

#KNOWvember



PRECISION ONCOLOGY AWARENESS MONTH • NOVEMBER 2026

precision oncology toolkit

#POAM26 #KNOWvember

what precision oncology is, where biomarker testing stands in Canada, what is getting in the way, and what each of us can do about it.

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01

what is precision oncology. why it matters.

Precision oncology uses detailed molecular and genomic information about a tumour to guide diagnosis, prognosis and treatment decisions. It helps people receive therapies targeted to the genetic or molecular drivers of the cancer, which can increase effectiveness, reduce unnecessary toxicity and improve outcomes.

In Canada, access to next-generation sequencing (NGS) and comprehensive genomic profiling (CGP) has the potential to transform how cancer is diagnosed and treated. Yet access remains inconsistent.

While research continues to advance our understanding of cancer biology and drive the development of new targeted therapies, system readiness, policy alignment and equitable implementation have not kept pace.

This primer provides a snapshot of the current landscape, the inequities that persist, and the practical levers available to make precision oncology equitable and sustainable across Canada.

the current landscape of biomarker testing in Canada

progress and potential

Scientific advances. Research continues to reveal new molecular targets, resistance mechanisms and biomarkers that can inform treatment decisions and drug development.

Clinical adoption. Nearly half of new oncology drugs approved by the U.S. FDA between 1998 and 2022 were precision therapies requiring molecular profiling for optimal patient selection. As treatment becomes increasingly informed by cancer biology, timely access to appropriate biomarker testing is essential.

Testing infrastructure. Every province has at least some molecular testing capability. However, the type, scope and comprehensiveness of testing vary widely, from hotspot testing to NGS and CGP. Reflex testing policies and access to liquid biopsy also differ significantly.

Assessment progress. Canada's Drug Agency has published a final assessment framework for cancer biomarkers. This provides a foundation for more consistent evaluation, but publishing the framework is distinct from assessing individual tests and connecting those assessments to funding and implementation decisions.

persistent gaps

Access variability. Molecular testing capacity differs significantly across Canada. Some centres have access to NGS or CGP, while others still rely on limited hotspot testing or send samples out of province or out of country. Testing panels, eligibility criteria and funding mechanisms are not standardized, leading to inconsistent access and delayed results.

Turnaround times. Time to results varies across testing programs and care settings. Delays in obtaining a biopsy, transferring specimens, completing testing and reporting results can postpone treatment decisions.

Integration. Limited interoperability between pathology, oncology and electronic medical record systems prevents efficient sharing of results and outcomes data.

equity and access. the uneven map

interprovincial inequities

Access to biomarker testing and companion diagnostics varies across provinces, because each one has set up its testing, labs and funding in its own way.

Patients in rural, remote and northern regions often face longer delays for biopsies, shipping samples and receiving results.

population-level inequities

Indigenous and racialized communities are underrepresented in genomic datasets and clinical trials, limiting relevance and inclusivity.

Socioeconomic barriers such as travel costs, unpaid leave and limited awareness create structural disadvantages.

Language and cultural barriers affect informed consent and understanding of complex genomic reports.

Without a coordinated national approach, precision oncology risks widening rather than narrowing Canada's cancer care gap.

system challenges

regulatory misalignment

Approval and reimbursement timelines for targeted therapies and their companion diagnostics are often out of sync. Regulatory authorization, evidence assessment, diagnostic funding and laboratory implementation are separate processes. Progress in one does not automatically ensure readiness in the others.

Canada's Drug Agency's final cancer biomarker assessment framework provides a foundation for more consistent evaluation, but does not itself align the availability, validation and funding of testing with associated therapies. This misalignment can delay access to both testing and treatment.

reimbursement gaps

Diagnostic funding mechanisms and testing practices vary widely across Canada. While some provinces have formal health technology assessment (HTA) processes and centralized laboratory systems, others rely on case-by-case decisions or research-based support.

Even within provinces, laboratories may differ in how testing is performed or prioritized, often due to differences in available financial and human resources. This lack of alignment contributes to inconsistencies in access, scope and sustainability across the country.

Publishing the assessment framework is an important step, but it is distinct from assessing individual tests and connecting those assessments to funding and implementation decisions. Considering diagnostic requirements within a drug review should not be confused with a completed assessment of the diagnostic itself. The continuing challenge is to evaluate the clinical and economic value of testing and make sure that assessment translates into sustainable access.

infrastructure and data fragmentation

Pathology laboratories operate within siloed systems with varying technology and quality standards.

