Can AI improve the Quality of Care?

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I have no disclosures

What is Artificial Intelligence (AI) in Healthcare?

Artificial Intelligence (AI) *refers to the use of advanced algorithms and machine learning models to simulate human intelligence in healthcare tasks. AI systems are designed to analyze complex medical data, identify patterns, and support clinical decision-making.*

Key Functions of AI in Healthcare

🧠 **Data Analysis:** AI processes vast amounts of medical data — from imaging scans to electronic health records — to uncover insights.

🔍 **Pattern Recognition:** AI detects subtle abnormalities or trends that may be missed by the human eye, enhancing diagnostic accuracy.

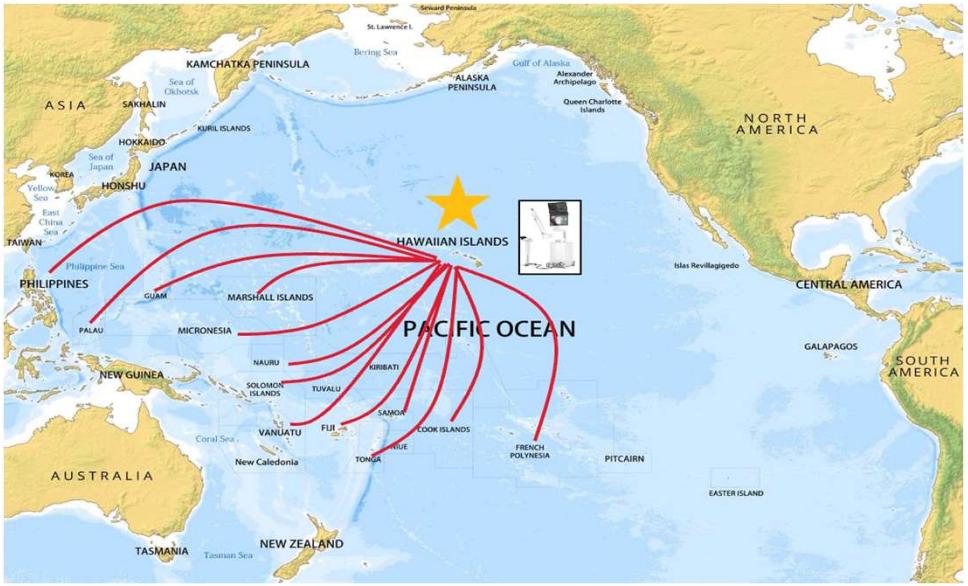
⚙️ **Automation:** AI streamlines routine tasks like data entry, appointment scheduling, and even predictive analytics.

💊 **Clinical Decision Support:** AI assists healthcare providers by recommending treatments, predicting outcomes, and personalizing care plans.

🚨 **Early Detection and Prevention:** AI identifies high-risk patients earlier, enabling timely intervention and improved outcomes.

Why AI in the HI

- **Lung cancer in Hawaii**
  - 6th highest incidence of lung cancer in the country
  - Rank last in the country for early detection of lung cancer



- **Many patients at risk aren't eligible for screening:**
  - 60% of **women** with lung cancer are non-smokers and don't qualify for screening.
  - **Native Hawaiians** often develop lung cancer 10 years before screening guidelines begin
  - AI helps to identify these patients

- **Unique island geography limits access to timely lung cancer care**
  - Tertiary care center for the Pacific
  - To decrease treatment delays we have implemented a single anesthetic approach to diagnose, stage and treat in one setting
  - AI helps to select patients for this pathway that have a high likelihood of malignancy

