



OPTELLUM MEDIA PACK

Resources for partners and journalists



The AtlantiCare surgical team

Contents

Introducing Optellum	4
The challenge	6
Optellum - the story so far	8
What people say about Optellum	10
Frequently asked questions	12
Our founding story	18
Additional resources	20
References	21

A lung health company with a world-first solution



“Our goal at Optellum is to redefine early diagnosis and treatment of lung cancer.”

Václav Potěšil, Ph.D., co-founder and CBO of Optellum

Optellum is a commercial-stage lung health company providing AI-powered decision-support software that assists physicians in early diagnosis and optimal treatment for patients. The company was founded so that every lung disease patient could be diagnosed and treated at the earliest possible stage, when the probability of better health outcomes is highest.

Optellum is the leader in AI-enabled lung cancer diagnosis, and the first and only medtech company to have attained FDA 510(k) clearance, CE-MDR in the EU, and UKCA in the UK for its software platform, Virtual Nodule Clinic.

The company’s strong clinical evidence from leading experts and existing customers have marked it one to watch in the medtech sector. As has its distribution and research partnerships in the USA with GE HealthCare and Johnson & Johnson Interventional Oncology. In 2022 Optellum received a Series A fundraising round from a diverse set of investors from the UK, USA, and Asia.

Optellum is located at the Oxford Centre for Innovation in Oxford, United Kingdom and in the US at the Texas Medical Center in Houston, Texas.

Media pack | 1.0



INTRODUCING OPTELLUM

Members of the Optellum team outside the Oxford office

The lung cancer challenge

How Optellum is making a difference

Lung cancer is the **most common type of cancer** and the **leading cause of cancer deaths** in the world¹. **1.8 million people die annually from lung cancer across the world¹; 134K+ in the US alone², and over 250k in Europe³.**

Past exposure to smoking is the strongest risk factor, but the number of people who have never smoked and who contract lung cancer is growing around the world. In countries with high air pollution rates, up to **50% of lung cancers are now diagnosed in never-smokers⁴**. Unlike many other cancers, symptoms of lung cancer typically do not appear until advanced stages, when the tumor has already spread, and survival rates are the lowest.

The current **worldwide five-year survival rate is 20%**, primarily due to most patients being diagnosed after symptoms have appeared and the disease has progressed to an advanced stage (Stage III or IV). By comparison, the **survival rate for small tumors treated at Stage IA is as high as 90%**⁵. This disparity highlights a critical need for diagnosis and treatment at the earliest stage possible.

Optellum's world-leading solution aims to solve three key problems:

- **60%** of the millions of lung nodules found annually are **lost to timely follow-up⁶**.
- Invasive procedures, **30% of invasive procedures** are conducted **on benign lung nodules⁷**.
- Delayed lung cancer treatment, which contributes to the poor survival rate for this type of cancer.

Optellum Virtual Nodule Clinic is the world's first AI-powered clinical decision support software for early lung cancer diagnosis and includes features designed to address all of these problems.

Millions of lung nodules found annually

90% are found incidentally in patients treated for another condition⁶.

2 million USA | 10 million Globally

Identify more patients at risk

Automatically identify patients with reported nodules from CT radiology reports and present them to the thoracic care team.

Missed follow-ups

60% of patients are lost to timely follow up⁶.

Speed up time to referral

Receive a list of incidental nodule patients the day after they are reported. Receive automatic alerts to ensure completion of patient follow-up.

Invasive procedures

30% of invasive procedures conducted on benign nodules⁷.

Enable optimal decisions with Optellum Lung Cancer Prediction score

Optellum Lung Cancer Prediction AI enables optimal decisions driving earlier cancer treatment and fewer invasive procedures on benign nodules.

