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Precision Oncology Moves Toward Prevention and Cure

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The market for innovative cancer diagnostics and therapies is far from a "one winner takes all" scenario. While certain tumor indications—such as multiple myeloma, breast and lung cancer—have benefited from significant advances in precision oncology, many cancers remain underserved by personalised approaches. As a result, over the next five to ten years, non-selective regimens such as chemotherapy are expected to progressively give way to biomarker-driven strategies, including minimal residual disease (MRD)-based approaches to deliver novel targeted therapies and immunotherapies, like cell therapies.

Precision Oncology at an Inflection Point

Over recent years, precision oncology has received a growing number of regulatory approvals, reflecting its increasing clinical relevance. In the past decade alone, 33 major new targeted therapies have been approved across 20 cancer types, opening new treatment options for genetically and histologically defined subtypes of tumors[1]. Between July 1, 2024, and June 30, 2025, the US Food and Drug Administration approved 20 new therapeutics for various cancer indications, one new device for treating lung cancer, and expanded indications of eight previously approved therapies to additional cancer types[1].

Looking ahead to 2026 and beyond, we expect this trend to continue, particularly in historically hard-to-treat cancers such as colorectal, prostate, urothelial and pancreatic cancers. Emerging therapies include selective inhibitors of known oncogenes—such as KRAS mutations in pancreatic, colon and lung cancers—as well as radiopharmaceuticals across multiple cancers. Radiopharmaceuticals combine a radioactive compound with a targeting agent that binds specific proteins expressed on cancer cells, enabling highly localised radiation delivery while sparing surrounding healthy tissues. This modality is increasingly positioned as a more precise and safer alternative to conventional radiotherapy.

At Candriam, we actively research and analyse novel pharmacological and diagnostic strategies that have the potential to deliver more effective and personalised cancer treatments. **Our oncology expertise is deployed to identify clinical and commercial assets with the strongest probability of success**, focusing on innovations that can translate into meaningful patient benefit and sustainable long-term value creation.

A Growing Market Driven by Personalisation and Precision

The US precision oncology market reached USD 40.03 billion in 2025 and is expected to grow to approximately USD 104.36 billion by 2035, representing a compound annual growth rate of 10.06% from 2026 to 2035[2].

Demographic trends, including population aging and socioeconomic changes, are expected to drive a substantial increase in global cancer incidence. By 2040, the number of new cancer cases worldwide is projected to rise by 47% compared to 2022, reaching 28.4 million annually. In parallel, government investments, a biotechnology boom, and the digitisation of health data have accelerated innovation across the oncology ecosystem—from drug discovery and diagnostics to smarter clinical trial design.

These developments are shortening development timelines and enabling more targeted and efficient clinical trials. Patients are becoming increasingly engaged in their own care, seeking personalised information that supports informed decision-making. Higher levels of patient engagement, in turn, lead to improved patient-provider relationships, better therapeutic adherence, and ultimately superior clinical outcomes. Together, these actors are reinforcing the long-term growth trajectory of precision oncology.

1 - Source: AACR Cancer Progress Report 2025
2 - www.precedenceresearch.com/precision-oncology-market

Opening the Door to Cancer Prevention Through Diagnostic Innovation

Molecular analysis of plasma samples can identify patients at risk of developing metastases earlier than conventional imaging techniques, while also informing the selection of the most appropriate precision therapies. The future of oncology increasingly depends on delivering the right treatment to the right patient at the right time.

Metastatic disease and cancer recurrence are frequently associated with poor prognosis[3]. Identifying and treating metastatic patients is certainly challenging from many perspectives—scientific, clinical, logistical, and financial. For decades, oncological research has sought to improve outcomes for patients with advanced disease, with notable progress. Today, and even more so in the future, **diagnostic innovation is enabling a shift toward earlier, more tailored interventions that are both clinically effective and less invasive[3].**

Central to this evolution is the integration of advanced diagnostics with personalised therapies. By identifying patients at a pre-metastatic stage or early post-treatment relapse, clinicians can intervene before disease becomes apparent, improving survival prospects. In this context, liquid biopsy—specifically the detection of circulating tumor DNA (ctDNA)—is emerging as a transformative tool in post-treatment management and cancer prevention.

