

#FOLLOW: Implementation of a Follow-Up Program for Incidental Pulmonary Nodules

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Background

- Incidental pulmonary nodules = very common radiologic finding
- Fleischner Society guidelines → many patients need follow-up

A: Solid Nodules*				
Nodule Type	Size			Comments
	<6 mm (<100 mm ³)	6–8 mm (100–250 mm ³)	>8 mm (>250 mm ³)	
Single				
Low risk [†]	No routine follow-up	CT at 6–12 months, then consider CT at 18–24 months	Consider CT at 3 months, PET/CT, or tissue sampling	Nodules <6 mm do not require routine follow-up in low-risk patients (recommendation 1A).
High risk [†]	Optional CT at 12 months	CT at 6–12 months, then CT at 18–24 months	Consider CT at 3 months, PET/CT, or tissue sampling	Certain patients at high risk with suspicious nodule morphology, upper lobe location, or both may warrant 12-month follow-up (recommendation 1A).
Multiple				
Low risk [†]	No routine follow-up	CT at 3–6 months, then consider CT at 18–24 months	CT at 3–6 months, then consider CT at 18–24 months	Use most suspicious nodule as guide to management. Follow-up intervals may vary according to size and risk (recommendation 2A).
High risk [†]	Optional CT at 12 months	CT at 3–6 months, then at 18–24 months	CT at 3–6 months, then at 18–24 months	Use most suspicious nodule as guide to management. Follow-up intervals may vary according to size and risk (recommendation 2A).

B: Subsolid Nodules*			
Nodule Type	Size		Comments
	<6 mm (<100 mm ³)	≥6 mm (>100 mm ³)	
Single			
Ground glass	No routine follow-up	CT at 6–12 months to confirm persistence, then CT every 2 years until 5 years	In certain suspicious nodules < 6 mm, consider follow-up at 2 and 4 years. If solid component(s) or growth develops, consider resection. (Recommendations 3A and 4A).
Part solid	No routine follow-up	CT at 3–6 months to confirm persistence. If unchanged and solid component remains < 6 mm, annual CT should be performed for 5 years.	In practice, part-solid nodules cannot be defined as such until ≥6 mm, and nodules <6 mm do not usually require follow-up. Persistent part-solid nodules with solid components ≥6 mm should be considered highly suspicious (recommendations 4A–4C).
Multiple			
Multiple	CT at 3–6 months. If stable, consider CT at 2 and 4 years.	CT at 3–6 months. Subsequent management based on the most suspicious nodule(s).	Multiple <6 mm pure ground-glass nodules are usually benign, but consider follow-up in selected patients at high risk at 2 and 4 years (recommendation 5A).

- Despite recommending follow-up, many patients do not receive proper surveillance

Background

- Follow-up program created for incidental pulmonary nodules

#FOLLOW dictated at bottom of radiology report

Clinical nurse coordinators contact patients and/or providers to orchestrate follow-up

Patient returns for follow-up imaging

Background

- Follow-up program created for incidental pulmonary nodules

#FOLLOW dictated at bottom of radiology report



Clinical nurse coordinators contact patients when recommendation becomes overdue to orchestrate follow-up



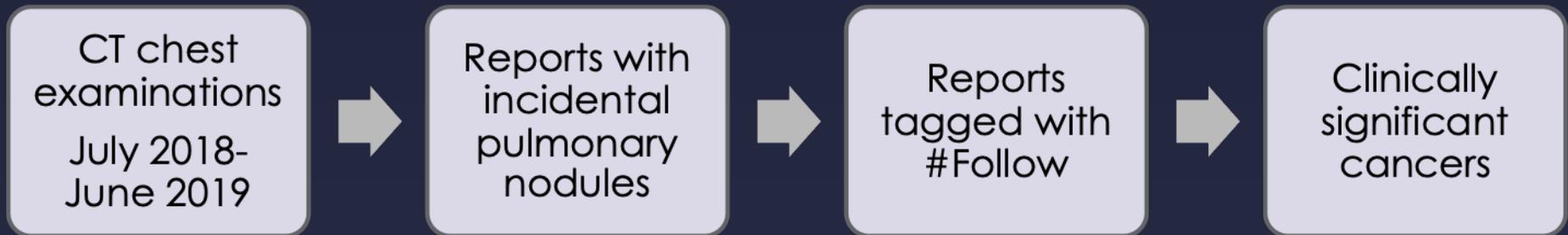
Patient returns for follow-up imaging

Purpose

1. Assess #Follow as an "incidentaloma" follow-up program by determining how appropriately our department tags examinations with incidental pulmonary nodule(s) using "#Follow"
2. Determine the amount of clinically significant cancers detected in patients tagged by "#Follow"

