



**Cassling Webinar**

**Implementing a Viable Lung Cancer Screening Program**

Webinar start time: 12 p.m. CST  
Dial-in phone number: 844-245-6892 / Conference ID: 53737750

Presented by Les Ciancibello RT R CT



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**APPROVED FOR 1.0 CE CREDIT**

To receive credit:

- **Individual attendance**
  - Complete the online poll at the end of the presentation to prove attendance.
  - If you are unable to attend the entire webinar, we cannot issue a CE certificate, per the ASRT.
- **Group attendance**
  - All participants must fill out the Webinar Group Attendance Sheet (sent in confirmation email).
  - Email the completed form to [marketing@cassling.com](mailto:marketing@cassling.com) or fax it to 402-334-8325 within two business days.

Note: CE Credit is for today's live viewing only, and not the archived recording available on our website.


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**Upcoming Events**

- **June 29 – Tomosynthesis Equipment Demo (Omaha)**
  - Monday, June 29
  - 5 – 9 p.m.
  - La Vista Conference Center
  - See Siemens True Breast Tomosynthesis technology in action
- **June 30 – Investing in Her Seminar (Omaha)**
  - Tuesday, June 30
  - 9 a.m. – 3:30 p.m.
  - Approved for 4.5 CE credits from the ASRT.
  - Topics include breast tomosynthesis implementation, breast density, mammography positioning and more!

**Register Today:**  
[www.cassling.com/events](http://www.cassling.com/events)




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**University Hospitals**  
 Seidman Cancer Center

**Experience in Implementing A Viable Lung Cancer Screening Program**

Cassing webinar  
 June 18<sup>th</sup>, 2015  
 Les Cianoello RT R CT

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**Disclosures**

- I am an employee of University Hospitals Case Medical Centers Seidman Cancer Center
- I have received payment for consultation services that I provided to Mallinckrodt Pharmaceuticals
- I have received compensation in the form of food and lodging for a presentation at ASRT Annual Meeting in Orlando in June
- I am a consultant for Siemens

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**Lung Cancer Screening in a Large Health System: Challenges and Lessons Learned**

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## Special Thanks

- Robert “Chip” Gilkeson MD
- Teresa Stevenson RT R BS
- Jennifer Sposato RT R CT

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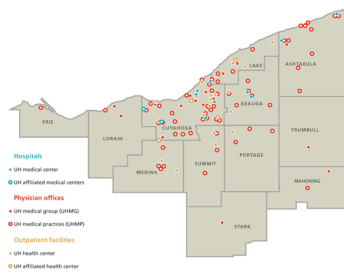
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## University Hospitals Health System

- Main Campus
  - 1032 bed tertiary medical center located in University Circle in Cleveland, OH
  - Home to three renowned hospitals including, Rainbow Babies and Children's, MacDonald Women's and Seidman Cancer Center



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## University Hospitals Health System

- Across the 12 county area we have
  - 8 Community Hospitals
  - 21 Health Centers
  - >40 Physicians offices and affiliated practices with over 4000 providers
- Covered lives = 3.5 million

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## Case Medical Center Main Campus



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## Lee and Jane Seidman

•Seidman Cancer Center is named after Jane and Lee Seidman

•Gift of \$42 million, ".....we are overjoyed to make this gift that may lead to finding cures for cancer."



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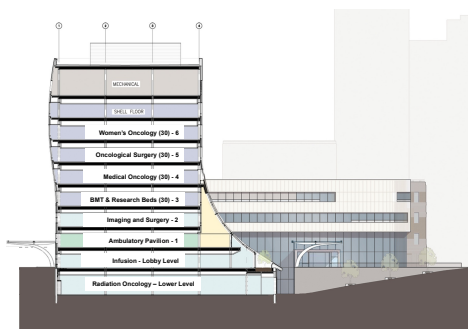
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## Seidman Cancer Center by Floor