Seeing the Invisible: Liquid Biopsy and Minimal Residual Disease

Liquid biopsy approaches are defining the next wave of personalised post-treatment care. By coupling highly sensitive ctDNA detection with targeted personalised treatments, clinicians can intervene before metastatic outgrowth becomes macroscopically evident, enabling faster, more precise treatments with curative intent.

Following surgery or treatment of a primary tumor, patients are often classified as tumor-free based on imaging modalities such as CT or MRI. However, microscopic reservoirs or cancer cells—referred to as minimal residual disease (MRD)—may persist and later drive relapse or metastatic spread. Detecting this microscopic disease represents a major challenge for conventional diagnostics.

Liquid biopsy addresses this unmet need by enabling the detection of very small numbers of cancer cells through the presence of their DNA—ctDNA—in the bloodstream. Even when minimal residual disease is present at microscopic levels, ctDNA can be identified through highly sensitive and non-invasive molecular assays. This allows clinicians to capture metastatic risk months or even years before it becomes visible on canonical imaging.

Importantly, ctDNA analysis offers more than early detection. It can identify tumor genetic alterations, some of which are actionable with targeted therapies. This dual role—detecting residual disease and guiding therapeutic decisions—forms the foundation of the MRD-driven precision oncology era.

From a biological perspective, intervening at the MRD-positive stage offers clear advantages. Microscopic disease is typically characterised by lower tumor burden and reduced genetic heterogeneity, making it more responsive to treatment. Clinical experience shows that drugs are more effective when deployed early, before widespread metastatic dissemination and outgrow occur. In this setting, MRD-guided intervention introduces the possibility of long-term remission, and in some cases, cure[4].

3 - PLoS One 2025 Jun 11;20(6):e0325769. doi: 10.1371/journal.pone.0325769
4 - Measurable residual disease (MRD)-testing in haematological and solid cancers – PMC. https://pmc.ncbi.nlm.nih.gov/articles/PMC11147778/

Early and Growing Clinical Successes of MRD-Guided Precision Oncology

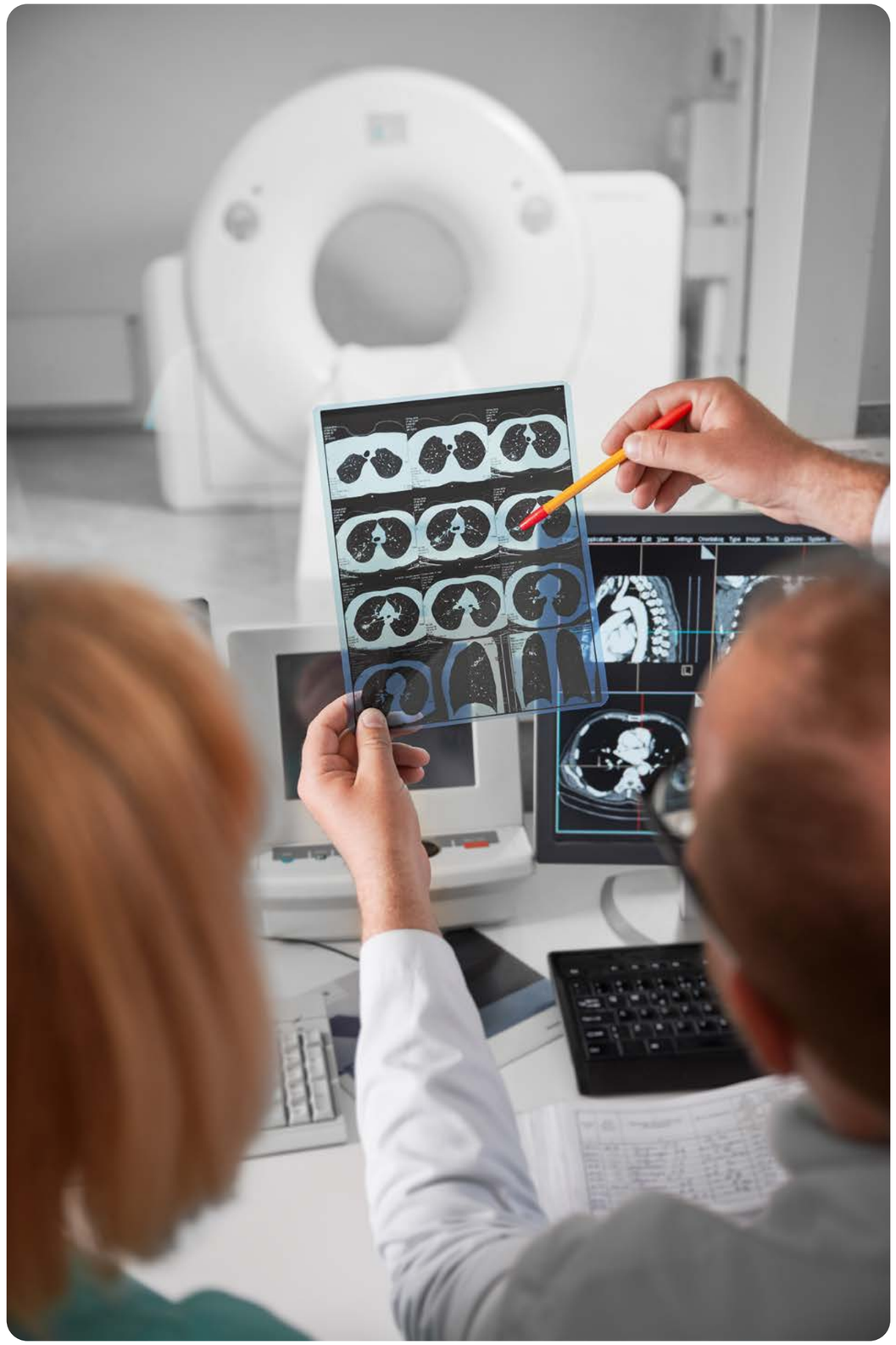
MRD testing is redefining therapeutic decision-making by shifting the focus from clinicopathological features alone to molecular and genomic characteristics. Monitoring of ctDNA dynamics can reveal treatment response, resistance, and relapse risk with greater precision than imaging.

