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PanTum Detect

The first blood test for the early detection of all cancers

A proven, cost-effective diagnostic tool for screening programs.

Providing a first point of information that will help save more lives and meet cancer targets in the UK and worldwide.

01

EXECUTIVE SUMMARY

A proven, non-invasive blood test that can detect any cancer at any stage, saving lives and resources now and in the future.

One in two people in the UK will be diagnosed with cancer in their lifetime.[1] The earlier cancer is diagnosed, the better the chances of survival.

But the disruption to cancer services caused by the COVID-19 crisis means many of these diagnoses are being missed or delayed. Postponed check-ups, tests and treatment are resulting in longer waiting times and poorer health outcomes.[2] And with cancer incidence rates already rising, this backlog will have a compounding effect on resources that are already overstretched.

Fast action is required to revolutionise cancer screening in order to address the prolonged waiting times and improve long term cancer survival rates in line with NHS targets.

Liquid biopsy is an exciting response to the early detection challenge that has been gathering momentum in recent years. Several cancer blood tests have been trialled with promising results. PanTum Detect is the first proven to provide early detection of multiple cancers with a single test.

Studies have shown that it can detect tumours anywhere in the body with a sensitivity of 82.3% and can rule out healthy individuals with 99.2% specificity: [3] the first to achieve this high level of accuracy for multiple cancers.

The test is the result of over two decades of international research and development.

To date, PanTum Detect has been tested using more than 160,000 samples and found to be effective across 50+ cancer tumour types, which together represent the majority of all cancer[3] cases.

Already commercially available as part of a screening program in Germany, India, Thailand, Belarus, and the UAE with plans for roll-out in China, it's a significant breakthrough for cancer diagnostics.

It's a cost-effective way to provide even earlier stage screening, so that further diagnostic activity and resources are focused on those with a higher probability of having a confirmed cancer diagnosis.

Rather than focusing on multiple single-cancer screening tests, a universal test can improve the overall effectiveness of early screening programs.

If implemented at scale, the PanTum Detect test could help the NHS and healthcare services worldwide to save many more lives and considerable resources now and in the future.

THE CHALLENGE:
Detecting Cancer Early

The earlier cancer is found, the sooner it can be treated.

Every two minutes, someone in the UK is diagnosed with cancer.[4]
What happens after that diagnosis depends a great deal on when the diagnosis was confirmed: earlier diagnosis means a better chance of survival. Unfortunately, almost half of all cancers in England are diagnosed at a late stage.

With cancer incidence continuing to rise, early detection is crucial to improve patient outcomes and reduce pressure on services. Recognising this, the NHS Long Term Plan outlines two targets to achieve a step-change in cancer diagnosis:[5]

- By 2028, the proportion of cancers diagnosed at stages one and two should rise from around half to three quarters of cancer patients.
- From 2028, 55,000 more people each year should survive their cancer for at least five years following diagnosis.

The public agree, with 95% of those asked in a survey commissioned by RMDM stating that early detection of cancer should be a top priority for the NHS.*

**Survey of 2003 British adults, undertaken in 2019 by Censuswide, commissioned by RMDM*

The lasting COVID effect: delayed diagnosis and overstretched services

These were already ambitious goals, but the remaining disruption to cancer diagnostic services caused by COVID-19 makes them even more challenging. More than 50,000 people were thought to be 'missing' a cancer diagnosis in early 2021.

Between March 2020 and March 2021, over 40,000 fewer people started cancer treatment than expected. Since then, the NHS has worked hard to catch up, but the lasting impact of the pandemic has only intensified existing problems. Recent data shows tens of thousands of people are still waiting longer for diagnosis or vital treatments. The BBC revealed that "cancer waiting times for 2023 in England were the worst on record".

Only 64.1% of patients started treatment within 62 days of a cancer suspicion, meaning nearly 100,000 people waited longer than they should for life-saving care.[6] These numbers are not just another statistic, they reflect the immediate action required by the NHS and the government.

Delayed diagnosis has a compounding effect as more patients are diagnosed at later stages, and services struggle to keep up with the backlog in diagnostic services and treatment. Improving early diagnosis programmes and interventions will not only achieve the existing long-term targets but is essential to ease pressure on overstretched services.

