen (Acute Viral)
HEPHBS	Hepatitis Screen (Acute Viral) & Anti-HBS
HEP-ACUTE + C	Hepatitis Screen (Acute Viral) & Hepatitis C
HSVCTP	Herpes Simplex Culture & Typing
TAYSACHS.SERUM	Hexosaminidase A & Total, Serum
TAYSACHS.COMP	Hexosaminidase A & Total, Leukocyte & Serum
HIV2AB	HIV-2 Ab, ELISA
HLA B27	HLA B27
HTLV12	HTLV I / II
HTLVWB	HTLV I & II, Western Blot
LEUK.LYMPH	Leukemia & Lymphoma Panel
LUPUS	Lupus Anticoagulant
LYME	Lyme (<i>B. burgdorferi</i>) IgG / IgM
MEL.SCR	Melanin, Urine
RPR	RPR
RPR/RUB	RPR & Rubella
RSVSCC	RSV Screen & Culture
STREP	Streptozyme, Titer
SUC	Sucrose Lysis Test
TSH.R	TSH with Reflex
UA	Urinalysis

Microbiology

AFB.PROBE	AFB Probe
AFB	Culture, AFB
BLOOD	Culture, Blood
CBF	Culture, Blood Fungus
CULT.FLD	Culture, Body Fluid
CWNDD	Culture, Deep Wound
CULTEAR	Culture, Ear
CULTEYE	Culture, Eye
FECES	Culture, Feces
FUNG	Culture, Fungus
FUNG.ID	Culture, Fungus (ID)
CFS	Culture, Fungus, Skin
GEN	Culture, Genital
CLRSP	Culture, Lower Respiratory
CURSP	Culture, Upper Respiratory
CULT.TISSUE	Culture, Tissue
CULT.CC	Culture, Urine Colony Count
WOUND	Culture, Wound
YST-SCR	Culture, Yeast Screen

All Special Stains

** List is subject to modification.*

Tests Requiring Proof of Medical Necessity

PAML CODE	DESCRIPTION	CPT4	EFFECTIVE DATE
AFP	Alpha Fetoprotein	82105	1996
ALIT	Ado Hematology	85027	1996
CA1 25	CA125	86316	1996
CA15-3	CA1 15-3	86316	1996
CA1 9-9	CA149	86316	Investigational
CA27.29	CA27-29	86316	1996
CA72-4	CA72-4	86316	Investigational
CBC, CBCW CBCMAN	CBC (All complete Blood Counts)	85023-85025	1996
CEA	C EA	82378	1996
CHO	Cholesterol	82465	12/10/96
CULT.CC	Culture Urine Colony Count	87086-87088	5/1/98
Multiple	Cytogenetics Studies, All	88230-88291	4/1/99
DIF, MAN.DIF	Differential (Blood Counts)	85007	7/1/96
DLDL	Direct LDL	83721	12/10/96
DPS	Urinalysis Dip Stick, No Micro	81003	1996
FERR	Ferritin	82728	10/10/96
FPSA	Free PSA	84153	Investigational
FREE T3	Free T3	84481	12/10/96
FREE T4	Free T4	84439	12/10/96
FRUCT	Fructosamine	82985	12/10/96
FTA.RUP	FTA Confirmation (Treponema Pallidum)	86781	5/1/98
GGT	Gamma Glutamyltransferase	82977	5/1/98
GLHGB	Glyhemoglobin	83036	12/10/96
GLU	Glucose	82947	1996
GLYCO	Glycoprotein	82985	12/10/96
GLYCOALBUMIN	Glycoalbumin	82985	12/10/96
HCG	HCG Qualitative	84703	1996
HC-QUANT	HCG Quantitative	84702	1996
HCVGAR	HCV Genotyping by PCR & Sequencing	Multiple	Investigational
HCT	Hematocrit Including Spun)	8501 W85014	1995
HGB	Hemoglobin	85018	1995
AUT	Hemogram, Automated	85021, 85027	1995
HDL	HDL	83718	12/10/96
HIV12	HIV (Viral Serology)	86701	1996
HIV12	HIV-1, Direct Probe	87534	7/1/99
HIV1US	HIV-1, Ultrasensitive Quant by PCR	87536	Investigational
HIV.DNA.PCR	HIV-1, Amplified Probe	87535	7/1/99
HIVBDNA, HIV.RNA.QUANT	HIV-1, Quant	87536	7/1/99
HIVBDNA, HIV.RNA.QUANT	HIV-2, Direct Probe	87537	7/1/99
HIVBDNA, HIV.RNA.QUANT	HIV-2, Amplified Probe	87538	7/1/99

PAML CODE	DESCRIPTION	CPT4	EFFECTIVE DATE
HIVBDNA, HIV.RNA.QUANT	HIV-2, Quant	87539	7/1/99
HOMCY	Homocysteine	82131	Investigational
HYPO	Hypothyroid Profile	80092	12/10/96
IRN	Iron	83540	10/10/96
IRON.BIND	Iron Binding Capacity	83550	10/10/96
LPHENO	Lipid Phenotyping	83715	12/10/96
LIPID	Lipid Profile	80061	12/10/96
MAG	Magnesium	83735	10/10/96
MAN.DIFF	Manual Differential	85007	1996
NTX	N-Telopeptides	82523	Never Covered
OC.BLD	Occult Blood	82270	1996
PAP	Prostatic Acid Phosphatase	84066	5/1/98
PAP SMEARS	Cervical Smear	88150	1996
POT	Potassium	84132	4/10/97
PSA	PSA	84153	1996
PT	Prothrombin Time	85610	5/1/98
PTT	Partial Thromboplastin Time	85730	5/1/98
RA	Rheumatoid Factor	86430-86431	5/1/98
RPR	RPR	86592	1996
RT3	Tool T3 by ICMA	84480	12/10/96
RTC	Retic Count	85044	12/10/96
SED	Sedimentation Rate	85651-85652	12/15/96
T3.UP	T3 Uptake	84479	12/10/96
T4	T4	84436	12/10/96
TAB	Microsomal Antibody	86376	12/10/96
TAB	Thyroglobulin Antibody	86800	12/10/96
TGNICH	Thyroglobulin & Thyroglobulin Antibody	Multiple	Investigational
TB	Thyroid Profile	80091	12/10/96
TBG	Thyroxine Binding Globulin	84442	12/10/96
TRANSFERRIN	Transferrin	84466	12/10/96
TRIG	Triglycerides	84478	12/10/96
TROPONIN	Troponin	84484	8/1/98
TSH	TSH	84443	12/10/96
TSI	Thyroid Stimulating Immunoglobulin	84445	12/10/96
LIAM	Urinalysis Dip Stick, with Micro	81000,81001	1995
DPS	Urinalysis, Dip Stick	81002,81003	1995
UA.MICRO	Urinalysis, Microscopic Only	81015	1996
VDRL, TPPA	VDRL (Syphilis, Quant)	86593	5/1/98
VIT D	Vitamin D (1,25-Dihydroxy)	82652	Investigational
WBC	White Cell Count	85048	1996

Reference Laboratories

ID	LABORATORY NAME	CITY	ID	LABORATORY NAME	CITY
01	PAML	Spokane, WA 99206	43	St Francis Hospital	Federal Way, WA 98003
02	Laboratory of Pathology	Seattle, WA 98104	44	Providence Seattle Medical Center	Seattle, WA 98214-1008
03	ARUP	Salt Lake City, UT 84108	45	Overlake Hospital Medical Center	Bellevue, WA 98004
04	Children's Hospital & Med Center	Seattle, WA 98105	46	Northwest Clinical Laboratory	Seattle, WA 98133
05	Allergy Testing Lab	Gainesville, FL 32065	47	Kadlec Medical Center	Richland, WA 99352
06	Endocrine Sciences	Calabasas Hills, CA 91301	48	Columbia Basin Hospital	Ephrata, WA 98823
08	Holy Family Hospital	Spokane, WA 99207	49	Kootenai Medical Center	Coeur D'Alene, ID 83814
09	Whitman Hosp & Med Center	Colfax, WA 99111	50	Alpha Medical Laboratories	Coeur D'Alene, ID 83814
10	St Vincent Hosp & Med Ctr/Lab	Portland, OR 97229	51	Ironwood Patient Service Center	Coeur D'Alene, ID 83814
11	Immuno Diagnostics	Buffalo, NY 14223	52	PAML at Group Health North Idaho	Coeur D'Alene, ID 83814
12	Mayo Medical Laboratory	Rochester, MN 55905	53	Northpointe Patient Service Center	Spokane, WA 99218
13	National Medical Services (NMS)	Willow Grove, PA 19090	54	Yakima Patient Service Center	Yakima, WA 98902
14	Genica	Worcester, MA 01605	55	PAML at Cornerstone Medical Clinic	Yakima, WA 98902
15	Nichols Institute	San Juan Capistrano, CA 92690	57	Veterinary Medical Center	Manhattan, KA 66506
16	Public Health Laboratories	Seattle, WA 98155	59	Yakima Valley Memorial Hospital	Yakima, WA 98902
17	Sacred Heart Medical Center	Spokane, WA 99204	60	Providence Centralia	Centralia, WA 98531
18	SmithKline Beecham Clinical Lab	Van Nuys, CA 91405	61	Puget Sound Blood Bank	Seattle, WA 98104
19	Specialty Laboratories	Santa Monica, CA 90404	62	PAML at Group Health Lidgerwood	Spokane, WA 99207
20	Inland Northwest Blood Center	Spokane, WA 99204	63	PAML at Group Health Maple Street	Spokane, WA 99205
22	University of Oregon Health Science Ctr	Portland, OR 97201	64	PAML at Group Health Riverfront	Spokane, WA 99201
23	University Hospital Clinical Laboratory	Seattle, WA 98195	66	PAML at Group Health Veradale	Spokane, WA 99216
24	St Patrick Medical Center	Missoula, MT 59801	67	PAML at Drs Berndt & Gaddy	Spokane, WA 99205
25	Unspecified Laboratory		68	PAML at South Hill Family Medicine	Spokane, WA 99223
26	College of Veterinary Medicine	Pullman, WA 99165	69	PAML at Family Medicine Spokane	Spokane, WA 99202
27	Providence Medical Center	Portland, OR 97213	70	PAML at Associated Family Physicians	Spokane, WA 99206
29	Antech Diagnostics	Memphis, TN 38100	71	Issaquah Patient Service Center	Issaquah, WA 98027
30	Unlisted Reference Lab		72	Community Medical Center	Brewster, WA 98815
31	St Peter Hospital	Olympia, WA 98506	74	Kaiser Regional Lab	Clackamas, OR 97015
32	Bellevue Patient Service Center	Bellevue, WA 98004	75	Olympic Medical Laboratory	Bremerton, WA 98310
33	Immunosciences Lab, Inc	Beverly Hills, CA 90025	76	Northwest Hospital	Seattle, WA 98133
34	Urolithiasis Laboratory	Houston, TX 77265-5375	77	NW Hospital/Medical Arts Bldg	Seattle, WA 98133
35	Microbiology Reference Laboratory	Cypress, CA 90630	78	NW Hospital/Northgate	Seattle, WA 98125
36	Rheumatology Diagnostic Laboratory, Inc	Los Angeles, CA 90025	79	Northwest Lipid Research Center	Seattle, WA 98103
37	Medtox	St Paul, MN 55112	81	St Vincent Hospital Laboratory	Billings, MT 59101
38	Providence General Medical Center	Everett, WA 98201	82	Mecstat Laboratories	Des Plaines, IL 60018
39	Providence Pacific Clinic	Everett, WA 98201	83	University Hospital at Stonybrook	Stonybrook, NY 11794
40	Everett Service Center	Everett, WA 98201	84	Genzyme Genetics	Santa Fe, NM 87505
41	St Joseph Medical Center	Tacoma, WA 98405	85	King County Dept of Health	Seattle, WA 98104
42	St Clare Hospital	Lakewood, WA 98499	86	Harborview Medical Center	Seattle, WA 98104

