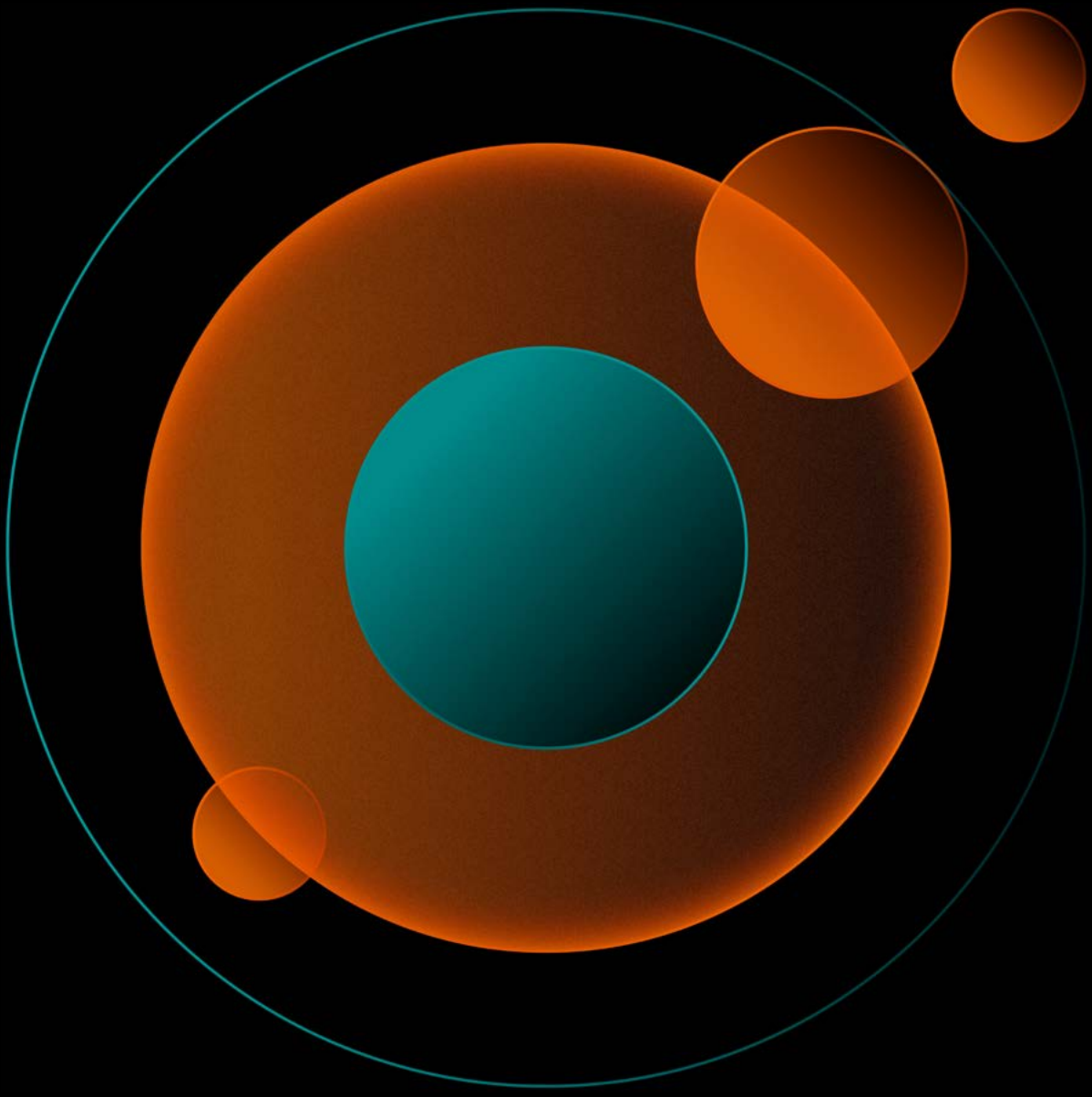


Case Study

Uncovering hidden threats

Alla Khashper, MD, a senior radiologist at Shamir Medical Center, Israel, highlights the impact of computer-aided detection (CAD) in identifying unexpected lung cancer cases

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Case Study

Uncovering hidden threats

Alla Khashper, MD, a senior radiologist at Shamir Medical Center, Israel, explains how computer-aided detection (CAD) assists radiologists in identifying incidentally detected pulmonary nodules on chest CT scans.