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## Radiology



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## Equipment

- State of the Art Technology
  - 2 CT
    - Siemens SOMATOM Definition Flash Dual Source
    - Siemens SOMATOM Sensation 16
  - 1 MRI
    - Siemens MAGNETOM Verio 3T
  - 1 PET/MRI
    - Philips Ingenuity
  - 2 PET/CT
    - Philips 64 row
    - Philips 16 row Large Bore
  - General Diagnostic Radiography
  - Ultrasound
  - Nuclear Medicine
  - Angiography
  - Area first Proton Therapy Center

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## Lung Cancer by the Numbers

- In the United States, > 201k\*\* new diagnosis - >158k deaths
- That is more deaths than the next four leading cancers combined:
  - Colon 51k
  - Breast 40k
  - Pancreatic 37k
  - Prostate 32k
- Lung Cancer has a 5 year survival rate of 16%
  - Colon 65%
  - Breast 89%
  - Prostate 99%
- 54 years of treatment
  - 1960 5 year survival 8%
  - 1974 5 year survival 13%
  - 2014 5 year survival 16%
- Early stage 1 cancers have an 80% of cure

\*Lung Cancer Fact Sheet – LCA  
\*\*CDC – Lung Cancer Statistics

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## Rationale for our Program

- Lung Screening Trials
  - Mayo Clinic Lung Screening Project\*
    - Mortality not affected by screening
  - Early Lung Cancer Action Program (ELCAP)\*\*
    - Results not supported by Society of Chest Physicians
  - National Lung Screening Trial (NLST)\*\*\*
    - Early results November 2010
    - Showed **20.9%** reduction in mortality from lung cancer
- Experience with CT Calcium Score Program
  - Screened over 11K in past 6 years

\*Mayo Clinic Lung Screening Project  
\*\*ELCAP Publications  
\*\*\*Publications from NLST

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## Terminology

- Initial Screening exam
  - The first exam performed as part of our low dose lung screen program offered for \$99 (CT199)
- Follow up Screening exam
  - An exam performed following an initial screening that is self pay, LR1 or LR2 (CT199)
- Diagnostic Follow up
  - An exam performed at low dose after an initial screening that is billed to insurance / 3<sup>rd</sup> party payer, LR3 and higher (CT30)
- Surveillance
  - An exam performed to monitor or follow a patient with a known history of malignancy

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## Timeline

- November 2010, NLST releases preliminary findings at American Society of Clinical Oncology (ASCO)
- December 2010, Seidman leadership initiates discussion with department of radiology regarding starting a Lung Screening Program
- January, 2011 Radiology begins to develop program
- June 5<sup>th</sup>, 2011 Seidman Cancer Center opens
- June 20<sup>th</sup>, 2011 first lung screen performed
- November 7<sup>th</sup>, 2011 first lung cancer diagnosis

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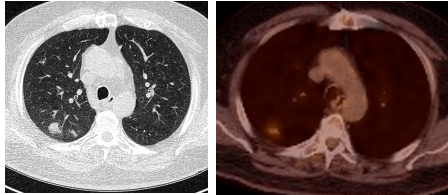
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## First Cancer Found



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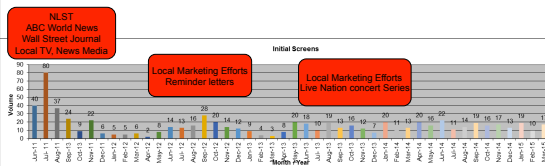
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## Initial Lung Screen Exams Performed



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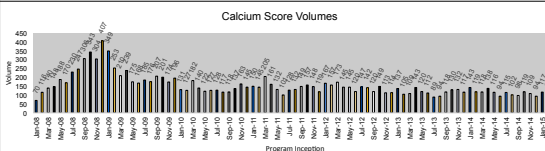
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## Calcium Score Program a Comparison



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### Why the Difference?

