Lahey Lung Health Program:

Lee Gazourian, MD
November 3rd, 2022

Beth Israel Lahey Health
Lahey Hospital & Medical Center

ILA DATA CTLS Cohort: Mortality Supported by Genentech

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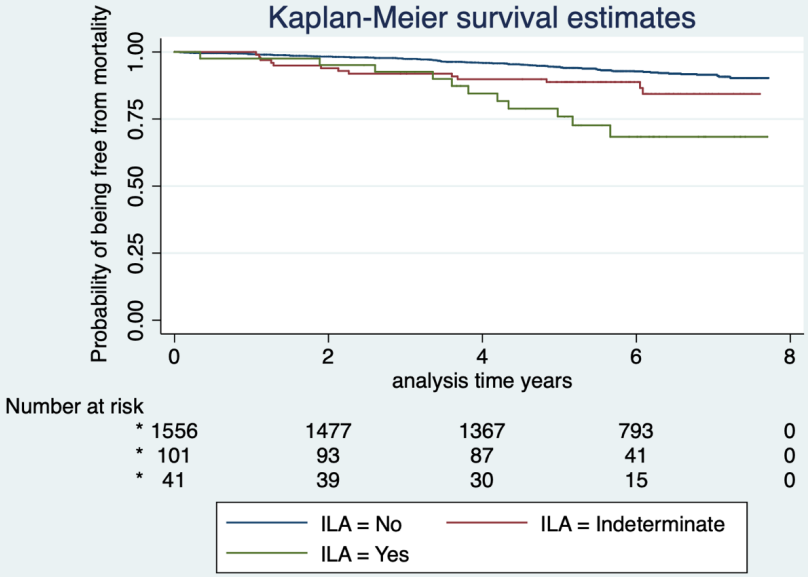
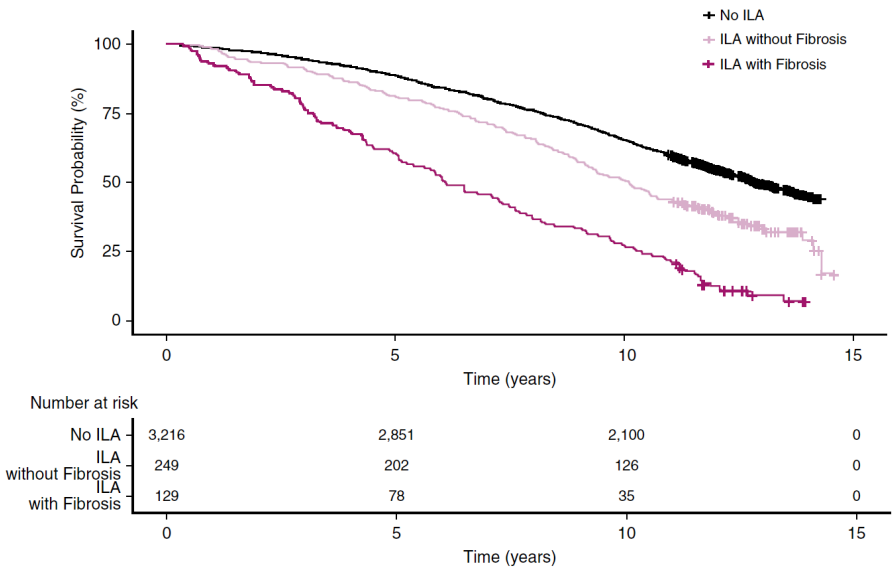
	HR	p-value
No ILA	Reference Group	-
Indeterminate ILA	1.83 (1.03, 3.26)	0.04
ILA	3.71 (1.99, 6.94)	<0.001

Table 4. Association between Imaging Pattern and Features and Mortality*

	Unadjusted Analysis		Adjusted Analysis†	
	HR (95% CI)	*P* Value	HR (95% CI)	*P* Value
Reticular markings‖	2.0 (1.3–3.1)	0.002	1.6 (1.0–2.5)	0.049
Centrilobular nodules	0.7 (0.6–0.9)	0.01	0.9 (0.7–1.1)	0.3
Nonemphysematous cysts	1.7 (1.3–2.2)	<0.0001	1.4 (1.1–1.8)	0.02
Traction bronchiectasis	2.0 (1.6–2.6)	<0.0001	1.6 (1.3–2.1)	0.0001
Lower lobe‡ predominance	1.5 (0.95–2.5)	0.08	1.1 (0.6–1.7)	0.8
Subpleural location§	2.0 (1.3–3.2)	0.003	1.6 (1.0–2.7)	0.050
ILA without fibrosis	1.3 (1.2–1.4)	<0.0001	1.2 (1.1–1.3)	0.0004
Definite fibrosis	1.9 (1.7–2.1)	<0.0001	1.5 (1.3–1.6)	<0.0001
Indeterminate for UIP	1.6 (1.3–2.0)	<0.0001	1.2 (0.98–1.5)	0.07
Probable UIP pattern	3.3 (2.6–4.2)	<0.0001	1.9 (1.5–2.5)	<0.0001
UIP pattern	6.9 (4.2–11)	<0.0001	4.5 (2.8–7.2)	<0.0001