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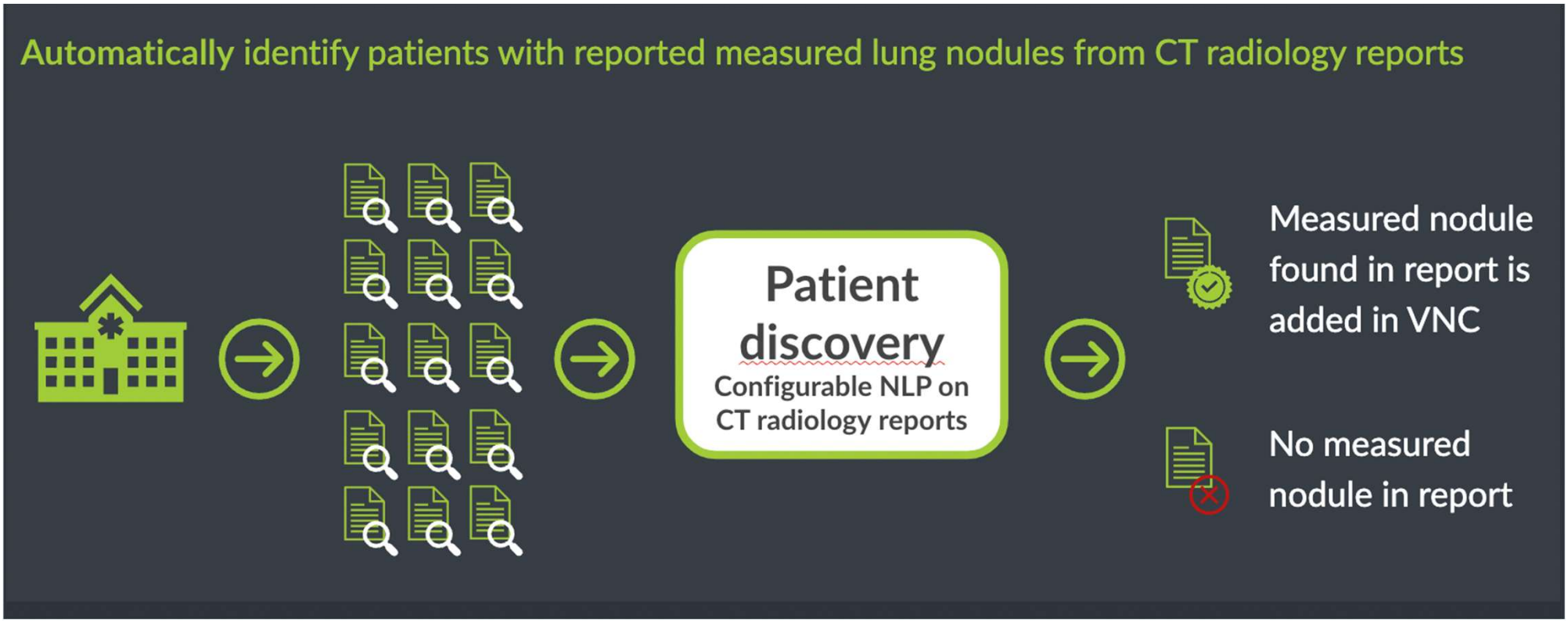
AI-Powered Pulmonary Nodule Detection

