# Setting up a Lung Nodule Program?

## Success requires aligning the right people, process, and technology

### Lung Nodule Follow-Up

Lung nodules can be easily missed by a radiologist when it is not the primary diagnosis. In fact, only 1/3 of patients with lung nodules get appropriate follow-up care1. There are several contributing factors to this that are well understood and documented. These include:

1. Overworked clinicians who are focused on the issue at hand

2. Complex clinical descriptions that are not well understood by the ordering clinicians

3. Poorly defined processes to support the care team

These misses drive some of the biggest fears from across the clinical spectrum — when a physician must tell a patient they have lung cancer and that it may have been prevented.

Every institution has dealt with a scenario where a small incidental lung nodule was missed or not properly followed, and it resulted in a patient developing lung cancer. These situations can be avoided if clinical teams implement robust surveillance programs with a focus on ensuring patients don't fall through the care gaps. Such programs require trained staff, clearly defined processes, and support from highly automated technologies that are:

1. Customizable to support the organization's clinical guidelines

2. Simple to adopt rapidly by the care team

3. Tightly integrated with the EHR

### Surveillance vs. Screening

While screening programs are often thought to be the patient care endpoint, surveillance of patients for disease progression should be used to determine the course of patient treatment. Unfortunately, very few patient surveillance programs exist—although they are becoming more common.

Those striving to set up a surveillance program should appreciate that their EHR likely contains thousands of patient charts whose screening should be prioritized. This effort will identify many existing patients already receiving care and will provide a strong foundation for the surveillance program. Typically, these charts were initiated by radiology when a follow-up recommendation of an incidental finding was included in the report. It is very important to identify these charts in the EHR and then enroll relevant patients in a surveillance program to ensure they are not once again "lost to follow-up."

Never again tell a newly diagnosed lung cancer patient that their cancer was missed on an earlier scan!

Lung nodule surveillance and lung screening programs have different yet intersecting purposes and patient management requirements. While lung screening programs are very important for identifying lung cancer early in non-symptomatic patients, it is well documented that most lung nodules are incidentally found on imaging studies of patients admitted through the emergency department.

However, the ongoing surveillance requirements and the multidisciplinary nature of a comprehensive lung nodule program significantly increases the patient management, tracking, and communication demands of these programs. Therefore, a lung nodule surveillance program benefits from software tools that support the continuity of patient data management and care that is required to optimize patient outcomes.

### Questions a Lung Nodule Surveillance Program Should Address:

1. How many lung nodule patients are we missing today given our current clinical guidelines?
2. What are the barriers to improved lung nodule patient outcomes?
3. What systems must be integrated to ensure all lung nodule patients are properly followed up?
4. How many patients with incidentally found lung nodules are not properly followed up? Why?
5. How effective is our lung screening programs at identifying patients with lung nodules?
6. Are all lung nodule patients who are found through our lung screening program receiving timely follow-up care?
7. Are we capturing all our incidentally found ER lung nodule patients in our EHR?

Ensuring lung nodule patients receive timely phone, text, email, and hard copy reminders about their need for a follow-up exam can be a time-consuming burden on an organization. In addition, lung nodule patients' follow-up imaging results must be tracked to help the team identify when more advanced imaging or noninvasive diagnostic procedures must be performed. The multidisciplinary nature of any lung nodule program also places additional demands on communication and highlights the need for a centralized and optimized tool that facilitates these processes.

Regardless of whether lung nodules are found incidentally or via a lung screening program, their timely follow-up and surveillance reduces morbidity and mortality.

## Quality Improvement Opportunity

A successful, comprehensive lung nodule program should enable the multidisciplinary care team to improve the quality of care that is delivered to at-risk patients. This requires close monitoring of lung nodules to determine when invasive measures should be taken to confirm whether a nodule is malignant or benign, as well as how and when it should be treated. The ability to determine appropriate testing versus monitoring is critical towards improving the clinical outcomes a patient experiences.

Providing information to the lung nodule care team and minimizing their workload is where machine learning AI software can help the organization improve quality using currently available resources. Reviewing old scans to confirm a nodule was previously present doesn't, by itself, improve lung patient care. But, software that prevents patients with suspected lung nodules from being overlooked can. Particularly when it can find existing patients in the EHR who may have already been "lost to follow-up" and risk stratify them according to the organization's clinical guidelines.