National work is underway to improve visibility of biomarker testing. A Pan-Canadian Cancer Biomarker Inventory project has sought to compile and validate information on publicly funded cancer biomarkers and explore maintaining a living inventory.

However, knowing which tests are funded is not the same as consistently measuring testing volumes, turnaround times, patient access and outcomes. Comparable data remain essential to identify gaps, understand who is being left behind, and assess whether changes improve care.

05

opportunities and levers for change

WHO**WHAT THEY CAN DO****WHY IT MATTERS****patients and public**

Ask about testing and understand how biomarkers inform treatment. Share stories that reveal real-world access barriers.

Builds awareness and bottom-up demand for equitable access.

clinicians and laboratories

Standardize reflex testing and expand CGP access in first-line settings where clinically indicated.

Reduces duplication, speeds up diagnosis and supports evidence generation.

policymakers and health leaders

Treat diagnostic testing as core health infrastructure and align funding, HTA and reimbursement processes.

Improves efficiency, supports equitable access and strengthens value-based care.

pharma and diagnostics industry

Work with governments, health systems and patient organizations to ensure equitable access to testing and targeted therapies. Co-create evidence and policy solutions that strengthen the sustainability of health systems, support local capacity building and expand testing infrastructure across all provinces.

Builds trust, advances equitable implementation and supports the long-term sustainability of precision oncology in Canada.

patient and advocacy groups

Represent the voices and needs of people living with cancer by connecting data to real experiences and making sure decisions reflect what matters to patients and families. Share patient stories, highlight the lived realities behind access data, and collaborate across sectors to close testing and treatment gaps.

Humanizes policy, drives accountability and makes sure innovation serves people, not just systems.

06 · WHAT YOU CAN DO

for patients and caregivers

To get the best care, and help build a better system.

1. educate yourself. know the science

- **Ask if biomarker or genomic testing is right for you.** Testing can identify which treatments are likely to work for the cancer and which are not.
- **Understand what test you're getting.** There are different kinds of tests. Some look for one gene, others for many. Ask your care team what test they're ordering and why.
- **Ask about results and next steps.** When will results be ready? Will they affect the treatment plan? Who explains them to you?

2. share your experience. know the stories

- **Tell your story.** If you've had testing, share your experience, good or bad. Were there delays? Did it change your treatment? We want to #know.
- **Help build the evidence.** Real-world patient experiences help show where the system is working and where it isn't. These stories are critical to improving access across Canada.
- **Join the conversation.** Use #KNOWvember and #POAM26 and connect with others advocating for timely testing and equitable care.

3. speak up. know the system

- **Advocate for better access.** Write to your MP, MPP, MNA, MLA or MHA and call for equitable access to biomarker and genomic testing in cancer care.
- **Stay informed.** Visit cancercolab.ca/knowvember for plain-language information about biomarker testing, letter templates and talking points for decision makers, and ways to share your experience and take part in the campaign.

WHY THIS MATTERS

Biomarker and genomic testing can change treatment decisions, improve outcomes and reduce the use of ineffective therapies. Patients and caregivers who ask, share and advocate help shape a system that delivers the right treatment to the right person at the right time.

06 · WHAT YOU CAN DO

for advocates and patient groups

To strengthen patient voice and support equitable access to precision oncology.

1. educate and equip. know the science

- Help your communities understand what biomarker and genomic testing are, how they inform treatment, and why access matters.
- Use resources from cancercolab.ca/knowvember, including plain-language explainers, the glossary, FAQs and campaign materials.
- Partner with clinicians or researchers to co-develop materials that make complex science clear and relevant to patients.

2. represent real experiences. know the stories

- Collect patient and caregiver experiences about testing, delays, costs and outcomes.
- Share stories that show how the way testing is set up, income or cancer type affected access and outcomes.
- Use the #KNOWvember engagement toolkit to educate your communities, share campaign resources and advocate for equitable access. Use #KNOWvember and #POAM26.

3. advocate and influence. know the system

- Represent your community's needs to policymakers and health system leaders.
- Work alongside clinicians, laboratories and other advocates to identify and address barriers to timely testing.
- Support the call for a pan-Canadian testing strategy, equitable reimbursement for diagnostics and faster turnaround times.
- Encourage your members to contact their elected representatives: MPs federally, and MPPs, MLAs, MNAs or MHAs provincially or territorially.
- Need help? Contact the cancer collaborative or visit cancercolab.ca/knowvember.

