Calgary Laboratory Services

Our Vision:
World Leaders in Laboratory Medicine
Calgary Laboratory Services is an independent, wholly owned subsidiary of Alberta Health Services. We are one of the largest integrated urban laboratory systems in North America providing leading-edge laboratory services that help diagnose, treat and monitor the health of more than a million patients in Calgary and the surrounding areas annually.

**Our Mission:**
Improving health and well-being through laboratory diagnostic excellence, education and research

**Our Vision:**
World leaders in laboratory medicine

**Our Values:**
At CLS, we take PRIDE in who we are and what we do through:

- Professionalism
- Respect / Caring
- Integrity
- Dedication
- Excellence

- Approximately 1,790 medical, technical and support staff
- Tests Performed - 21,000,000 annually
- Patient Visits - between 7,000 and 8,000 patients/day
- Physicians served - more than 2,000
CLS Provides a wide range of medical diagnostic services, including:

- Comprehensive diagnostic testing menus in Hematology, Immunology, Microbiology, Parasitology, Chemistry, Cytology, Anatomic Pathology, Toxicology, Endocrinology, Transfusion Medicine, Flow Cytometry.
- Service to family practice and specialist physicians, hospitals, long-term care facilities, medical scientific researchers, corporations and public service and government agencies.
- Mobile client services to nursing home and the private homes of disabled, elderly, terminally ill, immobilized and housebound patients.
- Employment related and occupational health clinical testing.
- Pre-employment drug testing.
- Equipment sterilization monitoring.
- Laboratory physician consulting services.
- Laboratory support to research projects and clinical trials.
- Laboratory management and consultant pathology services.
Calgary Laboratory Service
Laboratory Medicine

The Calgary Laboratory Services “Service Delivery Model” includes the following medical activities:

**Anatomic Pathology (AP)** is provided at all acute care sites, Foothills Medical Centre (FMC), Rockyview General Hospital (RGH), Peter Lougheed Centre (PLC), Alberta Children’s Hospital (ACH), and the Diagnostic and Scientific Centre (DSC). The division offers Frozen Section Diagnosis, Surgical Pathology, Dermatopathology, Autopsy Pathology, Cytogenetics and Molecular Pathology service and consultative services.

- **Frozen section service** for rapid diagnosis is provided at all acute care sites.
- **Surgical Pathology** provides the histologic interpretation of tissue specimens removed at surgery or by biopsy at all sites.
- **Dermatopathology** examines all skin specimens from dermatologists in the Calgary area. The service is located at the DSC.
- **Autopsy Pathology** of post mortem organs and tissues is essential for quality management in medical care, documentation of novel medical conditions and in education and teaching. The department is centralized to the FMC for adults and to the ACH for pediatrics.
- **Neuropathology** involves the study of disease in brain, nerve and muscle. The Neuropathology service is located at the FMC.
- **Molecular Pathology** is an important part of patient diagnosis and medical management in the fields of cancer pathology. The molecular laboratory is located in the Heritage Research Building at the University of Calgary Medical School.
- **Cancer Cytogenetics** involves the examination of a cell’s chromosomes for genetic abnormalities. This is an important part of the diagnosis in many malignancies, especially those arising from the hematopoietic system. This service is centralized to the DSC.
- **Cytopathology** (CP) is the interpretation of cells that spontaneously exfoliate or are removed from tissues by abrasion or fine needle aspiration, such as specimens from the cervix, breast, thyroid, lymph node, liver etc. The service is centralized to the DSC.

**Microbiology** provides comprehensive diagnostic infectious disease services and is divided into Bacteriology, Mycology, Parasitology, Virology, and HIV Viral Load Testing. The department has been fully consolidated to the DSC. Specimens received from physician offices, PSC and the RRL are processed immediately 24 hours a day, seven days a week. Critical results are phoned to the attending physician or nursing unit as soon as they become available. Molecular Microbiology provides molecular investigation into the epidemiology of infectious disease and the development of antimicrobial resistance.

**Clinical Biochemistry** analyzes blood and urine testing at all acute care sites, HCTL and the DSC. The scope of testing is very broad and includes the analysis of general and specialized chemistry tests such as protein and hormone levels, basic chemistry analysis and protein electrophoresis. Test availability is listed in the Guide to Services on the CLS website.

