Tracking Lung Nodules for Screening Follow-up

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Objectives
- Identify the utility of a Lung Nodule Registry for tracking lung nodules
- Describe the key features and infrastructure of a Lung Nodule Registry
- Recognize how a Lung Nodule Registry can be a valuable tool in a Lung Cancer Screening CT program

Background
Compliance with Fleischner Society Guidelines for CT follow-up of indeterminate lung nodules is variable among radiologists. At National Jewish Health, we created a systematic method (‘Tracker phrases’) to recommend timely follow-up. The tracker phrases are embedded in the chest CT reports. From the tracker phrases we implemented a computerized Lung Nodule Registry to facilitate guideline adherence, and to provide a safety net for patient follow-up.

Relevance to Lung Cancer Screening CT
- While the concept of our Lung Nodule Registry was developed for incidental nodules, the Registry has significant applications in the screening arena.
- The Tracker phrases can easily be adapted to for use with Lung-RADS.

National Jewish Health ‘Tracker Phrases’ for Lung Nodules
- We created a set of cryptic phrases for chest CT reports, identifying the presence of indeterminate lung nodule(s), and the recommended time to follow-up.
- The phrases are accompanied by text explaining the finding and the rationale for follow-up.
- The cryptic phrases are searchable by a computer algorithm—enabling systematic identification of patients by the type of nodule
- Enabling calculation of the due date of the follow-up scan

Operationalizing Fleischner Guidelines by the NJH ‘Tracker’ Phrases
- Solid nodule(s) <=4 mm: ‘Track12’
- Solid Nodule(s) > 4-6 mm: ‘Track6’
- Solid nodule(s) >6-8 mm: ‘Track3’
- Solid nodule > 8 mm: ‘Trackdx’
- Groundglass nodule new, >= 5 mm: ‘Track3GG’
- Groundglass nodule old, >= 5 mm: ‘Track12GG’
- Radiologist’s call: Trackad hoc, Trackdx, Track complete, TrackCa
Tracker Phrase in the Chest CT Report

1. No significant change in appearance, bronchial obstruction and bronchoconstriction, lobe(s) noted.
2. Further follow-up needed in 3 months for follow-up. (Follow-up tracking program is available)
3. Follow-up tracking program is recommended.

Tracker phrase

Lung nodule findings (Track12) (for NH Patient Tracking System)

The recommendation for follow-up interval is based on Fleischner Society guidelines for surveillance of solid lung nodules, or on interim guidelines for surveillance of non-solid lung nodules. Fleischner Society guidelines define “high risk” as history of smoking or other known risk factors. Clinical indications may supersede the recommendations.

For the solid nodule(s), reduced-dose Chest CT is recommended in 12 months if the patient is at high risk.

Registry Rule: Set follow-up due date in 12 months if patient is at high risk, or no follow-up if patient is at low risk.

EXAMPLE: Track12 Phrase

LUNG NODULE RECOMMENDATION (Track12) (for NH Patient Tracking System)

The recommendation for follow-up interval is based on Fleischner Society guidelines for surveillance of solid lung nodules, or on interim guidelines for surveillance of non-solid lung nodules. Fleischner Society guidelines define “high risk” as history of smoking or other known risk factors. Clinical indications may supersede the recommendations.

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EXAMPLE: Track3GG Phrase

LUNG NODULE RECOMMENDATION (Track3GG) (for NH Patient Tracking System)

The recommendation for follow-up interval is based on Fleischner Society guidelines for surveillance of solid lung nodules, or on interim guidelines for surveillance of non-solid lung nodules. Fleischner Society guidelines define “high risk” as history of smoking or other known risk factors. Clinical indications may supersede the recommendations.

For the ground-glass nodule(s), Chest CT is recommended in 3 months.

Registry Rule: Set follow-up due date in 3 months.

EXAMPLE: Trackcomplete Phrase

LUNG NODULE RECOMMENDATION (Trackcomplete) (for NH Patient Tracking System)

The recommendation for follow-up interval is based on Fleischner Society guidelines for surveillance of solid lung nodules, or on interim guidelines for surveillance of non-solid lung nodules. Fleischner Society guidelines define “high risk” as history of smoking or other known risk factors. Clinical indications may supersede the recommendations.

Further follow up of lung nodule(s) is not recommended at this time.

Registry Rule: No follow-up due date is set. Tracking is complete.

NJH Lung Nodule Tracker Phrases

*The choices of voice commands for the RIS dictation system are available. More than one may be used per report.

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Determining High Risk for Lung Cancer

1. Personal history of lung cancer
2. COPD
3. >= 20 pack years
4. Age >= 50 years
5. Parent or sibling with lung cancer

Risk factors are captured from the EMR.

Analytic Method

- No follow-up needed
- Follow-up in future (beyond Oct 2013)
- Follow-up scan before or on due date plus 30 days
- On-time
- Overdue
- N=6,113 scans
- Follow-up not done at all
- Scan done, but later than due date plus 30 days

% Compliance with Recommended Follow-Up

Compliance increased from 25% in 2011, to 40% in 2012, to 51% in 2013.

Resolving the Problem of ‘Overdue’ CT Scans

- The Lung Nodule Registry was used to set up an automated ‘just in time’ patient-reminder system for lung nodule follow-up.
- Daily computer checks for new chest CT scans are performed. If a patient goes 30 days past due, a report is sent to the NIH clinician, asking if it is appropriate to send a reminder letter to the patient.
- If the clinician does not answer with a reason to stop or delay the follow-up, a standardized reminder letter is sent directly to the patient with a copy to the primary care provider (if known). The letter is signed by the NIH clinician.

Resolution of Overdue: Letter to Patient

- Notify NIH Physician
- Screening CT/Outside Referral Patient
- If NIH Patient
  - Notify NIH Physician
  - Stop or Delay Tracking?
  - Reminder Letter
- If Screening CT/Outside Referral Patient
  - Sign by Radiologist
  - Sign by Pulmonologist

Summary: Building a Lung Nodule Tracking System

1. Identify patients with indeterminate lung nodules
2. Explicit ‘10’ is made by the reading radiologist (‘Tracker’ system)
3. Determine risk for lung cancer
4. Calculate next CT ‘Due Month’ for each patient (‘Tracker’ system)
5. Daily computer check for ‘resulted’ chest CT at NIH
6. If a patient goes 30 days past due for follow-up CT, they are reported as overdue to the ordering physician
Conclusions

- An automated system to track patients with lung nodules is associated with improved compliance for recommended follow-up.
- However, a substantial number of patients with indeterminate lung nodules do not return on time for CT follow-up.
- A systematic method to identify patients needing follow-up facilitates a patient reminder system, and improves timely follow-up.
- A Lung Nodule Registry can be a useful tool in a Lung Cancer Screening CT Program.