

Appropriate Management of Indeterminate Pulmonary Nodules Found on CT

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Purpose and Rationale

This project focuses on adherence to appropriate recommendations for follow-up of small, indeterminate pulmonary nodules detected on thoracic CT.

Incidental pulmonary nodules are found on 30-50% of thoracic CT studies. Radiologists' recommendations for follow-up may be inconsistent. Individual practices or institutions may or may not have an existing policy for follow-up of incidentally detected indeterminate pulmonary nodules.

The Fleischner Society has released guidelines for management of small pulmonary nodules detected on CT scans.¹ Practices may have a policy that is based on these guidelines or may have established their own. The goal of this project is to monitor and improve adherence to the practice policy.

Project Resources

1. Guidelines for management of small pulmonary nodules detected on CT scans: a statement from the Fleischner Society. MacMahon H, Austin JH, Gamsu G, Herold CJ, Jett JR, Naidich DP, Patz EF Jr, Swensen SJ; Fleischner Society. Radiology 2005 Nov;237(2):395-400.
2. Recommendations for the Management of Subsolid Pulmonary Nodules Detected at CT: A Statement from the Fleischner Society. Naidich DP, Bankier AA, MacMahon H, Schaefer-Prokop CM, Pistolesi M, Goo JM, Macchiarini P, Crapo JD, Herold CJ, Austin JH, Travis WD. Radiology 2013; 266:304-317
3. Hospital or practice policy on the follow-up of incidentally detected indeterminate pulmonary nodules

Project Measures

Metric 1

Numerator # of cases with the appropriate follow-up recommendation

Denominator # of cases with findings of indeterminate nodules

Metric 2

Numerator # of cases with an inappropriate follow-up recommendation

Denominator # of cases with findings of indeterminate nodules

Metric 3

Numerator # of cases with no follow-up recommendation

Denominator # of cases with findings of indeterminate nodules

Baseline data collection

Make a plan for selecting cases. Using CPT codes, PACS or RIS data, identify a list of consecutive CT exams. Obtain the final reports for the exams and exclude cases with a known malignancy, other than non-melanoma skin cancer.

The number of cases required will vary based on the patient demographics typical of your practice. A reasonable target would be to end up with 100 non-excluded CT exams. Therefore, if approximately 50% of your patient mix has a diagnosis of malignancy, 200 exams should be selected, leaving approximately 100 eligible exams.

Data can be evaluated by individual radiologist or aggregated for the practice as a whole. Note, however, that if there are more than two or three radiologists being evaluated, more than 100 cases will be necessary. To be statistically valid, at least 10 eligible cases for each radiologist are needed.

Sort your cases into those with and without indeterminate lung nodules. The number of cases with such nodules becomes your metrics denominator. Then code each of these cases as having appropriate recommendations for follow-up (those adhering to your practice policy), inappropriate recommendations for follow-up (not in compliance with the policy) and containing no follow-up recommendations. A tally sheet may be useful, to include radiologist name, subspecialty (if applicable), presence or absence of nodule(s), and the appropriateness /presence of a recommendation.

Data Analysis

The goal is to achieve high compliance with the policy. There may always be cases for which some deviation from the policy is medically appropriate, so 100% compliance may not be reasonable or desirable. It is reasonable, however, to set a goal of 0 cases containing no follow-up recommendation.

Factors Potentially Influencing Performance

After analyzing the data, identify metrics where there is room for improvement. Reflect on your setting and practice and identify factors that may have influenced your results. Then, design an intervention intended to improve performance.

Possible contributors may include:

1. Lack of radiologist knowledge/awareness of current Fleischner Society guidelines or your institution policy. Alternatively, the radiologist(s) may be aware of the policy but ignore it because they disagree with the policy. An appropriate intervention here might be an educational program about the current guidelines/policy including reviewing and seeking buy-in with the current recommendations or altering the policy through group deliberation.
2. Lack of a standard reporting template, which could be part of your voice recognition software or RIS. In this case, work with IT staff or colleagues to create reporting templates, including one for follow-up recommendations for indeterminate pulmonary nodules

3. Lack of familiarity with or use of reporting templates. Here, work with IT staff or colleagues to integrate the templates into the practice workflow and promote their use.
4. Lack of a transcriptionist template for nodule follow-up. Here, work with the transcription staff or company to adopt a pulmonary nodule follow-up template.
5. Radiologists' lack of adherence may be related to referring physicians' expectations and knowledge of guidelines. Here, the intervention may be meetings with referring physicians or departments to educate them about and seek buy-in into the guidelines/policy.

Post Intervention Data Collection

Plan to collect data again six months after baseline and then every six months for the duration of the project (one to three years is typical). In the interim, implement your intervention.

Make sure that cases are collected, tallies are performed and metrics are analyzed the same way as at baseline. The only exceptions to this would be to adjust the number of cases identified if more cases are needed for analysis or to correct a problem identified with the baseline data collection procedure. If so, once the procedure has been corrected use it consistently going forward.

You may want to make a chart or graph of your performance on the metrics to identify trends and patterns. Review the data with your project team after every six month collection period. If you are meeting your goals, no further changes may be necessary. However, you should plan to take steps to institutionalize whatever changes contributed to successful performance. If additional improvement is possible, look at your processes again and design additional interventions. It is generally best to only make one intervention per study cycle so that conclusions can be drawn about what caused the observed effect.

Once performance has stabilized or you feel the project is well underway, consider selecting and launching another PQI project.