Could liquid biopsy offer a solution?

While efforts to raise public awareness and overhaul screening programmes are to be welcomed, current diagnostic and screening pathways are not sufficient to radically improve early diagnosis, especially for asymptomatic cancers and cancers with no screening test available. Identifying accurate, reliable and cost-effective ways to diagnose all cancers as early as possible will reduce pressure and costs along the entire cancer pathway.

Liquid biopsy technology is one such method. This non-invasive blood test can detect cancerous tumours with extremely high levels of accuracy. There has been a huge amount of innovation in this area in recent years, and liquid biopsy tests are now becoming available commercially and in NHS trials.

By making diagnosis possible even earlier in the cancer pathway, a single test for multiple cancers has the potential to transform cancer services and save many more lives.

Patients with a result confirming the suspicion of solid tumours can be offered accelerated diagnosis and treatment, while those with a non-cancer suspicious result can be given faster reassurance without unnecessary use of resources further along the pathway.

Not only will this create a better patient experience and better management of waiting lists, it will also allow the system to focus its constrained diagnostic capacity on those most likely to be given a confirmed cancer diagnosis. Without such a test, healthcare professionals will be forced to continue to operate within a system that prevents them from making the difference they want to see. The existing conservative approach to early diagnosis is at odds with the bold goals of the NHS Long Term Plan, and is already overwhelmed by the long term effects of the pandemic.

Radical, innovative change requires buy-in and commitment at all levels of decision-making in the health service. But the evidence is there to support a compelling business case for embracing pan-tumour liquid biopsy technology more fully as part of the NHS' early detection strategy.

The Long Term Plan talks about optimism and possibilities for continuing medical advances and better outcomes of care. With just a simple blood draw, it is possible to detect the presence of many types of cancer at an early stage. Healthcare leaders are focusing less on limited individual cancer tests and prioritizing a multi-cancer test. This shift should hopefully lead to less-intensive treatments and better patient outcomes.[7]

This paper outlines how liquid biopsy in the form of the ground-breaking PanTum Detect test – the first universal cancer diagnostic blood test – could solve some of the biggest problems in cancer care, and transform cancer diagnostic services on a long-term, sustainable basis.

THE SOLUTION:

A Single Test For Early Detection Of All Cancers

Liquid biopsy: the future of cancer diagnostics

The gold standard in cancer detection has always been tissue biopsy. But the procedure is invasive, time-consuming, and often painful or stressful for patients.

More significantly, its efficacy is often limited: cancer cells may not be present in the area biopsied, and early-stage cancers may be undetectable or easily missed. Liquid biopsy is a non-invasive alternative.

Changes in cells can be detected far sooner than conventional imaging and biopsy tests, which means an earlier diagnosis for the patient. The quick test eliminates the need for long waiting times, so treatment can begin sooner, resulting in a much better prognosis for the patient. Unlike tissue biopsies, where changes in tumours over time mean results may not reflect the current status of the disease, liquid biopsy provides real-time information on disease stage.

This helps to identify the type of treatment that is likely to be most effective for the patient, and track treatment response and disease progression with greater accuracy.

Liquid biopsy tests are already in use in the NHS but are limited to certain cancer types. With PanTum Detect, we now have the world's first blood test able to detect solid tumours at an early stage. It's the new gold standard for cancer diagnosis.

The analysis of tumours using biomarkers in blood is beginning to transform cancer diagnosis. The challenge now is to make liquid biopsy a standard clinical tool.

Catherine Alix-Panabières
Cancer cell biologist at the University Medical Centre of Montpellier, France[8]

The Science

Dr Johannes Coy is a world-renowned cancer research scientist and the discoverer of the TKTL1 gene. With over 30 years of experience, Dr Coy is a pioneer in the field, forging fresh connections between medicine, nutrition and pharmaceutics; ultimately opening up a transformative way of detecting and treating cancer.

Many years of research were necessary to convince the scientific community – now we step into a new era of cancer treatment.