WHY THIS MATTERS

Patient advocacy is most powerful when it is informed, organized and data-driven. By combining science, stories and system change, advocates can close the gap between what exists in policy and what patients actually experience in care.

06 · WHAT YOU CAN DO

for clinicians and laboratories

To align clinical practice, diagnostic capacity and equitable access.

1. connect science to care. know the science

- Identify where the system constrains clinical or diagnostic decision-making, whether through limited panel funding, fragmented reporting or reimbursement barriers.
- Share practical insights on testing workflows, turnaround times and result interpretation that can inform national access mapping and policy development.

2. make barriers visible. know the stories

- Communicate real-world challenges to advocacy and policy partners. Frontline experiences with funding delays, referral pathways or specimen logistics provide the evidence needed for reform.
- Highlight how system fragmentation affects both patient outcomes and operational efficiency. These are policy and infrastructure challenges, not gaps in clinical or laboratory performance.
- Add your perspective through #KNOWvember and #POAM26 to help show how diagnostic access influences care.

3. advocate from within. know the system

- Engage with health system leaders to align testing infrastructure, reimbursement and reporting standards across provinces.
- Collaborate with advocacy groups and other stakeholders on shared recommendations that reflect both patient and provider realities.
- Contribute de-identified data, capacity metrics or workflow insights to support national benchmarking and evidence-based policy change.
- Want to be more involved? Contact the cancer collaborative: sabrina@cancercolab.ca.

WHY THIS MATTERS

Clinicians and laboratories understand where evidence meets reality. By sharing operational and clinical insights and partnering with advocates, you can help shape policies that make precision oncology accessible, efficient and equitable across Canada.

06 · WHAT YOU CAN DO

for health system leaders

To align policy, infrastructure and equity in precision oncology.

1. understand the evidence. know the science

- Recognize biomarker and genomic testing as core health care infrastructure rather than optional innovation.
- Review current testing capacity, turnaround times and funding models within your jurisdiction to identify bottlenecks and duplication.
- Align investment with evidence on how testing can improve treatment selection and patient outcomes, reduce the use of ineffective therapies and support more effective use of health care resources.

2. listen to those delivering and receiving care. know the stories

- Create formal channels for clinicians, laboratories and patients to share challenges in testing access, reporting and reimbursement.
- Use lived experience to inform decisions on diagnostic funding, infrastructure and workforce planning.
- Engage with #KNOWvember and #POAM26 to understand how delays, inequities and funding barriers affect real outcomes.

3. build coordinated systems. know the system

- Support a pan-Canadian testing strategy that ensures consistent access, quality standards and reimbursement across jurisdictions.
- Establish cross-sector working groups with policymakers, clinicians, advocates and diagnostic leaders to align policy and implementation.
- Publish transparent metrics on testing availability, turnaround times and coverage to promote accountability and continuous improvement.

WHY THIS MATTERS

Precision oncology can only succeed within a coordinated, well-funded and transparent system. Health system leaders have the authority to align policy with practice and to ensure equitable access to testing and targeted treatment across Canada.

06 · WHAT YOU CAN DO

for industry partners

To help bridge innovation, access and implementation in precision oncology.

1. align innovation with system needs. know the science

- Work with health system leaders and diagnostic networks to identify where testing access and reimbursement lag behind clinical advances.
- Support evidence generation that demonstrates the clinical and economic value of biomarker and genomic testing across cancer types.
- Collaborate on studies and pilots that connect molecular testing data with real-world outcomes to guide sustainable policy and funding decisions.

2. elevate transparency and trust. know the stories

- Share de-identified data and real-world insights that can inform national access mapping, equity analyses and value assessments.
- Take part in cross-sector dialogues to understand how delays, coverage gaps and variable reimbursement affect patients and clinicians.
- Contribute to #KNOWvember by highlighting collaborative efforts that expand testing access or show measurable system benefit.

3. enable equitable implementation. know the system

- Partner with policymakers, laboratories and advocacy groups to co-design practical reimbursement and infrastructure solutions.
- Support joint initiatives that build testing capacity in under-resourced regions and ensure alignment between public and private sectors.
- Commit to transparency in pricing, evidence sharing and outcome reporting to strengthen trust and speed up adoption of precision oncology.