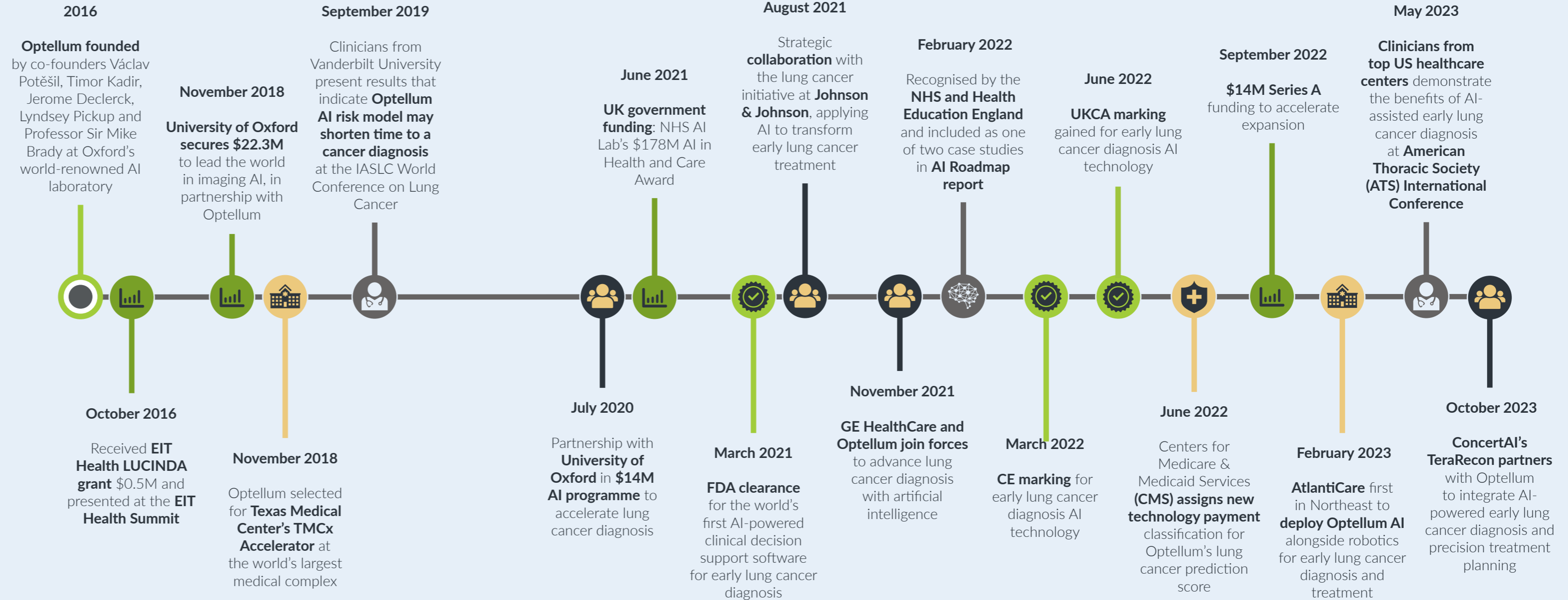
Optellum LCP Score	% cancer	% benign
1	0.2%	99.8%
2	0.4%	99.6%
3	0.8%	99.2%
4	2.0%	98.0%
5	5.6%	94.4%
6	15%	85%
7	34%	66%
8	64%	36%
9	84%	16%
10	93%	7%

22% of patients with cancer given more appropriate decisions¹⁰.



OPTELLUM

The story so far





WHAT PEOPLE SAY ABOUT OPTELLUM

Professor Fergus Gleeson using Optellum software at Oxford University Hospitals, credit Oxford Medical Illustration

Dr Amit Borah, Interventional Pulmonologist, AtlantiCare



"Optellum Virtual Nodule Clinic provides AtlantiCare with a powerful tool in our armory in the fight against lung cancer. Its ability to identify nodules detected incidentally allows us to screen diverse demographics for this deadly disease and get them on the treatment path earlier. Since the Optellum solution was introduced, the number of patients identified as having at-risk lung nodules has increased by 70%, allowing our team to recruit a second interventional pulmonologist.

Additionally, Virtual Nodule Clinic allows us to expedite cancer patients' diagnosis. We are now diagnosing patients within one to two weeks of a nodule being reported in an emergency room CT scan, when previously this could take up to months for an incidental nodule to be identified on follow up from a hospital stay.

What's even better for patients is that we have seen a significant increase in curative treatment of lung cancer by surgery or radiation. We're treating more patients as a direct result of using the Optellum AI-powered diagnostic assistance, lung cancer has moved from the sixth place to the second most common surgical oncology procedure at ARMC cancer center."

