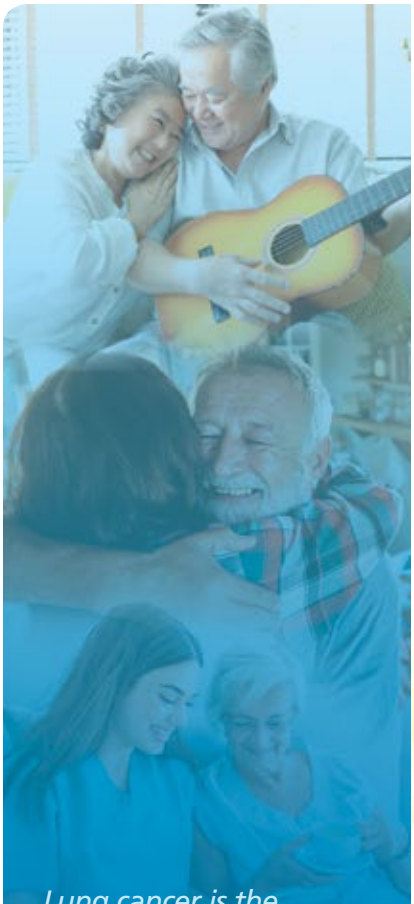
How many patients with ***lung cancer*** passed ***undetected*** through your institution last year?

- *Elevate your health system to a higher standard of care*
- *Diagnose lung cancers at an earlier stage to improve patient outcomes*
- *Save lives in your community*
- *Create a new and recurring revenue stream*
- *Improve patient retention*
- *Mitigate medical legal risk*

ILLUMINATE®
DiscoveryServices™
Incidental Lung Nodules



How do Incidental Lung Nodules Get Lost to Follow-up?

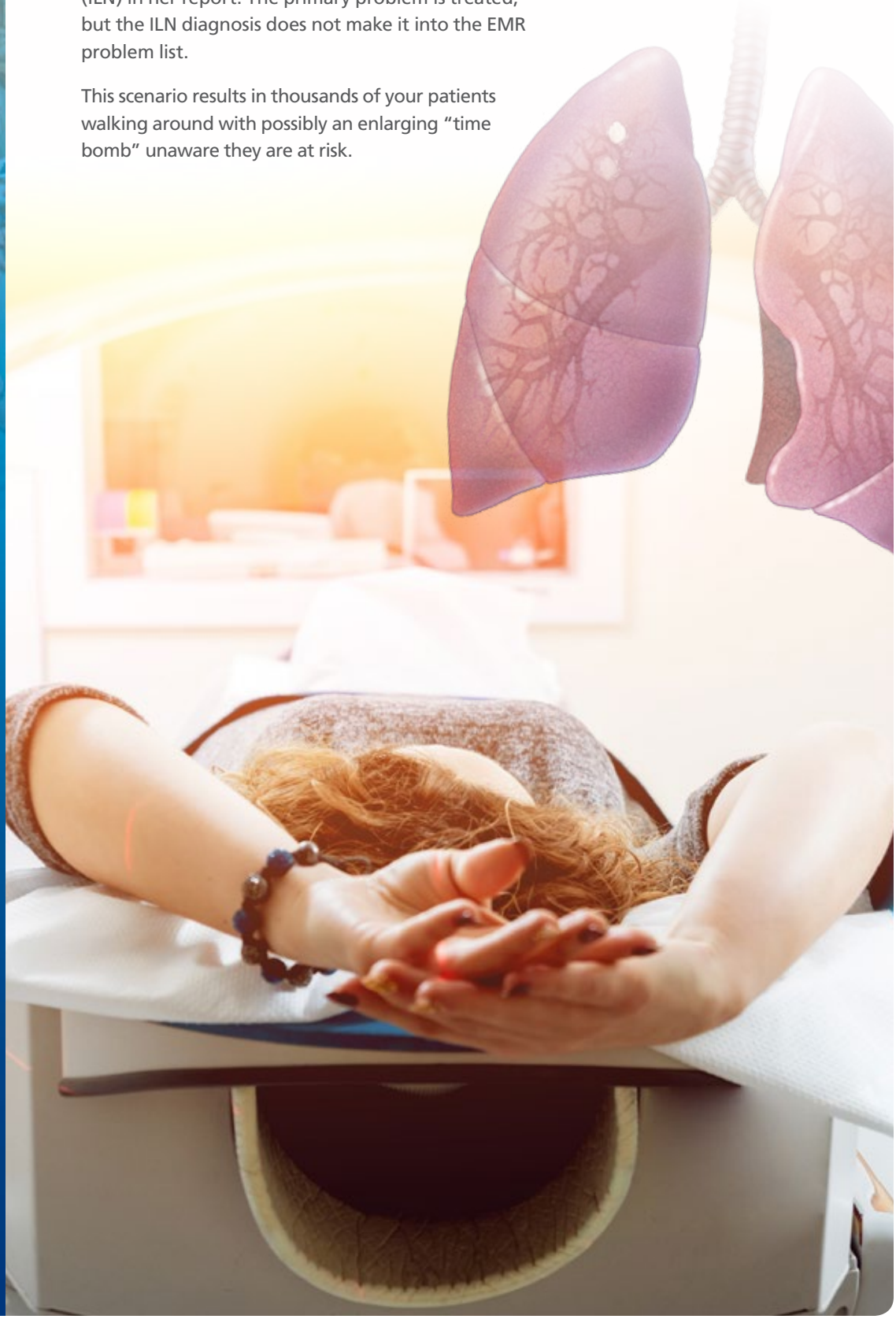
A patient presents with a medical problem for which a CT scan is performed. The radiologist makes the appropriate diagnosis, but also notes the existence of an Incidental Lung Nodule (ILN) in her report. The primary problem is treated, but the ILN diagnosis does not make it into the EMR problem list.