While curative outcomes remain challenging in many cancers, evidence supporting MRD-guided treatment strategies is expanding beyond hematological malignancies into solid tumors[4&5]. In pancreatic cancer, detection of a key genetic tumor discriminant, mutant KRAS, has been shown to predict metastatic relapses earlier than conventional methods, offering insights into surgical outcomes and post-treatment management. New targeted KRAS drugs currently in late-stage development with potential approval later this year in the US.

In colorectal cancer, a recent study showed that MRD-positive patients following surgical removal of the primary tumor had worse survival outcomes, whereas sustained conversion from MRD positivity to negativity during chemotherapy is associated with long-term survival. This enables risk-adapted treatment intensification for high-risk patients while sparing low-risk patients from unnecessary toxicity.

Similar findings have been reported in metastatic kidney cancer, melanoma, and cervical cancer, where ctDNA monitoring has been shown to predict cancer progression, relapse, and survival outcomes.

Collectively, these data underscore the **growing role of liquid biopsy in screening, diagnosis, monitoring, while offering a minimally invasive approach** to select patients most likely to benefit from specific therapies, improving clinical outcomes and reducing the risk of unnecessary toxicities. The increasing integration of liquid biopsy into clinical practice, supported by rapid advancements in this field, underscores its potential to refine oncology management[5&6].



5 - Frontiers | Minimal residual disease detection in lymphoma: methods, procedures and clinical significance. https://www.frontiersin.org/journals/immunology/articles/10.3389/fimmu.2024.1430070/full

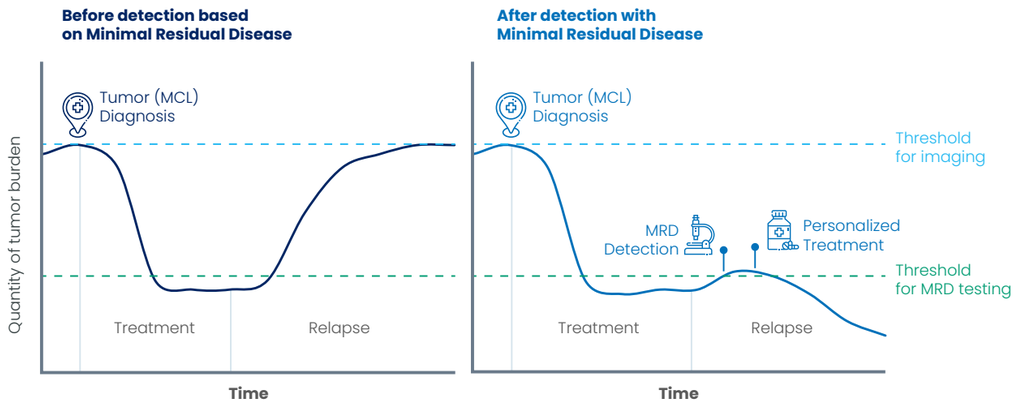
Treating Earlier, Treating Smarter: MRD Testing and Cell Therapy