Professor Fergus Gleeson, University of Oxford



"I believe every physician involved in the care of patients with lung nodules would benefit from having access to the Optellum technology.

Their software has been validated to improve CT interpretation and diagnosis for nodules that will lead to improved patient outcomes."

Dr Christina Bellinger, Director of the Interventional Pulmonary Program, Atrium Health Wake Forest Baptist



"The exciting part of the software is the artificial intelligence based lung cancer prediction tool which will help me risk stratify the patient.

This will likely help doctors intervene sooner and treat more cancers at an earlier stage."

Professor David Baldwin, Chair of the Clinical Expert Group for Lung Cancer, NHS England and co-author of the current clinical guidelines for lung cancer in the UK

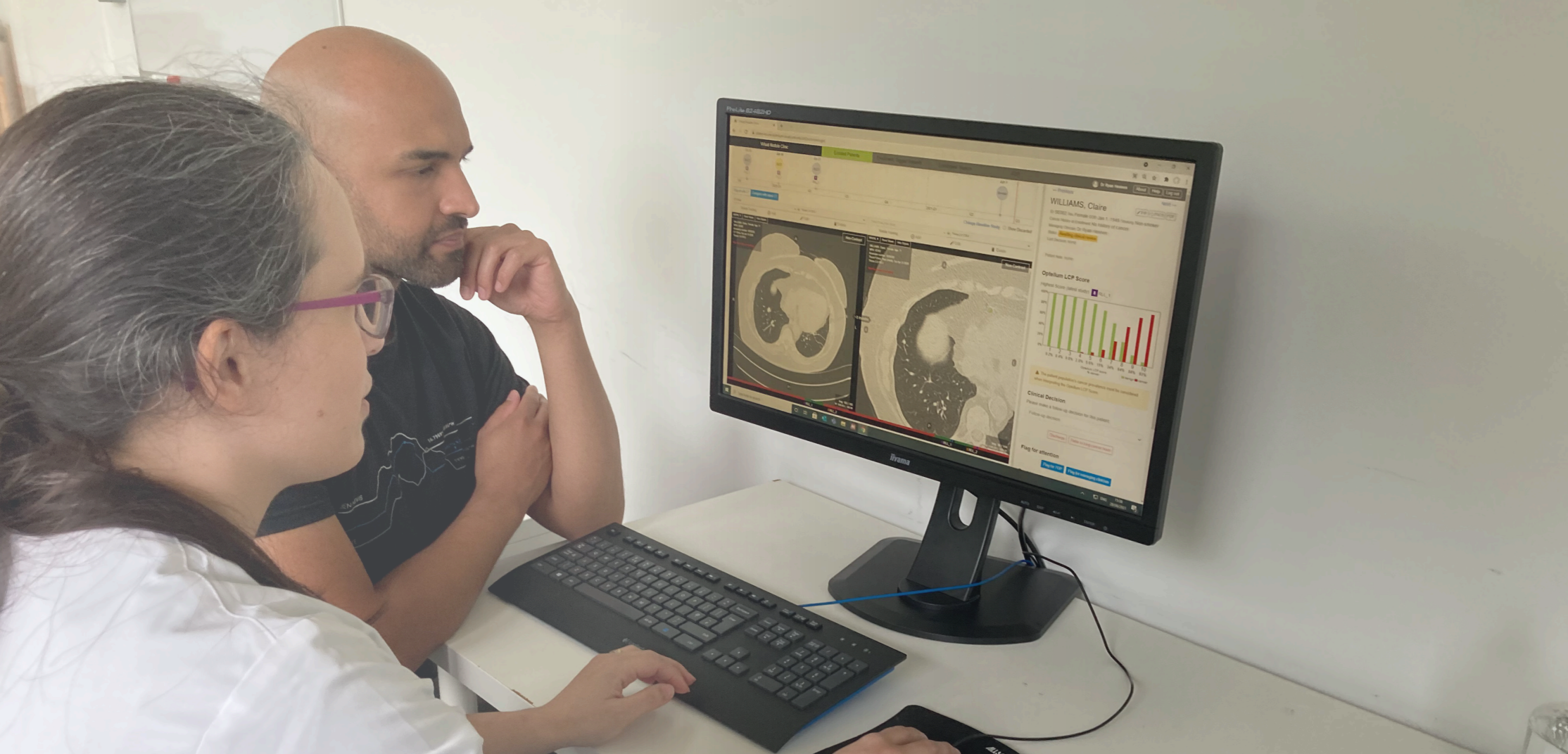


"We looked at the results and thought, 'this is amazing, this is the real deal that looks like it's going to be a game changer.'"