WHY THIS MATTERS

Industry partners have the resources, data and expertise to help build a sustainable precision oncology ecosystem. Collaboration that prioritizes evidence, equity and transparency helps innovation reach every patient who can benefit.

07

the case for a national strategy for precision oncology

the issue

Canada has taken important steps toward integrating precision oncology into cancer care. However, testing availability, turnaround times and reimbursement models differ across and within provinces, reflecting differences in infrastructure, resources and local decision-making.

why it matters

Without national alignment, efforts risk duplication, uneven quality and inequitable access. A coordinated approach would allow the health system to anticipate demand, plan resources and evaluate outcomes consistently across the country.

areas for national alignment

- A pan-Canadian strategy that coordinates federal, provincial and territorial efforts in precision oncology.
- A fit-for-purpose HTA approach for diagnostics that builds on Canada's Drug Agency's final cancer biomarker assessment framework and connects consistent, transparent evaluation to funding and implementation, whether or not a test is paired with a drug.
- Shared quality and reporting standards so laboratories across the country can work to comparable benchmarks.
- Sustainable funding models that recognize and reimburse testing as part of care, with clarity on consumables, infrastructure and workforce needs.
- Linked data systems that allow access, turnaround times and equity measures to be tracked nationally.
- Structured engagement so patients, clinicians, laboratories and payers contribute directly to planning and implementation.

Find policy and advocacy resources at cancercolab.ca/knowvember.

07

call to collaborate

The goal isn't for any one organization to decide how this happens.

Canada needs a collaborative, multi-stakeholder process to shape these elements into a workable national model, grounded in evidence, operational reality and equity.

We are inviting partners across sectors (patients, policymakers, clinicians, researchers, regulatory and reimbursement bodies, and industry) to help shape this framework together and make sure it reflects the system we all want to build.

a shared vision

Precision oncology represents both a scientific breakthrough and a systems challenge.

As our understanding of cancer deepens, new molecular targets and therapies will continue to emerge. But the promise of these innovations will only be realized if access to testing and treatment keeps pace, across all provinces, populations and care settings.

Learn more at cancercolab.ca/knowvember.

Developed by the cancer collaborative | le collaboratoire cancer for Precision Oncology Awareness Month. For general information, not medical advice.

glossary

plain-language definitions for the words you'll hear around biomarker testing and precision oncology. search the interactive version at cancercolab.ca/knownvember.

A

Actionable Mutation

A genetic change in a tumour that can be targeted with an existing therapy or used to guide a specific treatment decision. Not every mutation found in testing is actionable, only those linked to a therapy, clinical trial or treatment strategy.

ALK

A gene that can become fused with another gene (an ALK fusion or rearrangement), driving cancer growth. Most often tested in non-small cell lung cancer. A positive result can guide targeted therapy. Tested by IHC, FISH or NGS.

Amplification | Deletion

An amplification means extra copies of a gene; a deletion means a section of DNA is missing. Both can affect how cancer cells grow and respond to treatment.

B

BCR-ABL1 (Philadelphia Chromosome)

A gene fusion created when parts of chromosomes 9 and 22 swap places. It defines chronic myeloid leukemia and is found in some acute lymphoblastic leukemias. It guides targeted therapy and is measured over time to track response.

Biomarker

A measurable feature (such as a gene mutation, protein or molecular signature) that provides information about a cancer's behaviour or how it might respond to treatment. Biomarkers are often grouped by what they tell you: diagnostic (what the cancer is), prognostic (how it may behave) and predictive (which treatment may work). One biomarker can do more than one of these.

Biomarker Testing

Testing a sample of the cancer, or blood, to look for biomarkers that can help guide treatment. It includes protein tests like IHC and genomic tests like NGS.

Biopsy

A procedure to collect a small sample of tissue or fluid for testing. Biopsies can be taken from the tumour itself (tissue biopsy) or through a blood draw (liquid biopsy).

BRAF

A gene that helps control cell growth. The BRAF V600E mutation, and some others, can drive melanoma and some lung, colorectal, thyroid and brain cancers, as well as hairy cell leukemia. A BRAF mutation can guide targeted therapy.

BRCA1 / BRCA2

Genes that help repair damaged DNA. Changes can be inherited (germline) or found only in the cancer (somatic). They are tested in breast, ovarian, prostate and pancreatic cancers, where they can guide a type of targeted treatment called a PARP inhibitor. An inherited change also has implications for family members.