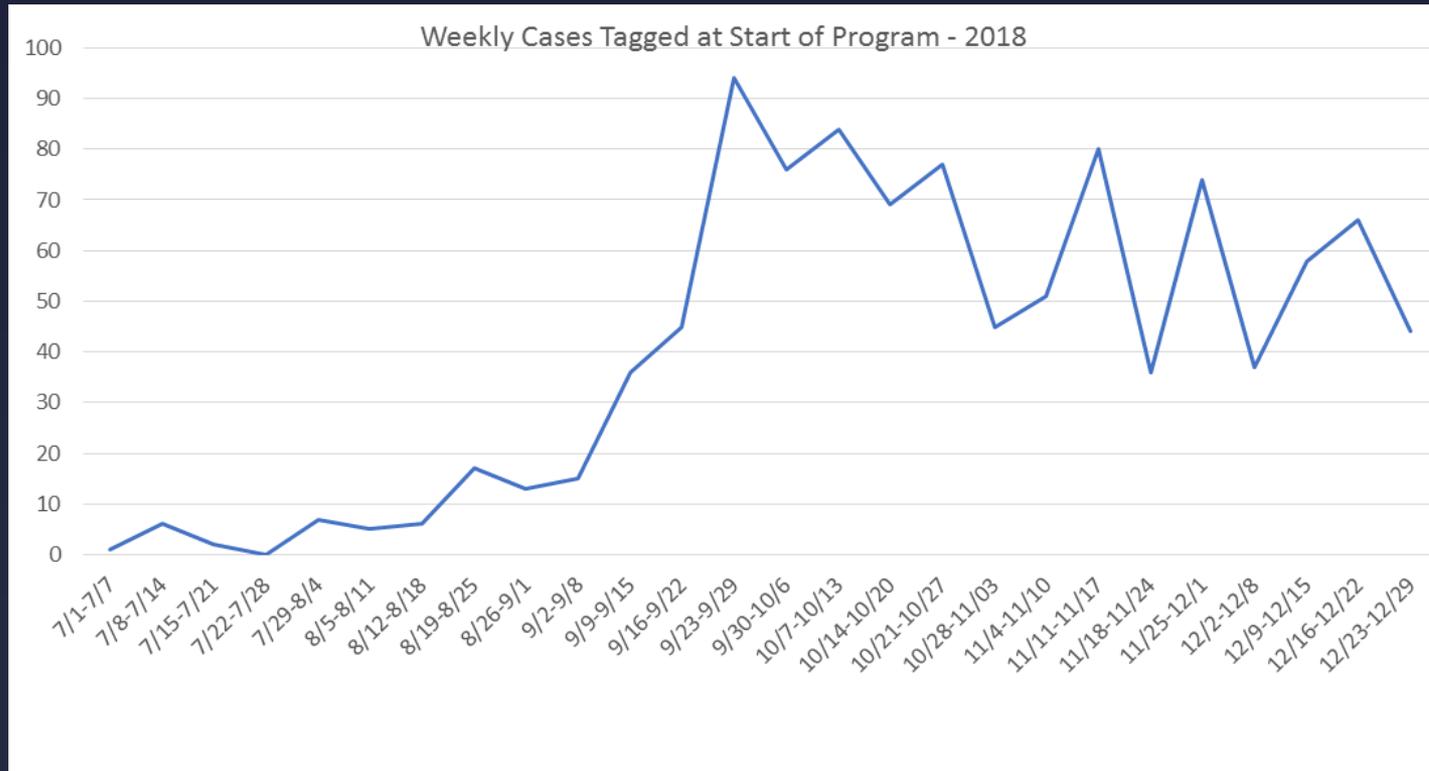
Methods

- The software program *Illuminate* was used to search all cases for incidental pulmonary nodules
- Patients with known cancer excluded from study



Data Collection

- Adoption rate after implementation of #Follow



Data Collection

- How tagged patients appear in EMR

The screenshot displays an EMR interface with a 'Chart Review' window on the left and a 'Results' window on the right. The 'Chart Review' window shows a list of imaging tests with columns for Date, Abnormal, Test, Body Region, Authorizing Provider, and Order Status. The 'Results' window shows the details for a CT chest scan, including a red warning message and sections for Results Information, Patient Images, PACS Images, and Patient Release Status.