Step 1: Patient Discovery AI



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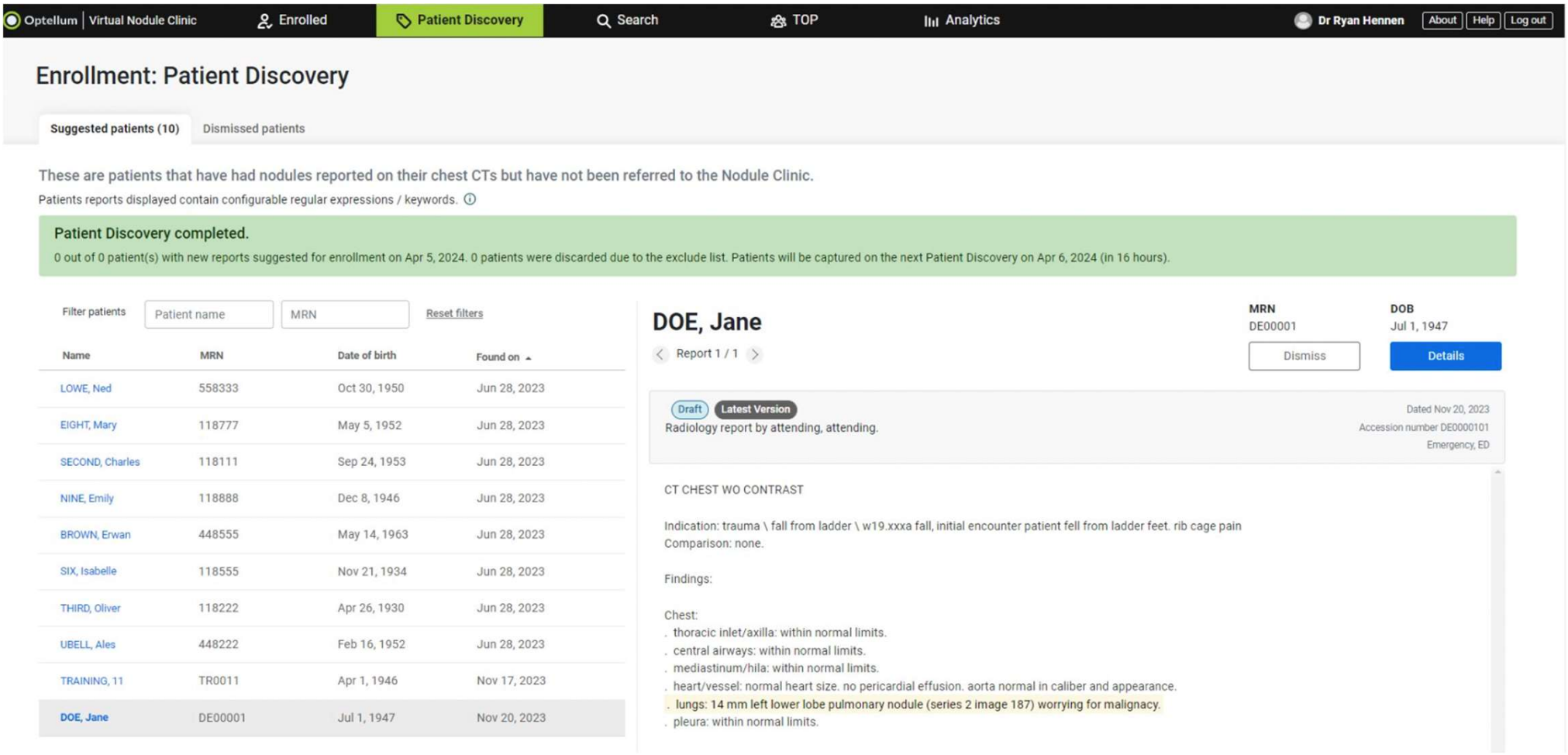
AI-Powered Pulmonary Nodule Detection

