



Understanding Your Options: An Introductory Guide to CTOAM Precision Cancer Care



CTOAM FAQ

**Discover how we can help you access the very best
precision cancer care, worldwide.**

Information for patients, caregivers, and advocates.

Table of Contents

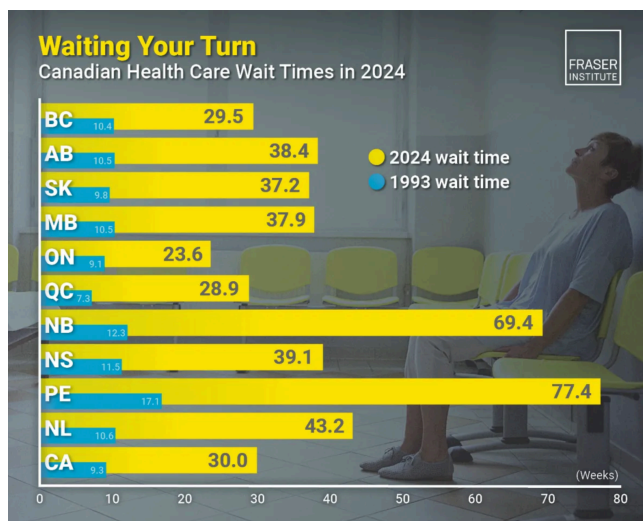
Challenges Patients Face with Standard Cancer Care	2
What is the Problem with Current Wait Times?	2
What is Missing from Standard Genetic Testing?	4
What is Missing from Standard Imaging?	5
Why PET-CT Imaging is Better	7
Why PSMA-PET Scan for Prostate Cancer?	10
When is MRI Best?	11
What is Prenuvo?	11
Why Speed and Precision are Key	12
Why is Early Detection So Important?	12
Why is Using Molecular Testing So Important?	14
How Can I Get a Faster Diagnosis and Optimal Treatment Plan?	15
RNA and DNA Sequencing	16
How Does RNA Testing Compare to DNA Testing?	16
How Does our LRNA Liquid Biopsy Differ from Other Tests?	17
How Does Liquid RNA Testing Compare to Tissue RNA Testing?	19
Why is Exosome-based Testing Important?	20
How Does our LRNA Test Compare to the Standard RGCC Test (“Greek Test”)?	21

Challenges Patients Face with Standard Care

What is the Problem with Current Wait Times?

The Problem with Wait Times in Canada (and Most Countries in the World):

Canada, as well as many other countries across the globe, is facing a nationwide shortage of doctors and nurses, creating significant delays in diagnosis.

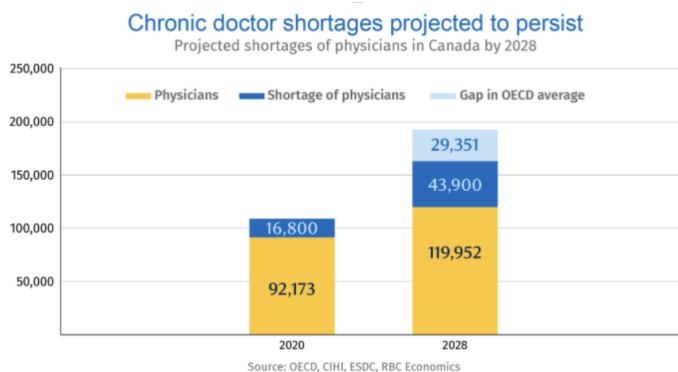


Doctor Shortage is Causing Delays in Diagnosis – and Patients are Suffering the Consequences

- Canada is facing a nationwide shortage of doctors and nurses, creating significant delays in diagnosis.
- Patients across the country are often forced to wait many months – sometimes years – for an accurate cancer diagnosis.
- Long diagnostic wait times can mean weeks or months of uncertainty, which is both stressful and dangerous if cancer is present.
- Delayed diagnosis increases the risk of more advanced disease and fewer treatment options.