ID	LABORATORY NAME	CITY
87	Diagnos-Techs, Inc	Kent, WA 98032
88	Great Smokies Diagnostic Lab, Inc	Seattle, WA 98125
89	Spectracell Laboratories, Inc	Houston, TX 77024
90	Colorado Coagulation Consultants	Aurora, CO 80014
92	Deer Park Health Center and Hospital	Deer Park, WA 99006
93	Immunodiagnostic Labs	San Leandro, CA 94577
94	Clark Fork Valley Hospital	Plaines, MT 59859
95	St James Communit Hospital	Butte, MT 59702
96	St Luke Community Hospital	Ronan, MT 59864
97	Kalispell Regional Medical Center	Kalispell, MT 59901
98	North Valley Hospital	Whitefish, MT 59937
99	Columbia Medical Laboratory	Kennewick, WA 99336
AA	IBT Reference Lab	Lenexa, KS 66214
AB	Interscience Lab Institute	Inglewood, CA 90302
AC	Joli Diagnostics Inc	Williamsville, NY 14221
AD	Meridian Valley Lab	Kent, WA 98032
AE	National Genetic Institute	Los Angeles, CA 90064
AF	National Jewish Hospital	Denver, CO 80206
AG	U of Calif-Davis Micro	Davis, CA 95616
AH	U of New Mexico Med Ctr Lab	Albuquerque, NM 87106
AI	U of Texas Health Ctr Lab	San Antonio, TX 78284
AJ	U of Utah-Red Butte Clinic	Salt Lake City, UT 84108
AK	UROCOR	Oklahoma City, OK 73104
AL	VIROMED Lab	Minneapolis, MN 55343
AM	Family Health Center	Spokane, WA 99204
AN	Lake Chelan Clinic	Chelan, WA 98816-0368
AQ	Diagnostic-Tech, Inc	Kent, WA 98032

Cellular Immunology, Flow Cytometry, Cytochemistry

Hematology / Cellular Immunology Laboratory

- Flow Cytometric Immunophenotyping
- Flow Cytometric Leukemia/Lymphoma
- Flow Cytometric Reticulocyte Counts
- Flow Cytometric DNA Content Analysis
- HLA B27
- Bronchoalveolar Lavage Analysis (BAL)
- Cytochemical Stains

Flow Cytometric Analysis

Flow Cytometric Analysis provides a powerful technique for the study of disease at the cellular and subcellular level. Flow Cytometry is a technique for rapidly counting and characterizing single cells, suspended in a narrow stream of fluid, passing one at a time through a beam of light from a laser light source. The selected photoemissions are counted by computer analysis to produce a histogram for interpretation. The process allows virtually any cell (or particle) to be analyzed for size, granularity, nuclear content and immunologic characteristics.

Immunophenotyping procedures identify specific cell types and subtypes for the monitoring of AIDS and other immune deficiency disorders, and the monitoring of transplantation therapy. It enhances and complements the morphologic and cytochemical diagnosis of leukemias and lymphomas.

Although most commonly done with blood samples; bone marrow, lymph node, cell suspensions, and body fluids including CSF, pleural and pericardial effusions, ascitic fluid and BAL (Bronchoalveolar Lavage) specimens are also evaluated.

Reticulocyte counts are a simple and direct method for assessing the effective rate of red cell production. Flow cytometry offers a more precise method than visual staining because a much larger number of cells is analyzed.

Total nuclear DNA Content can be rapidly measured by flow cytometry from a variety of tissues and fluids. The total DNA Content includes information on ploidy status (DNA Index) and proliferation (S-phase). Although the majority of tissue submitted is fresh or snap frozen, paraffin embedded tissue blocks can also provide the desired information.

BAL Analysis

BAL Analysis is utilized to assess Interstitial Lung Disease, pulmonary infection, hemorrhage and malignant disease. The specimen is submitted for Differential, Iron Stain, Oil Red O Stain and surface marker studies (T and B lymphocytes) as indicated.

Cytochemical Stains

A wide variety of cytochemical and immunologic stains are available for cell identification and subtyping of various leukemias and other diseases. All stains are accompanied by an interpretive report. Consultation services are encouraged.

Flow Cytometric Immunophenotyping

Test Name	Description			
CD3	CD3 (Absolute and %)			
CD4	CD4 (Absolute and %)			
Helper Suppressor Ratio	CD4	(Absolute	and	%)
	CD8	(Absolute	and	%)
	CD4/CD8			Ratio
	Interpretive Report			
T&B Cell Panel	CD3	(Absolute	and	%)
	CD4	(Absolute	and	%)
	CD8	(Absolute	and	%)
	CD19	(Absolute	and	%)
	CD4/CD8			Ratio
	Interpretive Report			

Specimen Requirements: 7 ml ACD (yellow top) whole blood and 5 ml EDTA (lavender top) whole blood. Maintain at room temperature. Transport ASAP. Specimen must be processed within 48 hours of collection.

In accordance with the CDC guidelines please provide the following patient information: WBC count and percent lymphocytes on the day of collection if sample will arrive after 24 hours.

ANALYTIC TIME: 48 hours

DAY(S) TEST SET UP: Monday - Saturday (by 11:00 AM). Sunday service is available by special request.

Flow Cytometric Leukemia/Lymphoma Phenotyping

Test Name	Description
T cells	CD3 CD5 CD7, CD1a, CD2 CD4 - helper/inducer CD8 - cytotoxic/suppressor
B cells	CD19 CD20 CD22, CD23, FMC7 Surface IgG, IgD, IgM Kappa, Lambda HLA-DR
CALLA	CD10
Myelo/Mono	CD13, CD14, CD33, CD64
Natural Killer	CD3-/CD16+ CD56+, CD57, CD56
Misc	CD41 CD34, CD38, CD11b, CD11c, CD25, CD45, MPO, TdT, CD38, CD138 Glyco A, CD15, CD16, CD30, CD13, CD55, CD59, CD62, CD103, BCL2*

**Additional antibodies as they become available.*

After reviewing morphology and accompanying patient history, a selection from the above markers is made by the Hematology Director. An interpretive report accompanies each study.

Specimen Requirements: 7 mL (1 tube) ACD (yellow-top) whole blood and 5 ml EDTA (lavender top) whole blood and 2 - 4 peripheral blood smears. Maintain at room temperature. Transport ASAP. Samples must be processed within 48 hours of collection. Immunophenotyping is also available on tissues, bone marrow and body fluids.

In accordance with the CDC guidelines please provide the following patient information: WBC count and percent lymphocytes on the day of collection if the sample will arrive after 24 hours.

ANALYTIC TIME: 72 hours

DAY(S) TEST SET UP: Monday - Saturday (by 11:00 AM). Sunday service is available by special request.

COMMENT: Additional antibodies will be added to the above panel as required for diagnosis, and an additional charge will be added. Please include clinical indication when ordering this test.

Flow Cytometric Reticulocyte Count

Test Name	Description
Retic - auto	Retic count (absolute and %) Corrected retic count

Specimen Requirements: 5 ml EDTA whole blood (lavender top tube). If more than 8 hours from time of collection, refrigerate.

ANALYTIC TIME: 24 hours
DAY(S) TEST SET UP: Monday - Saturday by 0900
COMMENT: The specimen must be in the laboratory by 0900 to be run the same day. The CV of the automated reticulocyte count is 10% compared with the 20-35% CV of the manual method.

Flow Cytometric DNA Content – Paraffin

Test Name	Description
DNA Analysis	Ploidy status DNA index % S phase Interpretive report

Specimen Requirements: Formalin-fixed, paraffin embedded tissue blocks that contain tissue representative of the tumor can be sent at room temperature. If an accompanying H&E section of the tissue block is not sent, one will be cut and stained upon arrival. The tissue block will be returned after 5, 50 micron sections are removed for the DNA content analysis.