This scenario results in thousands of your patients walking around with possibly an enlarging "time bomb" unaware they are at risk.

Lung cancer is the leading cause of cancer-related death worldwide.

While early detection markedly improves survival, only 16% of lung cancers in the United States are detected at early stages, when cure rates are highest.

While lung cancer patients are living longer thanks to newer treatment options, a much larger impact on long term survival can be made by finding more lung cancer patients early in their disease, when it is still asymptomatic and curable at a much higher rate.



We Help You Find and Manage these Patients

DiscoveryServices™ Incidental Lung Nodules uses a multi-phase solution to identify, follow, and when necessary, identify patients who need diagnosis and treatment. **DiscoveryServices ILN** is helping integrated care organizations improve patient care, mitigate medical legal risk and uncover new revenue sources.

YOUR PERSONALIZED SOLUTION WILL INCLUDE:

- Analyzing the unstructured data included in the millions of radiology reports and clinical notes of your EMR with our **Illuminate Data Science Platform™** algorithms using targeted machine learning (ML) and natural language processing (NLP). **DiscoveryServices** identifies patients who may need follow-up or biopsy.
- The deployment of an **Illuminate Clinical Team** utilizing proprietary tools to further tune these results. **DiscoveryServices** is able to make adjustments based on local radiologist and physician dictation styles with validation of all positive cases identified.
- Applying the **Data Science Platform** to sort the new ILNs into categories of risk based on the medical literature.
- We can help you manage a robust patient surveillance program for the remaining at-risk patients based on the follow-up treatment protocol your pulmonologist defines. This multi-year surveillance program is made possible through our **Illuminate ActKnowledge™** software patient tracking and monitoring solution; thereby, closing the loop on patient follow-up.

Put our Illuminate Clinical Team to work for you.

We routinely find nodules on neck CT scans and cardiac scans as well.

In addition to lung cancer screening there may be further opportunity for improved outcomes through better management of incidentally detected lung nodules (ILNs).

ILN is defined as a newly identified nodule detected on cross-sectional imaging performed for reasons other than lung cancer screening or cancer follow-up.

85% of new lung nodules are found as incidental nodules, while only 15% are found by lung cancer screening.

How A Diagnosis is Missed

The radiology report shown here is an example of one of the thousands of patients with an incidental pulmonary nodule that "could fall through the cracks" at a hospital. Note, the ED physician had requested an abdominal and pelvic CT scan for suspected appendicitis. When looking at the report, he saw the findings consistent with appendicitis confirming their diagnosis in the ED. The patient was subsequently sent to surgery and then home after recovering. What these doctors failed to notice was the 9 mm pulmonary nodule also reported by the dictating radiologist. **DiscoveryServices ILN** identified this patient. Subsequent PET/CT and surgery revealed an early stage 1 lung cancer. The patient is now cancer free.

DATE: 8/12/2013 10:29 AM
EXAM: CT ABDOMEN AND PELVIS W/O CONTRAST
CLINICAL HISTORY: 50-year-old with right lower quadrant pain. Suspect appendicitis.