C

Canada's Drug Agency (CDA-AMC)

The national agency (formerly CADTH) that reviews drugs and other health technologies and makes funding recommendations to the federal, provincial and territorial public drug plans, except in Québec. Its recommendations are not binding; each jurisdiction decides.

Cancer of Unknown Primary (CUP)

A diagnosis made when cancer is found in the body, but the place where it began (the primary site) cannot be identified through standard tests. Molecular and genomic profiling can sometimes help determine where the cancer started or reveal actionable mutations that guide treatment.

glossary

Clinical Trial

A research study that tests new treatments or new ways of using existing ones. Biomarker testing can help match patients to clinical trials likely to benefit them.

Companion Diagnostic (CDx)

A specific test developed to identify whether a person's tumour carries a biomarker that makes them eligible for a targeted therapy.

Comprehensive Genomic Profiling (CGP)

A broad testing approach, usually using NGS, that looks at many cancer-related genes and several types of changes in one test, such as mutations, fusions, extra gene copies, and patterns like MSI and TMB.

"Comprehensive" doesn't mean it checks everything. Coverage varies between tests.

D

Diagnostic Biomarker

A biomarker that helps confirm a diagnosis or identify the type or subtype of cancer. For example, some protein or genetic markers help a pathologist tell one type of cancer from another, or find where a cancer started.

Driver Mutation

A change that helps cause the cancer to grow. Many targeted treatments are designed to block a specific driver.

E

EGFR

A gene that helps control cell growth. Certain EGFR mutations, such as exon 19 deletions, L858R or exon 20 insertions, are common drivers in non-small cell lung cancer and can guide targeted therapy. New EGFR changes can appear when a treatment stops working.

Equitable Implementation

Ensuring that advances in precision oncology reach everyone fairly, in every province and territory, including rural, remote, Indigenous and underserved communities, through inclusive policies, data and partnerships.

Equity in Testing

The principle that every patient, regardless of geography, language or background, should have access to appropriate, timely biomarker and genomic testing.

ER (Estrogen Receptor)

A protein measured by IHC in breast cancer. ER-positive (ER+) means the cancer has estrogen receptors and may grow in response to estrogen, so it is likely to respond to hormone therapy. ER is also tested in some other cancers, such as endometrial cancer.

ESR1

The gene for the estrogen receptor. ESR1 mutations often develop during hormone therapy for hormone receptor-positive breast cancer and can make it stop working. They are usually found by liquid biopsy and can guide the next treatment.

F

FGFR2 / FGFR3

Genes that help control cell growth. FGFR2 fusions are tested in cholangiocarcinoma (bile duct cancer) and FGFR3 changes in urothelial (bladder) cancer. Both can guide targeted therapy.

Flow Cytometry

A lab test that measures proteins on the surface of individual cells, often from blood or bone marrow. It is widely used to diagnose and classify blood cancers and to measure minimal residual disease.

FLT3

A gene often mutated in acute myeloid leukemia (FLT3-ITD or FLT3-TKD). Testing is needed quickly at diagnosis because a positive result can guide targeted therapy and gives information about prognosis.

Fluorescence In Situ Hybridization (FISH)

A lab test that uses glowing (fluorescent) probes to see whether a gene is rearranged, fused or present in extra copies, for example ALK fusions or HER2 amplification.

Folate Receptor Alpha (FR α)

A protein measured by IHC in ovarian cancer. A positive result can guide treatment with an antibody-drug conjugate, a targeted antibody that carries chemotherapy directly to the cancer cells.

G

glossary

Genetic

Relating to genes or heredity. In cancer care, “genetic testing” usually means looking for inherited changes that may affect cancer risk, but the word is not used consistently. Ask whether a test is looking at the cancer, at inherited risk, or both.

Genetic Counselling

Support from a genetic counsellor or other trained professional to help people decide about inherited (germline) testing, understand results, and think through what they mean for family members. Wait times for genetic counselling vary across Canada.

Genome

All of a person’s genetic material: their complete set of DNA instructions that tells cells how to grow and function. Every person has their own unique genome.

Genomic

Relating to the genome or its study. In cancer care, “genomic testing” usually means testing the cancer for changes that may guide treatment, but the word is not used consistently. Ask whether a test is looking at the cancer, at inherited risk, or both.

Genomic Testing

A type of laboratory testing that examines the DNA of cancer cells to find changes that can guide diagnosis, prognosis or treatment. It includes methods such as hotspot testing, single-gene tests, multigene panels, NGS and CGP.