Step 2: Patient Enrollment in the Virtual Nodule Clinic



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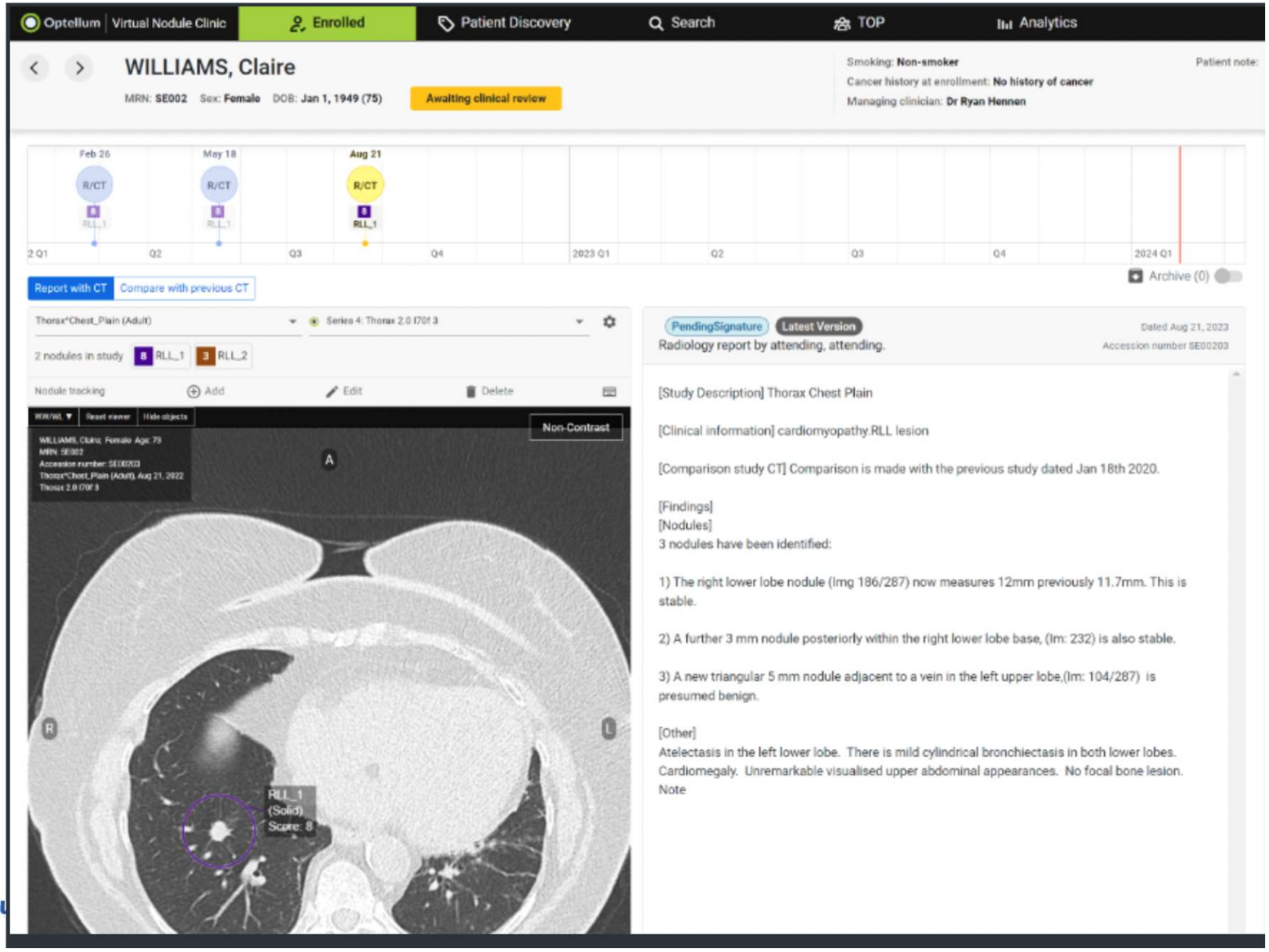
AI-Powered Pulmonary Nodule Detection

Step 3: Evaluate the Nodule



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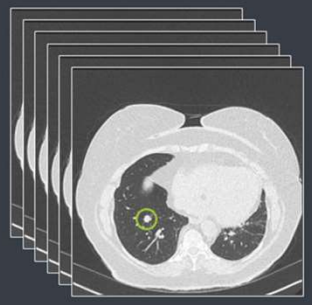
AI-Powered Pulmonary Nodule Detection

Step 4: Lung Cancer Prediction Score

World's first AI-powered decision support for early lung cancer diagnosis

- ✓ Imaging AI (radiomics) digital biomarker – computed from CT images only, harnessing all pixels in 3D
- ✓ Produces a malignancy score between 1 (benign) and 10 (malignant) for a nodule of interest



User triggers the Optellum LCP score in a single click

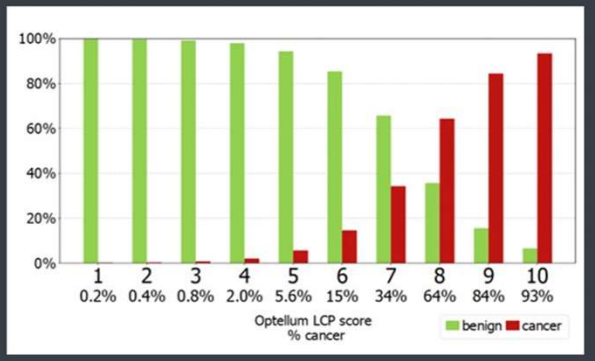
3D ROI around the nodule is automatically extracted ...