FINDINGS: Unenhanced CT of the abdomen and pelvis obtained. Suboptimal evaluation of the solid organs, vasculature and bowel due to lack of IV and oral contrast. DLP=695

ABDOMEN:

Lung Bases: There is an 9 mm solid nodule in the left lower lobe.
Liver: Normal size and homogeneous density.
Gallbladder: No calcified gallstones.
Spleen: Normal size and homogeneous density.
Adrenals: No mass.
Pancreas: No peripancreatic fat stranding.
Aorta and IVC: Normal.
Kidneys: Normal.
Stomach and visualized esophagus: No abnormality.

PELVIS:

Appendix: The appendix is dialated measuring 11 mm in diameter with adjacent inflammatory stranding. No drainable fluid collections or free air.
Colon: Postoperative changes and transverse colon.
Small Bowel: Postoperative changes in the small bowel left abdomen. No dilatation.
Bladder: No calculus.
GU: Normal sized prostate.
Mesentery: No adenopathy.
Body wall: Postsurgical changes at the umbilicus.
Bones: No destructive lesion.

IMPRESSION:

1. Findings as described above consistent with acute appendicits.

THE FACE OF THE AVERAGE PATIENT

AGE: Over 35
GENDER: Male and Female
PROGNOSIS: Treatable if managed appropriately

Typical protocol may include the following at an above-average reimbursement rate.

IMAGING:

- CT follow-up to determine growth
- PET/CT scan to determine metabolic activity

PROCEDURES:

- Bronchoscopy
- Biopsy

TREATMENTS:

- Radiation Therapy
- Chemotherapy
- Immunotherapy
- Surgery

Why Hospitals Rally Around DiscoveryServices ILN

PRIMARY CARE PHYSICIANS – Provides an excellent example of how new technologies can help primary care doctors deliver more efficient, optimized care for their patients. Also protects them from missed opportunities to cure early stage lung cancer.

PULMONOLOGISTS AND THORACIC SURGEONS – Identifies patients in need of follow-up imaging or immediate attention. Approximately 36% of incidental lung nodules are lost to follow-up.

CEO/COO/CMIO – Introduces a new and recurring revenue stream with a quick, measurable ROI and an opportunity to increase pulmonary surgical suite and radiology utilization rates.

QUALITY IMPROVEMENT AND RISK MANAGEMENT – Further establishes your hospital as being proactive in maximizing patient care, mitigating medical legal risk and eliminating potential professional liability claims of missed diagnoses.

RADIOLOGISTS – Reinforces their pivotal role in both diagnosing and capturing incidental medical problems and performing ongoing ILN surveillance studies.

LET US SHOW YOU WHAT YOUR DATA KNOWS

For the cost of repainting your hospital lobby, we can provide you a Proof of Performance by simply taking a historical download of your radiology reports and delivering the following:

- Patients with an identified ILN diagnosis.
- Patients that are qualified for a surveillance protocol and/or treatment.
- An estimate of the total number of ILNs stratified across risk categories.