ANALYTIC TIME: 7 Days
DAY(S) TEST SET UP: Monday and Thursday/days

HLA B27

Test Name	Description
HLA B27	HLA B27

Specimen Requirements: 5 mL ACD whole blood (yellow-top tube). Store and transport at room temperature. It is preferred that specimen be received in laboratory within 12 hours of collection. If result is indeterminate, specimen will be sent to INBC for confirmation by microlymphocytotoxicity. A fee will be added.

ANALYTIC TIME: 2-4 Days
DAY(S) TEST SET UP: Monday – Friday, Saturday if specimen is in laboratory by 11:00 am.
COMMENTS: Minimum amount: 2 mL. Sodium heparinized whole blood (green-top tube) is acceptable. Unacceptable specimens: EDTA whole blood (lavender-top tube), refrigerated or frozen specimens. Stability: 48 hours at room temperature. HLA B27 has been found to be highly associated with ankylosing spondylitis.

Bronchoalveolar Lavage

Test Name	Description
BAL differential	differential
BAL iron stain	hemosiderin
BAL Oil Red O stain	fat
BAL lymphocyte subsets	Done only if differential shows >10% lymphocytes. Includes CD2, CD4, CD8 and CD19. Interpretive report

Specimen Requirements: Depending upon physician's orders, allocate specimen accordingly:

- A. Cell Analysis 25 cc or more lavage fluid into sterile container. No anticoagulant.
- B. Microbiology Culture 10 cc lavage fluid into sterile container.
- C. Cytology 15 cc lavage fluid, plus 15 cc lavage fluid, fixative.

(For Microbiology and Cytology, fill out appropriate test request forms).

Grossly bloody specimens and specimens which are 3/4 or more mucous are not appropriate. The specimen must be delivered to the Laboratory as soon as possible. Transport at room temperature.

ANALYTIC TIME: 72 hours

DAY(S) TEST SET UP: 7 days a week.

COMMENT: A description will be ordered automatically at no charge. An interpretive report will be ordered and charged with each BAL differential.

Cytochemical Stains

Test Name	Description
Combined Esterase	Useful for the identification of monocytes and precursors, myelocytes and precursors, and cells which stain with characteristics for both. Most useful when coordinated with single esterase (NSE and CAE).
Leukocyte Alkaline Phosphatase (LAP)	Useful for the differential diagnosis of chronic granulocytic leukemia, leukemoid reactions, myelofibrosis and polycythemia vera. <i>Note: Unfixed, unstained slides must arrive at lab within 12 hrs of collection.</i>
Non-Specific Esterase (NSE)	Useful for identification of monocytes and their precursors.
Periodic-Acid Schiff (PAS)	Useful for the identification of early erythroid precursors in erythroleukemia and the differential diagnosis of acute lymphoblastic from acute myeloblastic leukemia.
Peroxidase (myeloperoxidase)	Useful for distinguishing between lymphocytic and nonlymphocytic leukemia.
Specific Esterase (chloroacetate esterase, CAE)	Useful for distinguishing granulocytic (M 1-3) leukemia from myelomonocytic (M4) and monocytic (M5) leukemia.
Sudan Black B	Useful for distinguishing between lymphocytic and nonlymphocytic leukemia.
Tartrate Resistant Acid Phosphatase (TRAP)	Useful for the diagnosis of hairy cell leukemia. <i>Note: Specimen must arrive at lab within 12 hrs of time drawn.</i>
Terminal deoxynucleotidyl transferase (Tdt)	Useful for the diagnosis of acute lymphoblastic leukemia.

Specimen Requirements: Send 3 peripheral smears, tissue touch preps or bone marrow coverslips or slides for each stain requested. The slides should be air dried, unstained and unfixed. EDTA and heparin slides are acceptable for all stains except LAP smears. Avoid prolonged exposure to bright light and transport at room temperature. If possible, also include 1, 3 mL EDTA (lavender top tube) and/or sodium heparinized (green top tube) whole blood.

ANALYTIC TIME: 72 hours.

DAY(S) TEST SET UP: Monday - Saturday by 11:00 AM

Cytogenetic Services

Located in Spokane, Washington, the Sacred Heart Medical Center (SHMC) Cytogenetics Laboratory has been in operation over 30 years. Through its PAML affiliation, SHMC Cytogenetics provides a comprehensive selection of cytogenetics services to clients, including molecular studies utilizing FISH (fluorescent in situ hybridization).

The use of chromosome analysis for diagnostic and prognostic purposes has grown tremendously in the past two decades as technological advances in cytogenetics have occurred. These include improved cell culturing and harvesting methods, development of new staining techniques, and the use of molecular DNA probes for detection and characterization of subtle chromosome abnormalities. Cytogenetic analysis can provide critical information in a diagnostic workup of constitutional disorders and also give valuable diagnostic and/or prognostic information in various neoplastic conditions.

State-of-the-art Quality

SHMC Cytogenetics Laboratory uses the newest technologies, including computer-enhanced image analysis, to consistently produce high-quality studies; routine peripheral bloods average at the 600 band level of cytogenetic resolution, high-resolution peripheral bloods at 700-800, and amniotic fluids at 500-600. Bone marrows and other neoplastic specimens consistently yield a minimum band level resolution of 400-450.

Our high annual volume of neoplastic procedures continually reinforces our knowledge base of bone marrow, lymph node and other solid tumor studies. Special handling and culturing methods, developed over a period of years, help to yield the high-quality studies that allow detection of subtle aberrations that might otherwise go undetected. SHMC was nationally recognized for a bone marrow karyotype featured on the cover of The Cytogenetic Symposium 1994, published by the Association of Cytogenetic Technologists.

Rapid Turnaround Time

SHMC Cytogenetics turnaround times consistently rank among the best in the industry. We provide 24-48 hour preliminary results on bone marrow analysis on request. In addition, SHMC offers a 24-hour STAT service for newborns with congenital anomalies. Some years ago, we discovered that a small number of mitotic cells are present in the peripheral blood of newborns, allowing the laboratory to provide a 2-5 cell preliminary result – without performing a painful bone marrow tap. Turnaround times on amniotic fluid analysis consistently average 7 days.

Extensive Service Area

SHMC Cytogenetics has experience serving a geographically large and diverse area. We are the cytogenetics reference laboratory of choice for hospitals and physicians throughout the western United States.

Professional Integrity

A clinical cytogeneticist certified by the American Board of Medical Genetics and an ABMG board-eligible molecular geneticist direct the laboratory. In addition, current staff includes twelve cytogenetic technologists, including two who specialize in FISH techniques, and a laboratory assistant. Six technologists, including the division supervisor, hold current certification as clinical lab specialists in cytogenetics through the NCA. All personnel are trained in, and aware of the issues regarding patient confidentiality and genetic laboratory testing in general. The cytogenetics laboratory is CAP certified and takes part in both national and regional certification QC/QA testing and inspections.

Extended Hours of Operation

The SHMC Cytogenetics Laboratory is staffed to be responsive to you and your patients' needs. We are available seven days a week, from 5 AM to 7 PM weekdays, and from 8 AM to 5 PM on the weekends. Voice messaging is also available for after-hours needs.

Results

Results are telephoned or faxed upon completion of the study, and a full report with karyotype is then mailed.

Telephone Consultation Services

Either laboratory director is available to answer questions regarding testing and associated issues affecting patient care.

Services

Cytogenetics

Amniotic Fluids

Cells from amniotic fluid are cultured and analyzed using the in-situ method, a technique that provides shorter turnaround times and a more accurate interpretation in cases of chromosome mosaicism. Normally, 15 cells from 15 cell colonies are analyzed. AFP and acetylcholinesterase testing are provided upon request. In addition, any other prenatal testing, such as fetal antigen testing or testing for other suspected genetic disorders can be also accommodated if required.

Peripheral Bloods

Twenty cells are analyzed for either a routine or high-resolution peripheral blood chromosome study. Level of resolution for a routine study averages 550-600 band length and for a high-resolution study, 700-800. The latter test may be appropriate and is offered for cases where a subtle chromosome aberration is suspected, such as in cases of developmental delay or when the phenotype of the proband is suggestive of a known microdeletion syndrome. Although peripheral blood chromosome analysis requires a 48-72 hour culture time following mitogenic stimulation to provide mitotic cells, we are usually able to analyze overnight non-stimulated cultures of peripheral blood stem cells from newborns and provide a 24 hour preliminary result in those cases.

Abbreviated studies (5 cells) are available at a lower cost. These are offered to confirm presence or absence of a previously identified cytogenetic abnormality in additional family members.

In cases of suspected chromosomal mosaicism, 20 cells are analyzed as for a routine study, with 80 additional cells examined for the anomaly in question (i.e., to rule out mosaicism for Down syndrome, Trisomy 21).

Fragile X

Fragile X mental retardation syndrome is the most common form of inherited mental retardation. It has a variable expression and prognosis, and has historically been diagnosed by the presence of a fragile site on the long arm of the X chromosome. The current test of choice is molecular analysis (polymerase chain reaction with Southern blot DNA analysis) in addition to a routine or high-resolution peripheral blood chromosome analysis (recommended by the American College of Medical Genetics, 1994). This is appropriate in cases where the etiology of the mental retardation is unknown, as up to 10% of patients referred for Fragile X testing actually have other cytogenetic abnormalities. The molecular test readily identifies most mutations in affected males or females, phenotypically normal transmitting males or normal carrier females. Fragile X molecular testing done without cytogenetic analysis is offered only for those families in which a previously affected member has been identified by molecular means.