Physician workforce shortages are projected to persist, contributing to continued delays in patient access to diagnostic testing and treatment. Proactive solutions are needed now.

- [More than one in five Canadians](#) – an estimated 6.5 million people – don't have a family doctor or nurse practitioner they see regularly.
- [Canada is estimated](#) to be short nearly 44,000 physicians, including over 30,000 family doctors and general practitioners by 2028.
- [Health Canada](#) anticipates a shortage of 78,000 doctors by 2031 and 117,600 nurses by 2030.



While wait times for patients with confirmed cancer diagnoses have not increased to the same degree, significant gaps in care remain:

- Limited access to general practitioners
- Loss of routine annual physical examinations
- Prolonged waits for specialist consultations
- Continued reliance on limited diagnostic tools (e.g., mammography, CT, ultrasound, X-ray), which may miss early disease or produce false-negative and false-positive results

Together, these factors contribute to a critical national issue: A high proportion of cancers in Canada are first diagnosed at Stage IV.

Earlier detection expands treatment options and improves outcomes. Improving timely access to advanced diagnostics must be a national priority.

Patients don't have time to wait. Every week matters.



What is Missing from Standard Genetic Testing?

Limited coverage

- **The problem:** Standard genetic testing is also extremely limited compared to what is possible in medical science today – and available to you immediately through LBL. For example, typical standard genetic testing tests for maybe 10 or 20 mutations.
- **Our solution:** Our comprehensive genetic testing panel tests for over 550 genetic mutations! After receiving those results, we then run our RNA expression testing panel, which tests for over 20,000 genes.

Failure to account for variables

- **The problem:** Standard genetic testing often fails to take into consideration VUSs (Variables of Unknown Significance), sensitivity, emerging mutations, nor the fact that mutations can interact with one another in myriad ways. These variables *must* be factored into things when determining a treatment.
- **Our solution:** Our team of experts account for all of these variables and nuances when analyzing your test results. We conduct personalized cancer research for each patient to match their results to the right treatment – and we also use RNA data gathered from our RNA expression sequencing panels (tissue and blood) to narrow down these treatments with the greatest precision possible.

Improper biopsy handling

- **The problem:** Did you know that in public healthcare genetic testing fails to produce any beneficial data more than 40% of the time? This is because of the improper handling of biopsy samples. Even the most reputable sequencing companies do not use LCM, because it makes their profit margins too small. And patients are unaware that their results are useless due to their biopsy tissue being too degraded.
- **Our solution:** But rest assured, we have a solution – and it's called, Laser Capture Microdissection. Our team uses a specialized type of tissue separation process, called LCM (Laser Capture Microdissection), which provides us with a highly purified sample of DNA or RNA from the smallest amount of tissue. This ensures that our samples are viable and produce valuable results over 98% of the time.



What is Missing from Standard Imaging?

Standard cancer treatment typically begins with diagnostic tests such as Ultrasound and CT scans. However, these tests:

- Do not effectively differentiate cancerous tissue from non-cancerous
- Do not identify the most aggressive tumours
- Do not clearly identify the location of all tumours in your body

This leads to far worse outcomes for patients because of the following:

- Patients are frequently misdiagnosed.
- Doctors are unable to prioritize treatment effectively.
- Doctors are unable to match patients to newer, targeted therapies because there is no molecular testing done.
- It is common for tumours to be completely missed, or to have only partial tumour removal during surgery.

We see far too many patients come to us after being misdiagnosed or having gone on the wrong treatment for years, or after being told they were cancer-free only to learn that the cancer had never gone away. We do not want this to happen to you!

The newer diagnostics within Precision Cancer Medicine – including PET-CT imaging, PET-MRI, and Next-Generation Sequencing (NGS; molecular testing) – provide the ability for experts to:

- Identify exactly where the cancer is in your body;
- Identify the cancer's level of aggression;
- Match you to the exact right treatment for the specific mutations driving your cancer;
- Determine whether your treatment is working optimally within just a few weeks of you starting treatment!