- Same referring physician groups
- Same low cost
- Same convenient access

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### Some Thoughts

- Different patient populations
  - Smokers
  - Health conscious
- Patients fear the word cancer
  - Find heart disease less scary
- Enrollment criteria
- Primary Care Physicians reluctance
- Lack of a physician driver
  - This may be the key difference



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### Inclusion / Exclusion Criteria

- Adopted the NLST/CMS inclusion/exclusion criteria\*
  - Those current or former heavy smokers
    - Age 55-77
    - Asymptomatic for lung cancer
    - 30 pack year history
    - Quit smoking less than 15 years ago
    - Have not had a chest CT in past 2 years
    - Have no history of malignancy\*
  - Why not just include everyone
    - Quality & Outcome Registries
    - Inappropriate screening is not cost effective & potentially harmful

\*Publications from NLST

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## History of Malignancy

- NLST guidelines for enrollment\*
  - The NLST did not decline enrollment to those participants who had a history of a “non life threatening malignancy”
  - Definition of “non life threatening malignancy?”
  - How would we educate technologist staff, scheduling staff, finance staff and the like to know the difference?

\*Publications from NLST

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## History of Malignancy

- Opted to exclude any patient with any history of malignancy from the program
  - This lead to push back from referrers and patients
  - Our rationale
    - Patients with history of malignancy are already under surveillance using established protocols
    - Patients and referrers would use this low cost system to perform surveillance imaging to avoid high cost insurance deductibles
  - New thinking
    - Perhaps we should make enrollment decisions in these patients on a case by case basis
      - Type of malignancy
        - » Remote breast
        - » Remote prostate
      - Surveillance history
    - Scheduling issues/Delays

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## Centralized Scheduling Education

- Our health system has several “centralized” scheduling departments, as well as an Ambulatory Electronic Medical Record
- Education included
  - Inclusion/ Exclusion criteria
  - Medicare v Non-Medicare
  - Determination of study needed
    - Initial Screen
    - Follow up Screen
    - Follow up Diagnostic
  - Offering payment options
  - Scheduling in the performing locations

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## Technologist Education

- Held meetings with chief technologists from across the health system
  - Protocol development
  - Phantom testing
  - Scheduling and Finance
  - Routing of images
  - Post processing
  - Database management
  - F/U exam determination and eligibility
    - Screening vs. diagnostic

## Referring Physician Education

- Held meetings with key leaders in physician groups across our system
  - Discussed NLST
  - Shared inclusion/exclusion criteria
  - Scheduling of exams
    - Primary Care Physician (PCP) order required
    - For those patients who do not have a PCP we were able to provide one
  - Payment
    - Self pay vs. insurance
  - Follow up process
    - 3 year commitment
    - Screening vs. diagnostic
  - Radiation Dose
    - ~ 1 mSv or 3 years natural background radiation

## Dose

UH Seidman Cancer Ctr C: 300.0, W: 50.0  
RSP Status: Final

DOB: 07-Nov-2011 14:32  
MRN: 00000000000000000000  
ACCP: 00000000000000000000  
Consent: 00000000000000000000  
Gender: F Ward: 00000000000000000000  
Size: mm Physician: 00000000000000000000  
Pos: mm Operator: 00000000000000000000  
Pat.pos.: 00000000000000000000

	Scan	kV	mAs	/ ref	CTDIvol mGy	DLP mGycm	TI s	cSL mm
Patient Position H-SP								
Topogram	1	120	33	mA		3.8	0.6	
Thorax	2	120	40		2.64	100	0.5	0.6

Total mAs: 542 Total DLP: 100 mGycm

Filter: W40Cu0.5  
W40Cu0.5  
Image 1 of 1  
11/07/2011 - 02:41:05 PM

## Dedicated Order (requisition)

University Hospitals  
Radiology & Imaging Center

Radiology Requisition for Computed Tomography

Patient Name: \_\_\_\_\_  
Patient ID#: \_\_\_\_\_  
Date of Birth: \_\_\_\_\_ (mm/dd/yyyy)

Requested From: \_\_\_\_\_ (Select One) (Click on "Link" to view Clinical Guidelines)

Referring Physician: \_\_\_\_\_  
Referring Physician Signature: \_\_\_\_\_  
Referring Physician Phone: \_\_\_\_\_

Referring Physician (Date printed): \_\_\_\_\_

Referring Physician Signature: \_\_\_\_\_

Referring Physician Phone: \_\_\_\_\_

Patient must meet the following criteria, for inclusion of exam to be performed in Radiology. Please circle answer.