- **Analytical Toxicology** analyzes blood and urine specimens for the presence of therapeutic and toxic drugs for acute care and community patients as well as the addiction programs in the area. The department also provides testing for immunosuppressive drug analysis to support organ/tissue transplants. Analytical Toxicology is centralized at the DSC with the exception of volatile and ethylene glycol measurements which remains at FMC. Rapid screening for drugs of abuse is available at the RRL sites and at Sheldon M. Chumir Health Centre (SMCHC) on a STAT basis.
- **Immunoochemistry** performs autoimmune testing, allergy testing, vitamin D, serum tumor markers, hormone levels and first and second trimester maternal serum prenatal screening. Immunoochemistry has been centralized to the DSC with the exception of first trimester screening which is offered through the Early Prenatal Risk Assessment Program at the Teaching, Research and Wellness (TRW) site on the FMC campus.
Hematology provides testing of blood and urine specimens for patients from all acute care sites and the community. The most frequently ordered tests include urinalysis, complete blood count (CBC) and Prothrombin Time/INR and Partial Thromboplastin Time. The department provides services at all acute care sites as well as at the DSC for the community patients. Testing is available 24 hours a day, seven days a week. Test availability is listed in the Guide to Services on the CLS website.

- **Special Hematology** (SH) receives and processes bone marrow samples from all adult acute care hospitals. The department also screens for abnormal hereditary hemoglobin diseases for patients from Calgary and Southern Alberta. SH provides services on weekdays and has been centralized to the FMC as the department requires significant interaction with the Hematologists, most of whom practice at the FMC.

- **Molecular Hematology** (MH) provides molecular analysis for the diagnosis and monitoring of patients in the bone marrow transplant program. It also provides support for the diagnosis of inherited disorders such as hemophilia or for the risk factors implicated in excessive blood clotting. The department is centralized to the DSC and offers services weekdays for patients from Calgary and Southern Alberta.

- **Special Coagulation** (SC) performs specialized testing to determine hereditary predisposition to clotting or bleeding disorders such as those in Hemophilia. SC also assists in the diagnosis of acquired bleeding problems and helps identify the most effective treatment for the condition. This service has been centralized to the DSC and offers service weekdays for patients from Calgary and Southern Alberta.

- **Flow Cytometry** (FC) is a regional laboratory servicing southern and central Alberta, as well as southeastern BC, and offers the largest scope of clinical applications in Canada. This department aids in the diagnosis of leukemia and lymphomas, immunodeficiency disorders, and in the monitoring of patients with HIV. It serves as a reference laboratory for other facilities across Canada. FC has been centralized to the FMC and provides support Monday to Friday with “on call” testing available on a STAT basis.

**Tissue Typing** (TT) is responsible for Human Leukocyte Antigen (HLA) and antibody investigations necessary for kidney and bone marrow transplantation. The department types and screens both donors and patients regularly before transplantation and monitors the patients after surgery to assess the success of the procedure and the risk of organ rejection. The department also tests for strong HLA disease association to identify disease specific susceptibility and for protective markers. TT has been centralized to the DSC and staff are available 24 hours a day, seven days a week. This program currently supports the bone marrow program for the province of Alberta and solid organ kidney pancreas transplant program for Southern Alberta. The Tissue Typing Department is the only laboratory in Western Canada accredited by the American Society of Histocompatability and Immunogenetics (ASHI).

**Transfusion Medicine** (TM) service is provided at all of the acute care sites 24 hours a day, seven days a week. Transfusion Medicine performs pre-transfusion testing and is responsible for the distribution of blood and blood products. Testing also includes investigating blood group incompatibilities between mother and baby, complex antibody investigations and computer assisted cross matches. Transfusion Medicine is also responsible for the Cellular Laboratory Therapy (CLT) Program, which provides bone marrow processing, storage, and preparation for transplantation.

**Laboratory Information Centre** (LIC) is an integral link in the delivery of health care services. Staff respond to inquiries for test results, specimen requirements, collection procedures, diet/fasting instructions, Patient Service Centre locations and hours of operation. LIC is also responsible for relaying routine, Stat and critical results, both verbally and via fax, to physicians and other health care providers consistent with the Health Information Act (HIA). At the doctor’s request, LIC staff ensure additional testing is performed on diagnostic samples that have already been collected. An average of 28,000 incoming calls and 7,000 outgoing calls are handled each month. LIC is co-located with the Avenida Patient Service Centre.