LCP

... and automatically sent to the Optellum LCP engine

LCP Score:
9

Optellum LCP score is returned within seconds for clinician interpretation



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Impact of AI: Real World Application

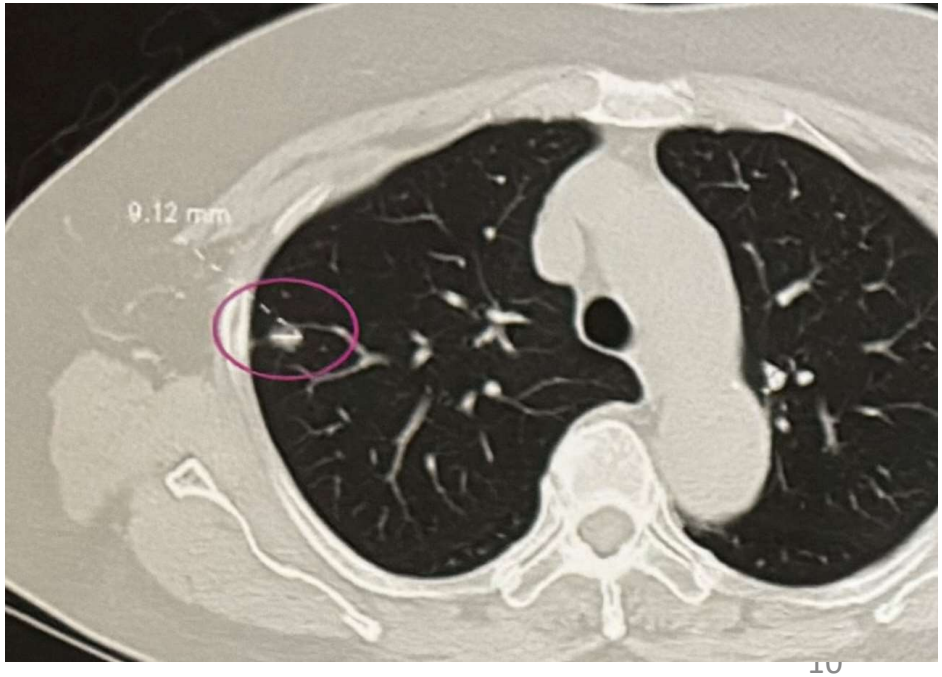
69yo woman, never smoker and no family history of lung cancer, presents to the ER with abdominal pain

- Diagnosed with appendicitis by CT scan
- Incidental finding of a 0.9cm right pulmonary nodule

Is this malignant?

Low Risk vs. High Risk

Surveillance vs. Biopsy



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Impact of AI: Real World Application

Nodule Detection

- AI software screens all radiology reports with natural language processing

Patient Enrollment

- Identifies the patient and enrolls into the virtual nodule clinic

Risk Assessment

- Apply traditional & historical risk calculators
- Apply AI lung cancer prediction score

Impact of AI: Real World Application

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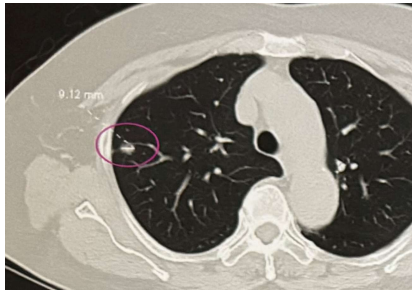


PET/CT scan

- SUV 1.5

Fleischner Recommendation (part solid >8mm)

- CT in 3 to 6 months to confirm persistence. If unchanged and solid component below 6mm, CT annually for 5 years