Dr. Johannes Coy

Short summary of scientific achievements:

a) Scientific achievements related to DNaseX and its clinical impact enabling the early detection of all types of tumours

b) Scientific achievements related to TKTL1 and its clinical impact enabling the early detection of malignant tumours as well as the detection of a target (TKTL1), which can be used for a small compound-based treatment with benfo-oxythiamine (B-OT)

c) Establishment of the vitamin B1 (thiamine) derivative benfo-oxythiamine for sensitizing resistant tumours to established cancer drugs

d) Establishment of a nutritional concept to sensitize tumours to chemo-, radio- and targeted therapies by inducing a metabolic switch from sugar fermentation to OxPhos based energy release

e) Establishment of a new method for detecting biomarkers in blood – the epitope detection in monocytes (EDIM)

f) Use of the EDIM technology for detecting biomarkers DnaseX/ Apo10 and TKTL1 in blood enabling an early detection and characterization of cancer

g) Use of the EDIM technology for detecting neuron-specific markers in blood enabling an early detection of neurodegenerative diseases

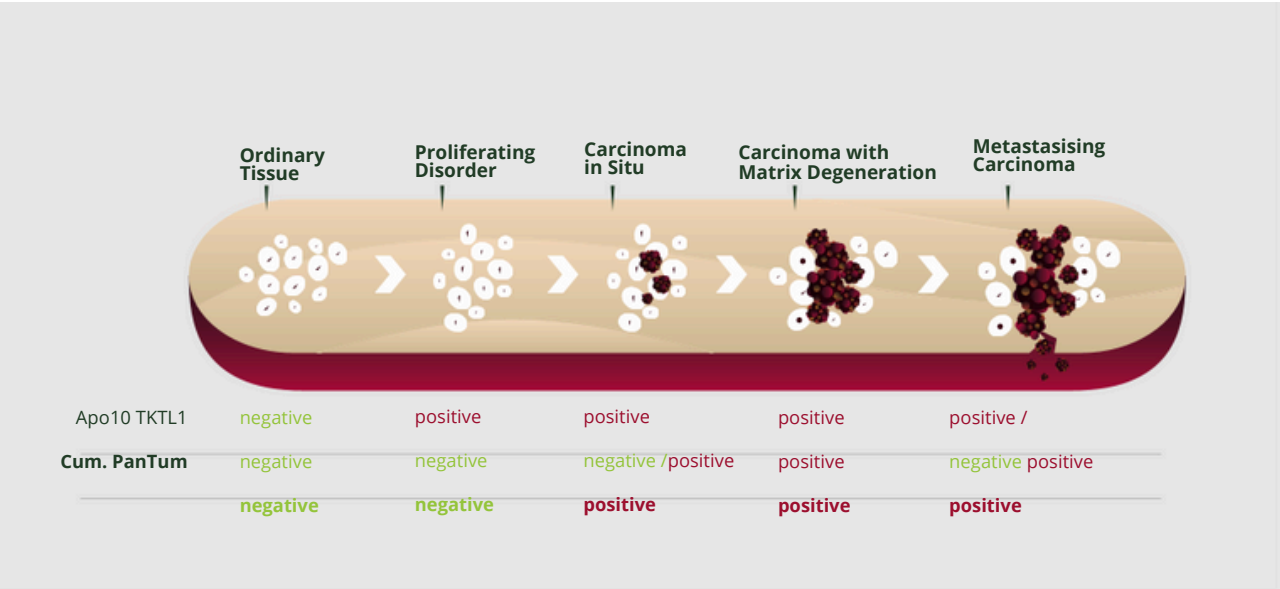
The PanTum Detect test: using the body's immune system to detect cancer anywhere in the body

Decades of research have confirmed the efficacy of different types of liquid biopsy for multiple types of cancer. But one particular ground-breaking discovery unlocks the possibility of a pan-cancer test with extremely high sensitivity and specificity.

World-renowned cancer researcher Dr Johannes Coy and his team developed Epitope Detection in Macrophages (EDIM), an innovative technology which draws upon the natural mechanism of the immune system to collect macrophages and detect universal biomarkers Apo10 and TKTL1. Apo10 is found in the earliest signs of tumour development, while TKTL1, discovered by Dr Coy, manifests at the early stages of metastasis. [9,10]

While other cancer blood tests search for multiple biomarkers for specific cancer types, the PanTum Detect test uses EDIM to track these two biomarkers, which together can detect the presence of any early-stage cancer. It's far more efficient and cost-effective.