Neoplastic Studies

Many chromosome abnormalities in human cancers are nonrandom and have the potential to yield clinically valuable information. Some recurring aberrations are so specifically associated with certain neoplasms that they provide diagnostic information. Others have independent prognostic significance and may be the single most important factor in determining treatment choice and predicting outcome. Our special handling and culturing methods developed over the years yield high-quality metaphases, which allows detection of even subtle aberrations that may otherwise be undetectable. We offer cytogenetic analysis on bone marrow aspirates or cores, leukemic peripheral bloods if blasts are present, lymph nodes, and other solid tumors.

Kits with bone marrow or tumor tissue transport medium and a requisition form are provided for convenience in sampling and shipping. While overnight transport is acceptable, speed in handling is important to specimen viability and the quality of the chromosome preparations obtained for analysis.

Solid Tissues

Chromosome analysis is possible on any viable solid tissue, including placental villi, membranes, skin, and various organ tissues. Analysis is usually carried out on in situ cell colonies, again to aid in interpretation on cases with possible chromosome mosaicism. Tissues should be transported in some type of cell culture media, and kits with tissue transport medium and a requisition form are available from the laboratory for convenience in sampling and shipping. Less desirable, but acceptable for shipping, is the use of normal saline or Hank's Balanced Salt solution. Unacceptable sample conditions include samples that have been frozen or placed in fixative of any kind, or samples shipped in Viral Transport Media.

FISH (fluorescent in situ hybridization)

Chromosome aberrations are, of course, variable in size, some near or below the level of cytogenetic resolution and detection. An approach to identifying/characterizing these is by in situ hybridization of DNA probes to chromosomes on a slide. Probes for a number of clinical conditions are now commercially available and can be used for either interphase or metaphase analysis. This technique can be used as an adjunct to standard cytogenetic analysis in either constitutional or neoplastic conditions. It can also be used reflexively to answer questions raised by routine cytogenetic analysis. In constitutional disorders, as is the case for Fragile X syndrome, it is recommended that a routine or high-resolution cytogenetic analysis also be performed in conjunction with FISH in the majority of cases – to rule out other chromosome etiology for the clinical phenotype seen. At the current time, FISH is used to answer specific clinical questions and is not used for genome-wide screening.

Constitutional Disorders

Angelman Syndrome
Prader-Willi Syndrome
DiGeorge/Velocardiofacial Syndrome
Williams Syndrome
Miller-Dieker Syndrome
Kallman Syndrome
X-linked Ichthyosis
Smith-Magenis Syndrome
Cri-du-Chat syndrome
Wolf-Hirschhorn Syndrome

Neoplastic conditions

CML: bcr/abl
Pediatric ALL: tel/aml
M3 AML: pml/rara
Anaplastic Large Cell Lymphoma: t(2;5)
MDS/AML: monosomy/deletion 5 and 7
MDS/AML CLL: trisomy 7, 8, 9 12, 21, del(13)(q)
ALL/AML: MLL gene rearrangement, del(11)(q)
MM/MPD: del(13)(q)
X and Y post BMT

Depending on the clinical situation, other FISH probes may be used as part of the analysis. The laboratory also has access to use of other non-commercially available probes. Please contact one of the laboratory directors for questions regarding specific requests.

Her-2/neu Gene Amplification Assessment

Her-2/neu overexpression status can be measured and detected one of two ways, via IHC (immunohistochemistry) or FISH, and both methods can be performed using either archived or current specimens. FISH allows direct quantification of the number of HER-2/neu gene copies present in the tumor cells, enabling differentiation between low- versus high-amplification status. In at least one study, patients with a high level of gene amplification have a higher recurrence risk. Establishment of Her-2/neu amplification status has become increasingly important for patients with breast cancer as data indicates a different prognosis, allows triage for specific and/or more aggressive treatment modalities and possibly confers a different response to treatment in the two classes of patients (amplified versus non-amplified). Analysis is performed on paraffin-embedded breast tissue.

Instructions for Sampling Tissue

General

Each specimen must be clearly labelled with patient name and birth date. Requisition must supply name, birth date, gender, physician, originating lab or clinic, **and clinical indication**. Samples should be sent promptly to SHMC Cytogenetics Laboratory. Overnight shipping is acceptable where necessary. Courier service is available in some areas. Call above number for shipping information. Sample requirements for FISH correspond to the tissue type being studied (e.g., blood, bone marrow, amniotic fluid).

Peripheral Blood

Aseptically draw venous blood into a *sodium* heparin tube and mix well (or draw blood into syringe lubricated with Na heparin for injection). Do not use lithium or ammonium heparin. Sample size is 2 - 5 mL (1 mL minimum, 10 mL for detailed studies). For Fragile X studies, draw 2 - 3 mL in Na heparin and 7 - 10 mL in ACD A or B or EDTA. If heel stick is necessary, cleanse area with alcohol and allow to dry. Collect blood in sterile capillary tubes and place into tube of prewarmed (37°C) transport medium obtained from Cytogenetics. Minimally, approximately 0.5 mL of blood should be collected. Results are normally available in 4 -10 days. Stats on newborns are usually available within 24-48 hours.

In cases of fetal demise or stillbirth:

BLOOD (peripheral heart puncture, or cord) if time of death is 3 days or less. Aseptically draw into sodium heparin tube.

Bone Marrow

Add marrow (0.5 mL minimum) immediately into prewarmed (37°C) bone marrow transport medium obtained from Cytogenetics. Peripheral blood slide (or ACD tube), bone marrow slide, and CBC should be sent with sample if hematological interpretation is also requested. If transport medium is not available, a sodium heparin tube is acceptable. Preliminary results are available on request in 24-48 hours. Complete analyses are normally available in 5-7 days.

Solid Tissue for Fibroblast Culture

These samples must be taken before fixative (formalin) is used! Samples should never be frozen or placed on ice!

Tissue requirements for spontaneous abortion or fetal demise:

TISSUE 1 - 2 mm³ of skin or placenta if autopsy is not ordered; chest wall cartilage (particularly if macerated), gonad, spleen, kidney, or other internal organs if autopsy is performed; placenta (fetal side; i.e., villi)

Place each tissue in a separate tube with warmed transport media obtained from the Cytogenetics Department. Please include with clinical information the *approximate gestational age, state of tissue deterioration, and fetal sex* if known. Keep sample at room temperature or refrigerated and send to SHMC laboratory as soon as possible. Refrigerate if sample is not to be shipped immediately. Analysis may require 12-14 days or longer, depending on viability.

SKIN OR OTHER TISSUES FROM CHILDREN OR ADULTS 1-2 mm punch biopsy placed in warm tissue culture media.

Amniotic fluid

15 - 20 mL sterile amniotic fluid in sterile screw-capped tubes (centrifuge tubes, Falcon 2037 or equivalent). First few mLs drawn should be discarded to reduce chance of maternal cell contamination. Check form if AFP and/or ACHE is requested. Results are usually available in 7 - 10 days.

HER-2/neu

Paraffin-embedded breast tissue. Include information regarding fixation method. Intact block is preferred; if not available, submit 4-micron section cut using distilled water bath. Include H&E stained slide for review.

Shipping Instructions

Kits with transport media are supplied for use with bone marrow , solid tissue, and solid tumor specimens. All specimens should be sent at room temperature. Transport is usually available by courier at your facility. If courier service is not available in your area, please send specimens via overnight transport (FedEx, UPS, or Aiborne).

Cytogenetics Request Form

101 West Eighth Avenue
P.O. Box 2555 • Spokane, WA 99220-25555
(509) 474-4415 • Fax (509) 474-2052

PATIENT NAME		SEX	DATE OF BIRTH (required)
FINANCIAL RESPONSIBLE PERSON		RELATIONSHIP TO PATIENT	
ADDRESS OF FINANCIALLY RESPONSIBLE PERSON			
INSURANCE		POLICY NO./ GROUP NO.	
REFERRING PHYSICIAN			
REFERRING HOSPITAL / LAB			
DATE SAMPLE DRAWN		TIME SAMPLE DRAWN	
CLINICAL INDICATION (SAMPLE CANNOT BE PROCESSED WITHOUT THIS)			

TEST REQUESTED

CYTOGENETIC ANALYSIS:
 Routine Analysis
 High-Resolution
 Mosaicism
 Family Study

FISH Probe(s) requested: _____

OTHER: _____

TYPE OF SPECIMEN

PERIPHERAL BLOOD
 SOLID TISSUE TYPES: _____

BONE MARROW
 OTHER: (Please describe) _____

AMNIOTIC FLUID

COMPLETE FOR ALL AMNIOTIC FLUIDS AND POCs AS APPROPRIATE

GESTIONAL AGE (WKS LMP):

GESTIONAL AGE (BY ULTRASOUND):
AFP: YES NO

G _____ P _____ SAB _____
ACHE: YES NO

COMPLETE FOR ALL BONE MARROWS

PREVIOUS BONE MARROW ASPIRATIONS (DATE):

PREVIOUS CYTOGENETIC STUDIES (DATE): _____
CASE # IF KNOWN: _____

MEDICATION (PAST AND PRESENT): _____

RADIATION THERAPY: _____

CHEMOTHERAPY: _____

Sacred Heart
Cytogenetics Laboratory

101 West Eighth Avenue
P.O. Box 2555 • Spokane, WA 99220-25555
(509) 474-4415 • Fax (509) 474-2052

Fluorescent In Situ Hybridization (FISH) Reflex Testing

Constitutional Disorders

PATIENT NAME
CLINICAL INDICATION / CYTOGENETIC RESULT

Fluorescent in situ hybridization (FISH) analysis with DNA probes can be performed to evaluate this specimen for the presence of a microdeletion. FISH is considered an important adjunct, and when used in conjunction with classical cytogenetic analysis in certain clinical situations, can yield additional important information. If you think that additional FISH is clinically indicated, please indicate the considered diagnosis and the probe(s) desired. There is an additional charge for FISH analysis.