Patient is greater or lesser than stated on Requisition (if not 75)	Y	N
Patient has 10 years history of prior abdominal surgery (if not 10)	Y	N
Patient has 10 years history of prior abdominal surgery (if not 10)	Y	N
Patient has 10 years history of prior abdominal surgery (if not 10)	Y	N
Patient is pregnant (if not 10)	Y	N
Patient is pregnant (if not 10)	Y	N

For Radiology use only

Code: CT009 Date: \_\_\_\_\_ Radiologist: \_\_\_\_\_

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## Acquisition and Reconstruction

### • Utilization of low dose protocol

Patient's BMI	mAs
< 30	40
31-34	50
> 35	60

- 120 kVp

### • Reconstructions

- Axial Mediastinal windows 2 x 1
- Axial Lung windows 2 x 1
- Axial MIP lung windows 8 x 4
- Coronal MIP lung windows 8 x 4
- 4D volumetry using lung analysis software on nodules > 5mm

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## Imaging Workflow

- Patient or physician call to schedule exam
- Scheduling department verifies
  - Valid order
  - Inclusion criteria met
  - Instruct patient on payment options
    - Phone
    - At Point of Service with financial counseling
- Technologist places phone call to patient night before exam
  - Verification that enrollment criteria is met
- Patient presents to radiology
- Payment is made/verified
- Imaging
- Data sent to Image Lab for processing
- Images to PACS for dictation

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# Physician Reports

- Dictated reports are sent to referring physicians within 24 hours of the exam.
- Category and follow up recommendations are part of the dictation

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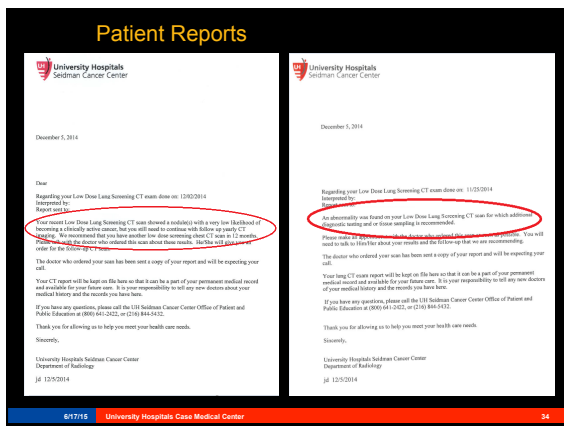
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### Expansion to Community

- In order to provide access to the greatest amount of patients we expanded the program to our community hospitals and health centers
- This required extensive education and training
- Protocol development

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### Follow Up Imaging

- Follow up imaging is performed in accordance with American College of Radiology LungRAD V1.0
  - Increased incidence of Histoplasmosis due to geographic location
- Insurance reimbursement
  - Concern for 3<sup>rd</sup> party payer complaints for small nodule follow up imaging
    - Opted to keep those patients with nodules <5 mm in screening regimen

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## Follow Up Categories- Adoption of ACR Lung RADS Version 1.0 Assessment Categories

Category	Description	Category	Management	Probability of Malignancy %
LR1	No or definitely benign nodules	Negative	Continue annual screening in 12 months	< 1%
LR2	Nodules with very low likelihood of becoming clinically active cancer	Benign Appearance or Behavior	Continue annual screening in 12 months	< 1%
LR3	Probably benign finding	Probably benign	6 month low dose CT	1-2%
LR4A	Additional diagnostic testing recommended	Suspicious	3 month low dose CT; PET if nodule $\geq$ 8mm solid component	5-15%
LR4B,4X	Additional diagnostic testing recommended	Suspicious	Chest CT with or without contrast, PET/CT and/or tissue sampling depending on probability of commodities. PET/CT if nodule $\geq$ 8mm solid component	> 15%