Using flow cytometry, each biomarker is given a score depending on how much is present in the sample and the scores combined to give a positive or negative result. Clinicians can then use that result to decide on the best next steps for the patient, taking into account the wider clinical picture.



The PanTum Detect test has been proven reliable in several studies. CE certification in 2017 was awarded on the basis of the following performance data: [3]

82.3%
SENSITIVITY

&

99.2%
SPECIFICITY

This means the test correctly identifies a tumour in 82.3 out of every 100 people, and only 1 in 100 people is given a false positive result. This high level of sensitivity is possible because the relevant tumour biomarkers are well-conserved and highly concentrated in the macrophages (white blood cells) analysed in the test.

It is important for an early detection cancer test to have a very high specificity since the uncertainty of a false-positive result is an unnecessary burden for asymptomatic patients. Most liquid biopsy tests usually detect the presence of a biomarker in the blood, however the use of macrophage detection in the PanTum Detect test enables a very accurate result. This high specificity is achieved by observing the immune system's response to these biomarkers.

How PanTum Detect measures up against other cancer liquid biopsy tests

Test	Number of confirmed cancer types tested	Sensitivity %	Specificity %
Pantum Detect	>50	82.3	99.2
iFinder	8	90	94
Cancer Seek	8	70	99
OncoDiscover	12	80	98
Grail	20	80	99
IvyGene Core Test	4	84	88
Epigeonemics	3	80	96
Freenome	7	85	93

According to the latest publicly available data, PanTum Detect has more cancer types confirmed than any other liquid biopsy test either on the market or in clinical development. Also the 82.3% sensitivity, recorded officially for the CE license approval, is the best in its class, as well as the combination with specificity.

The Strength of Pantum Detect Proven by Clinical Studies

Numerous studies by researchers at the University Hospital of Tübingen prove the performance strength of the PanTum Detect test. For a decade, the test has been rigorously studied with a total of 652 cancer patients and 252 healthy volunteers (control groups) examined. Out of the group of cancer patients, the test delivered correct-positive results for 627 of 652 samples. In the control groups (252 healthy volunteers), the test showed a total of only 3 false-positive results.

These results showcase the reliability and accuracy of Pantum Detect and confirms that it can indicate tumour suspicion, independent of the tumour entity. Therefore, for the first time, tumours without established detection methods can now be detected. Further tests showed PanTum Detect's ability to easily distinguish between healthy and sick patients by accurately delivering a test-positive result for sick patients.

An overview of all published studies on the EDIM technology can be found in Table 1, in the appendix.

A fundamental clinical study with 5,000 participants was completed in Germany in May 2022. This study strongly confirms the efficacy of combining the PanTum Detect test with imaging to detect and localize early signs of cancer.

The randomised, multi-centre study was conducted by the University Hospital Hamburg Eppendorf (UKE) under the direction of Prof. Dr Ralf Smeets and Dr Simon Burg.

Over 3% of the 5,000 healthy study participants were referred for imaging procedures following a cancer-suspicious blood test result. In 82% of the cancer-suspicious cases (about 124 people), a previously undetected, symptom-free cancer or precancerous stage was found.

A total of 29 different types of cancer were detected during the study.

The researchers highlighted the benefits of combining the test with imaging as an early detection screening program:

"Our results indicate that the PanTum Detect blood test could be used as a screening tool and, in combination with PET/CT and MRI, enables the detection of malignant tumours and pre-malignant lesions at a stage where, in many cases, there is a good chance for a cure." [11]

It is also important for an early cancer detection test to distinguish between benign tumours and invasive malignant tumours. A study by Xie et al demonstrates that the biomarker combination of TKTL1 and DNaseX (Apo10) with EDIM technology is superior to other commonly used markers.

In a study of 156 patients with early-stage lung cancer and 153 subjects in the control group of healthy patients (some healthy, some with benign lung nodules) the PanTum Detect score was significantly higher in the diseased group compared to the control group.[12]

These consistent results from a variety of studies support the importance of these unique biomarkers and the EDIM technology.

How could the PanTum Detect support and improve cancer diagnostics in the UK?

The PanTum Detect test, brought to market by the RMDM Group, has enormous potential to support the NHS Recovery Programme for patients experiencing longer waiting times as a result of the pandemic. Quickly administered and analysed, it could cut through the screening and testing backlog much faster than traditional biopsy methods.