With the ongoing diagnostic advancements, therapeutic strategies are shifting toward earlier deployment aiming at safer, more effective and durable treatments. Among these, **we expect cell therapies to gain approvals in earlier disease settings across multiple cancer indications.**

Recent studies in lymphomas have demonstrated that liquid biopsy can detect residual tumor cells missed by imaging, with up to 80% of MRD-positive patients eventually relapsing[7]. Early intervention therefore aims to avoid overtreatment while prioritising therapies with the most favorable benefit-risk profile.

Personalised immunotherapies such as cell therapies—engineered immune cells designed to recognise and eliminate specific cancer clones—represent a promising option in this context. These therapies can be administered as a single, potentially curative treatment, offering durable disease control while minimising long-term toxicity. By combining MRD testing with early development of cell therapies, oncology is moving toward a paradigm in which patients receive the most effective treatments only once, at the optimal time[6] (figure 1).

Figure 1. Pre and post MRD era in treatment outcome and decision in lymphomas



Source Candriam, based on data from The University of Texas MD Anderson Cancer Center © All rights reserved.

General overview of minimal residual disease detection. The figure shows two scenarios emphasising the importance of MRD detection after initial treatment of mantle cell lymphoma (MCL). (Left) When MRD detection is not performed, there is no indication of how effective the treatment was on the tumor as the canonical imaging detection (-) is below the range of sensitivity to capture early relapse, and macroscopic relapse may eventually occur over time. (Right) If MRD diagnosis confirms a positive result, the patient can be prescribed to a more personalised treatment to prevent any future relapses (Source: Journal of Hematology & Oncology 13(1):127:10.1186/s13045-020-00961-8).

6 - Impact of Circulating Tumor DNA–Based Detection of Molecular Residual Disease on the Conduct and Design of Clinical Trials for Solid Tumors – PMC. https://pmc.ncbi.nlm.nih.gov/articles/PMC8926064/

7 - Liquid biopsies and minimal residual disease in lymphoid malignancies - PMC. https://pmc.ncbi.nlm.nih.gov/articles/PMC10203459/

Oncology: a Defensive Growth Segment in a Challenging Macroeconomic Environment

Oncology remains one of the most dynamic segments within healthcare, supported by strong demographic, clinical and technological drivers. Healthcare is driven by a constant demand of cures as the result of the increasing prevalence of diseases including cancer that remains, unfortunately, the second leading cause of death in the US and globally. We believe that the oncology market is undergoing significant growth, that can be captured from a financial perspective.

Healthcare demand is largely insensitive to economic cycles, and oncology continues to benefit from sustained innovation, high pricing power, high margins and expanding clinical markets. Many oncology companies exhibit bolstered balance sheets with growing revenues and lesser sensitivity to higher financing costs.

Looking at valuation and the financing dynamics of the most innovative companies in the sector, we acknowledge the presence of key triggers that should support growth:

- an advanced level of maturity of technologies in development, indicating a higher likelihood of success);
- greater approval of new medicines and diagnostic tools;
- reasonable and/or depressed valuations of these companies/assets with regard to their advanced stage of clinical/commercial development. Many companies in an advanced stage of development or close to drug approval exhibit valuations closer to early-stage companies.

We see these indicators as a signal of **increased investment opportunities** in solid companies with mature data and development stages. Additionally, we expect a recovery in business consolidations (acquisitions) in the public sector. In this regard, 2025 saw four major oncology acquisitions by big pharma, representing 34% of the entire capital deployed in M&A for the year[8].

Candriam's oncology strategy focuses on best-in-class technologies and assets with strong clinical data, commercial potential, and long-term growth prospects. For investors, this represents a unique opportunity to gain exposure to a resilient, innovative sector poised for sustainable, long-term growth.

8 - LifeSci Capital BioPharma M&A Quarterly Update Q42025