Please fax your request back to the laboratory. An updated report will be issued when the FISH analysis is complete.

Considered Diagnosis

Fish Probes

Angelman Syndrome	D15S11/SNRPN
Cri du Chat	D5S23
DiGeorge/VCF Syndrome	TUPLE 1 or D22S75
Kallman Syndrome	KALL
Miller-Dieker Syndrome	D17S379 or LIS 1
Prader-Willi Syndrome	D15S10/SNRPN
Smith-Magenis Syndrome	D17S258
Yp;Xp or Yp;autosome translocation	SRY
Williams Syndrome	Elastin
Wolf-Hirschorn Syndrome	4p16.3
X-linked Ichthyosis	Steroid Sulfatase
Other: _____	_____

CPT Code(s): _____

TEST ORDERED BY	DATE
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Sacred Heart
Cytogenetics Laboratory

101 West Eighth Avenue
P.O. Box 2555 • Spokane, WA 99220-25555
(509) 474-4415 • Fax (509) 474-2052

Fluorescent In Situ Hybridization (FISH) Reflex Testing

Bone marrow / blood Neoplastic Specimens

PATIENT NAME
CLINICAL INDICATION / CYTOGENETIC RESULT

Fluorescent in situ hybridization (FISH) analysis with DNA probes can be performed to evaluate this specimen further for the presence of a specific abnormal cell clone. FISH is considered an important adjunct technique, and when used in conjunction with classical cytogenetic analysis in certain clinical situations, can yield additional important information. If you feel that additional testing is clinically indicated, please circle the considered diagnosis and the probe(s) desired. There is an additional charge for FISH analysis.

Please indicate the desired test and fax your request back to the lab within three working days. An updated reported will be issued when the FISH analysis is complete.

Considered Diagnosis	FISH Probes	Purpose
AML - FAB Type M3	PML/RARA	Detects masked translocation on metaphase chromosomes and in nondividing (interphase) cells.
CML/ALL	BCR/ABL	Detects masked translocation on metaphase chromosomes and in nondividing (interphase) cells.
CLL	+12/del(13)(q)	Detects trisomy 12 clone in nondividing cells.
ALL – Pediatric	t(12;21)	Detects cryptic translocation on metaphase chromosomes.
MDS/AML/ALL/MPD	+8/+9/+21/-7/+7/del(13)(q)	Detects abnormal clone in nondividing cells.
MM	del(13)(q)/del(11)(q)	Detects abnormal clone in nondividing cells.
Bone Marrow Transplant	X/Y	Detects sex chromosome complement in nondividing cells. (opposite sex donor)
Other considered diagnosis:	Recommended probe	Detects abnormal clone in nondividing cell.

CPT Code(s): _____

TEST ORDERED BY	DATE
-----------------	------

BASIC PROFILES

ARTHRITIS PANEL

ORDER CODE ARPAN

RA
Sed Rate
Uric Acid

BASIC METABOLIC PANEL

ORDER CODE BMPA

Glucose
BUN
Creatinine
Sodium
Potassium
Chloride
CO₂
Anion Gap
BUN/Creatinine Ratio
Calcium

COMPREHENSIVE METABOLIC PANEL

ORDER CODE CMPA

Glucose
BUN
Creatinine
Calcium
Total Protein
Albumin
Total Bilirubin
Alkaline Phosphatase
ALT (SGPT)
AST (SGOT)
Sodium
Potassium
Chloride
CO₂
BUN/Creatinine Ratio
A/G Ratio
Globulin
Anion Gap

ELECTROLYTE PANEL

ORDER CODE EP

Sodium
Potassium
Chloride
CO₂
Anion Gap

GENERAL HEALTH

ORDER CODE GHPNA

Comprehensive Metabolic Panel
CBC
TSH

HEPATIC FUNCTION PANEL

ORDER CODE HFPA

Albumin
Total Protein
Total Bilirubin
Direct Bilirubin
Alkaline Phosphatase
AST (SGOT)
ALT (SGPT)

HEPATITIS PANEL, ACUTE

ORDER CODE HEPACU

Anti-HAV, IgM
HBsAg Screen
HBsAg Confirmation (if positive)
Anti-HBc, IgM
Anti-HCV Screen
Interpretation

LIPID PROFILE

ORDER CODE LIPID

Cholesterol
Triglycerides
HDL
LDL (calculated)
LDL/HDL Ratio
Cholesterol/HDL Ratio

OBSTETRIC PANEL

ORDER CODE OB.PANEL

ABO
Rh
Antibody Screen
CBC
HBsAg
HBsAg Confirmation
RPR
Rubella

PRENATAL PROFILE

ORDER CODE PRENAT

ABO
Rh
Antibody Screen
RPR

RENAL FUNCTION PANEL

ORDER CODE RENALA

Glucose
BUN
Creatinine
Calcium
Phosphorus
Albumin
Sodium
Potassium
Chloride
CO₂
Anion Gap

DIAGNOSTIC PROFILES

AMENORRHEA PROFILE

ORDER CODE AMEN

FSH
LH
Prolactin

ANEMIA PROFILE

ORDER CODE ANEMIA

Autohematology
Coombs, Direct
Iron, Total
Iron Binding Capacity
% Saturation
Platelet Count – in Auto
Reticulocyte Count
• Absolute
• Corrected
Interpretation
Reviewed By

ANTI-THYROID PROFILE

ORDER CODE TAB

Thyroglobulin Autoantibodies
Thyroid Peroxidase Ab

CHEM REFLEX

ORDER CODE CHEMRA

Comprehensive Metabolic Panel
Lipid Panel
TSH
Free T₄ if TSH is abnormal

COAGULATION PROFILE

ORDER CODE COAG-BAT

Bleeding Time
Platelet Count
PT
PTT
Interpretation
Reviewed By

CSF PROFILE

ORDER CODE CSF

Tube #
Cell Count
Clarity
Color
Differential
Glucose
Nucleated Cells
Protein
RBCs
VDRL
Xanthochromia
Note

DIAGNOSTIC PROFILES

GLOMERULAR FILTRATION PROFILE

ORDER CODE **GFP**

Creatinine Clearance
Protein, Urine, Quant.
Protein / Creatinine Ratio

HEAVY METAL PROFILE

ORDER CODE **HVY**

Arsenic
Lead
Mercury

HEPATITIS A DIAGNOSTIC PANEL

ORDER CODE **HAVABP**

Anti-HAV, Total
Anti-HAV, IgM
Interpretation

HEPATITIS PANEL, CHRONIC

ORDER CODE **HEPCHR**

Anti-HAV, Total
HBsAg Screen
HBsAg Confirmation (if positive)
Anti-HBc, Total
Anti-HBs
Anti-HCV Screen
Interpretation

HEPATITIS PANEL, HBV PROGNOSIS

ORDER CODE **HBCHR**

HBsAg Screen
HBsAg Confirmation (if positive)
HBeAg
Anti-HBe
Anti-HBs
Interpretation

HYPERTHYROID PROFILE

ORDER CODE **HYPERA**

T3 Uptake
T4 (Total by ICMA)
FTI (Free Thyroxine Index)
T3 (Triiodothyronine) by ICMA

HYPOTHYROID PROFILE

ORDER CODE **HYPOA**

T3 Uptake
T4 (Total by ICMA)
FTI (Free Thyroxine Index)
TSH (Thyroid Stimulating Hormone)

IMMUNOGLOBULIN PROFILE

ORDER CODE **AGM**

IgA
IgG
IgM

PRENATAL RISK SCREEN (PRS)

ORDER CODE **PRS**

Gestational Age (weeks)
Gestational Age (days)
Gestational Age Method
Ultrasound Date
Diabetic (Y/N)
Maternal Weight (lbs)
Maternal DOB
Race
Date of LMP
Previous Down's (Y/N)
Previous NTD (Y/N)
Multiple Gestational (Y/N)
Prenatal Risk Assessment

PSA REFLEX

ORDER CODE **PSAR**

PSA Reflex
Total PSA
Free PSA if Total PSA is 4.0-10.0 ng/mL

RDS RISK PANEL

ORDER CODE **RDS**

Appearance
Color
Creatinine (amniotic)
L/S Ratio
PG
RBCs
Risk Comment

SEMEN EXAMINATION

ORDER CODE **SEMN**

Absolute Count
Appearance
Liquifaction
Morphology
Motility with activity grade
Sperm Count
Viscosity
Volume
WBCs
Comments
Reviewed By

SYNOVIAL FLUID PROFILE

ORDER CODE **JNT FLD**

Bands
Basophils
Clarity
Color
Crystals, Synovial Fluid
Crystals, Identification
Eosinophils
Fibrin
Lymphocytes
Variant Lymphocytes
Mesothelial Cells
Mononuclear Phagocytes
Mucin Test
Non-Heme Cells
Nucleated Cells
Nucleated RBCs
Number of Cells Seen
Others
RBCs
Segs
Specific Gravity
Note
Reviewed By

TESTICULAR FUNCTION PROFILE

ORDER CODE **TFP**

FSH
LH
Testosterone

THYROID PROFILE

ORDER CODE **BTB**

T3 Uptake
T4 (Total by ICMA)
FTI (Free Thyroxine Index)