Germline Mutation

A genetic change that is inherited from a parent and present in every cell of the body. Germline mutations can increase the risk of developing certain cancers.

Germline Testing

Testing, usually on blood or saliva, to look for inherited gene changes that may affect a person’s cancer risk or their family’s. A tumour test can sometimes flag a possible inherited change that needs confirming with germline testing.

H**Health Technology Assessment (HTA)**

A structured process that looks at the clinical, economic and social impact of a health technology, such as a cancer drug or a diagnostic test, to guide funding decisions. In Canada, HTA is done by CDA-AMC and, in Québec, by INESSS. Drugs and the tests that go with them are often assessed separately, which can mean a drug is funded before its test is.

HER2

A protein, and the gene that makes it, tested mainly in breast and stomach cancers, and increasingly in others such as colorectal, lung and gynecologic cancers. Results are reported as HER2-positive, HER2-low or HER2-negative (and sometimes HER2-ultralow), and each can guide different targeted treatments. In lung cancer, HER2 mutations are also tested.

Homologous Recombination Deficiency (HRD)

A sign that a cancer can’t properly repair a certain type of DNA damage. It is often linked to changes in genes like BRCA1 and BRCA2. HRD testing can help show whether a type of targeted treatment called a PARP inhibitor may work, for example in some ovarian, breast, prostate and pancreatic cancers.

Hormone Receptors (ER / PR)

Estrogen and progesterone receptors are proteins measured by IHC in breast cancer. A positive result means the cancer may grow in response to hormones and is likely to respond to hormone therapy.

Hotspot Testing

A focused test that looks for changes in a small number of genes known to drive specific cancers (for example, EGFR or KRAS).

HR-Positive (HR+)

Short for hormone receptor-positive: a breast cancer that is ER-positive, PR-positive or both. It is the most common type of breast cancer and is usually treated with hormone therapy, sometimes with targeted therapy.

glossary

Immunohistochemistry (IHC)

A lab test that uses special stains to look for specific proteins in a tissue sample. It shows whether a protein is present and where. Examples include HER2 and PD-L1.

Immunotherapy

A type of treatment that helps the body's immune system recognize and attack cancer cells. Some biomarkers, like MSI, TMB or PD-L1, can help show whether immunotherapy might work.

INESSS

Québec's health technology assessment body (Institut national d'excellence en santé et en services sociaux). It reviews drugs, tests and other technologies and makes recommendations to Québec's minister of health.

J

JAK2 / CALR / MPL

Genes that drive myeloproliferative neoplasms, blood cancers where the bone marrow makes too many blood cells. Testing helps confirm the diagnosis and guides risk assessment and treatment decisions.

K

KIT / PDGFRA

Genes that drive most gastrointestinal stromal tumours (GIST). Testing helps confirm the diagnosis and shows which targeted therapy is likely to work, because some mutations respond better than others. KIT mutations are also found in some melanomas and in systemic mastocytosis.

KMT2A Rearrangement

A gene rearrangement found in some acute leukemias in adults and children. It gives information about prognosis and can guide newer targeted therapies or clinical trial options.

KRAS / NRAS (RAS)

Genes that, when mutated, keep cancer cells growing. KRAS mutations are common in lung, colorectal and pancreatic cancers, and some (such as KRAS G12C) can now be targeted. In colorectal cancer, a KRAS or NRAS mutation means certain antibody treatments are unlikely to work, so RAS testing guides treatment choice.

L

Liquid Biopsy

A blood test that looks for fragments of DNA shed by the cancer (ctDNA). It is less invasive than a tissue biopsy and can be repeated over time. It does not always find what a tissue test would: a negative result may mean the cancer DNA wasn't detected, not that the change isn't there. Sometimes a tissue biopsy is still needed.

M

MET

A gene that helps control cell growth. MET exon 14 skipping mutations and high-level MET amplification are tested mainly in non-small cell lung cancer and can guide targeted therapy. MET changes can also appear as a cause of resistance.

MGMT Methylation

A change that switches off the MGMT DNA repair gene in some brain tumours (glioblastoma). It helps predict whether a type of chemotherapy is likely to work and gives information about prognosis.

Microbiome

The trillions of bacteria and other microbes that live in and on the body, especially in the gut. Research suggests the gut microbiome may influence how well some cancer treatments work, including immunotherapy. This is an active area of research and not yet used to guide routine treatment decisions.