Did you know...a cancer diagnosis based on CT scan has the potential to be completely wrong up to 30% of the time!

That means that 30% of the time people will either be told they don't have cancer when they do...or people will be told they do have cancer when they don't, based on CT scans alone.

So, right off the bat, when your doctor is telling you, "You have cancer" based on a CT scan, it's going to be impossible for you to have confidence in what's actually happening in your body and what your next steps should be.

CT scans...

- Cannot differentiate cancerous tissue from non-cancerous tissue – for example, they can't differentiate between cancerous tissue and cysts or fibroids
- Cannot identify which tumors are slow-growing and which are aggressively growing
- Lack detail and cannot clearly identify the location of all tumours in your body
- Can miss tumors entirely
- Require comparison to base results on, meaning that you need to wait months between scans to get any information at all from them...and insufficient information at that!

They often lead to a false negative, preventing you from accessing treatment while your cancer progresses. And they simply do not provide enough information for your doctor to be able to know with certainty whether you have, or don't have, cancer; where the cancer is in your body; whether or not it is growing; how aggressive or slow-growing it is; and which treatment you should be on.

They're also not sufficient for treatment monitoring. A CT scan is unable to determine whether masses leftover are cancerous. Your CT scan might show signs of cancer, but that cancer might not be active – for example, it could be scar tissue left over from cancer killed off by your treatment. So either way, you won't know whether or not you need to continue treatment.



Why PET-CT Imaging is Better

Why PET-CT?

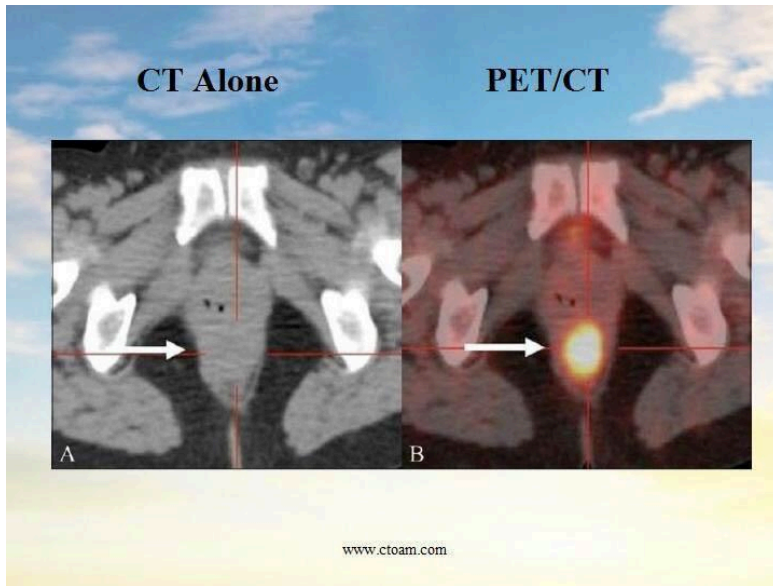
[Statistics from studies](#) worldwide show that cancer treatment plans are changed, on average, over 87% of the time based on PET/CT results. (And 93% of the time for breast cancer!) PET/CT provides you and your doctors with critical information regarding the true stage of your cancer. You will know if you have metastases or not and, if so, where. This helps ensure you get the fastest access to the most effective treatment.

- Surgery can be more effective - more of the tumour(s) can be removed.
- Radiation can be properly targeted.
- You'll get a better biopsy sample to have genetic testing performed.