Quantitative Risk Calculator

- 1.2% risk of malignancy

AI Lung Cancer Prediction Score

- **Score 8 (64% risk of malignancy)**

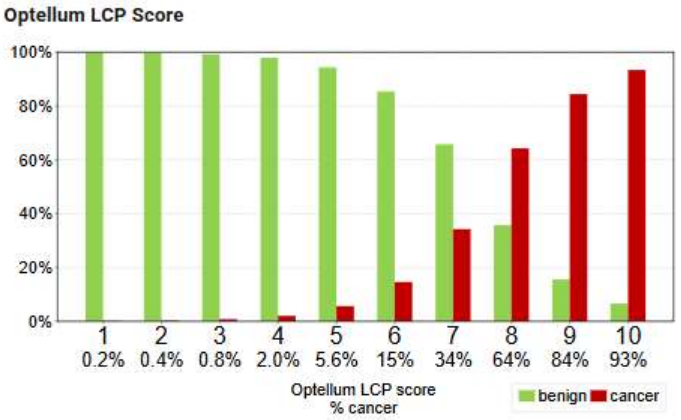
Age	69	years
Nodule diameter	9	mm
Current or former smoker	No 0 / Yes +1	
Extrathoracic cancer diagnosis ≥5 years prior	No 0 / Yes +1	
Upper lobe location of tumor	No 0 / Yes +1	
Nodule spiculation	No 0 / Yes +1	
FDG-PET (Optional, if performed)	PET not performed / No uptake / Faint uptake / Moderate uptake / Intense uptake	

1.2 %

Probability of malignancy

One study suggests watchful waiting only at very low post-test probabilities (<2%), biopsy at "lower" post-test probabilities (2% to 20%), and surgery at higher post-test probabilities (>70%). See Next Steps.

Copy Results | Next Steps



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Impact of AI: Real World Application

OR for diagnosis, staging and treatment

1

Ion Biopsy of RUL nodule:

+ NSCLC

Home 2 days after surgery

negative

3

Robotic RUL Segmentectomy Stage I NSCLC

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Our Experience

Launched: October 2024

- **Daily Impact:** AI identifies **40-50 patients** with lung nodules detected on CT scans from the previous day.
- **Nurse Navigator Review:** Patients already known to the nodule clinic or undergoing scans for known cancers or nodules are filtered out.
- **New Patients Identified:** This process results in **15-20 new patients** with newly detected pulmonary nodules being enrolled in the nodule clinic each day.
- **Monthly Enrollment:** Approximately **350-400 new nodule patients** are added to the clinic each month.
- **Biopsy Rate:** Around **20%** of these patients proceed to biopsy for further evaluation.

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Our Workflow

AI powered detection of lung nodule and enrollment into virtual nodule clinic

Nurse navigator reviews the patients and filters out known nodules or cancers and identifies new nodule patients

Contact PCPs and ordering provider to inform them of their patient's detected lung nodule and offer management and monitoring through our nodule clinic

AI -powered lung cancer prediction score and review in multidisciplinary nodule conference

- Nodule Surveillance
- Nodule Biopsy
- Single Anesthetic Diagnosis to Resection

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Key Pointers for Implementing AI in Healthcare:

- **Identify Clear Use Cases:** Focus on areas where AI can provide the most impact, such as diagnostics, predictive analytics, workflow optimization, or patient care personalization.
- **Data Quality and Integration:** Integration with existing electronic health records (EHR) systems is crucial for seamless implementation.
- **Regulatory Compliance:** Adhere to healthcare regulations such as HIPAA, GDPR, and FDA guidelines to ensure patient data privacy and model safety.
- **Clinician Involvement:** Engage healthcare providers throughout development to ensure AI tools align with clinical needs to enhance and not replace decision-making or the workforce.
- **Scalability and Sustainability:** Design AI solutions that are adaptable to new data, evolving clinical practices, and expanding healthcare environments.
- **Continuous Monitoring and Improvement:** Regularly evaluate AI performance, ensuring it maintains accuracy, reliability, and value in real-world clinical settings.

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Thank you

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