Dr Anil Vachani MD, Co-Director of Lung Cancer Screening and Associate Professor of Medicine at the Hospital of the University of Pennsylvania



"Clinical management of lung nodules is a challenge, particularly those incidental nodules identified independently of a screening program. Innovations such as the Optellum imaging AI will assist physicians to manage a lung nodule population and make confident decisions resulting in better outcomes."



? FREQUENTLY ASKED QUESTIONS

Clinician and research scientist with Optellum Virtual Nodule Clinic software.

+ Why is early intervention important in lung cancer?



Lung cancer kills more people than any other kind of cancer.

Lung cancer is the leading cause of cancer-related deaths worldwide, accounting for the highest mortality rates among both men and women¹.

- 1.8 million people die annually from lung cancer globally¹.
- 134k in the US².
- 257k in Europe³.
- 35,100 in the UK¹¹.



Survival rates are high when caught early, but frighteningly low when found late.

The current worldwide five-year survival rate is 20%, primarily due to most patients being diagnosed after symptoms have appeared and the disease has progressed to an advanced stage (Stage III or IV). By comparison, the survival rate for small tumors treated at Stage IA is as high as 90%⁹.

- 15% 5-year survival for late stage diagnosis in the US⁹.
- ~13% survival for late stage diagnosis in the UK¹².

‘Emergency presentation’ is the most common route to diagnosing lung cancer, but by then it’s often too late.

Patients will visit their primary care practitioner or a hospital emergency room as a result of symptoms painful enough for a patient to seek help. But because lung cancer symptoms usually don’t occur until a late stage, the chances of cure are low for these patients who notice chest pains, coughs, shoulder pain and other seemingly minor ailments.

- In the US there are screening programs to help detect lung cancer but people are not using them. Less than 5% of all eligible individuals have undergone screening.
- The UK does not yet have a screening program for lung cancer.

Lung nodules are recorded ‘incidentally’ in patients treated for other reasons, but these can be missed, misdiagnosed or simply not followed up.

- 90% of lung nodules that could be cancerous are found incidentally in patients treated for another condition⁸.
- Up to 60% of patients are lost to timely follow-up⁶.
- 33% of clinical evaluations vary for the same patient¹³.

Optellum’s software uses the ‘incidentally’ found nodules as an opportunity to diagnose cancer early when chances of the cure are the highest.

+ What is the Virtual Nodule Clinic?

Optellum Virtual Nodule Clinic (VNC) is an AI-powered clinical decision support software that provides support for clinicians in identifying and tracking at-risk patients who present suspicious lung nodules (which may or may not be cancerous). It calculates a clinically validated Lung Cancer Prediction (LCP) score based on imaging AI, and has the potential to improve clinical care coordination and decisions.

This first-of-a-kind platform can help physicians optimally diagnose the signs of lung cancer early so treatment can be started sooner for patients with tumors. This also helps minimize invasive procedures such as biopsies on benign lesions.

The VNC is the only FDA-cleared, AI-assisted diagnosis software for early-stage lung cancer, and has been shown to improve the sensitivity and specificity of malignancy assessments of indeterminate nodules.

Using VNC guidance, clinicians can provide personalized diagnosis and treatment plans, enabling lung cancer patients to be treated at the earliest possible stage when survival rates are the highest.

+ What does the platform do?