Putman et al. 2019

* Multivariable analysis adjusted for age, sex, BMI, pack years, current smoker

ILA DATA CTLS Cohort: Clinical Opportunity

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N=41 (2.6% of CTLS scans)	N (%)	Years to
Followed by Pulmonary Pre	7 (17.1%)	-
Followed by Pulmonary Post N=34	29 (85.3%)	2.37 ± 2.87
ILD diagnosis	10 (24.4%)	4.47 ± 2.72

ILA DATA Non-Screening Cohort: Clinical Opportunity 2/9/2022-5/6/2022

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Table 7. CT Chest N 5451	N (%)	Extrapolation to 1 year
Table 7:	**ILA Criteria**	
ILA*	99 (1.82%)	429
New to Pulmonary	46 (0.84%)	199
Carry ILD Diagnosis		
ILD	155 (2.84%)	672
Currently on Antifibrotic treatment	22 (0.40%)	95
Treatment opportunity		
Met antifibrotic Treatment Criteria#	17 (0.31%)	74
Potential antifibrotic candidates#	68 (1.25%)	295

*Excluded age>85, Active metastatic cancer, dementia or other major comorbidities.
#Did not exclude age>85

Screening ILD Increases Referral
UC Davis Study

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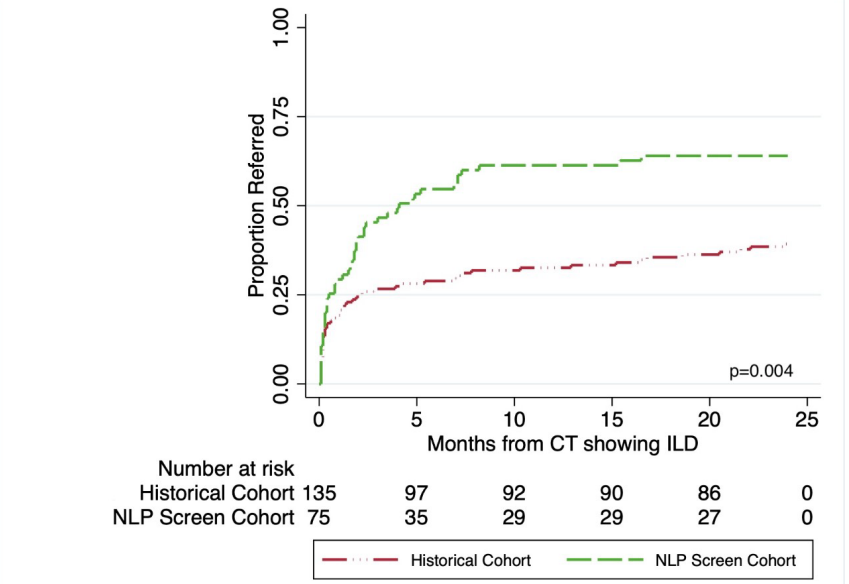
- Outpatient CT reports screened using NLP
- Flagged patients reviewed by ILD specialist
- Patients with incident ILD had pulmonology referral recommended to PCPs



W. Leon, J. V. Pugashetti, J. Oldham. ATS 2022

UC Davis Model:

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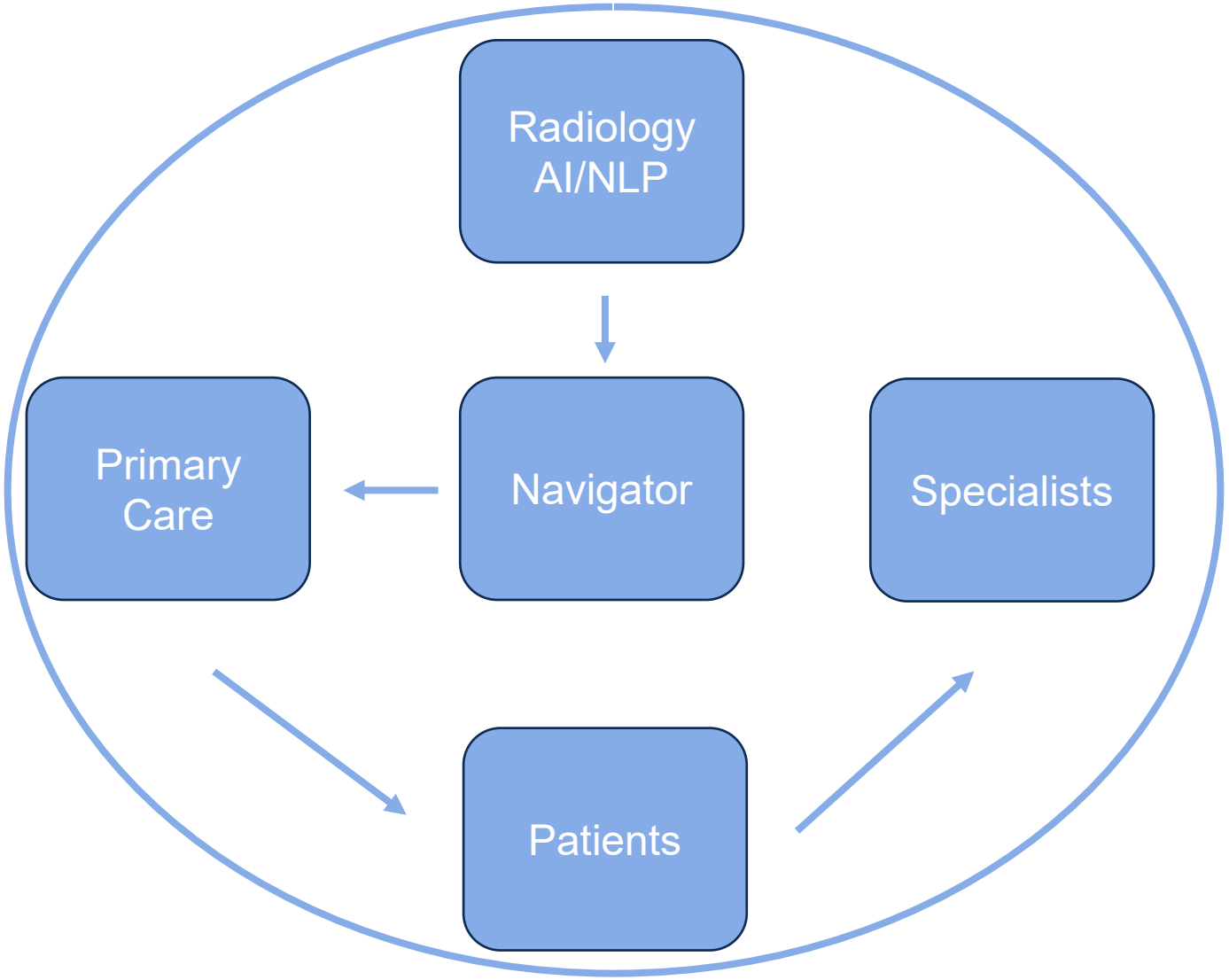

AI integration: Imbio Patient Engagement

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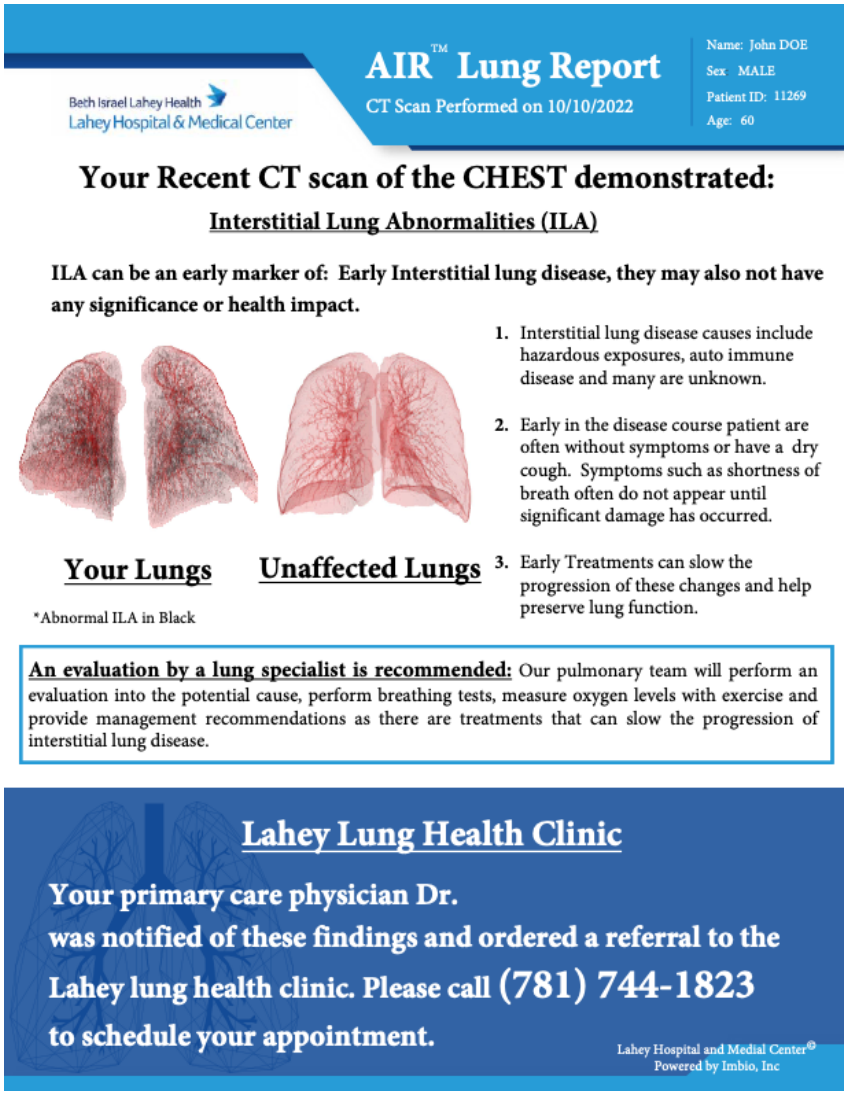