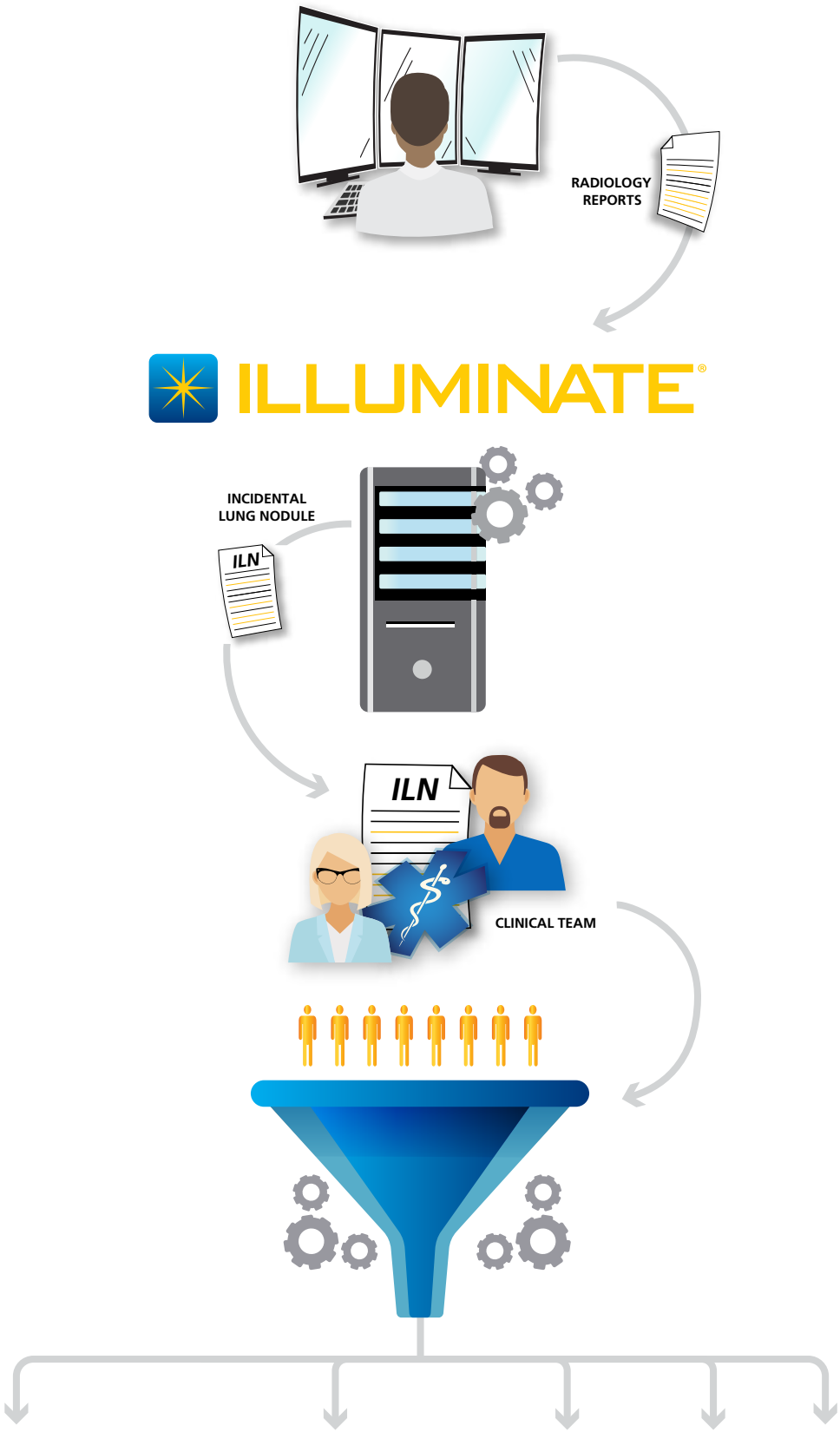
The rate of ILNs among chest imaging studies has been shown to be as high as 25-30% which is approximately 1.57 million newly diagnosed nodules in the United States each year.

Most of the ILNs are benign. However, approximately 5% receive a lung cancer diagnosis within 2 years which equates to 78,500 new lung cancers per year.

In one study of 15,000 ILNs only 36% received subsequent workup leaving the remaining 64% with untreated or unfollowed lung nodules. Therefore, as a result, approximately 50,200 incidental lung cancers may go untreated each year, leading to increased mortality and morbidity.

In recent years, an increasing number of centers have developed incidental lung nodule management as well as screening programs in an attempt to better manage these nodules and improve patient outcomes.

DISCOVERYSERVICES ILN PROCESS FLOW



All reports from the hospital's Radiology Servers and EMR are imported into Illuminate Infrastructure.

These reports are then digested by the Illuminate Discovery System, which uses novel **Natural Language Processing** (NLP) approaches combined with Machine Learning to discover all patients with ILNs who are at risk for lung cancer.

The **Illuminate Clinical Team,** comprised of nurse navigators and supervising physician specialists, analyzes the output of the **Machine Learning,** and provides a "safety net" to ensure that all "at-risk" patients are identified and triaged appropriately.

Infographic continued on next page ...

... Infographic continued

The sophisticated **NLP** and clinical algorithms then sort Incidental Lung Nodules into categories of stable, low, medium and high risk.

These patients are then entered into the **Illuminate ActKnowledge System** where they are easily tracked and appropriately monitored by Nurse Navigators.

The **Illuminate Clinical Team** in partnership with hospital physicians and nurses follows a locally tailored surveillance protocol ensuring that patients receive the diagnostic testing and care they need in a timely fashion.

Give us an hour of your time to show you a proof of concept of **DiscoveryServices™ Incidental Lung Nodules.** Contact us at **913.981.5300** or send your email to **sales@illuminate.ai.**

ILLUMINATE
DiscoveryServices™
Incidental Lung Nodules

Good for your **Patients.**
Good for your **Hospital.**
Good for your **Community.**

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