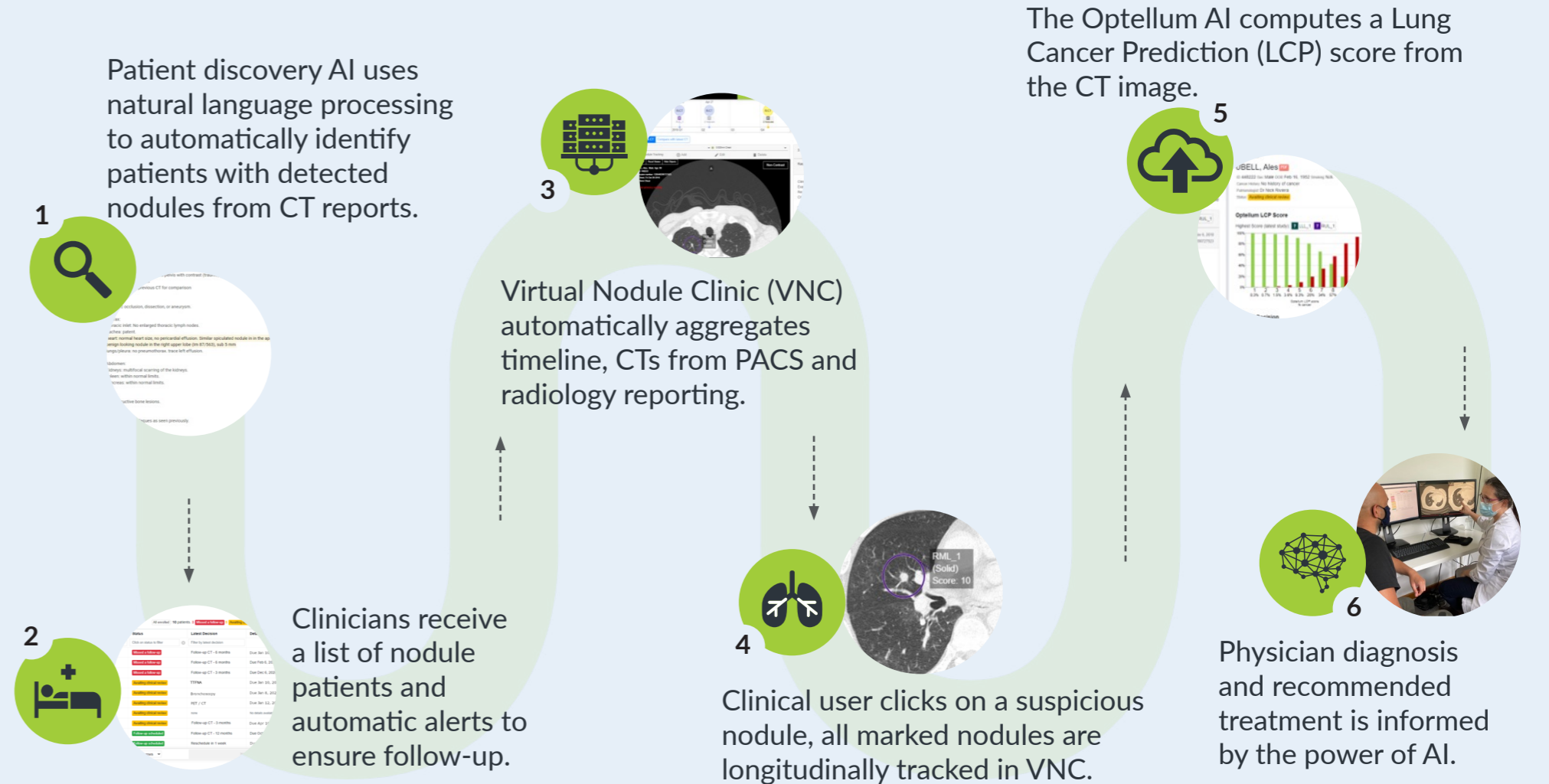
Our first product supports clinicians in identifying and managing at-risk patients who present suspicious lung nodules found in Computed Tomography scans, which may or may not be cancerous, with the goal of speeding up cancer treatment and minimizing invasive biopsies and surgeries on suspicious lesions which are not cancerous.

The AI is first applied to “read” any radiology report across the health system and then helps doctors make optimal decisions, by turning the CT image into a personalized malignancy score, using a “digital biomarker” based on neural networks.

+ How does Virtual Nodule Clinic use CT images to assess lung nodules?