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AIR™ Lung Report

CT Scan Performed on 10/10/2022

Name: John DOE
Sex MALE
Patient ID: 11269
Age: 60

Your Recent CT scan of the CHEST demonstrated:

Interstitial Lung Abnormalities (ILA)

ILA can be an early marker of: Early Interstitial lung disease, they may also not have any significance or health impact.

Your Lungs **Unaffected Lungs**

*Abnormal ILA in Black

1. Interstitial lung disease causes include hazardous exposures, auto immune disease and many are unknown.
2. Early in the disease course patient are often without symptoms or have a dry cough. Symptoms such as shortness of breath often do not appear until significant damage has occurred.
3. Early Treatments can slow the progression of these changes and help preserve lung function.

An evaluation by a lung specialist is recommended: Our pulmonary team will perform an evaluation into the potential cause, perform breathing tests, measure oxygen levels with exercise and provide management recommendations as there are treatments that can slow the progression of interstitial lung disease.

Lahey Lung Health Clinic

Your primary care physician Dr.
was notified of these findings and ordered a referral to the Lahey lung health clinic. Please call (781) 744-1823 to schedule your appointment.

Lahey Hospital and Medical Center®
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Emphysema: Publication

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Check for updates

Qualitative emphysema and risk of COPD hospitalization in a multicenter CT lung cancer screening cohort study

Lee Gazourian [a,*], William B. Thedinger [b], Shawn M. Regis [c], Elizabeth J. Pagura [a], Lori Lyn Price [d,e], Melissa Gawlik [f], Cristina F. Stefanescu [g], Carla Lamb [a], Kimberly M. Rieger-Christ [h], Harpreet Singh [i], Marcel Casasola [i], Alexander R. Walker [i], Arashdeep Rupal [i], Avignat S. Patel [a], Carolyn E. Come [a], Ava M. Sanayei [b], William P. Long [b], Giulia S. Rizzo [j], Andrea B. McKee [c], George R. Washko [k,l], Raul San Jose Estepar [k,m], Christoph Wald [n], Brady J. McKee [n], Carey C. Thomson [i,o,p,1], Timothy N. Liesching [a,1]

Emphysema: Opportunity

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Table 5

Rates of active smoking, PFT/COPD screening in the 5 years prior to baseline exam and pneumococcal 23 (PPSV 23) vaccination rates in patients with qualitative emphysema on their baseline CTLS exam in patients with in network primary care physicians.

	LHMC	MAH
	N = 3226	N = 915
Emphysema (Yes)	**1839 (57.0%)**	**475 (51.9%)**
Active Smoking	**1045 (56.8%)**	**261 (54.9%)**
PFTs (No)	**1238 (67.3%)**	**371 (78.1%)**
PPSV 23 (No)	**713 (38.8%)**	**254 (53.5%)**

Emphysema: ROI Opportunity

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Quantitative CT Assessment in the CT Lung Cancer Screening (CTLS) Population: A potential tool for screening candidates for bronchoscopic lung volume reduction (BLVR)

Approximately 4% of the CT lung screening population may benefit from further evaluation for candidacy for bronchoscopic lung volume reduction with systematic use of quantitative emphysema CT assessment.