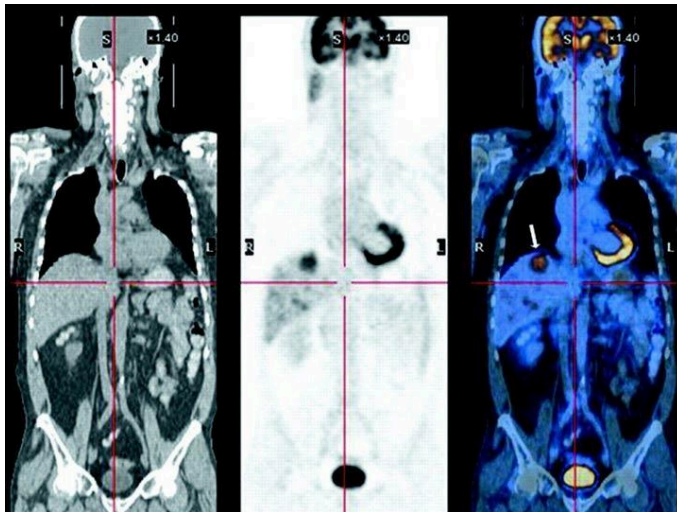
ASCO, for example, has [hundreds of studies](#) touting the merits of PET-CT and PSMA-PET for cancer diagnosis.

PET/CT (Standard FDG PET) and PSMA-PET (for prostate cancer – Prostate Specific Membrane Antigen PET) are the only imaging tests that can tell you definitively with one scan whether you do or don't have cancer.

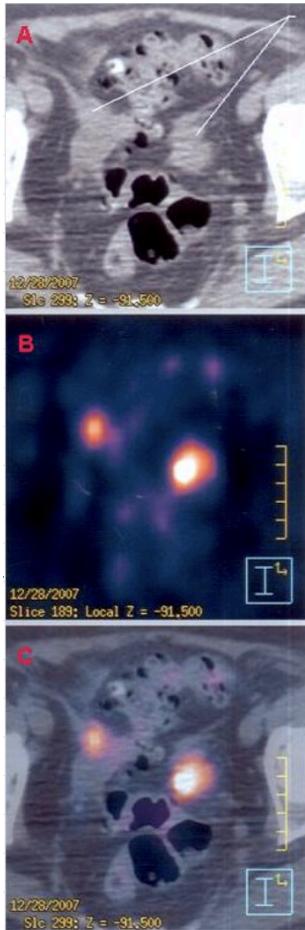
- [The number of clinical PET](#) and PET/CT scans performed in the U.S. was estimated at 1.945 million in 2017. These scans were performed at approximately 2,400 sites.
- [Canadian public health](#) has 45 PET/CT machines at 34 sites and we perform approximately 63,000 PET/CT scans a year, including 7 private ones.
- [Europe and UK](#) were an early adopter of PET/CT.



For example, in the image above, the patient was told they were cancer-free based on the CT scan (left side). When the patient opted to get a private PET/CT scan (right side), the PET/CT scan showed a tumour that would have otherwise gone untreated.



The image above shows a CT scan. You can see some questionable masses in it, but there's NO information to tell us if the masses are, in fact, cancerous – because the CT scan cannot show the difference between abnormalities that are live (malignant) and those that are dead (benign).



The image shows the difference between CT and PET-CT of a 69-year-old woman with colon carcinoma.

- A) is from a CT scan;
- B) is from a PET scan; and
- C) is from a PET/CT scan.

"With PET/CT, Stanford doctors can make more accurate diagnoses, develop more targeted treatment plans, and do better, less-invasive treatment monitoring, which should result in improved patient outcomes." – [Stanford Healthcare](#)

"Unlike computed tomography (CT) or magnetic resonance imaging (MRI), which show anatomic detail, PET images biochemical or physiological phenomena. Because of this, PET offers substantial advantages over anatomic imaging modalities in oncologic imaging. PET can often distinguish between benign and malignant lesions when CT and MRI cannot." – [PubMed](#)
(From 2005!)



Why PSMA-PET Scan for Prostate Cancer?