A universal cancer blood test can help mitigate the challenge of healthcare demand outstripping resources. This could be managed in several ways:

- **Mass/targeted screening in primary care:** The test could be rolled out as a more accurate, agile and cost-effective alternative to routine population screening programmes. The PanTum Detect test, alongside imaging methods such as PET/CT or MRI, can detect cancer and its precursors with unprecedented accuracy. Patients with a non-cancer suspicious result can be ruled out quickly without being referred for more invasive and expensive tests, thus reducing pressure on downstream services and allowing those with cancer suspicious results to be referred for further tests without delay. The test could also be recommended for patients with familial or genetic risk of particular cancers, and patients at high risk of developing asymptomatic cancers.

- **Corroboration of existing screening methods:** the test can be used to validate tests with lower sensitivity, such as PSA assessment, either to increase confidence in the results or as a precursor to ensure more invasive tests are used only when absolutely necessary. For example, pancreatic cancer is considered one of the most aggressive tumours. It is usually only discovered in the metastasized state. At this stage, there is usually no chance of a cure. However, PET/CT could provide valuable information as to whether a metabolic change can be detected in a cyst. This would allow healthcare providers to act sooner.

Reducing costs to the NHS

As a straightforward biomarkers test based on a simple blood draw, PanTum Detect is an affordable and cost-effective test.

Through increasing the rates of early diagnosis, the test can also reduce the NHS's massive (and growing) cancer diagnosis and care costs by:

- **Reducing the total number of referrals to specialist cancer care**
- **Increasing the number of early-stage cancer patients, as treatment is more cost-effective in early-stage cancer**
- **Targeting patients with asymptomatic cancers, which tend to have very high treatment costs, as they are often diagnosed at a late stage**

The test is simple to use for the patient and the clinical team, further releasing capacity for the workforce and lab services further down the line. A step-by-step protocol exists to simplify training and implementation, and training support can be provided. Running the test and capturing the results can be done within a single day, depending on demand and capacity.

Addressing clinician/patient demand for better cancer diagnostics

Our survey confirmed that patients want better access to regular cancer testing. Out of more than 2000 people asked, 63% think current cancer diagnosis methods take too long, while 84% would use cancer screening technologies if they were made available earlier and more regularly.

They also much prefer non-invasive options. While physical biopsies may ultimately be required, imagine the relief to be offered a simple blood test instead of an uncomfortable cervical screening examination, prostate examination, or colonoscopy in the first instance.

Clinicians want to be able to support their patients with earlier cancer testing, and the PanTum Detect test offers them the ability to do this with more confidence, and refer to secondary care more quickly.

Regular use of FDG-PET/CT scans for screening of healthy, asymptomatic people is not cost-effective and exposes patients to high levels of radiation. Filtering out patients with tumour-suspicion for further imaging with a blood test optimises the pathway to treatment.

> ”Following extensive research, investment and development, we are now in a position to revolutionise cancer care in the UK. Over 80% of the British adults in our research stated that they would prefer a non-invasive blood test to current screening procedures. Our blood test will take away the fear factor for biopsies and will give the NHS the confidence to run more universal screening campaigns.”
>
> *Dr Letizia Gulino, PhD, Head of Science & Technology, RMDM*

Support for PanTum Detect in the UK

A year-long internal validation and trial of PanTum Detect concluded in September 2021 at The Centre for Health and Human Performance (CHHP) in Harley Street, London.

Despite the difficulties of the pandemic, CHHP continued to trust that this technology can help save lives. We are grateful to Dr Jack Kreindler and Professor Greg Whyte OBE for their support.

A number of London-based functional clinicians, physicians, and oncologists have shown great interest in sending patients to a lab hosting the technology for earlier diagnosis.

There is a huge opportunity to build on the lessons learned from the use of existing liquid biopsy tests in the NHS, and develop a plan for the adoption of a universal cancer test that can benefit many more people in the UK.

"Current cancer screening generally detects cancer too late, when it is firmly established. Detecting the earliest signs of cancer presence has been a major challenge to doctors and scientists over the years; and is still the case.