TSH REFLEX

ORDER CODE **TSH.R**

TSH
Free T4 if TSH is abnormal

Helpful Information

Key to Units

UNITS

Methods

METHODS

Drug Names, Brand and Generic

DRUG NAMES

Specimen Collection and Handling

SPECIMENS

Blood Smear Criteria

BLOOD SMEARS

Key to Units

'	minutes	conc	concentrated
"	seconds	cPU	centipoise unit
%	percent	cpy/mL	copies per milliliter
<	less than	d	day
>	greater than	dL	deciliter
°C	degrees Celsius	EIA	enzyme immunoassay
°F	degrees Fahrenheit	EU	enzyme immunoassay unit
μg	microgram	ETU/mL	endotoxin units/per milliliter
μg Eq/mL	microgram equivalents per milliliter	EU	Ehrlich unit
μg/24h	micrograms per 24 hours	EU	ELISA units
μg/d	micrograms per day	EU/24h	Ehrlich units per 24 hours
μg/dL	micrograms per deciliter	EU/mL	Ehrlich units per milliliter
μg/g	micrograms per gram	FIU	fluorescent intensity units
μg/g CRT	micrograms per gram creatinine	fL	femtoliter
μg/g/Cr	micrograms per gram creatinine	fmol	femtomole
μg/g/Cre	micrograms per gram creatinine	g	gram
μg/L	micrograms per liter	g/24h	grams per 24 hours
μg/mg	micrograms per milligram	g/5h	grams per 5 hours
μg/mL	micrograms per milliliter	g/d	grams per day
μg/spec	micrograms per specimen	g/dL	grams per deciliter
μgE	microgram equivalents	g/L	grams per liter
μgE/mL	microgram equivalents per milliliter	g/mL	grams per milliliter
μL	microliter	GPL	IgG phospholipid units
μm/L	micromoles per liter	GT	greater than
μmol	micromole	Hb Eq/g	hemoglobin equivalent per gram
μmol/d	micromoles per day	hpf	high-power field
μmol/dL	micromoles per deciliter	hr	hour
μmol/g	micromoles per gram	ISR	immune status ratio
μmol/L	micromoles per liter	IU/g Hgb	international unit per gram hemoglobin
μmol/mL	micromoles per milliliter	IU/L	international units per liter
μU	microunit	IV	index value
μU/mL	microunits per milliliter	K/μL	thousand per microliter
AU/mL	arbitrary units per milliliter	kg	kilogram
bill	billion	L	liter
cc	cubic centimeter	lb	pound
CFU/mL	colony forming units/ per milliliter	LIV	Lyme index value
cm	centimeter	lpf	low-power field
cmm	cubic millimeter	LT	less than

IU	international unit	mU/mL	milliunits per milliliter
IU/g	international units per gram	mL/min	milliliters per minute
IU/mL	international units per milliliter	ng	nanogram
M/ μ L	million per microliter	ng Ab N/mL	nanogram antibody nitrogen per milliliter
mEq	milliequivalents	ng/dL	nanograms per deciliter
mEq/24h	milliequivalents per 24 hours	ng/L	nanograms per liter
mg	milligram	ng/mL	nanograms per milliliter
mg%	milligram percent	ng/mL/hr	nanograms per milliliter per hour
mg/24h	milligrams per 24 hours	nM/mM	nanomole per millimole
mg/d	milligrams per day	nmol	nanomole
mg/dL	milligrams per deciliter	nmol/d	nanomoles per day
mg/g	milligrams per gram	nmol/dL	nanomoles per deciliter
mg/g Cr	milligrams per gram creatinine	nmol/g	nanomoles per gram
mg/g Cre	milligrams per gram creatinine	nmol/L	nanomoles per liter
mg/g CRT	milligrams per gram creatinine	nmol/mL	nanomoles per milliliter
mg/L	milligrams per liter	NR	nonreactive
mgHb/g	milligram hemoglobin equivalents per gram	O.D.	optical density (equivalent to absorbance)
MIF	microimmune fluorescence	ODR	optical density ratio
MIF	mean intensity fluorescence	pg	picogram
mill	million	pg/dL	picograms per deciliter
min	minute	pg/mL	picograms per milliliter
mIU	milli international units	pmol	picomole
mIU/hr	milli international units per hour	pmol/g	picomoles per gram
mL	milliliter	pmol/L	picomole per liter
mm	millimeter	ppm	parts per million
mL/24h	milliliters per 24 hours	REV	relative ELISA value
mL/min/1.73 ²	milliliter per minute per 1.73 squared	RIV	Rubella index value
mm ³	cubic millimeter	SD	standard deviation
mmol	millimole	sec	second
mmol/d	millimoles per day	TIV	Toxoplasma index value
mmol/L	millimoles per liter	TV	total volume
mmol/mol Cr	millimoles per mole creatinine	U	unit
mmol/mol Cre	millimoles per mole creatinine	U/d	units per day
mmol/mol CRT	millimoles per mole creatinine	U/g	units per gram
mo	month	U/hr	units per hour
mol	mole	U/L	units per liter
mos	months	U/mL	units per milliliter
mOsm	milliosmole	var	variable
mOsm/kg	milliosmoles per kilogram	yr	year(s)
MPL	IgM phospholipid units		
mPOL	millipolarization units		
mu	milliunit		
mU/g	milliunits per gram		
mU/L	milliunits per liter		

Methods

Acid elution (Kleihauer Betke stain)	Stain	Agarose gel	AE
Agglutination	Aggl	Agarose gel, high resolution	HRE
Aggregation	Agg	Cellulose acetate	CAE
Anticomplement immunofluorescence	ACIF	Enzymatic	
Atomic absorption spectrophotometry	AAS	Enzyme digestion	
Graphite furnace flameless	GFAAS	Enzyme immunoassay	EIA
Automated	Auto	Enzyme linked immunosorbent assay	ELISA
Bacterial inhibition		Enzyme multiplied immunoassay	
Bioassay		technique	EMIT
Calculation	Calc.	Equilibrium dialysis	
Chemiluminetric assay		Extraction	E
(Chemiluminescence) ICMA		Farr technique	
Chromatography	Chromatog	Ferric chloride	FeCl ₃
Affinity	AC	Fibrometer	Fib
Ion exchange		Flame emission spectroscopy	FES
Column	CC	Flame photometry	FES
Gas	GC	Flocculation	FLO
with mass spectroscopy	GC–MS	Flow Cytometry	FC
Chromogenic		Fluorescence polarization immunoassay	FPIA
Clot lysis		Fluorescent immunoassay	FIA
Colorimetric	Color.	Fluorescent in situ hybridization	FISH
Biuret		Fluorescent flow cytometry	FLOW
Calculated		Fluorescent spot test	
Modified Jaffe		Fluorometry	Fluor.
Heat fractionated		Freezing point depression	
Complement fixation	CF	Gas chromatography	GC
Culture and sensitivity	C&S	Gas chromatography/	
Cytochemical stain		mass spectroscopy	GC–MS
Direct equilibrium dialysis		Gas chromatography/nitrogen	
Direct fluorescent antibody	DFA	phosphorus detector	GC/NPD
Directly coupled plasma		Gel electrophoresis	AE or PAGE
emission spectroscopy	DCP	Gram stain	GS
Disc susceptibility (Kirby Bauer)	KB	Graphite furnace atomic absorption	
DNA hybridization	DNA hyb	spectroscopy	GFAAS
DNA probe	DP	Gravimetric	Grav.
Double diffusion	DD	Headspace gas chromatography	HSGC
Electrophoresis	ELP	Hemagglutination	HA
Polyacrylimide gel	PAGE	Hematofluorometric	Hematofluor.

Hemocytometer		Nephelometric	NEPH
Hemolysis by colorimeter		Neutralization	Nt
Hemolytic assay	H	Nucleic acid hybridization (<i>See DNA/RNA hyb</i>)	
Hexokinase	HK	Optical density	O.D.
High performance liquid chromatography	HPLC	Organism isolation	
HPLC with electrochemical detection	HPLC-EC	Photoionization detection	PID
HPLC with ultraviolet detection	HPLC-UV	Polymerase chain reaction	PCR
HPLC with fluorescence		Precipitation	
High voltage amino acid electrophoresis		Protamine sulfate dilutions	PSO ₄
Hydrolysis of gelatin (<i>See enzyme digestion</i>)		Prussian blue stain	
Image analysis	Image	Radial immunodiffusion	RID
Inductively coupled plasma emission spectrometry	ICP	Radiobinding assay	RBA
Immunoblot	IB	Radio immunoassay	RIA
Immunochemiluminetric assay	ICMA	Radioimmunoassay with enzymatic digestion	
Immunocytochemical assay	ICA	Radioimmunoassay with extraction	
Immunodiffusion	ID	Radioreceptor assay	RRA
Radial immunodiffusion	RID	Rapid fluorescent focus inhibition	
Immunoenzymatic	EIA	Rapid immunoassay	
Immuno electrophoresis	IEP	Recombinant immunoblot assay	RIBA
Immunofixation	IFE	Refractometry	Refractom.
Immunofluorescence	IF	RNA hybridization	
Immunoradiometric assay	IRMA	Saturation binding assay	
Immunoturbidometric		Serum neutralization	
Immunoturbidom.		Stain	stain
Indirect fluorescent antibody	IFA	Slide latex agglutination	SLA
Indirect (passive) hemagglutination	IHA	Slide test	
Indirect immunofluorescence	IFA	Solid phase RBC adherence	
Indirect platelet aggregation		Southern blot (DNA hybridization)	SB
In vitro bioassay		Spectrofluorometry (<i>See fluorometry</i>)	
Ion selective electrode	ISE	Spectrophotometry	
Ion transfer electrode		Spectrophotom.	
Isoelectric focusing	IEF	Spectroscopy	
Latex particle agglutination	LPA	Spectrophotom.	
Ligase Chain Reaction	LCR	Thin layer chromatography	TLC
Lymphocytotoxicity		Tissue culture	
Manual		Tissue culture toxicity	
Microagglutination titer	MAT	Truant fluorochrome stain	
Micro-animal		Tube agglutination	
Micro-indirect fluorescence		Turbidimetric	Turbidim.
Microparticle enzyme immunoassay	MEIA	Ultraviolet	UV
Microscopic	Micro	Urea solubility	
Microscopic/polarization		Virus isolation	
Microtiter technique		Visual	
Minimal Inhibitory Concentration	MIC	Westergren	
		Western blot	WB
		Widal test direct agglutination	