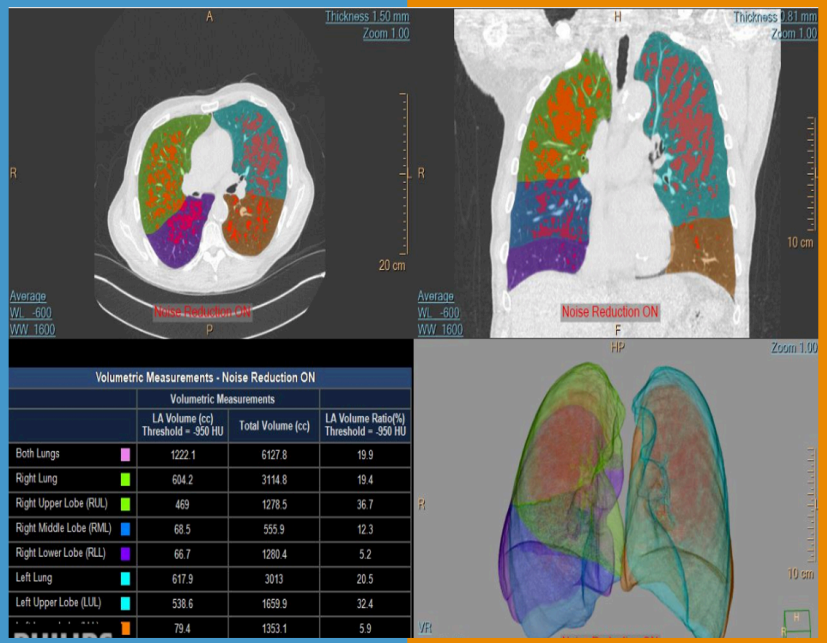
Carla Lamb MD, Shawn Regis PhD, William Thedinger BA, Effie Adjei MD, Julia Rabazzi, Susan Jin Kim BS, Elizabeth Pagura BA, Kim Rieger-Christ PhD, Christoph Wald MD PhD, Brady McKee MD, Andrea McKee MD, Tim Liesching MD, Lee Gazourian MD

BACKGROUND:
15 million Americans are estimated to be eligible for CT lung cancer screening (CTLS). CTLS may help identify patients who could clinically benefit from BLVR or lung volume reduction surgery (LVRS).

METHODS
A retrospective, single center study assessed all baseline CTLS exams from January 1, 2012-September 30, 2017. All analysis was performed utilizing a lung analysis software on IntelliSpace Portal 9.0 (CT COPD Philips Healthcare Cleveland OH) Readers blinded to outcomes data performed the analysis and reviewed multiplanar images and corrected any errors in interlobar segmentation. Attenuation of each voxel within segmented lungs was calculated automatically. Emphysema destruction was calculated as the sum of voxels with attenuation below -950 Hounsfield units (HU)

PRESENTED AT

CHEST 2021
ANNUAL MEETING | OCTOBER 17-20



Volumetric Measurements - Noise Reduction ON

	Volumetric Measurements		
	LA Volume (cc) Threshold = -950 HU	Total Volume (cc)	LA Volume Ratio(%) Threshold = -950 HU
Both Lungs	1222.1	6127.8	19.9
Right Lung	604.2	3114.8	19.4
Right Upper Lobe (RUL)	469	1278.5	36.7
Right Middle Lobe (RML)	68.5	555.9	12.3
Right Lower Lobe (RLL)	66.7	1280.4	5.2
Left Lung	617.9	3013	20.5
Left Upper Lobe (LUL)	538.6	1659.9	32.4
	79.4	1353.1	5.9

Results:
A total of 4673 patients were included in the study. Quantitative global and lobar emphysema scores were obtained on 4495 patients (96.2%). A majority of patients 2845 (60.9%) had less than 1% emphysema destruction. 1207 of the patients (25.8%) had between 1-5% emphysema destruction with 235 patients (5%) between 5-10% destruction and 208 patients (4.5%) with greater than 10% emphysema destruction. In our cohort, 124 patients(59.6%) demonstrated a global % LAA of -950 HU > 10% and had heterogeneous disease defined as delta of 15% LAA between ipsilateral lobes. There were 182 patients (3.9%) who had at least one lobe with at least 20% lung destruction (%LAA -950 HU> 20%).

CLINICAL IMPLICATIONS
- Utilizing a systematic quantitative emphysema CT assessment in patients undergoing CT lung screening may identify potential candidates for further evaluation for BLVR or LVRS.