I believe that the PanTum test represents a significant potential breakthrough in that it is based on detection of the much earlier changes in metabolism that differentiate cancers cells from normal cells and that occur when a cancer is more juvenile. Results thus far suggest that the PanTum test has a high degree of accuracy."

Dr Nyjon Eccles, The Natural Doctor Clinic London

Prior to the COVID-19 crisis, the RMDM team met the Secretary of State for Health and numerous members of the Health Select Committee in Parliament, who were enthusiastic about the PanTum Detect test's potential to revolutionise cancer diagnostics.

RMDM welcomes partnerships with research programs to showcase how Pantum Detect can enhance multi-cancer screening efforts. We are actively collaborating with research institutions and public health authorities to propose pilot studies aimed at alleviating the pressures on national healthcare services, with a focus on showcasing PanTum Detect as an effective screening tool.

> "Whilst the NHS Long Term Plan has identified early detection of cancer to be a top priority, it is clear from this research that the government must act faster to improve cancer screening in the UK. RMDM's non-invasive blood test can detect any cancer at any stage with a high level of accuracy, improving cancer survival rates and saving the NHS time and money. Our ground-breaking technology is already being used in Germany and the UAE and we are urging the UK government to act quicker to adopt lifesaving cancer technologies."
>
> *Ali Ghaidan, CEO, RMDM*

We welcome the opportunity to discuss PanTum Detect with any decision-makers who are curious about how the test can help move the NHS closer to its target of saving up to half a million lives more.

PANTUM DETECT:
A Universal Solution for a Global Issue

Cancer is a global issue. Based on current scientific evidence, at least 40% of all cancer cases could be prevented with effective primary prevention measures, and further mortality can be reduced through early detection of tumours.[13] Alongside our activities in the UK, we're actively teaming up with key opinion leaders in the MENA region to tackle the issue of rising cancer rates by implementing early detection solutions.

How could the PanTum Detect support and improve cancer diagnostics in the MENA region?

The Gulf States and the Eastern Mediterranean Region (EMR) countries show a disturbing rise in the number of cancer patients. Long-term estimation illustrates that by 2030, there would be a 1.8-fold spike in the cancer incidence rate. According to the latest cancer incidence report from the Gulf Centre for Cancer Control and Prevention, most cancers from the Gulf States are diagnosed at late stages and affect a much younger population.[14] Approximately 4,807 new cancer cases were reported in 2020 in the UAE alone (International Agency for Research on Cancer, WHO).

The most frequent cancer cases reported in 2020 in the UAE include:

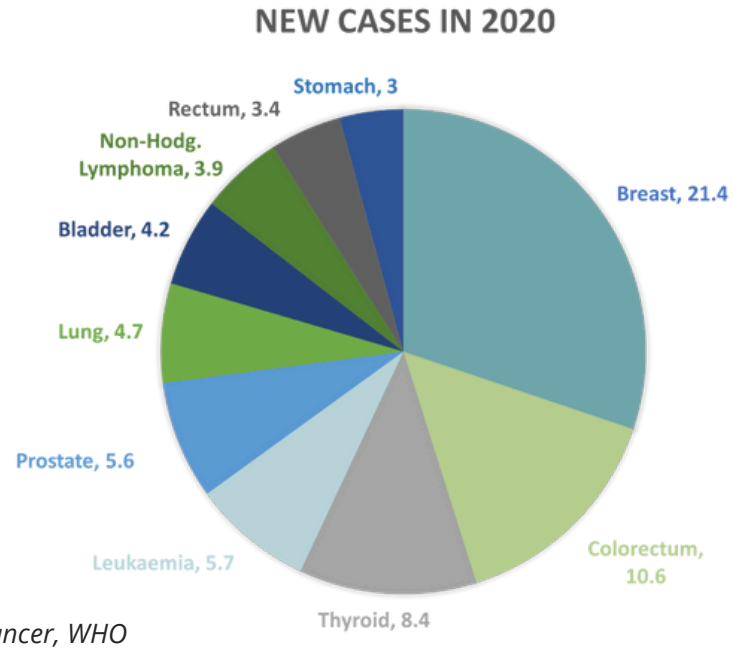


Fig. 1 International Agency for Research on Cancer, WHO

Therefore, now is the time for effective action to start shifting these statistics. In recent years, the United Arab Emirates (UAE) has experienced a dynamic healthcare landscape, marked by significant advancements in medical infrastructure and services. There are local screening programs available for breast, colorectal and cervical cancers in major cities such as Abu Dhabi and Dubai. However, this current system presents certain challenges, including:

- It is difficult to record the uptake of these screening programs, due to a lack of published data. Unofficial reports estimate that breast and colorectal cancer screening is used by only 25% of the population.