A PSMA-PET scan is specifically for prostate cancer. It stands for: Prostate Specific Membrane Antigen (not the same as PSA). This test provides prostate cancer patients with a very accurate diagnosis. An entire field of cancer treatment, called Theronostics, has been established for prostate cancer patients based on the benefits of this scan. If you get a PSMA-PET and we learn that Theronostics is the right treatment for you, our team can help coordinate access to this leading-edge treatment. Many of our patients have had great success with Theronostics.

There are many studies proving the benefits of PSMA-PET scans for patients with prostate cancer, such as:

- The researchers [in this study](#) discovered that 46% of the patients with high-risk prostate cancer previously classified as nonmetastatic by conventional imaging had metastatic disease when evaluated with advanced PSMA-PET imaging. Based on PSMA-PET imaging, 24% of the patients showed five or more lesions that had been missed by conventional imaging.
- [This study](#) focused on PSMA-PET/CT and how it can help improve clinical treatment of prostate cancer. It showed that, "compared to the standard scans alone, when PSMA-PET/CT was used, clinicians changed how they might treat a patient with clinically significant prostate cancer in 19% of cases. The technique also helped detect significantly more clinically significant prostate cancers."



When is MRI Best?

What is it and how does it work?

An MRI (Magnetic Resonance Imaging) is a medical imaging technique that uses strong magnetic fields and radio waves to create detailed images of the inside of the body. Unlike X-rays or CT scans, an MRI does not use ionizing radiation, making it a safer option for many patients.

What are the benefits?

MRI is particularly useful in oncology (cancer care) because it provides highly detailed images of soft tissues, making it easier to distinguish between healthy and abnormal tissue. Depending on the case, a contrast agent like gadolinium may be injected into the bloodstream to enhance image clarity.

When is an MRI a good choice for you?

An MRI works really well for cancers that a PET-CT is unable to work for. For example, PET-CT is not a great choice for patients with glioblastomas / brain cancers – because the brain drinks up a lot of the glucose solution (from a PET-CT), which can give false readings. MRI is the preferred imaging test for the brain, since it is very clear. It is worth noting, however, that PET/CT can be used to determine necrosis versus progression in brain cancers.

What is Prenuvo?

What is it and how does it work?

Prenuvo is a specialized whole-body MRI screening service designed for early disease detection, including cancer. It uses advanced high-resolution MRI imaging to scan the entire body in a single session, typically lasting around 60 minutes.

What are the benefits?

Prenuvo is marketed as a preventive screening tool that can help detect cancer in its early stages before symptoms appear. Unlike traditional MRI scans ordered for specific symptoms or conditions, Prenuvo provides a full-body overview, identifying abnormalities in multiple organs at once.

- Early Cancer Detection – Identifies small tumors that may not yet cause symptoms.
- Non-Invasive and Radiation-Free – Uses MRI technology, avoiding radiation exposure from CT scans or PET scans.
- Whole-Body Coverage – Scans the brain, spine, major organs, and soft tissues for potential malignancies.
- Detailed Soft Tissue Imaging – Helps differentiate between benign and malignant growths.



Why Speed and Precision are Key

Why is Early Detection So Important?

When it comes to cancer, time is critical. Early detection greatly increases the chances of successful treatment and long-term remission.

This study, "[Could a Liquid Biopsy Lead to Earlier Diagnoses for Numerous Cancer Types?](#)", highlights the benefit of liquid biopsy for early diagnosis, showing it can significantly reduce cancer-related mortality by enabling earlier intervention.