A specialist in abdominal and chest imaging at Shamir Medical Center in Israel, Alla Khashper, MD, deals with a wide range of cases, from outpatients to ER arrivals. She knows lung cancer can be found in the most unexpected cases and demonstrates how using computer-aided detection (CAD) in scans, beyond standard protocols, could significantly improve patient care.

Early diagnosis is crucial for successful treatment

Lung cancer is the leading cause of cancer deaths worldwide, claiming about 1.8 million lives each year.[1] In Israel, too, it remains a major health concern, with over 2,500 new cases diagnosed annually.[2] Early detection is crucial for effective lung cancer treatment, as symptoms such as shortness of breath or pain typically indicate advanced disease. “As radiologists, we are the ones who can identify it even when it’s unexpected,” says Alla Khashper, MD.

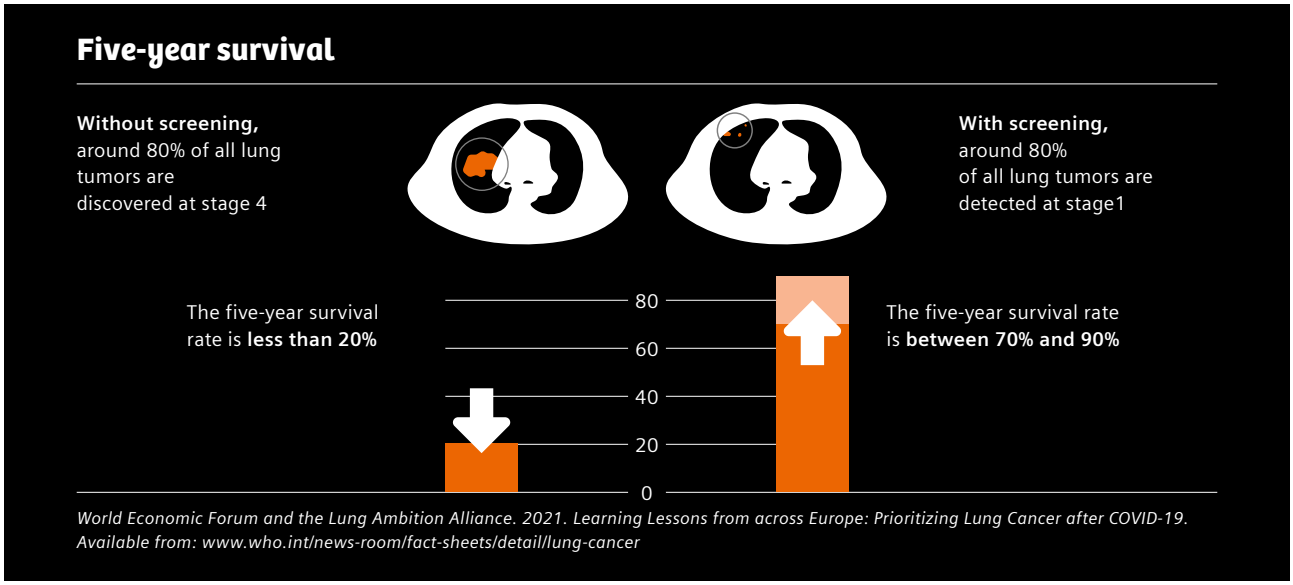
Lung Cancer

Lung cancer remains the most commonly diagnosed cancer worldwide, with nearly 2.5 million new cases reported in 2022.[3, 4] Alarmingly, this number is projected to almost double by 2050, underscoring the urgent need for global attention and action.[4] As the leading cause of cancer-related deaths, lung cancer accounted for 18.7 percent of all cancer fatalities in 2022 alone.[3, 4] These figures highlight the critical importance of advancing research, improving early detection, and expanding access to effective treatments.



“As radiologists, we are the ones who can identify lung cancer even when it is unexpected.”

Alla Khashper, MD
Shamir Medical Center, Israel



Pilot study recommends adding lung screening to routine care

Lung cancer screening has been performed in Israel for over 20 years.[5] The Israeli Ministry of Health has recently completed its pilot for a national lung cancer screening program for individuals aged 50–79 focusing on smokers or former smokers with a history of at least 20 pack years. Shamir Medical Center participated in the pilot, using low-dose CT scans that minimize radiation exposure while still identifying potentially serious findings. The pilot program concluded with a recommendation to incorporate lung screening into standard care, covered by basic health insurance.