Microsatellite Instability (MSI)

A biomarker showing that a tumour's DNA repair system isn't working properly. High MSI can predict benefit from certain immunotherapies.

Minimal Residual Disease (MRD)

Very small amounts of cancer that may remain after treatment and can't be seen on scans. In some blood cancers, MRD testing is already part of care and helps guide decisions. In solid tumours, ctDNA blood tests are being studied to detect MRD and recurrence earlier. These are mostly available through research or privately, and a negative result doesn't guarantee the cancer won't come back.

glossary

Molecular Alteration

A change in a gene, protein or pathway that drives cancer growth. Not all alterations are mutations; some involve fusions, amplifications or deletions.

Molecular Profile

A detailed snapshot of the specific genes, mutations and molecular changes found in a tumour. Each person's cancer can have a unique molecular profile that helps guide treatment.

Molecular Profiling

The process of analyzing a tumour's genes and proteins to create its molecular profile. Molecular profiling helps identify actionable mutations and supports treatment decisions.

Molecular Tumour Board (MTB)

A meeting where oncologists, pathologists, geneticists, genetic counsellors and other experts review complex test results together and recommend next steps, such as a targeted treatment, a clinical trial or further testing. Access to an MTB varies across Canada.

Multigene Panel

A test that checks a group of genes at the same time. Panels can be small and focused or very broad.

Multiplex Testing

A workflow that combines several different biomarker tests (such as IHC, PCR or NGS) to analyze multiple biomarkers from the same sample.

Mutation (or Genetic Alteration)

A change in the DNA sequence of a gene. You may also hear "variant" or "alteration." Some mutations are harmless, while others drive cancer growth or affect how a tumour responds to treatment.

N

Next-Generation Sequencing (NGS)

A technology that reads large amounts of DNA or RNA at once. NGS describes how testing is done, not how much is tested: an NGS test might look at a few genes or hundreds.

NPM1

A gene commonly mutated in acute myeloid leukemia. It gives information about prognosis, can guide treatment choices, and is often used to measure minimal residual disease after treatment.

NRG1

A gene that can become fused with another gene. NRG1 fusions are rare and found in some lung, pancreatic and other cancers, often in people whose tumours have no other driver. They can guide targeted therapy or point to a clinical trial. RNA testing finds them best.

NTRK (NTRK1, NTRK2, NTRK3)

Genes that can become fused with other genes. NTRK fusions are rare but can occur in many types of cancer, in adults and children. A positive result can guide targeted therapy whatever the cancer type, which is why it is called a tumour-agnostic biomarker.

O

Off-Label Use

When a drug is used for a type of cancer, a group of people or a dose that isn't listed in its Health Canada approval. It can be appropriate and supported by evidence, for example when a biomarker suggests it may work, but public drug plans often don't cover it.

Oncologist

A physician who specializes in cancer. Medical oncologists treat cancer with drugs, radiation oncologists with radiation, and surgical oncologists with surgery.

P

1p/19q Codeletion

The loss of parts of chromosomes 1 and 19, used together with IDH status to diagnose a type of brain tumour called oligodendroglioma. It also gives information about prognosis.

pan-Canadian Pharmaceutical Alliance (pCPA)

The group through which the federal, provincial and territorial governments, including Québec, negotiate drug prices together after a drug has been reviewed. A drug usually needs a pCPA agreement before public plans list it.

glossary

Pathway

A series of signals or steps inside cells that control how they grow and divide. Cancer often develops when one of these pathways is disrupted by genetic changes.

PD-L1

A protein measured by IHC that can help predict whether some immunotherapies may work.

PIK3CA / AKT1 / PTEN

Genes in a growth pathway that is often switched on in hormone receptor-positive breast cancer. Changes in these genes can guide targeted therapy, usually alongside hormone therapy. They can be found in tissue or by liquid biopsy.

PML-RARA

A gene fusion that defines acute promyelocytic leukemia (APL), a type of leukemia that needs urgent, specific treatment. Finding it quickly changes care.

Polymerase Chain Reaction (PCR)

A lab method that makes many copies of a small piece of DNA or RNA so specific changes can be detected. PCR tests are usually quick and focused on one gene or a few known changes.

PR (Progesterone Receptor)

A protein measured by IHC in breast cancer, usually alongside ER. PR-positive (PR+) means the cancer has progesterone receptors. It adds information about how the cancer may behave and respond to hormone therapy.