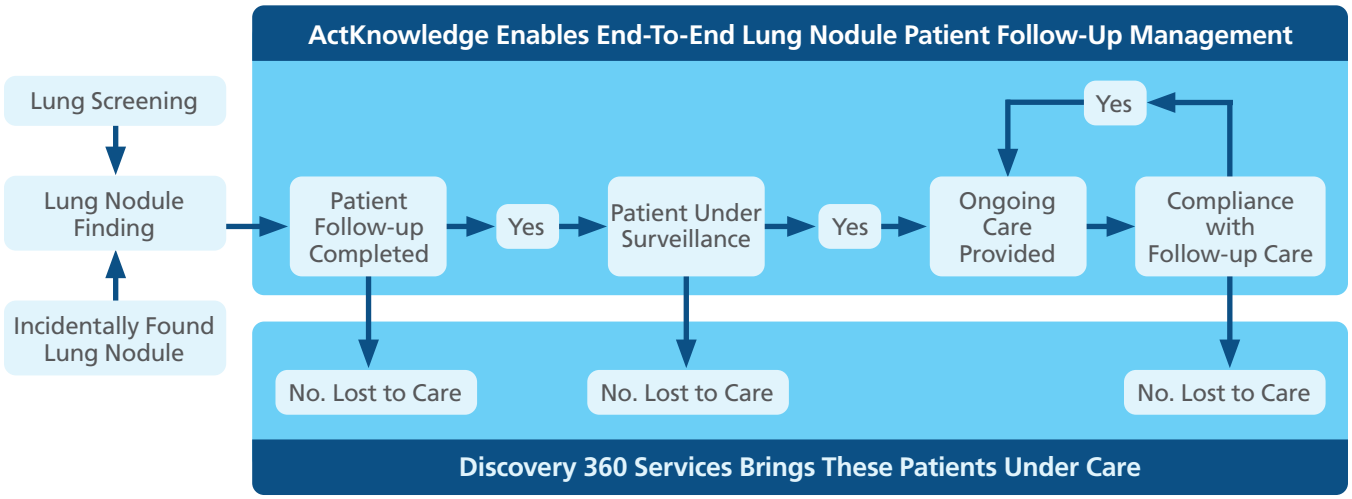
EHRs have come a long way and provide great benefits. However, the major challenge with the EHR is around its focus on meeting regularity drivers. This prescriptive based development over the last 10 years has left the EHR in somewhat of a gordian knot. They do not integrate new data easily, the workflows are fixed upon implementation, and, in many regards, have interlocking considerations that can't easily take advantage of emerging technological advances. These factors are particularly limiting when considering the previously mentioned requirements.

When launching a new lung nodule program there are three key aspects that should be kept in mind when implementing new technology that will be used to support that program. They are:

1. **Identify –** Identify what is happening and predict what will happen
   a. Example: Identify patients of interest who may be lost to follow-up or in need follow-up.
2. **Prioritize –** Decide which patients and providers to act upon first
   a. Example: Prioritization of patients who are in the greatest need of follow-up care.
3. **Manage –** Cost, quality, and health of your patient population
   a. Example: Measure the success, volumes, follow-up rates of the lung patients.

When efficiently done, this strategy will help keep the people, process, and technology synchronized and aligned with the clinic's capacity and patients' needs. Organizations then are embowed to establish a continuous learning and quality improvement cycle. This in turn drives desirable outcomes, such as improved mortality, better quality of life, lower costs, prevention of delayed treatment, appropriate venue shift, and no patients falling through the cracks who need care.

## END-TO-END LUNG NODULE SURVEILLANCE WORKFLOW




Illuminate Discovery 360 for lung nodule patients combines our deep understanding of lung nodule surveillance clinical best practices with our machine learning AI software and nurse navigator services. In addition to retrospectively identifying lung nodule patients in the EHR, we can streamline management of prospectively identified lung nodule patients.

In addition, our registered nurse navigators can supplement your nursing staff to manage closed-loop communications, tracking and scheduling of your lung nodule patients as a service. This eliminates the need to hire additional nursing staff and facilitates getting the program up and running quickly.

Learn more about how we can help
illuminate.ai/disease-pages/lung

## References:

[1]Pyenson BS, Bazell CM, Bellanich MJ, Caplen MA, Zulueta JJ. No Apparent Workup for most new Indeterminate Pulmonary Nodules in US Commercially-Insured Patients. J Health Econ Outcomes Res. 2019 May 8;6(3):118-129. doi: 10.36469/9674. PMID: 32685585; PMCID: PMC7299483.

[2]About Learning Health Systems. Content last reviewed May 2019. Agency for Healthcare Research and Quality, Rockville, MD. https://www.ahrq.gov/learning-health-systems/about.html



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