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## Return to Screening

- Current protocol requires patients who are LR2 or higher to have follow up exams performed using the diagnostic protocol
  - Low dose
  - Billed to insurance
- What if their category is downgraded on diagnostic follow up?
  - Do we return to screening regimen?
    - No
      - Over burden payers, or patients with high out-of-pocket costs
    - Yes
      - Change inclusion and scheduling workflow
- Current scheduling workflow
  - Once you receive a diagnostic exam – you cannot get a screening
    - scheduling/ payment issues

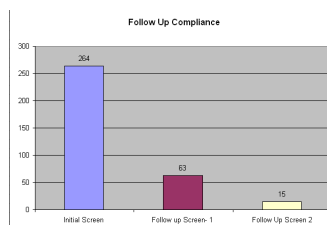
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## Follow up Compliance

- Of the 264 patients who underwent screening during program year 1 and were LR1or LR2
  - Only 63 (37%) returned for their 1 year follow up
  - Only 15 (<1%) of those 63 returned for their 3 year follow up



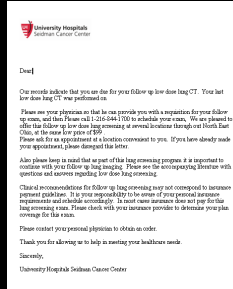
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## Reminder Letters to Patients

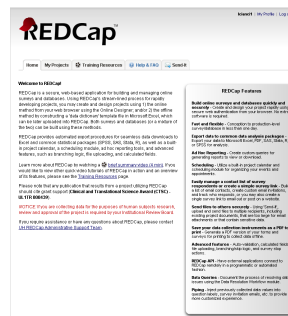
- Reminder letters are sent to all patients who have not returned for their recommended follow up imaging



## Database Management

## Database Management

- Secure Web based application
- Created by Vanderbilt University
- Allows you to build custom templates
- Provided by grant support



## Database Management

My Reports		Lung Cancer Screening	Lung Cancer Screening	Lung Cancer Screening	Lung Cancer Screening
		Screen 1	Screen 2	Screen 3	Screen 4
1. d	view	view	view	view	view
2. i	view	view	view	view	view
3. e	view	view	view	view	view
4. Can	view	view	view	view	view
5. (physicians)	view	view	view	view	view
6. cat 4	view	view	view	view	view
7. PEG	view	view	view	view	view
8. batch	view	view	view	view	view
9. July	view	view	view	view	view
10. new	view	view	view	view	view
11. new cat	view	view	view	view	view
12. cat 4	view	view	view	view	view
13. cat A3	view	view	view	view	view
14. cat A4	view	view	view	view	view
15. exp	view	view	view	view	view
16. Initial screen and category	view	view	view	view	view
17. doc c	view	view	view	view	view

## Database Management

Enrollment : [Refresh Plot](#) [View as Bar Chart](#) 

Counts/frequency: initial screen ct199 (545, 76.8%), Follow up screen 1 ct199 (90, 12.7%), Follow up screen 2 ct199 (18, 2.5%), Follow up Diagnostic ct30 (57, 8%)



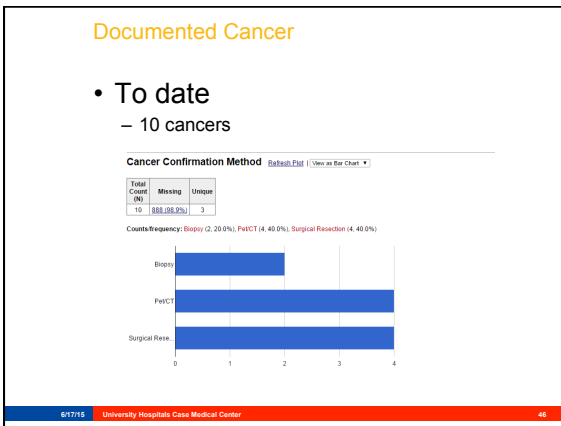
## Database Management

New Category [Refresh Plot](#) | [View as Bar Chart](#) •

Total Count (N)	Missing	Unique
800	28 (3.50%)	1

Counts/Frequency: LR0 (3, 0.0%), LR1 (121, 55.1%), LR2 (563, 70.4%), LR3 (63, 7.9%), LR4A (28, 3.5%), LR4B (11, 1.4%), LR4X (10, 1.2%), LR5 (41, 5.1%), LR6 (3, 0.0%)