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BLVR screening

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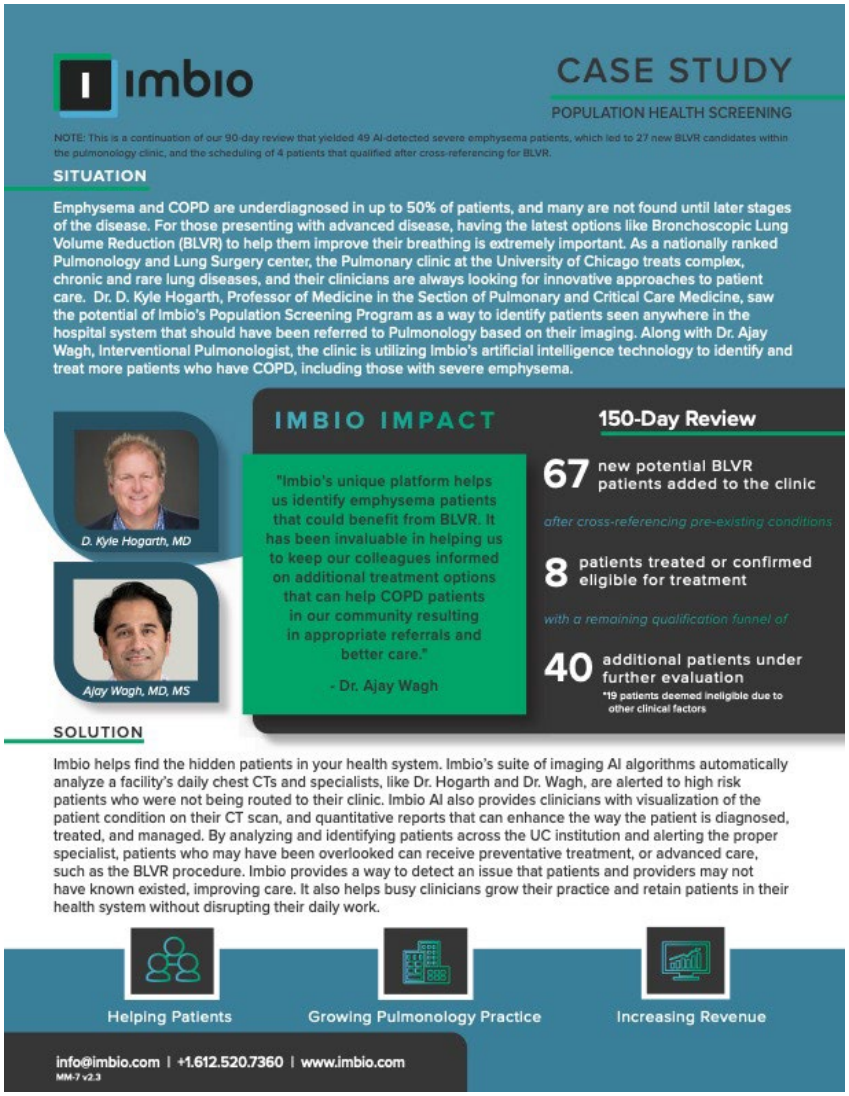

U Chicago Model:

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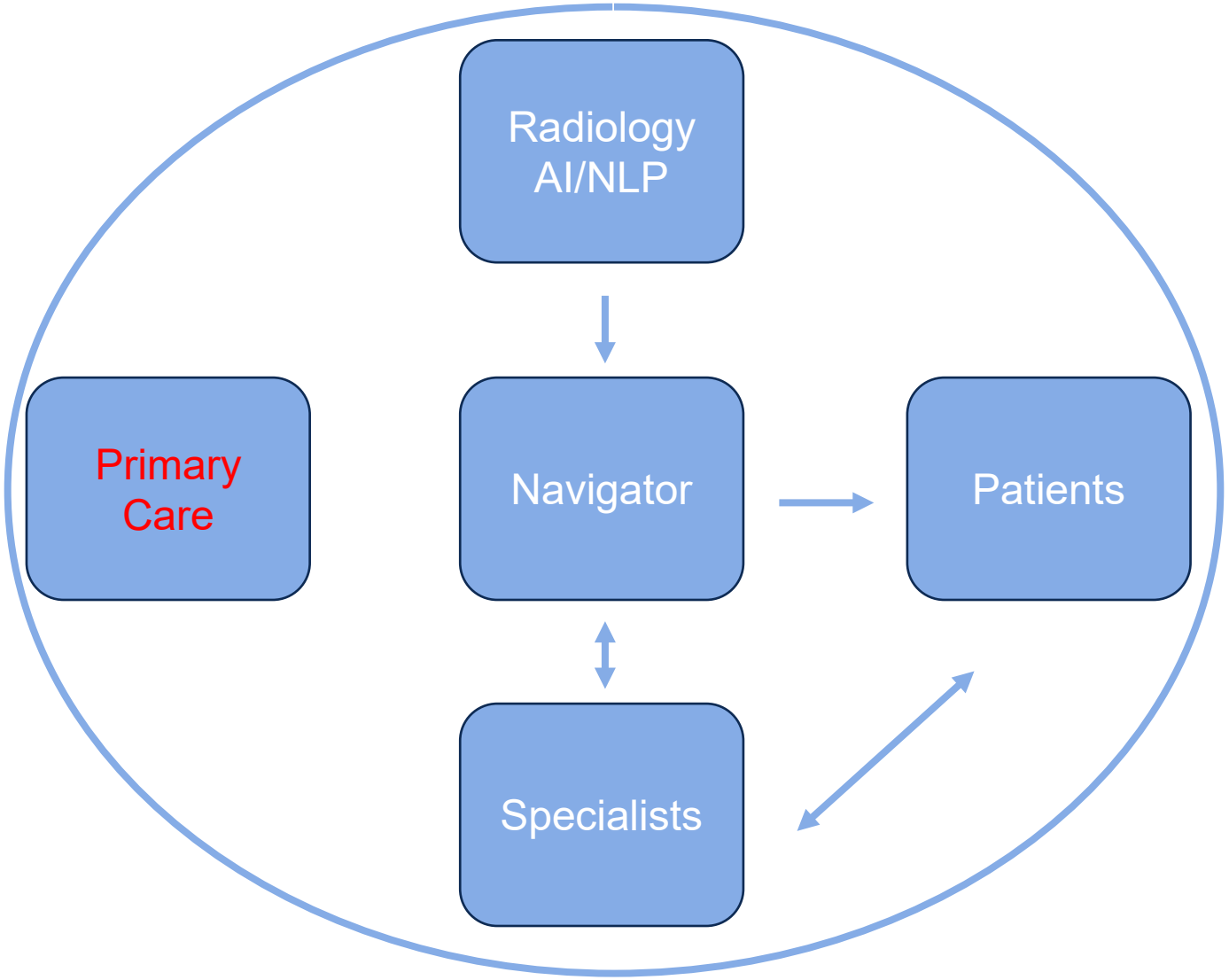

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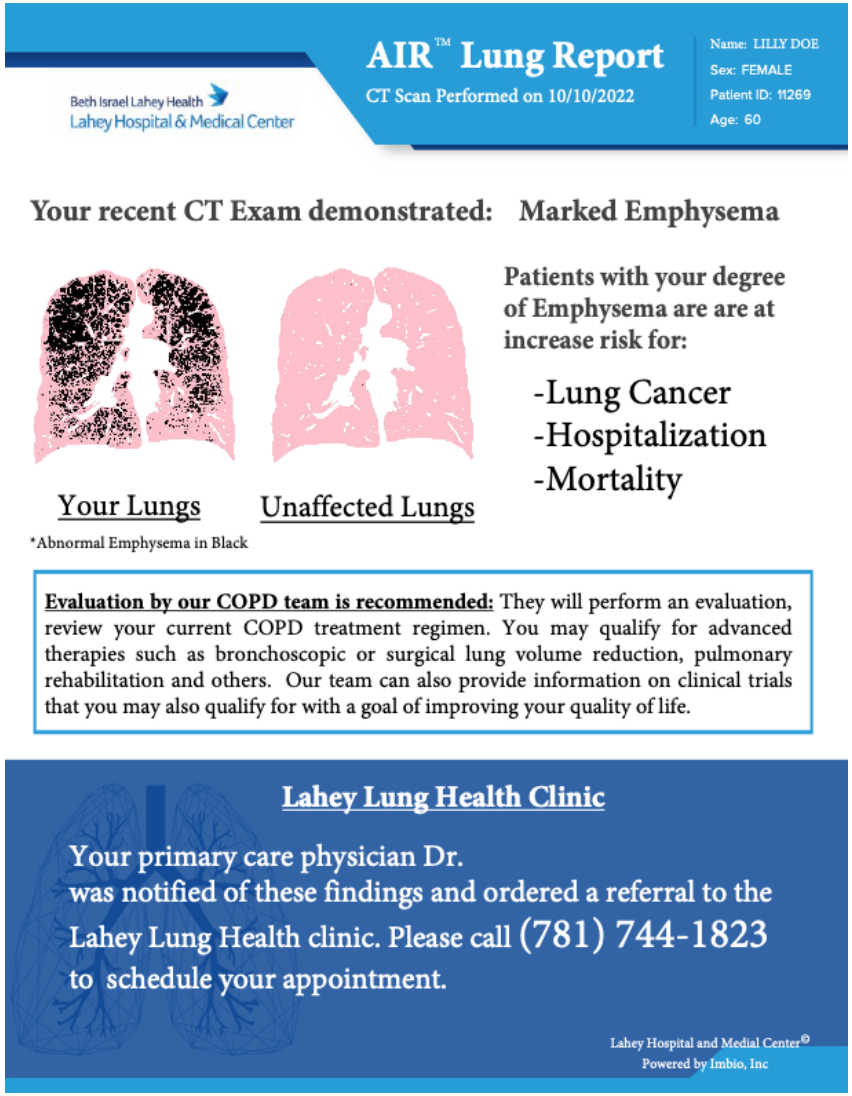