**CLS Courier:** The main function of the CLS Courier department is the efficient transfer of specimens, reports, biohazardous waste, and limited supplies for all CLS’ functional groups, Health Centre Testing Laboratories (HCTL), Extended Care Facilities and Physician offices throughout the communities of Calgary, Airdrie and Cochrane. Both routine and Stat samples are transported seven days a week.
Every year more than two thousand physicians access the services of Calgary Laboratory Services (CLS) to help diagnose, treat and monitor their patients’ health.

Recognized as one of Alberta’s top employers for the past 2 consecutive years, CLS is a world-class health organization that is committed to improving health and well being through laboratory diagnostic excellence, education and research.

CLS is one of the largest multi-site integrated acute care and community laboratory practices in North America providing multi-disciplinary diagnostic laboratory and pathology services to more than 1 million people. Through our community collection sites, mobile services, and hospital laboratories, we perform approximately 21 million tests annually.

CLS is committed to continuous improvement in client service ensuring that the organization remains a model for high quality and accuracy serving a healthcare system where clinicians depend upon laboratory results to diagnose, treat, and monitor their client’s health.

CLS, is well positioned to provide beta testing needs for:
- Reagents and supplies
- Instruments
- Software
- Laboratory management

Enjoying leading edge facilities, testing methods and equipment, CLS has the test volume and patient complexity that makes it attractive to companies/organizations interested in beta testing. In addition to offering a unique one-stop “shopping” approach to your beta testing needs, you will also benefit from our:
- Low overhead
- Affiliation with the University of Calgary
- Impressive history as an established reference laboratory
- Access to a high volume of tertiary care samples
- Flexibility to work outside of FDA approved kits, reagents and methods
- Corporate maturity coupled with vast clinical knowledge base

We have a history of providing broad scope beta testing to our clients. Our experience in providing beta testing to leading edge companies has helped us to produce the most advanced beta testing capabilities (especially in Flow Cytometry) that are offered today.

Our accredited Flow Cytometry department offers more than 30 validated assays and has most recently been involved in multiple beta testing projects including reagents and protocol validation for leukemia lymphoma.
Beta testing at CLS will allow your organization to:

- Improve products and services
- Establish historical trending and analysis
- Generate customer insight into future products and services
- Establish a final assessment of every part of your product prior to release
- Report real problems based on first-hand experience.
- Provide structured customer field testing
- Create customer’s beta testing experience
- Test a product/service performed by real users in a real environment

CLS has the scientific expertise and laboratory excellence to support all your beta testing needs. Our comprehensive and flexible testing capabilities include an in-house network of approximately 71 medical staff and pathologists including internationally recognized specialists.

CLS occupies a unique space where insight and execution meet. We will work with you to plan and execute the best beta testing trials for your clinical needs.

Client service, timely delivery, technological advancement, education and research are the cornerstones of CLS.

CLS is recognized as a leader in laboratory medicine and has recently received two awards for Process Excellence:

- Clinical Laboratory Management Association (CLMA) Pre-Analytical Excellence Award
- Association for Manufacturing Excellence (AME) Award of Recognition

“Beta testing is one way to have good relationships with vendors and be on top of technology”—Katalin Zay, Flow Cytometry, CLS.

To find out more about how CLS can help your organization, please contact: gareth.lewis@cls.ab.ca.
In an ever changing health-care environment, a medical laboratory must constantly evaluate and update its processes to sustain a cost-effective model that meets current and future healthcare challenges and demands. An organization whose culture promotes continuous Process Excellence will stay proactive rather than reactive to change.

**Vision:** Enabling organizations to achieve their vision and mission.

**Mission:** Optimizing business processes through various process excellence methodologies and sustaining the improvement through training and education

Calgary Laboratory Services adopted Lean and Six Sigma as process improvement tools in 2005 due to the rapidly changing environment of healthcare in Alberta and Canada.