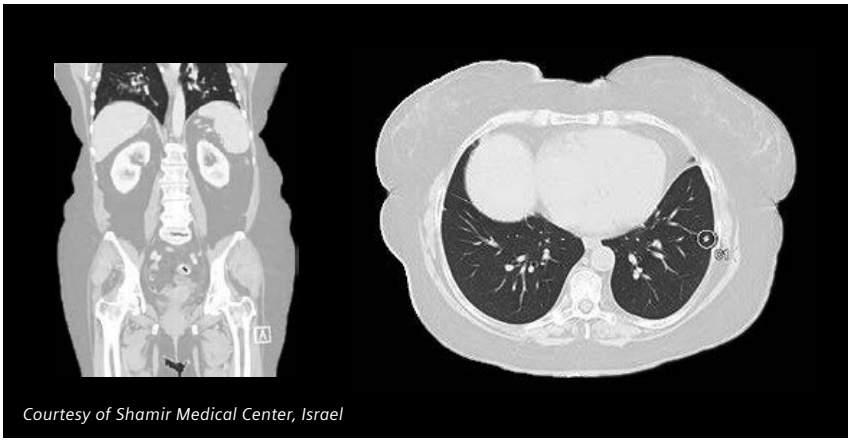
In 2025, low-dose CT screening for all smokers (with the relevant pack-year history) was included in the healthcare "basket" covered by national health insurance in Israel.

Is proactive screening the key to early detection?

Launching a screening program is a significant step forward, but some groups such as passive smokers – still fall through the cracks. Assumptions that women are less likely to smoke heavily can lead to missed screening opportunities. And although Israel's healthcare system provides free standard appointments and tests, participation in screenings is inconsistent as many eligible patients skip screenings due to low awareness, hesitation about follow-ups, or socioeconomic challenges. "That's why we need to be proactive," says Alla Khashper, MD. "When patients come in for other exams, we should look for any unexpected findings."

About Shamir Medical Center

Shamir Medical Center, Israel's fourth-largest government hospital, is affiliated with the Sackler Faculty of Medicine at Tel Aviv University and serves approximately 1.5 million people in central Israel. Renowned for its advanced medical care and technological innovations, the center is undergoing significant expansion to address demographic growth and resource needs. It aspires to become Israel's largest hospital within the next decade.



A young female patient referred for a CT scan due to acute abdominal pain. *syngo*.CT Lung CAD was automatically applied and revealed a small nodule at the base of the left lung.

Can lung CAD support accuracy in a busy environment?

Alla Khashper, MD, balances her time between clinical duties and teaching at Tel Aviv University. To maintain accuracy in a busy environment, she uses *syngo*.CT Lung CAD with Rapid Results Technology, allowing the automatic application of lung CAD to any scan. The system flags suspicious lesions for radiologists, helping them identify potential findings in busy clinical workflows. “The CAD results help us prioritize findings, enabling quicker decisions on whether further studies are needed,” explains Khashper.

Looking for lung cancer beyond lung screening exams

Today, at this busy 780-bed hospital, *syngo*.CT Lung CAD is fully integrated into all CT scans that include part of the lungs, across various protocols. Given shared risk factors for lung cancer and cardiovascular diseases, combining lung and vascular assessments make good clinical sense.

Alla Khashper highlighted that head-and-neck CT angiography (CTA) scans may contain incidental findings in the lung apices. In a study of approximately 200 CTA scans, pulmonary nodules were evaluated in examinations with partial lung coverage. The findings suggested that CAD was able to identify nodules even when only the lung apices were included. According to Khashper, these observations may provide additional insights for neuroradiologists reviewing neuro-focused imaging studies.