Date	Abnormal	Test	Body Region	Authorizing Provider	Order Status
		NM BONE SCAN WHOLEBODY	10-Body/Whole Body	Alin, Dennis M, MD	Final result
		US GUIDE NDL PLCMNT BRST IMG	11-Multiple/Misc	Moore, Kathryn, A.	Edited Res
		US BIOPSY BREAST 1ST LESION LT		Moore, Kathryn, A.	Edited Res
		US BREAST TARGET LT		Moore, Kathryn, A.	Final result
		FLUORO MOBILE IN OR		Wise, Brent T, MD	Final result
		TIBIA & FIBULA 2 VIEWS LEFT	06-Extremity Lower	Berry, Stepheny D.	Final result
		HUMERUS MIN 2 VIEWS RIGHT	07-Extremity Upper	Sweeney, Kyle R.	Final result
	!	CT ABD/PELV W CONTRAST		Alin, Dennis M, MD	Final result
	!	CT CHEST W CONTRAST	03-Chest	Alin, Dennis M, MD	Final result
		FEMUR 2 VIEWS LEFT	08-Extremity Lower	Riangprakasong, T.	Edited Res
		HIP 2-3 VIEWS W PELVIS LT		Riangprakasong, T.	Edited Res
		HUMERUS MIN 2 VIEWS RIGHT	07-Extremity Upper	Riangprakasong, T.	Final result
		SHOULDER MIN 2 VIEWS RIGHT	07-Extremity Upper	Riangprakasong, T.	Final result

Results
CT CHEST W CONTRAST

This report has recommendations for additional follow up imaging that needs to be addressed.

Results Information
Reading Resident: [Redacted] Interpreting Radiologist: [Redacted]

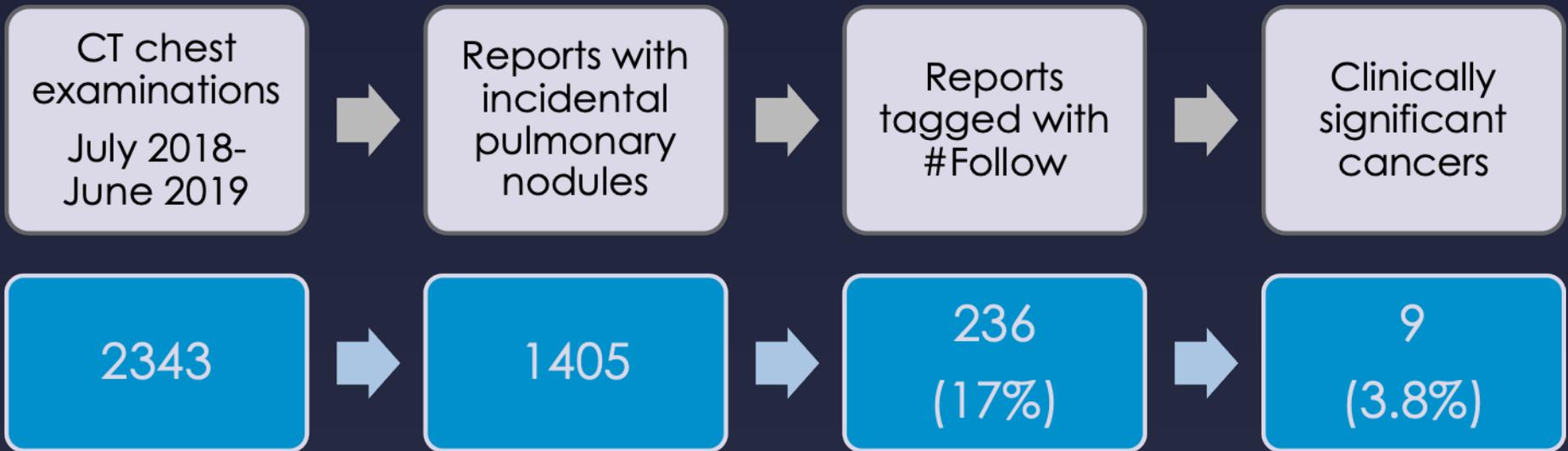
Patient Images
Show images for [Redacted]

Flag: **Abnormal !** Status: Final result

PACS Images
Show images for CT CHEST W CONTRAST

Patient Release Status:
This result is not viewable by the patient.

Results



Conclusion

- Nonroutine Communication programs on follow-up recommendations are difficult to implement and require acceptance from radiologists as well as referring physicians
- #Follow use was limited, but may have provided a clinical judgement of high risk as 9 clinically significant cancers were found!
- Cancer detection rate (CDR) on tagged cases of 3.8% compares favorably to National Lung Screening Trial and other Low Dose CT data.
- Such programs have the potential to improve outcomes through earlier detection of malignancy