



CORONARY CALCIUM CATEGORY MEASUREMENT USING AUTOMATED POST-PROCESSING SOFTWARE ON NON-GATED CARDIAC CT IMAGES

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Credentials

Introduction

- Coronary artery disease (CAD) accounts for 50% of all cardiovascular related deaths
- CAD remains a leading cause of death worldwide
- Cardiac gated CTs minimize image noise caused by cardiac motion, there are an estimated 20 times as many non-cardiac-gated CTs of the chest performed in the USA each year.

Objective

- The HealthCCSng (NanoxAI) device is an artificial intelligence software to evaluate calcified plaques in the coronary arteries on non-ECG gated chest, which may present risk for coronary artery disease.
- The software device , which returns a coronary artery calcium category was evaluated in a stand-alone retrospective study for its overall agreement compared to a cardiologist-determined ground truth.

methods

Image criteria:

- Aged 30 and above
- Non gated Chest CT scans with no contrast

The device was tested by the Preventive Cardiology Service of Spectrum Health (Michigan, US) on a retrospective cohort of chest CT scans

The device was run retrospectively on 549 cases from the clinic selected in a serial manner and the device outputs were reviewed by the lead preventative cardiologist and his team. The cardiologists reviewed all cases identified by the device to have a category of Moderate (medium) or Severe (high) and classified feedback as ‘agree’ or ‘disagree’ regarding the output category provided by the NanoxAI device.

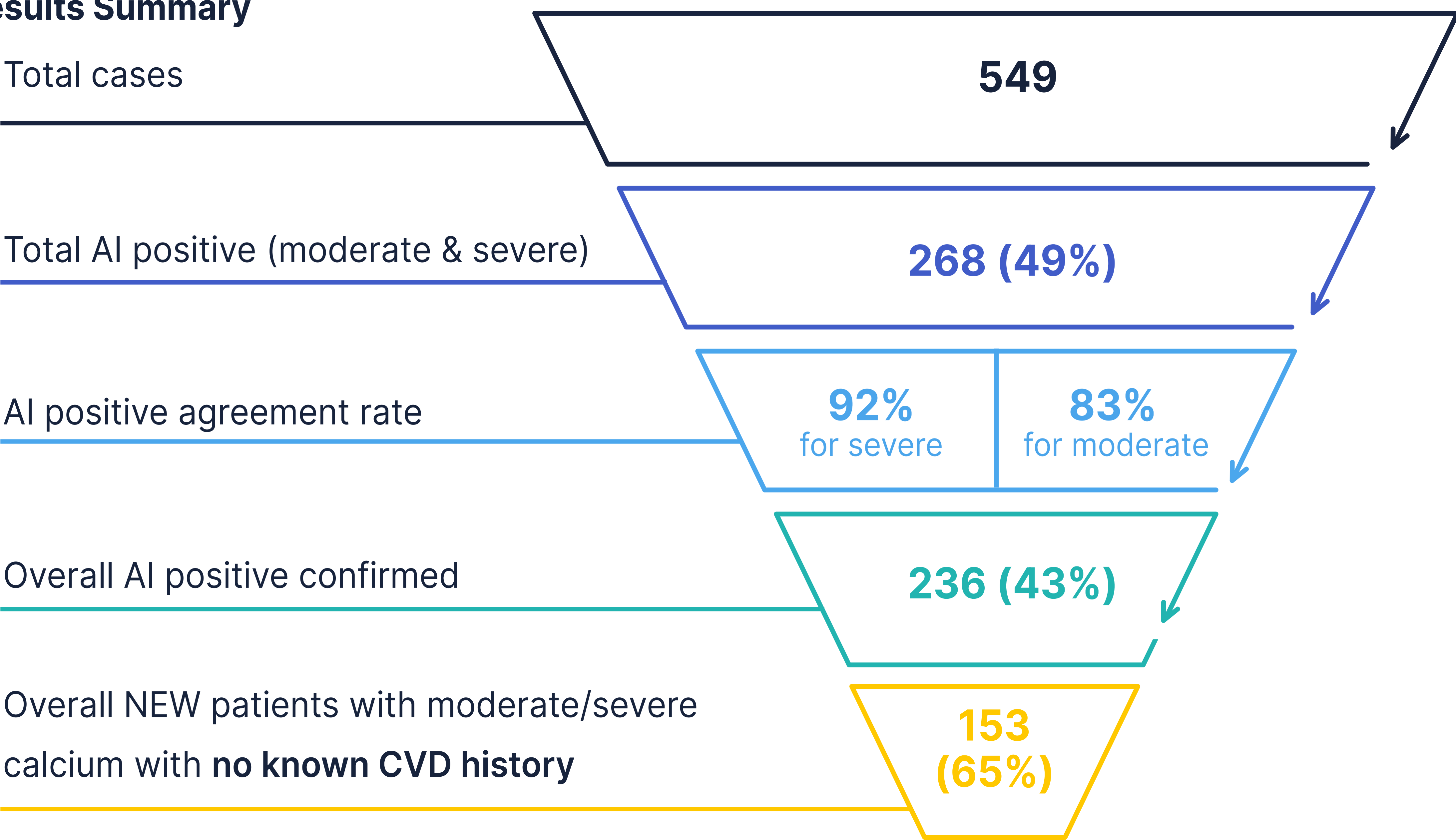
Results

- 268/549 (49%) cases were classified as moderate or severe calcium by the device.
- Agreement rate for moderate calcium was 94/113 (83%) and 142/155 (92%) for severe calcium.
- Low calcium category group was excluded from the analysis although this group of little to no calcium showed to have the highest agreement rate of the three categories.
- Overall agreement rate with the device output was 89%.
- 65% of patients with moderate or severe calcium were not previously diagnosed with CAD.

Conclusion

- This study undertaken in a preventative cardiology service demonstrated the HealthCCSng device has a high overall agreement with the ground truth coronary calcium category across the test cohort
- Device has the potential to find additional patients who may benefit from the preventive cardiology services.

Results Summary



Sample images – HealthCCSng output depicting different coronary calcium levels (each patient is assigned one single level)