In the research project conducted at Shamir Medical Center, the scans were first evaluated by two radiologists for lung nodules only. They were then transferred to the *syngo*.via server, where *syngo*.CT Lung CAD was applied. Clinically significant lung nodules are 6 mm and above.[6] “However, we didn't want to make a system of low sensitivity and exclude small nodules. Based on professional recommendations, we decided to configure CAD detecting 3 mm nodules and above. Most of those 3 and 4 mm micronodules are insignificant, but some patients may have a history of oncological disease and a small but new nodule is of high significance," explains Khashper. Even with only partial lung coverage on standard CTA head and neck, the CAD algorithm performed impressively, functioning in 95 percent of cases. It flagged nodules with a sensitivity of 60.8 percent and a positive predictive value of 63.6 percent. Its accuracy in excluding nodules was remarkable, with a specificity of 94.9 percent, a negative predictive value of 94.3 percent, and an overall accuracy of 90.6 percent. Only 11 cases were too limited for CAD to process, with no clear reason identified.[7]

syngo.CT Lung CAD

syngo.CT Lung CAD is an automated tool that aids radiologists in detecting solid lung nodules on chest CT scans. Acting as a second reader, it flags potential areas of interest that may have been overlooked during the initial review, enhancing the accuracy and efficiency of lung nodule detection.



"Those who embrace AI will be more competitive, improving accuracy and patient management."

Alla Khashper, MD
Shamir Medical Center, Israel

Study showed enhanced detection of lung nodules in all imaging cases

Initially skeptical about CAD's performance for images where the lungs are only partially visible, the team confirmed it could effectively detect nodules even on these limited scans, offering valuable insights for neuroradiology teams that might overlook lung apices due to their neuro-focused workflows. "We were not sure that a limited part of the lung scanned is enough for the existing algorithm to work, but it works!" said Alla Khashper, MD.

Khashper's study underscored two key points.

- First, the CAD software's high negative predictive value is particularly useful for ruling out significant findings.
- Second, although its positive predictive value was modest, it aligned with results from full-lung CAD studies. "As a radiologist, you might think lung cancer shows up on lung CTs or chest X-rays. But our study highlights that even partial lung views require vigilance to detect nodules, and we may utilize existing CAD tools to improve the results."

The team's findings highlight that even experienced radiologists benefit from using detection tools. In Khasper's words: "My colleague and I are chest imaging specialists. When we reviewed CTA exams for study purposes, focusing on lung nodules, lung CAD identified three nodules missed in both parts, including the initial clinical report and our study's retrospective reviews – even though we were specifically looking for nodules. In one case, CAD detected a 7 mm nodule near a vessel, which was challenging to spot but clinically significant. This demonstrates CAD's value in finding subtle, but potentially important findings that can be easily overlooked."

Improved patient care at no extra cost

The Shamir Medical Center team now incorporates lung CAD in all CT scans that partially cover the lungs, including spine, abdomen, and neck exams. This is an innovative step that provides patient benefits without added costs. Alla Khashper believes that AI will elevate radiologists' skills: "AI can sort and analyze existing data in new ways, tailoring follow-up timelines and treatment protocols for individual patients. It brings together all relevant data for personalized care." Like many radiologists, she doubts that AI will replace human imaging specialists completely. "Those who embrace AI will be more competitive, improving accuracy and patient management. These tools allow me to perform even better."

Further reading

- Kass TP, Chankowsky J, Sosna J, Taragin BH, and Khashper A. Computer-aided Nodule Detection in the Lung Apices in Head and Neck Computed Tomography Angiography An Unexpected Opportunity. J Thorac Imaging. 2025 Sep 1;40(5):e0836. doi: 10.1097/RTI.0000000000000836.
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syngo.CT Lung CAD is not commercially available in all countries. Its future availability cannot be guaranteed.

syngo.via can be used as a standalone device or together with a variety of *syngo*.via-based software options, which are medical devices in their own right. *syngo*.via and the *syngo*.via-based software options are not commercially available in all countries. Due to regulatory reasons their future availability cannot be guaranteed. Please contact your local Siemens Healthineers organization for further details.

The statements by customers of Siemens Healthineers described herein are based on results that were achieved in the customer's unique setting. Because there is no "typical" hospital or laboratory and many variables exist (e.g., hospital size, samples mix, case mix, level of IT, and/or automation adoption) there can be no guarantee that other customers will achieve the same results.

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[7] Kass TP, Chankowsky J, Sosna J, Taragin BH, and Khashper A. Computer-aided Nodule Detection in the Lung Apices in Head and Neck Computed Tomography Angiography An Unexpected Opportunity. J Thorac Imaging. 2025 Sep 1;40(5):e0836. doi: 10.1097/RTI.0000000000000836.

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