Documenting the Presence of Coronary Artery Calcification in Routine Thoracic CT

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Purpose and Rationale

This project aims to increase documentation of coronary calcification in the final radiology report.

Cardiovascular disease remains the leading cause of death in the United States. The presence of coronary artery calcification on thoracic CT indicates the presence of coronary artery disease. Men less than 55 years of age and women less than 65 years of age with coronary artery calcification are a higher cardiovascular risk group, based on nomograms of asymptomatic individuals undergoing coronary calcium scoring by CT.

Findings of coronary calcification noted while reading thoracic CT scans should be documented so that appropriate preventive or therapeutic measures can be taken.

Resources

Callaway MO, Richards P, Goddard P, Rees M. The incidence of coronary artery calcification on standard thoracic CT scans. Brit J Radiol 1997;70:572-574 (UK 8-mm slice thickness) 26% of males and 15.6% of females\\

Shemesh J, Henschke, CI, Farooqi A, Yip R, Yankelevitz DF, Shaham D, Miettinen OS. Frequency of coronary artery calcification on low-dose computed tomography screening for lung cancer. Clin Imaging 2006(3):181-185. Individuals < 50 years of age 22% of males and 7% of females.

AHA/ACC guidelines for secondary prevention for patients with coronary and other atherosclerotic disease: 2006 update. JACC 2006(47):2130-2139

Measure

Numerator	Number of thoracic CT reports documenting coronary calcification
Denominator	Number of thoracic CT scans demonstrating coronary calcification

Collecting Baseline Data

Obtain a list of consecutive non-cardiac thoracic CT exams. A minimum of 100 consecutive cases is recommended. Data can be obtained from CPT codes, PACS, RIS, etc. Then obtain the final reports for these exams. Exclude all exams performed on individuals with known CABG or cardiac stents.

Assign one or more individuals to review the cases and identify those with documentation of the presence or absence of coronary calcification. Assume those findings to be accurate. For those cases with no such documentation, review exam images for presence or absence or coronary calcification.

Baseline Data Analysis

Calculate the percentage of cases that document coronary calcification when coronary calcification is present. Data should be evaluated in the aggregate but can also be analyzed by interpreting radiologist.

Factors that Can Influence Performance

After analyzing the baseline data, determine where there is room for improvement. Examine the cases categorized as inappropriate to identify any patterns of contributing factors. Reflect on your setting and practice, and identify factors that may have influenced your results. Design an intervention to address these factors.

Possible contributors may include:

- Lack of radiologist familiarity with coronary artery anatomy or about the significance of reporting the presence of coronary artery calcification as a trigger for secondary prevention measures. In these cases, an educational program may be appropriate to correct these knowledge gaps.

- Variation in practice among interpreting radiologists. In instances where the rates of coronary calcification reporting are notably lower in a small handful of radiologists, individual educational interventions may be desirable. In those cases, involvement of a respected radiologist in these conversations may increase the likelihood of change.

- Lack of facility standards for reporting coronary calcification. Here, departmental guidelines, checklists, visual prompts in the reading room or development of a standard thoracic CT report template may be a valuable intervention.

In selecting an intervention, pick one to implement that you think has the best likelihood of positive effect. Do not perform multiple interventions at once; if you do you will not be able to determine which one had an effect.

Post-Intervention Data Collection and Analysis

Plan to collect data again at a set interval—three to six months after baseline—and then at specified intervals thereafter for the duration of the project (one to three years is typical).

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 collected 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.

Data should continue to be collected over time. If improvement is continuing, the same intervals for data collection should be recommended. As improvement plateaus the interval for measuring and the number of exams that are measured can be reduced—as long as the metrics are stable. If a significant decrease in performance is seen, the project should start anew with analysis as to cause and potential fix.

You may want to make a chart or graph of your performance over time to identify trends and patterns. Review the data with your project team after every data 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.