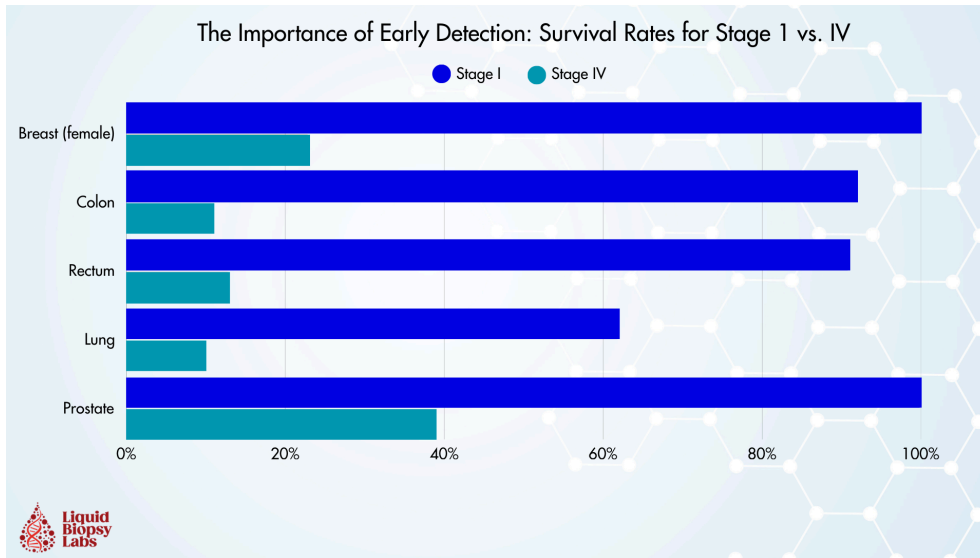
One LRNA Liquid Biopsy is all it takes to know whether cancer is present – with 95% accuracy – and if so, what the molecular profile of your cancer is.

Standard diagnostics like CT scans are too slow and often produce faulty results. They require at least two separate scans for comparison, often spaced months apart, plus additional waiting time for results – and often produce a false positive or false negative.

The World Health Organization Agrees:

"Early diagnosis leads to higher survival and less morbidity; delays mean lower survival, more treatment problems, and higher costs."

The following chart shows the survival rates from a [Canadian study](#) on national stage-specific 5-year net survival rates (2010–2017, Canada excl. QC).



This study shows that early detection makes a dramatic difference in outcomes. Across cancers, 5-year survival is generally over 92% when found early, but falls steeply with advancing stage.



Why is Using Molecular Testing So Important?

Studies show that starting early on the right targeted treatment improves outcomes

This recent study, "[Molecular Profiling to Match Individually Dosed, Personalized Drug Combinations](#)", shows what our team at Liquid Biopsy Labs and CTOAM has known for over 15 years now:

The benefits of matching patients to the correct targeted treatment protocol as early as possible. In this study, 95% of the patients involved (a total of 210) had significant, unique, and – most importantly – targetable mutations.

And this was using an older, small panel of just 324 genes, rather than a panel that covered all known cancer related mutations!

Cancer is not a one-size-fits-all disease.

The more thorough your molecular profiling is, the more options for new molecular targeted therapies and integrative therapies you will identify.

You will also be able to more effectively personalize your diet and supplements to those with proven impact on your primary cancer driving molecular alterations.



How Can I Get a Faster Diagnosis and Optimal Treatment Plan?

Speed and Accuracy Determine a Patient's Success

In standard care, it can take up to 18 months to get a diagnosis...and, even then, the diagnosis is incomplete, lacking the detail needed to identify all possible treatment options – or, in the worst case, the diagnosis is outright inaccurate.

With our testing services, you can receive an accurate diagnosis, and critical information about the molecular features of your cancer, within 3 weeks...

And, if you would like to have further support from our team, we can move forward from there to help you identify and access the most effective targeted treatment for your cancer.

With our team, the entire process – from diagnosis to treatment – takes just two months. In that time, you'll receive:

- LRNA liquid biopsy to confirm whether cancer is present
- PET-CT scan for precise detection and staging
- Tumor DNA sequencing (550+ gene panel) to fully understand your cancer's molecular profile
- Personalized treatment recommendations – proven, leading options from around the world matched to your cancer's unique features

This faster, more detailed process often detects cancer at an earlier stage, dramatically improving treatment success – instead of allowing the disease time to progress to a more advanced stage.



RNA and DNA Sequencing

A critical point for you to understand:

After you get our tumor DNA testing and RNA testing done with us once, you never need to get these tests done again!