Drug Names

Brand Name	Generic Name	Brand Name	Generic Name
A.P.B.	Aprobarbital	Bufferin	Salicylates
	Phenobarbital	Butazolodin	Phenylbutazone
	Butabarbital	Buticaps	Butabarbital
Adapin	Doxepin	Butiserpazide	Butabarbital
Aerolate	Theophylline		Hydrochlorothiazide
Aldactazide	Hydrochlorothiazide		Reserpine
Aldactone	Spironaolactone	Butisol	Butabarbital
Algic	Chlorpheniramine	Carbocaine	Mepivacaine
Alurate	Aprobarbital	Carbrital	Pentobarbital
Ambenyl	Diphenhydramine		Carbromal
Amikin	Amikacin	Cardioquin	Quinidine
Aminophylline	Theophylline	Celontin	Methsuximide
Amytal	Amobarbital	Chlor-Trimeton	Chlorpheniramine
Anafranil	Clomipramine	Chlorimipramine	Clomipramine
Antabuse	Disulfiram	Chloromycetin	Chloramphenicol
Antipress	Imipramine	Clonopin	Clonazepam
Antora-B	Secobarbital	Cogentin	Benztropine
APAP Capsules	Acetaminophen	Combid Spansule	Prochlorperazine
A-Poxide	Chlordiazepoxide	Compazine	Prochlorperazine
Arvynol	Ethchlorvynol	Cordarone	Amiodarone HCL
Asendin	Amoxapine	Coumadin	Warfarin
Aspirin	Acetylsalicylic Acid	Crystodigin	Digitoxin
Atarax	Hydroxyzine	Dallery Capsules	Chlorpheniramine
Aurothioglucose	Gold	Dalmane	Flurazepam
Aventyl	Nortriptyline	Darvocet	Propoxyphene
Azene	Clorazepate		Acetaminophen
Bancap	Acetaminophen	Darvon	Propoxyphene
Bardon	Scopolamine	Datril	Acetaminophen
Benadryl	Diphenhydramine	Decadron	Dexamethasone
Bendectin	Dicyclomine	Demazin	Chlorpheniramine
	Hydrochloride		Phenylephrine
Bentyl	Dicyclomine	Demerol	Meperidine
	Hydrochloride	Depakene	Valproic Acid
Benzedrine	Amphetamine	Depakote	Valproic Acid
Broncomar	Theophylline	Desoxyn	Methamphetamine
	Pseudoephedrine	Desyrel	Trazodone
	Butabarbital	Dexamyl	Amobarbital
Bronkodyl	Theophylline		Dextroamphetamine

DRUG NAMES

Brand Name	Generic Name	Brand Name	Generic Name
Dexedrine	Dextroamphetamine	Haldol	Haloperidol
Diabinese	Chlorpropamide	Histadyl	Methapyrilene
Diamox	Acetazolamide	Hydrodiuril	Hydrochlorothiazide
Dilantin	Phenytoin	Hydryllin	Diphenhydramine
Dilaudid	Dihydromorphinone	Hygroton	Chlorthalidone
Dilor	Dyphylline	Imavate	Imipramine
Dimetane	Brompheniramine	Inderal	Propranolol
	Phenylpropanolamine	Indocin	Indomethacin
Dimetapp	Brompheniramine	INH	Isoniazid
	Phenylpropanolamine	Janimine	Imipramine
Diphenadril	Diphenhydramine	Ketalar	Ketamine
Dolene	Propoxyphene	Lanoxin	Digoxin
Dolonil	Butabarbital	Largactil	Chlorpromazine
Dolophine	Methadone	Lasix	Furosemide
Doriden	Glutethimide	Librax	Chlordiazepoxide
Ducolax	Bisacodyl	Librium	Chlordiazepoxide
Dymelor	Acetohexamide	Lida-Mantle Creme	Lidocaine
Ectasule	Ephedrine	Limbitrol	Amitriptyline
	Amobarbital	Liquiprin	Acetaminophen
Edecrin	Ethacrynic Acid	Lomotil	Atropine
Elavil	Amitriptyline		Diphenoxylate
Elixophylline	Theophylline	Loxitane	Loxapine
Eme-nil	Pentobarbital	Ludiomil	Maprotiline
Empirin	Salicylates	Lufyllin	Dyphylline
Endep	Amitriptyline	Luminal	Phenobarbital
Enkaid	Encainide	Marax	Hydroxyzine
Equagesic	Meprobamate	Marcaine	Bupivacaine
Equanil	Meprobamate	Matropinal	Homatropine
Eskalith	Lithium		Pentobarbital
Eskatrol	Destroamphetamine		Phenobarbital
	Prochlorperazine	Mebaral	Mephobarbital
Etrafon	Amitriptyline	Mebroin	Mephobarbital
Excedrin	Salicylates	Mellaril	Thioridazine
Felbatol	Felbamate	Mepergan	Meperidine
Fiorinal	Salicylates	Meprospan	Mephenytoin
	Butalbital	Mesantoin	Mephenytoin
	Caffeine	Methenex	Methadone
FK506	Tacrolimus	Mexate	Methotrexate
Flexeril	Cyclobenzaprine	Milantin	Mephobarbital
Flucytosine	5 FC	Milontin	Phensuximide
Gantrisin	Sulfonamides	Milpath	Meprobamate
Garamycin	Gentamicin	Miltown	Meprobamate
Gutase-Plus	Homatropine	Moban	Molindone

Brand Name	Generic Name	Brand Name	Generic Name
Motrin	Ibuprofen	Procalm	Chlorpromazine
Murocoll	Scopolamine	Prolixin	Fluphenazine
Mysoline	Primidone	Pronestyl	Procainamide
Nalline	Nalorphine	Prozac	Fluoxetine
Narcan	Naloxone	Pyridium	Phenazopyridine
Nardill	Phenelzine	Quaalude	Methaqualone
Navane	Thiothixene	Quibron	Theophylline and/or Ephedrine
Nebcin	Tobramycin		Butabarbital
Nembutal	Pentobarbital	Quinaglute	Quinidine
Neurontin	Gabapentin	Quinidex	Quinidine
Nisentil	Alphaprodine	Repan	Betalbital
Noctec	Chloral Hydrate		Acetaminophen
Noludar	Methypylon	Rifamate	Isoniazid
Norpace	Disopyramide		Rifampin
Norpramin	Desipramine	Ritalin	Methylphenidate
Novacain	Procaine	Rivotril	Clonazepam
Novahistine	Chlorpheniramine	Robaxin	Methocarbamol
Nupercainal	Dibucaine	Robaxisal	Methocarbamol
Orinase	Tolbutamide	Rynatuss	Chlorpheniramine
Ornade	Chlorpheniramine	Salicylamide	Salicylate
	Phenylpropanolamine	Sandimmune	Cyclosporine
Pamelor	Nortriptyline	Seconal	Secobarbital
Panalgesic	Methyl Salicylate	Seda Drops	Homatropine
Panamine	Phenylpropanolamine	Sedapap-10	Acetaminophen
Panwarfin	Warfarin		Butabarbital
Paradione	Paramethadione	Senokot	Senna
Parest	Methaqualone	Septra	Sulfamethoxazole
Pathibamate	Meprobamate		Trimethoprim
Peganone	Ethotoin	Serax	Oxazepam
Pensive	Meprobamate	Serentil	Mesoridazine
Percocet-5	Oxycodone	Seromycin	Clycloserine
Percodan	Oxycodone	Serpasil	Reserpine
Permitil	Fluphenazine	Sinequan	Doxepin
Pertoframe	Desipramine	Sinonna	Butabarbital
Phenergan	Promethazine	Sk-65	Propoxyphene
Placidyl	Ethchlorvynol	Sk-Lygen	Chlordiazepoxide
Plaquenil	Hydroxychloroquine	Sk-Pramine	Imipramine
Plexonal	Scopolamine	Slo-Phyllin	Theophylline
Preludin	Phenmetrazine	Solganal	Gold
Presamine	Imipramine	Soma	Carisoprodol
Primaclone	Primidone	Somnafac	Methaqualone
Prograf	Tacrolimus	Somophyllin	Theophylline
Pro Banthine	Propantheline		

Brand Name	Generic Name
Sopor	Methaqualone
Stelazine	Trifluoperazine
Surmontil	Trimipramine
Synalgos	Dihydrocodeine
Tagamet	Cimetidine
Talwin	Pentazocine
Tedral	Ephedrine Theophylline and/or Phenobarbital, Butobarbital
Tegretol	Carbamazepine
Temaril	Trimprazine
Tempra	Acetaminophen
Teractan	Chlorprothizene
Theolair	Theophylline
Thiosulfil	Sulfamethizole
Thorazine	Chlorpromazine
Tofranil	Imipramine
Tolinase	Tolazamide
Tonocard	Tocainide
Tranxene	Chlorazepate
Triavil	Amitriptyline Perphenazine
Tridione	Trimethadione
Trilafon	Perphenazine
Tuinal	Secobarbital Amobarbital
Tylenol	Acetaminophen
Tylox	Oxycodone
Unigesic-A	Propoxyphene
Unisom	Doxylamine
Valium	Diazepam
Valmid	Ethinamate
Valproate	Valproc Acid
Vancocin	Vancomycin
Vesprin	Triflupromazine
Vistaril	Hydroxyzine
Vivactil	Protriptyline
Wygesic	Propoxyphene
Xylocaine	Lidocaine
Zarontin	Ethosuximide
Zipan-25	Promethazine
Zipan-50	Promethazine

Collection and Handling of Specimens

Prior to specimen collection, review the specimen requirements for each procedure. The accuracy of laboratory testing depends on careful patient preparation, collection, handling, storage, and transportation of specimens.