- The screening centres are only located in major cities, creating accessibility issues for a majority of the population.[15]

- Increasing the number of individual cancer tests is not cost-effective, therefore other solutions are required.

Given these obstacles, it's understandable why a UAE-wide national screening program does not exist yet. The government has formulated and implemented a **Cancer Control Plan** to effectively combat and manage this health crisis.[16] By combining prevention, early detection, treatment, and research, the UAE aims to create a comprehensive and effective strategy to combat cancer and ensure a healthier future for its citizens. Regular evaluation and surveillance will be crucial in responding to the evolving landscape of cancer care and treatment.

A swift and definitive diagnosis is the key to prompt treatment. We lack efficient and well-developed pathways to ensure that patients are referred to an appropriate physician and centers in time to be diagnosed within a minimum possible time. It is a must to establish, improve, sustain, and monitor all-inclusive cancer services, including surgical oncology, medical oncology, radiation oncology, pediatric oncology, and palliative care services.

-Prof. Humaid Al-Shamsi, Director of Burjeel Cancer Institute Comprehensive Cancer Center
(A Proposal for a National Cancer Control Plan for the UAE: 2022–2026)

The primary focus of the UAE cancer control plan is prevention, which revolves around the axes of education, understanding, prevention and detection, early and rapid diagnosis.

Given the UAE's proactive approach to address their cancer care system, PanTum Detect proposes a solution to implement a multi-cancer screening program aimed at bridging the existing gaps in care.

Additionally, it's imperative to confront screening barriers and explore less invasive methods like blood-based screening, which is likely to be preferred within the UAE population.

Support for PanTum Detect in the MENA region

RMDM, a partner in the **Doctors Center Polyclinic**, launches an early cancer detection screening program using PanTum Detect in Dubai, UAE. Cancer is the third leading cause of death in the United Arab Emirates (UAE) after cardiovascular diseases and trauma.[15]

RMDM joined forces with the polyclinic to introduce the Doctors Center Cancer Screening Program for Early Detection. This partnership aims to leverage our combined resources and expertise to enhance early diagnosis; revolutionizing the landscape of preventive healthcare.

As the pioneering multi-cancer screening program in the region, we hope it will increase the utilization of preventative approaches.

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Conclusion & Recommendations

In order to hit government's cancer targets worldwide, speed is critical. PanTum Detect can diagnose patients quickly and accurately, helping a government to cut through the diagnostics backlog and fulfil its early intervention promises.

There is an opportunity to reduce cancer mortality and treatment costs with an effective early detection solution. The combination of the PanTum Detect test with imaging provides a unique approach to a nation-wide screening program.

For example, in 2022, the early detection screening program combining PanTum Detect and imaging procedures became available throughout Germany.

In Germany alone, around half a million people are diagnosed with cancer annually. The earlier cancer is detected, and treatment begins, the higher the chances of a full recovery. Most standard methods only detect cancer when a malignant tumour has grown into healthy tissue.

Furthermore, as the population grows older and public awareness campaigns lead to more people seeking tests, the burden on cancer services is set to increase.

PanTum Detect can help alleviate growing pressures and costs in the longer term by providing a cost-effective diagnostic tool that saves time and money.

A pan-tumour liquid biopsy test that can detect solid tumours at a pre-malignant and malignant stage, has the potential to transform cancer diagnostics and subsequent treatment and care, now and in the future. PanTum Detect can not only increase cancer survival rates and create a better patient experience, but revolutionise screening and early diagnosis programmes and secure significant savings for the NHS and other healthcare services.

It's accurate, affordable, and available now.

But to achieve this, we must work in partnership with governments, charities and other public health bodies to deploy our ground-breaking technology across hospitals in the most effective way.

To introduce the benefits of a universal cancer blood test and join the leading edge of innovation, healthcare systems require investment, data, and advocates.