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Lahey Lung Health Model:
Supported by Three Lakes Foundation

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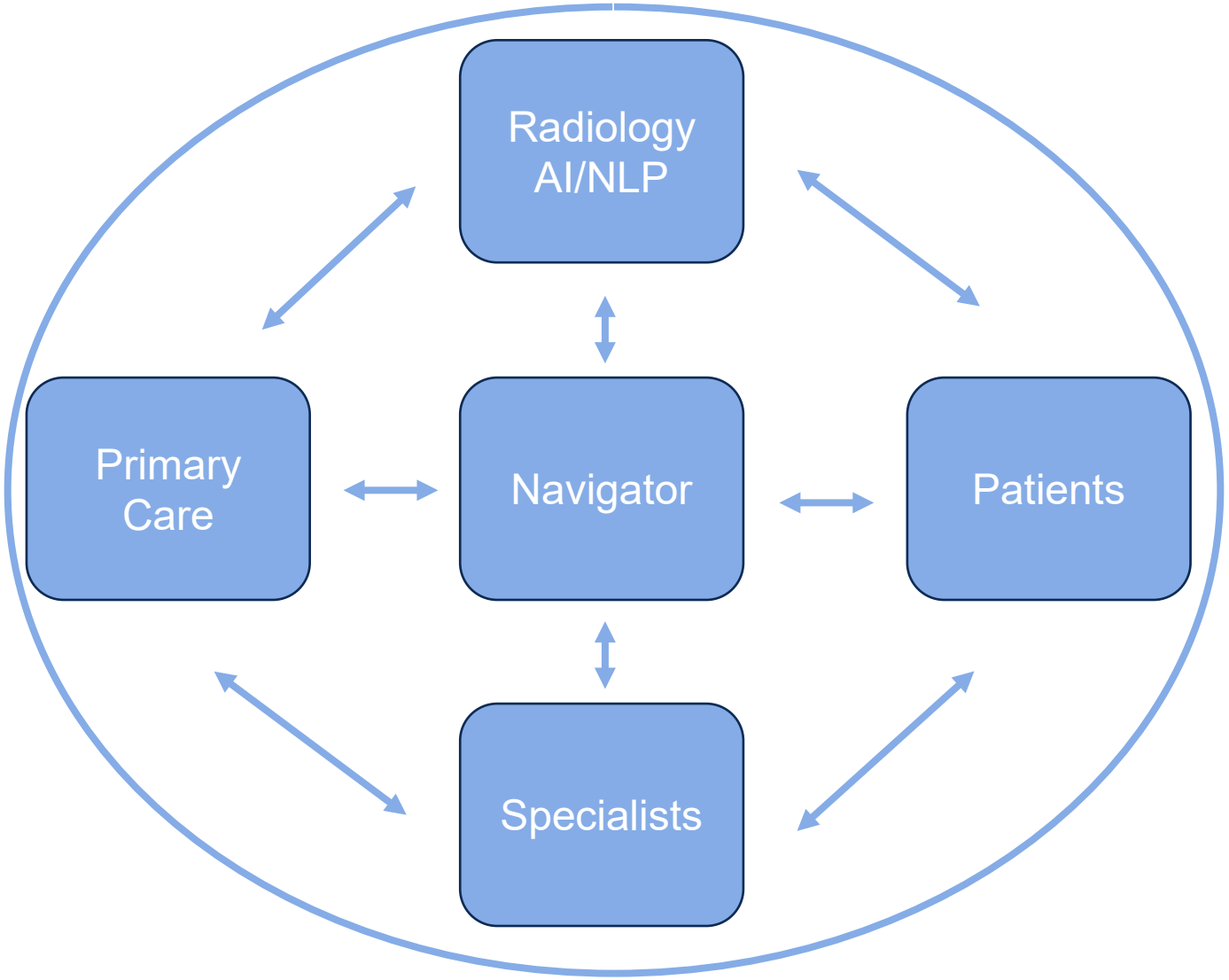

Lung Health Program Mission.

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