DETECTION OF CORONARY ARTERY DISEASE ON CT CHEST IMAGING

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Problem Definition

Background: Cardiovascular disease (CVD) remains the leading cause of death in the United States, responsible for 840,768 deaths in 2016.. In addition to previously well described atherosclerotic risk factors (advancing age, male gender, hypertension, dyslipidemias, diabetes, cigarette smoking and family history), an underrecognized surrogate marker for CAD is coronary artery calcification (CAC). This should be considered ***diagnostic*** for CAD. In the PROVIDI study, using a qualitative scoring system for CAC, the authors found a stepwise increase in the likelihood of cardiovascular events with increasing CAC burden (four-fold increase in CV events in patients with severe CAC relative to patients without CAC). Yet despite this, CAC remains an under-recognized and under-reported marker of CAD and an opportunity for improvement.

Study population: For this project, we have selected a total of 194 patients aged ≥40 years who had an inpatient stay at TJUH between July of 2018 and June of 2019, did not have an existing diagnosis of CAD and had CT imaging of the chest for any indication. **Results**: There was a higher prevalence of females in this study 57% compared to males 43%. The majority of the patients fell into the age range of 60-79 and were White. Among the patients with CAC on CT, 57% were not taking a statin. Among the patients with diagnosis of diabetes and CAC on CT, 33% were not taking a statin. 31% of patients with hyperlipidemia and CAD findings were not taking a statin. Among those who had severe CAC, 30% were not prescribed a statin. Among them only 1 patient (2%) was prescribed alternative cholesterol lowering medication (ezetimibe). Only 18% of patients who had CAC had CAD discussed in their chart. 31% of patients who had evidence of CAD on CT had follow-up with cardiology. 48% of patients with CAC on CT had Jefferson providers as PCP. Among them, 51% had follow-up with PCP shortly after imaging and only 11% had CAD discussed during that visit.

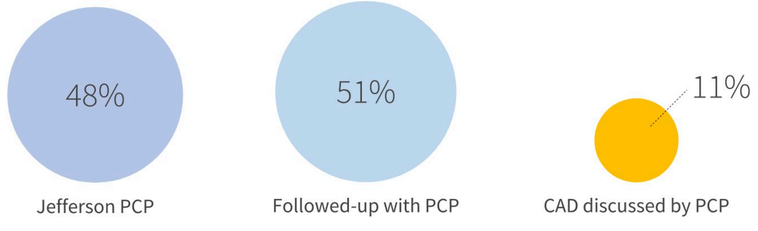


Fig 2. Percent of patients with CAC findings on CT who had an internal PCP, followed-up with their PCP shortly after imaging and had CAD discussed by PCP during that visit.

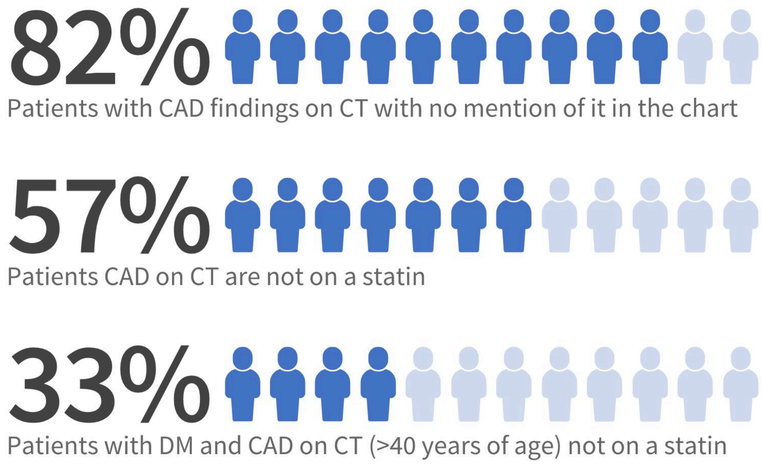


Fig 1. Summary of important findings based on initial analysis of study population.

Aims For Improvement

Overall aim: Improve diagnosis and management of CAD based on CT chest imaging.

- Improve diagnosis of silent CAD based on CT chest imaging: more patients who have findings of CAC on CT chest imaging will be diagnosed with CAD.
- Increase the number of appropriate statin prescriptions based on CAD findings on CT chest imaging.

Proposed Intervention

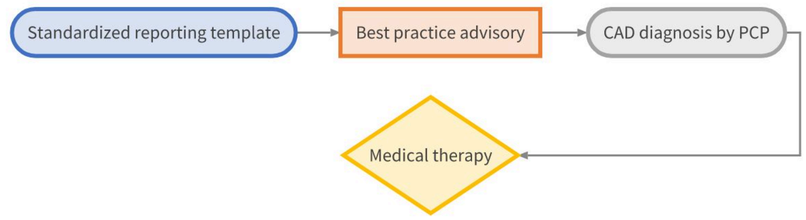
Our overall goal is to bring incidental CAC findings to the attention of primary care physicians with the hope of increasing recognition of this surrogate marker of CAD and increasing statin use in this population.

1. Standardize the reporting format for CAC on CT chest.
2. Creation of best practice advisory for CAC CT findings in Epic.
3. Educate Jefferson primary care providers on new best practice advisory that will prompt them to have a discussion about the presence of CAD and risks and benefits of statin initiation.

Implementation Plan

Our proposed intervention has three components which will be implemented sequentially.

- First, we are working with the radiology department to have a standardized reporting system for CAC by creating a dictation template.
- The second portion of our intervention would be inclusion of CT findings in the best practice advisory section in Epic. This will alert any provider accessing the patient's chart that the patient does have CAC on CT. If a patient does have CAC and is not already prescribed a statin, the best practice advisory will highlight this discrepancy.
- The final portion of our proposed intervention will prompt the PCP to have a discussion about the presence of CAD and risks and benefits of statin initiation. Before this can be implemented, we will plan to have an educational campaign with primary care providers on this change in reporting and recommendations.



Measurement Strategy

The following will serve as our outcome, process and balancing measures:

Outcome Measures

- Decrease in the number of patients with CAC findings on CT and no diagnosis of CAD
- Increase in the number of patients with CAC finding on CT prescribed a cholesterol lowering medication

Process Measures

- Increase in the number of standardized reports for CT chest which include CAC findings
- Increase in the number of patients who had CAD discussed with PCP during follow-up visit

Balancing Measures

- Statin tolerance and alternative agent prescriptions
- Number of follow-up visits with PCP