As we've mentioned already, our tests are far more comprehensive than any other test out there (including Foundation Medicine, CARIS, etc.).

The results that we gather from your DNA and RNA testing provide us with enough information to identify all possible treatment options for you, both now as well as in the future! So as more new treatments become available, we will immediately be able to identify the ones that will work for you if your current treatment stops working or if something new and better comes out that you can change to.

This is all to say: The investment that you make up front to get these tests done now is an investment that will continue to pay itself forward for years and years to come.

When it comes to cancer, time is of the essence and accuracy of diagnosis & treatment is critical. Get the proper testing done as soon as you can, and you will be reaping the benefits for the rest of your life.

How Does RNA Testing Compare to DNA Testing?

- DNA mutations reflect historical changes in the tumor genome; they do not indicate real-time tumor behavior.
- RNA changes precede DNA mutations and radiologic changes, making RNA ideal for early detection and screening.
- RNA captures current gene activity, pathway activation, immune-tumor interactions, and treatment-sensitivity markers.
- Whole-transcriptome profiling reveals thousands of dynamic biological signals missed by DNA-only tests.



How Does our LRNA Liquid Biopsy Differ from Other Tests?

When it comes to cancer testing, the difference between tests can be literally life-changing.

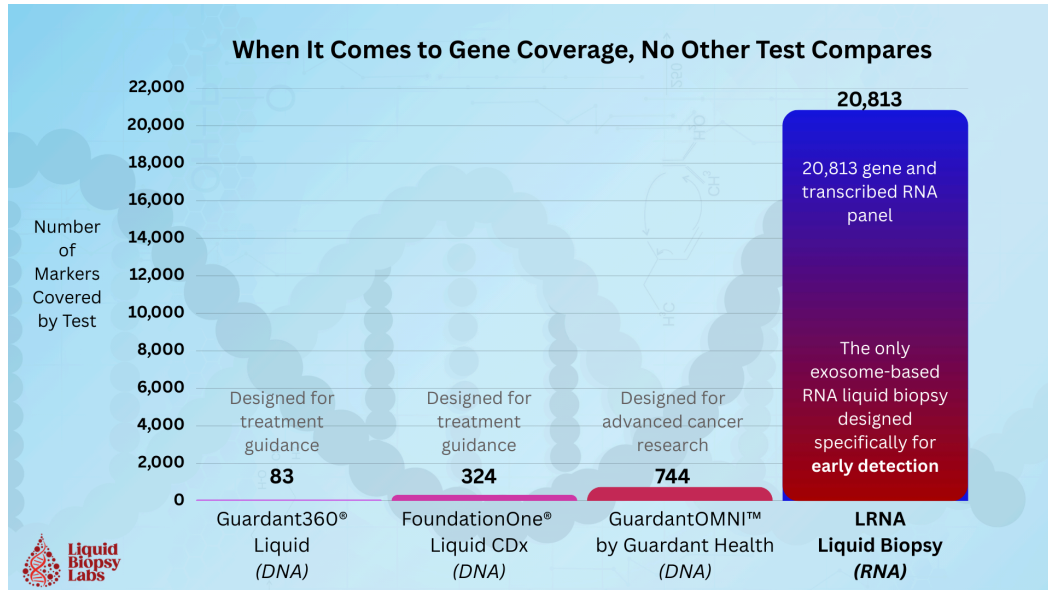
Most liquid biopsies on the market today are DNA-based, looking only at a small slice of cancer-related genes.

In contrast, LRNA is the first oncology test that uses epigenetic regulation to detect early cancer activity.

This means it doesn't just capture static DNA mutations – it reveals real-time cancer activity across cancer-related molecular markers, including the latest genetic and epigenetic markers.

That's why LRNA liquid biopsy analyzes an unprecedented 20,813 genes, compared to just 744 for the next closest test. And, unlike other tests, the LRNA does not just detect the presence or absence of a marker but it also determines the level it is expressed relative to all human tissues.