Our initial objectives were to improve operations through three over-arching goals:

- Improve staff satisfaction,
- Meet or better contractual turnaround time targets,
- Increase productivity

Our commitment to Lean and Six Sigma has had many positive impacts to efficiency and effectiveness throughout the organization including a significant reduction in the turnaround time (TAT) for routine testing, consistently meeting turnaround time targets in various areas, and improved work environments:

- 23% reduction in waiting time for outreach patients
- 20% reduction in TAT (draw to verify) for routine acute care testing
- 25% reduction in TAT (in lab to verify) for STAT pre-transfusion testing

Process Excellence is supported by 3 main elements:

- Lean/Kaizen – improves efficiency
- Six Sigma – improves effectiveness
- Change leadership - manages change and ensures sustainability

The CLS Process Excellence team can bring these advantages to your organization:

- Visionary and strategic direction for continuous improvement of your end-to-end business value stream
• Integration and alignment of Process Excellence philosophy with other corporate goals and objectives
• Proven background in Lean and Six Sigma for healthcare and an understanding of the unique challenges faced by medical laboratories and hospitals
• Knowledge to guide your team in project selection and execution
• Experience with best practices in an integrated regional lab model

Undertaking Process Excellence requires commitment from all levels of an organization. Prior to beginning the process, CLS has the knowledge to:
• assess your readiness and commitment to ensure success
• assist in creating an engaging, process improved environment to ensure sustainability

Strategy – Achieve Paradigm Shift

Optimize processes, improve competency and measure and sustain key performance indicators

CLS Process Excellence Deployment Framework
Calgary Laboratory Services
Reference Laboratory / Referral Testing Service

**Microbiology**
- KPC PCR (Klebsiella pneumoniae carbapenemases 1 & 2).
- MBL PCR (Imp and Vim Metallo Beta lactamases)
- Bacterial molecular typings (SPA, PFGE, Bacterial barcodes, ERIC).
- Clostridium difficile PCR ribotyping.
- Bacterial identification by 16S rDNA Sequencing.
- HIV viral load detection.
- Nuceric Amplification test for the detection of Chlamydia trachomatis and Neisseria gonorrhoeae.
- Helicobacter pylori stool antigen.

**Molecular Pathology**
- IDH1 exon 4: IDH2 exon 4
- BRAF V600E
- DNA mismatch/contamination tests
- LOH oligodendroglioma tests K
- Synovial Sarcoma SYT-SSX1, SYT-SSX2
- Ewings Sarcoma EWS-FLI1; EWS-ERG

**Clinical Biochemistry**
- Androstenedione
- Beta-2-Microglobulin
- Beta-Carotene
- C-Telopeptide (CTx)
- Cardiac CRP (high sensitivity CRP)
- Chromogranin A (coming soon)
- Cortisol, Salivary
- Erythropoietin (EPO)
- Immunoglobulin Free Light Chains
- Leflunomide Metabolite
- Metanephrines, Plasma
- N-telopeptide (NTx)
- Phenytoin, Free (Dilantin, Free)
- Plasma Renin Activity (Angiotensin 1)
- Testosterone, Bioavailable
- Testosterone, Free
- Vitamin A (Retinol)
- Vitamin D, 1,25 Dihydroxy (Calcitriol)

To inquire about additional tests that CLS may perform, please contact: gareth.lewis@cls.ab.ca

A complete list of the CLS testing menu can be found on our website: www.calgarylabservices.com
CLS is committed to excellence, integrity and innovation in health care, research and education.

**CALGARY LABORATORY SERVICES (CLS)**, located in Calgary, Alberta, has been serving clients with the highest quality testing since 1996.

The CLS delivery model consists of:
- One Diagnostic and Scientific Centre
- Specialized testing laboratories
- Four Rapid Response laboratories (one in each hospital)
- Eighteen strategically located Patient Service Centres
- Three Health Centre Testing laboratories (one in each Health Centre)
- A mobile collection service
- One centralized transportation system
- One region-wide information system

Research is an integral part of CLS. Research activities are supported throughout the organization. Over sixty physicians and scientists along with staff throughout the organization initiate and provide services to approximately 600 research projects.

CLS works closely with educational institutions to provide training in laboratory medicine. We have a long-standing affiliation with the University of Calgary’s Faculty of Medicine to assist in the training of medical residents in Anatomic Pathology and Neuropathology, as well as fellows sub-specializing in areas of pathology and laboratory medicine. Partnerships have also been formed with the Southern Alberta Institute of Technology (SAIT), Northern Alberta Institute of Technology (NAIT) and Alberta Business and Education Services (ABES) to offer medical laboratory technologist, medical laboratory assistant and cytotechnology programs.

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