Precision Oncology

An approach to cancer care that uses detailed information about a person's cancer, including its genetic and molecular features, to tailor diagnosis and treatment.

Predictive Biomarker

A biomarker that helps show whether a specific treatment is likely to work. Most biomarkers that guide targeted therapy or immunotherapy are predictive.

Prognostic Biomarker

A biomarker that gives information about how a cancer is likely to behave, such as how fast it may grow or come back, regardless of treatment. Some biomarkers are both prognostic and predictive.

Provincial Cancer Agency

The organization that plans and funds cancer care in some provinces, for example BC Cancer or Ontario Health (Cancer Care Ontario). In other provinces and territories, this role sits with the health authority or ministry. Who decides on testing varies across Canada.

PSMA

A protein found on most prostate cancer cells, measured with a special PET scan rather than a tissue test. A PSMA-positive scan can guide radioligand therapy, a treatment that delivers radiation directly to cells carrying PSMA.

Public Funding (Reimbursement)

Whether a provincial or territorial health system pays for a test or treatment. Funding decisions are made in each province and territory, so a test that is covered in one place may not be in another, or may take longer to become available.

R**Real-World Evidence (RWE)**

Data gathered outside of clinical trials, such as through health records or patient registries, to understand how tests or treatments perform in everyday practice.

Reflex Testing

When a laboratory automatically performs biomarker testing once a diagnosis is confirmed, without waiting for a separate request from the treating physician.

Resistance

When a cancer stops responding to a treatment that was working, sometimes because it has developed a new change. Testing again, by tissue or liquid biopsy, can help find the reason and guide the next treatment.

RET

A gene that can be fused with another gene (in lung and thyroid cancers) or mutated (in medullary thyroid cancer). Both can guide targeted therapy. Some RET mutations are inherited and linked to a family cancer syndrome.

glossary

Somatic Mutation

A genetic change that develops in tumour cells during a person's lifetime. Somatic mutations are found in the cancer, not passed down in families, and are the main focus of precision oncology testing.

Special Access

Ways to get a treatment that isn't approved or funded, such as Health Canada's Special Access Program or a manufacturer's compassionate access program. Access usually depends on the person's situation and their doctor's request, and costs aren't always covered.

T

t(11;14) Translocation

An exchange of material between chromosomes 11 and 14, found in some multiple myelomas. It gives information about the disease and can point to a targeted treatment option, sometimes used off-label or in clinical trials.

Targeted Therapy

A drug designed to act on specific genetic or molecular changes in cancer cells, unlike traditional chemotherapy, which affects all rapidly dividing cells.

Tissue Sample (Tumour Block)

Tissue removed during a biopsy or surgery is preserved, usually in a small block of wax, and stored by the pathology lab. This is what most biomarker tests are run on. Each test uses up some of the tissue, so sometimes there isn't enough left for further testing.

TP53 / del(17p)

A TP53 mutation or loss of part of chromosome 17 (where TP53 sits). In chronic lymphocytic leukemia, it means chemotherapy-based treatment is unlikely to work well, so it guides the choice of targeted therapy. It also gives information about prognosis in other blood cancers and many solid tumours.

Triple-Negative Breast Cancer (TNBC)

A breast cancer that is ER-negative, PR-negative and HER2-negative. Hormone therapy and HER2-targeted treatments don't work for it, so other biomarkers, such as PD-L1, BRCA1/2 and HER2-low, help guide treatment.

Tumour Burden

The total amount of cancer in the body, meaning the size and number of tumours. A lower tumour burden can mean less cancer DNA in the blood, so a liquid biopsy is more likely to miss changes.

Tumour Content (Tumour Cellularity)

The share of cells in a sample that are cancer cells. If a sample has too few tumour cells, or too little tissue, a genomic test may fail or miss changes, and a new biopsy or a liquid biopsy may be needed.

Tumour Mutational Burden (TMB)

A measure of how many mutations are in a cancer's DNA. A high TMB can mean the immune system is more likely to recognize the cancer, so it can help show whether immunotherapy may work in some cancers. It is one piece of information, not a guarantee, and how "high" is defined can vary between tests.

Turnaround Time

How long it takes from when a sample is sent to when results reach the care team. Long turnaround times can delay treatment decisions.

V

Variant of Uncertain Significance (VUS)

A change found by testing where there isn't enough evidence yet to know whether it matters. It is not a treatment target, and it may be reclassified as more is learned.