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### Economics

- \$99.00 Initial Screening
- <2 minutes technologist time
- Studies show the downstream revenue from offering low cost screening will pay for the cost of the program

Siemens' CT product family is indicated for low-dose lung imaging and is not cleared for lung cancer screening.

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### Future of Reimbursement

- CMS
  - Has decided to cover the cost of lung cancer screening for those age 55 to 77 under the NLST inclusion criteria, effective 2/5/2015
- ACA
  - Requires insurers to cover preventative services that receive a "B" recommendation or higher from the USPSTF (2015)

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### What they have not decided

- Radiology Imaging Facility Criteria
- CMS approved registries
- Shared decision making policy
- Codes for shared decision making encounters
- Codes for CT exam reimbursement
- According to CMS this may take months to sort out

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### Our plan!

- Medicare Patients
  - Meet eligibility criteria
    - Offer screenings at no cost
      - V76.0
    - Submit to CMS for reimbursement
- Non-Medicare Patients
  - Meet eligibility criteria
    - 305.1
    - Offer screening for \$99 self pay

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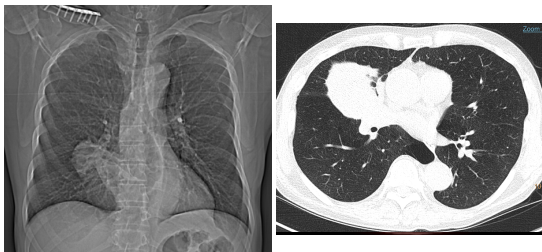
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### Findings



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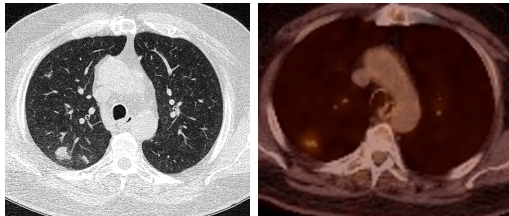
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### Findings



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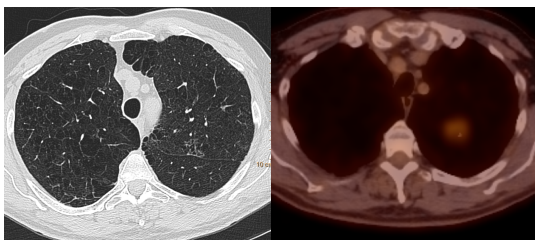
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### Findings



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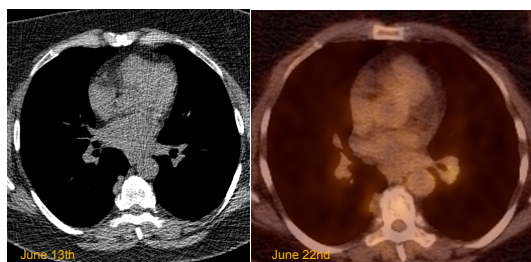
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### Findings



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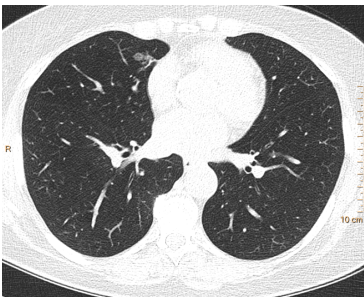
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**Findings**  
Patient did not qualify for screening



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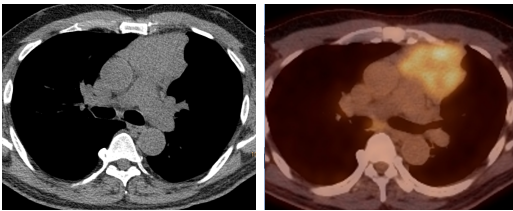
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**Findings**  
Even when things go wrong.....