The Lung Cancer Prediction (LCP) AI looks at a CT image of a lung nodule and its surroundings, using imaging analytics based on deep neural networks. It analyses the three-dimensional CT scan at the pixel level to identify any clues that may indicate malignancy. It is sensitive to high-level features of lung nodules such as their size, shape, and location, as well as fine-grained patterns within the texture of lung nodules and the lung tissue around them.

How Virtual Nodule Clinic (VNC) works



+ What partnerships has Optellum formed?

Optellum's platform was developed and clinically validated in partnership with leading universities and healthcare systems around the world. Optellum also has research collaborations and distribution agreements with GE HealthCare, Johnson & Johnson Interventional Oncology and ConcertAI's TeraRecon to accelerate clinical deployments and continue the advancement of the platform.

+ How has the company evolved over the last couple of years?

Optellum has evolved from an initial proof of concept to product development and clinical trials in partnership with leading hospitals around the world. The early R&D work was supported through UK and EU innovation grants, including EIT Health, the National Institute for Health and Care Research (NIHR) and Innovate UK. Major recent milestones have been obtaining FDA and CE clearances, and the first implementation of the platform at US hospitals. In the UK, the platform is being used in a multi-centre study as part of a major NHS investment in AI. To accelerate global clinical deployments and continue the advancement of the platform, Optellum has partnered with GE HealthCare, Johnson & Johnson and Concert AI as well as securing strategic investment from the venture capital arm of Intuitive, the world leader in surgical robotics.

+ What funding has Optellum received?

In 2022, Optellum secured \$14M Series A Funding, enabling the company to scale its base, operations and commercial launches in the UK and USA, accelerate its research and development, and expand its platform into personalized therapy decisions, integrating imaging with molecular data, robotics, and liquid biopsies. This funding round was led by Mercia, a UK investor on a mission to support UK-based companies that are having a significant impact on global health issues. Additional investors include Intuitive Ventures (Sunnyvale, CA, USA) and Black Opal Ventures (New York, NY, USA), St John's College in the University of Oxford (Oxford, UK), IQ Capital (London, UK), and the family office of Sir Martin & Lady Audrey Wood (Oxford, UK). In total Optellum has received more than \$30 million in grant, seed, and investment funding.

+ How many countries around the world have approved Optellum's lung cancer prediction AI?

It is cleared in almost 30 countries and is currently implemented in hospitals and healthcare systems in the United States (FDA clearance), the European Union (CE-MDR regulations) and the United Kingdom (UKCA).

+ What does it cost healthcare systems in the US to use Optellum's lung cancer prediction AI?

Optellum uses a software-as-a-service (SaaS) subscription model, tiered by the size of the institution and their volume of patients and studies. Optellum aims to make sure the software is accessible to every customer, from large academic medical centres and hospital networks to small community hospitals, so that their physicians can deliver the best possible care to their patients.

+ Is the technology eligible for reimbursement in the US?

Yes. The Centers for Medicare & Medicaid Services (CMS) has established a national payment rate for Optellum's Lung Cancer Prediction technology under the New Technology Ambulatory Payment Classification. CPT codes 0721T & 0722T facilitate the process of reclaiming the costs of using the technology for clinicians and health insurance claims for individuals enrolled in Medicare and other health insurance programs, enabling more patients to access innovative, potentially life-saving early lung cancer diagnostic technology.

+ Is Optellum working with the NHS in the UK?

In the UK Optellum's solution is being used to predict at-risk lung nodules in a multi-center study with NHS Trusts as part of a major investment in AI for healthcare. Optellum has been supported by partnerships with the NHS and funding from Innovate UK, the NIHR and EIT Health, and has been named as one of two case studies within the NHS Health Education England (HEE) AI Roadmap report. Report findings highlighted learnings from the deployment of AI in the NHS Lung Cancer Screening Programme across several NHS trusts showing the potential impact on earlier diagnosis rates at a stage where treatment is more likely to be successful.

Earlier diagnosis of lung cancer has become a key focus for the NHS, with the ambition of diagnosing three in four cancers at stage I or II. Late-stage diagnosis is common due to GPs missing signs despite repeated visits. Up to 56% of people in some parts of England are only diagnosed with lung cancer when visiting A&E. Such people are five times more likely to die within a year than those whose cancer was diagnosed by a GP or through a cancer screening programme¹⁴.