RMDM invites health leaders, policy-makers and third sector stakeholders to endorse the adoption of the PanTum Detect test in an early-screening program.

If you would like to find out more or arrange a meeting, please contact: reception@rmdm.group

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About the RMDM Group

RMDM Group is a UK-based one-stop shop for cancer diagnostics, prevention and treatment. We use ground-breaking technology to provide healthcare partners around the world with non-invasive, low cost and highly accurate early intervention diagnostic tools.

Established in 2017, RMDM is founded on the principles of the pioneering work of Dr Johannes Coy, who discovered the TKTL1 gene. Our purpose is to harness the power of cutting-edge research and technology to provide practical and affordable interventions to support health and wellbeing, focusing particularly on diagnostics and metabolism.

The revolutionary PanTum Detect test is one such example.

Through our commitment to rigorous research and scientific collaboration, we work to translate evidence into practice in a way that positively disrupts the health and wellbeing industry.

Find out more about the PanTum Detect test:
rmdm.group/diagnostics/pantum-detect/

Management Team

Ali Ghaidan

Chief Executive Officer

An entrepreneur with extensive business experience in several senior roles, Ali formed the RMDM Group as a one-stop shop for healthy living. He is committed to furthering the significant societal impact of Dr Coy's work within healthcare.

Dr. Johannes Coy, Ph.D.

Oncology Expert & Discoverer of the TKTL1 Gene

Dr Johannes Coy is a world-renowned cancer research scientist and the discoverer of the TKTL1 gene. With over 30 years of experience, Dr Coy is a pioneer in the field, forging fresh connections between medicine, nutrition and pharmaceutics.

Dr Letizia Gulino, Ph.D.

Head of Science & Technology

Dr Letizia Gulino is a molecular biologist with more than 20 years' experience in cellular and molecular biology. Her goal is to offer science as a tool for people to make healthy lifestyle choices.

Dr Joachim Stein

Advisory Board

Womens Health and Cancer Specialist

Dr. Joachim Stein is a highly respected specialist in gynecology and obstetrics, whose career spans over two decades of dedicated medical practice and research.

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Resources

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Appendix Table 1

Reference	Entity	Total subjects	Apo10 positive	TKTL1 positive	Apo10/ TKTL1 positive	True positive / total cancer subjects	True negative / total healthy subjects	Sensitivity [%]	Specificity [%]
Feyen et al. 2012 [62]*	17 different	240		225					
	Healthy control	117		22		225/240	95/117	94	81
Grimm et al. 2013 [50]	OSCC	50	45	46	47				
	Breast cancer	48	42	43	47				
	Prostate cancer	115	109	105	112				
	Healthy control	74	4	3	3	206/213	71/74	96.7	95.9
Japink et al. 2014 [42]	CRC	222	-	-	-	-	-	-	-
	Healthy control	23	-	-	-	-	-	-	-
Grimm et al. 2016 [52]	OSCC	44	42	43	44				
	Healthy control	85	-	-	-	44/44	-	100	-
Grimm et al. 2016 [63]**	OSCC	92	-	-	89	89/92	-	96.7	-
Todenhöfer et al. 2017 [64]**	Prostate cancer	174	163	162	162	162/174	-	93.1	-
Saman et al. 2020 [53]	CCC, PC, CRC	62	62	62	62				
	Healthy control	29	-	-	0				
	Inflammation group	13	0	2	1	62/62	29/29	100	100
Urla et al. 2022 [35]	Rhabdomyosarcoma	29	25	28	28				
	Healthy control	27	0	0	0	28/29	27/27	96.6	100
Stagno et al. 2022 [54]	Neuroblastoma	38	34	36	36	36/38	37/37	94.7	100
	Healthy control	37	-	-	0	-	-	-	-
Burg et al. 2022 [55]*	Asymptomatic individuals; 32 different localizations	5114	-	-	186	-	-	-	-
Xie et al. 2023 [56]*	Lung cancer	156	-	-	-				
	Healthy control	153	-	-	-	-	-	-	-
Total asymptomatic		5114							
Total cancer		1270							
Total healthy control		545							

Table 1: Overview of published studies that have applied EDIM technology. Where the respective information is available, sensitivity and specificity are given.

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