For patients, this translates into earlier detection, faster clarity, and the most comprehensive insight available into what's really happening in the body.



Comparing the LRNA test to Others

Genetic tests from other companies fall into three functional categories:

1. DNA mutation profiling – these identify genetic mutations to guide drug selection.
2. Tumor tissue prognostic RNA tests – these estimate recurrence risk based on gene expression in removed tumor tissue.
3. ctDNA MRD tests – these look for fragments of tumor DNA in blood after treatment to detect residual disease.

Our L-RNA liquid biopsy is fundamentally different from all three.

It measures exosomal RNA released by living cancer cells into the bloodstream, which reflects real-time tumor biological activity across the entire body.

This allows dynamic assessment of tumor activity, treatment response, recurrence, and disease progression — something DNA tests and tissue-based RNA tests cannot provide.



How Does Liquid RNA Testing Compare to Tissue RNA Testing?

Tissue RNA tests analyze RNA from tumor tissue that was removed during biopsy or surgery. They provide a static snapshot of how aggressive that tumor was at the time it was removed.

Our L-RNA assay analyzes exosomal RNA in blood, which comes from living cancer cells that are actively secreting RNA into circulation. This captures ongoing tumor activity, metastasis, immune evasion, and therapy resistance in real time, including from tumors and micrometastases anywhere in the body.

In summary:

Tumor-tissue RNA tests describe what the tumor was.

Exosomal L-RNA describes what the cancer is doing right now.

Why is Exosome-based Testing Important?

We know that tumours release exosomes which carry the DNA/RNA and proteins the cancer needs to metastasize, and we know that these exosomes can also convert normal cells into tumour cells, so we need to know if they are present to ensure you get the treatment you need before cancer has a chance to progress.

This test looks to see which of those genes are over-expressed in the exosomes, meaning which genes in your blood are showing up in your blood in higher percentages than they should be when we compare your sample to normal / non-cancerous samples.

With the information this test provides we can zero in on the over-expressed genes that are highly involved in your cancer NOW and identify the level of active cancer in your body, as well as start to point towards the treatments that exist to target the most highly expressed genes.

The LRNA Test ensures that patients and doctors have more confidence in which treatment is going to be the most effective; no time wasted and no unnecessary side-effects.

It looks at 20,813 genes found in the exosomes released by tumour cells – all those identified in the widely publicized ‘human genome project’, plus a few thousand genes that have been identified since.

Given the massive amounts of information and numerous targeted treatment options this testing identifies for each patient, it will not be long before this test is standard-of-care.

In the meantime, we are here to ensure you have the most comprehensive and accurate information from which to make your treatment decisions.



How Does our LRNA Test Compare to the Standard RGCC Test (“Greek Test”)?

Developed by molecular oncology scientist, Alex Rolland, the L-RNA Liquid Biopsy far surpasses the standard RGCC – or “Greek Test” – in its capacity for early and accurate detection and for identifying uniquely targeted integrative therapeutic interventions.

The key differentiations between the RGCC and L-RNA tests are:

- RGCC assays are cell-centric, emphasizing the detection and behavior of intact tumor cells. RGCC tests do not provide any genomic mutation data, making it less clinically useful for precision medicine.
- The L-RNA assay is molecular and transcriptomic, capturing active gene expression biology. Because of this, L-RNA provides real time insights into tumor activity, signaling pathways, and biological dynamics, not just tumor cell presence.
- L-RNA can detect disease-associated signals earlier, particularly in settings where circulating tumor cells are rare or absent.
- RGCC and L-RNA address different layers of cancer biology. RGCC assays support cell-based monitoring whereas L-RNA provides high-resolution molecular surveillance and early biological insight.

While RGCC and L-RNA approaches are complementary, they are not equivalent: L-RNA offers a distinct molecular advantage in early detection and longitudinal monitoring.