+ What clinical evidence exists for the accuracy and other benefits of the Optellum AI?

Optellum's technology has been independently validated by world-leading lung cancer experts interested in verifying our claims and quantifying benefits to their own patient populations. A selection of publications from high-quality pulmonary and respiratory journals can be found on the Optellum website at <https://optellum.com/clinical-validation/>

The key publications are:

- American Journal of Respiratory and Critical Care Medicine "Assessing the Accuracy of a Deep Learning Method to Risk Stratify Indeterminate Pulmonary Nodules, Pierre P. Massion et al"
- Thorax "External validation of a convolutional neural network artificial intelligence tool to predict malignancy in pulmonary nodule, David R Baldwin et al"
- Radiology "Artificial Intelligence Tool for Assessment of Indeterminate Pulmonary Nodules Detected with CT, Roger Kim, Anil Vachani, et al"



OUR FOUNDING STORY

Who founded Optellum?

Václav Potěšil is co-founder and chief business officer at Optellum. He holds an Oxford Doctorate (DPhil) in Computer Vision (lung cancer therapy planning) in collaboration with Siemens Molecular Imaging and Mirada Medical. He developed and launched pioneering medical robotics devices as global product manager at Hocoma, the global market leader in neuro-rehabilitation exoskeletons. Václav has worked in eleven countries and speaks seven languages. He has been involved in AI applied to lung cancer since his undergraduate thesis in 2005, through the Oxford Computer Vision Lab (supervised by co-founders Timor Kadir, and Prof Sir Mike Brady), where the team were one of the first to apply modern computer vision to help physicians diagnose and treat cancer.

What were Optellum's first steps in achieving its mission?

In the earliest stages of Optellum's journey, the Founders and early team worked with leading hospitals, to develop the technology and product, and validate it on diverse data sets from patient populations.

Our clinical partners included the ThoraxKlinik and Heidelberg University Hospital, University Medical Centre Groningen (UMCG), Oxford University Hospitals NHS Foundation Trust, Nottingham University Hospitals NHS Trust, The Leeds Teaching Hospital NHS Trust, and others across EU and the USA. The early R&D work was enabled by critical support through EU and UK government innovation grant funding, including EIT Health, the NIHR and Innovate UK.

What was the light-bulb moment?

Optellum's co-founder, Václav Potesil, was inspired by a personal connection through an aunt, who passed away from lung cancer despite never smoking a cigarette. This experience inspired him to become involved in computer vision research applied to lung cancer – way before AI in healthcare became popular (and even ready for clinical use). Later on, whilst doing a Doctorate at the Oxford's world-renowned AI laboratory, Václav met with future co-founders Timor Kadir, Jerome Declerck, Lyndsey Pickup and Professor Sir Mike Brady. Being a keen mountaineer, the "lightbulb moment" came during a high mountain expedition when he came close to dying in a tragic accident – realizing life is too short to delay his dreams and ambitions further, Optellum was born two months later. Optellum was founded with the goal of enabling every patient with lung disease to be diagnosed and treated as early as possible, and cured – starting with lung cancer, the number one cancer killer.

What can we hope to see from Optellum in the future?

Optellum has made significant progress towards becoming the standard of care in early lung cancer diagnosis. To broaden access to its platform to every patient and clinician, Optellum is investing in additional clinical studies to secure reimbursement by health insurers, and strategic distribution partnerships to accelerate delivery of the platform to hospitals around the world. As the next step, Optellum is closely following the patient journey and expanding the platform into personalized therapy decisions by integrating imaging with molecular data, robotics and liquid biopsies, with the goal of guiding the right patients into minimally invasive and drug therapies.

Optellum's ultimate vision is to enable physicians to diagnose every patient with deadly diseases of the lungs as early as possible, treat them in the optimal way, and help save lives.

Additional resources

Optellum works with media organisation and our clinical partners to tell the story of how we're helping patients and changing the lung cancer pathway.