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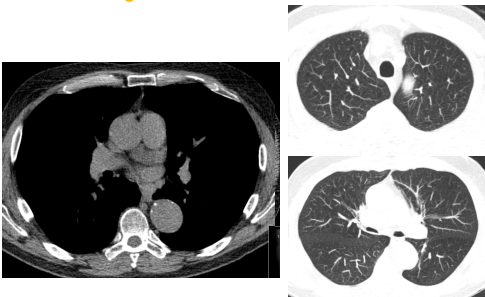
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**Findings**



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### Incidental Findings

- 25 Patients had incidental findings including:
  - Liver 5
  - Adrenal 3
  - Aortic 3
  - Breast 2
  - Renal 2
  - Bone 2
  - Tracheal 1

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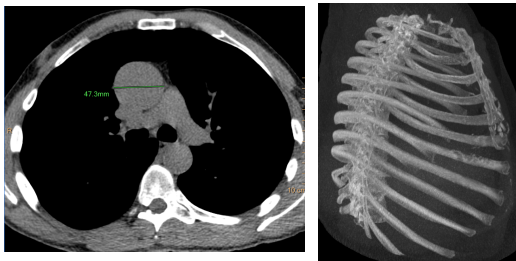
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### Incidental Findings



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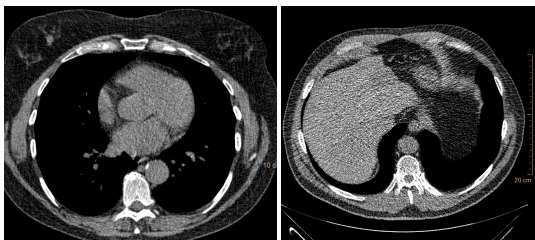
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### Incidental Findings



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After the Finding...

- Pulmonologist
  - Dedicated Pulmonology Clinic
    - Nodules up to 9 mm
- Thoracic Surgeon
  - All nodules  $\geq 1$  cm

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Lessons Learned

- Education, Education, Education
  - Patients
    - Importance of follow up imaging even if initial screen negative
    - Smoking cessation programs
  - Physicians
    - Inclusion/Exclusion criteria
    - Following radiology recommendations for follow up imaging
      - Imaging too early, too late or not at all
      - Need dedicated staff to perform follow up monitoring
    - Not a substitute for diagnostic imaging
      - Tobacco use disorder 305.1

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Lessons Learned

- Education, Education, Education
  - Scheduling & Finance staff
    - Inclusion/Exclusion criteria
      - Determination of exam appropriateness
      - Schedule accordingly
    - Payment options
      - Medicare v Non-Medicare
      - Provide clear instructions for payment at POS
  - Technologist staff
    - Inclusion/Exclusion criteria
    - Imaging protocol development
    - Performing the correct follow up
    - Work closely with radiologists

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Lessons Learned

- Patients will be less than truthful
  - Smoking history
  - Previous imaging history
  - Health history
  - Avoidance of high out-of-pocket costs

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Lessons Learned

- Database management
  - Need a robust system
    - Something similar to MQSA
  - Staff to manage

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Lessons Learned

- It's not just about hanging up a sign
  - Keep your program manageable
  - Make it a real program
  - Include every aspect of the program in one visit
    - Imaging with interpretation
    - Pulmonology consultation
      - » Face to face with a physician
      - » Pulmonary Function Testing
      - » Referral to surgeon if indicated
    - Smoking cessation counseling
      - » Another connection to the organization
    - Follow up visit scheduling
      - » Keeps patients in your system
    - Nurse Navigator



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Questions?

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Thank You.