All specimens must be labelled with the patient's first and last names. Please print patient identification with the last name followed by the first name and middle initial.

Serum Specimens

1. Draw 1 full, 10-mL red-top Vacutainer* for up to 4 mL serum.
2. Leave tube upright in rack. Do not invert.
3. Allow blood to clot at room temperature for 10 to 15 minutes, but no longer than 30 minutes.
4. Centrifuge at appropriate speed for 10 minutes.
5. Remove serum and place in a separate plastic labelled tube.

* Serum separator tubes (SST or Corvac brands) are available upon request from the laboratory. After centrifugation, a gel interface forms between the cells and serum. We suggest that clients using mail, air and ground service for specimen transportation place serum in a separate, plastic and labelled tube. The gel may dislodge during mailing, which can resuspend the cells in the serum and possibly compromise the results of some laboratory procedures.

Plasma Specimens

1. Draw 1 full 5-mL or 7-mL Vacutainer tube containing the specified anticoagulant (see Vacutainer color code table). Gently invert the tube approximately 10 times to ensure proper mixing.
2. Centrifuge at appropriate speed for 10 minutes.
3. Remove plasma and place in separate plastic labelled tube.

Whole Blood Specimens

1. Be sure the Vacutainer tube is filled to avoid dilution errors. Invert the tube gently 10 times to insure proper mixing.
2. Please print the patient's last name followed by the first name and middle initial on the tube label.
3. If a delay in test performance is anticipated, prepare blood films from fresh blood at the time of drawing. (Complete instructions for blood smear preparation are in the Useful Information section of this directory.)
4. Please submit any pertinent clinical information and/or known diagnoses that may aid in interpretation of test results. This information is particularly helpful when requesting hematology testing.

Frozen Specimens

Freeze specimens in a separate plastic tube for each test because glass will crack and can result in loss of sample.

Please identify any frozen specimens to the courier. Call the laboratory if you need a special container to keep specimens frozen.

Semen Specimens

Semen specimens for examination should be collected after a period of three days abstinence. The specimen should be collected into a clean, screw-top jar or similar glass container and maintained as close to 37°C (body temperature) as possible. The specimen should be delivered to the laboratory within one hour of collection. Printed patient instructions are available from the specimen collection facilities.

Microbiology Specimens

The correct performance of specimen collection is of utmost importance if valid and useful culture results are to be obtained. The primary goal is to obtain infected material

from the involved site that contains the etiologic agent (pathogen). Care should be taken to minimize contamination of the specimen with normal skin or mucous membrane flora. Whenever possible, specimens should be collected prior to antibiotic therapy. Specimens should be transported to the lab as soon as possible to minimize loss of viability of the pathogen and overgrowth of contaminating organisms. Use transport media if appropriate. Patient information, including relevant clinical history (underlying disease, disease suspected, symptoms, etc.) and antibiotic usage are helpful in evaluation of culture results.

Urine Specimens

For random urine collections, the preferred specimen is the first urine voided in the morning. This is the most accurate single sample because of the high concentration of various urine constituents.

Containers should be clean, closed tightly and labelled before transport. Assays requiring a 24-hour timed urine

collection may require a preservative. Urine containers and preservatives are available from patient service centers and the Supply Department. Written urine collection instructions are also available from the Supply Department to aid patients in the proper urine collection procedure.

Please refrigerate all urine specimens.

Request Form

A request form should accompany each specimen or patient to the laboratory. Designate the test requested clearly by marking it with an "X." For procedures not listed on the requisition, write orders clearly in the vacant space. It is important to check specimen requirements in the Test Directory to be assured that the patient is properly prepared (fasting, etc.) and that the appropriate specimen is collected. This saves telephone time for the office staff as well as ensures expected turnaround time of results.

Please include appropriate ICD-9 codes for each test as well.

VACUTAINER COLOR CODING		
Stopper Color	Anticoagulant	Specimen Type
Red	None	Serum
Red mottled (SST / Corvac)	None; contains gel for separating cells from serum	Serum
Gold	None; contains gel for separating cells from serum	Serum
Lavender	EDTA	Plasma / whole blood
Green	Sodium heparin	Plasma / whole blood
Blue (liquid)	Sodium citrate	Plasma / whole blood
Black	Sodium citrate and citric acid	Whole blood
Grey	Sodium fluoride and potassium oxalate	Plasma / whole blood
Royal blue	Sodium heparin (trace element tube)	Plasma / whole blood
Royal blue	EDTA (for lead levels)	Plasma / whole blood
Royal blue	None	Serum
Yellow	ACD solution A	Plasma / whole blood
Yellow	ACD solution B	Plasma / whole blood

Criteria for Blood Smears

If a delay in test performance is anticipated, two well made slides are requested for CBCs, platelet counts, differentials, and RBC morphology evaluation. To assist your office in preparing the smears from the fresh blood in the needle tip, may we offer the following suggestions:

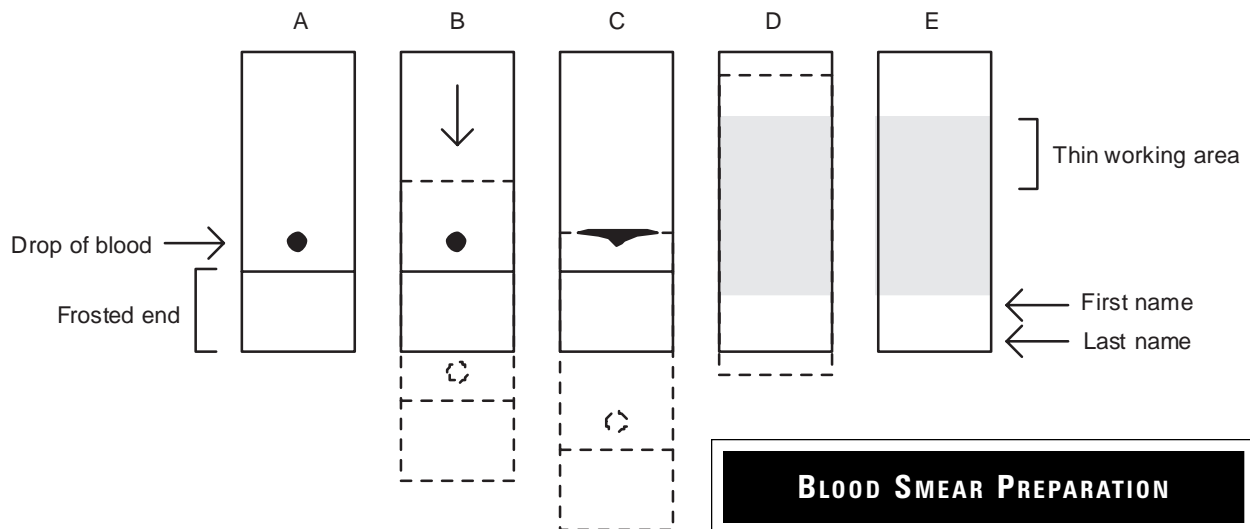
1. The frosted end slides are preferred. The patient's full name should be printed in pencil on the frosted end portion with the last name appearing at the bottom of the slide (figure A).
2. Place a small drop of blood from the needle directly above the frosted portion of the slide. Grasp a second slide by the side edges and pull back into the drop at an angle of 20°-30° depending on the thickness of the blood (figure B). Pause briefly to allow the drop of blood to spread nearly to the edges of the spreader slide (figure C). Then push straight ahead, allowing the blood behind the edge to completely "run out" (figure D). Repeat for second smear.
3. This is basically the same method as the "thumb print" method; however, the angle of the spreader slide is decreased, and the push motion is slower. This will cause the area directly behind the "feather tip" to lengthen and will appear as in figure E.

4. When frosted end slides are not available, print the patient's name with pencil in the thick portion of the smear after the blood has dried.

If you would like additional information, call the lab and request the Hematology Department.

Tips on Techniques and Handling of Blood Smears

1. Fresh blood from the needle tip is preferred, to avoid possible artifacts which can be caused by anticoagulants.
2. Slides must be grease and dust free. Fingerprints destroy cell morphology because of oils or moisture from the skin. Prepare slides away from vaporizers or other sources of humidity to avoid destruction of RBCs.
3. Slides must be made immediately after drawing to avoid clumping of platelets, which occurs very rapidly. Do not allow the drop to begin to dry!
4. Dry cotton should be used when removing the needle from the patient's arm. Alcohol from the cotton ball, as well as from the blood drawer's fingers, will "pickle" the RBCs, which destroys their normal morphology.



5. Discard the first drop of blood from the needle, since it may be contaminated with traces of alcohol or with endothelial cells from the patient's vein.
6. Handle the slides by the edges (before and after preparing smears), or by the frosted end.
7. Tilting the slides while still wet should be avoided or minimized, since it can induce false rouleaux formation.
8. Avoid having blood in front of spreader slide since this causes marked cellular distortion.
9. The movement of the spreader slide must be smooth and firm to insure an even graduation from thick to thin. This preserves RBC morphology, leaves WBCs evenly distributed, and gives the technologist the choice of the best area for evaluation.
10. Placing the slides on the patient's requisition will not only give them a clean surface, but will assure proper labeling.

SOURCES OF ERRORS AND ARTIFACTS

Oils	slides, finger tips, counters
Alcohol	fingers, cotton, splatters
Moisture	fingers, counters, humidifiers, blowing by mouth, spills in transport, incomplete drying before packaging
Contamination	dust, cells from mouth, cells from skin, cells from inside vein
Technique	cells ahead of spreader slide, uneven spreading, delay in placing drops on slides after drawing, delay in preparing smear, drop of blood too large or too small, pushing too rapidly or too slowly
Miscellaneous	tilting slides, improper fixing or prestained slides

Two well made unstained slides submitted to the laboratory provide the best diagnostic information.