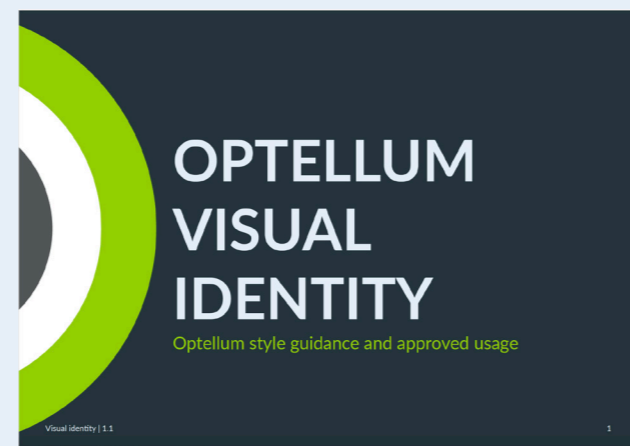
Please visit our website for guidelines, assets and contact details for our Communications and Press team.



<https://optellum.com/media-assets/>

References

1. World Health Organisation: <https://www.who.int/news-room/fact-sheets/detail/cancer>
2. American Lung Association Lung Cancer Trends Brief: <https://www.lung.org/research/trends-in-lung-disease/lung-cancer-trends-brief/>
3. European Commission Lung Cancer Fact Sheet: https://visitors-centre.jrc.ec.europa.eu/sites/default/files/poster_flyer/lung_cancer_factsheet_-_interactive_-_27.05.2021_2%5B1%5D_0.pdf
4. Das A, Krishnamurthy A, Ramshankar V, Sagar T G, Swaminathan R. The increasing challenge of never smokers with adenocarcinoma lung: Need to look beyond tobacco exposure. *Indian J Cancer* 2017;54:172-7
5. AJCC Lung Cancer Staging manual (7th edition)
6. Pyenson BS, Bazell CM, Bellanich MJ, Caplen MA, Zulueta JJ. No apparent workup for most new indeterminate pulmonary nodules in US commercially-insured patients. *Journal of health economics and outcomes research*. 2019;6(3):118.
7. Mazzone PJ, White CS, Kazerooni EA, Smith RA, Thomson CC. Proposed quality metrics for lung cancer screening programs: a national lung cancer roundtable project. *Chest*. 2021 Jul 1;160(1):368-78.
8. Optellum projections based on Gould MK, Tang T, Liu IL, Lee J, Zheng C, Danforth KN, Kosco AE, Di Fiore JL, Suh DE. Recent trends in the identification of incidental pulmonary nodules. *American journal of respiratory and critical care medicine*. 2015 Nov 15;192(10):1208-14.
9. Surveillance, Epidemiology, and End Results (SEER) Program (Surveillance, Epidemiology, and End Results Program) SEER*Stat Database: SEER 18 2010-2016, All Races, Both Sexes. Available at Cancer of the Lung and Bronchus - Cancer Stat Facts
10. Kim RY, Oke JL, Pickup LC, Munden RF, Dotson TL, Bellinger CR, Cohen A, Simoff MJ, Massion PP, Filippini C, Gleeson FV. Artificial Intelligence Tool for Assessment of Indeterminate Pulmonary Nodules Detected with CT. *Radiology*. 2022 May 24:212182.
11. Cancer Research UK statistics: <https://www.cancerresearchuk.org/health-professional/cancer-statistics/statistics-by-cancer-type/lung-cancer>
12. NHS England database "Cancer Survival in England, cancers diagnosed 2016 to 2020, followed up to 2021", <https://digital.nhs.uk/data-and-information/publications/statistical/cancer-survival-in-england/cancers-diagnosed-2016-to-2020-followed-up-to-2021>
13. Van Riel SJ, Sánchez CI, Bankier AA, Naidich DP, Verschakelen J, Scholten ET, de Jong PA, Jacobs C, van Rikxoort E, Peters-Bax L, Snoeren M. Observer variability for classification of pulmonary nodules on low-dose CT images and its effect on nodule management. *Radiology*. 2015;277(3):863-71.
14. UK Lung Cancer Coalition, 2020



COMMUNICATIONS & MEDIA CONTACT



Rhiannon Lassiter

Head of Communications and Marketing

rhiannon.lassiter@optellum.com

Created by: Rhiannon Lassiter for Optellum 2024

Designed by: Evolene Ltd