AI-Automated Opportunistic Screening for Cardiomegaly on CT

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• Multiple patents issued and pending on AI medical imaging solutions
Background

- Heart Disease is the #1 cause of death in the U.S.

- Current screening methods for heart disease have been ineffective in reducing mortality rates.

Cardiomegaly (Abnormal Heart Enlargement) is asymptomatic and can lead to major heart problems.

Chronic conditions:
- Elevated Blood pressure
- Decreased blood flow to heart
- Valvular disease
- Congenital

Major Heart events:
- Myocardial Infarction
- Heart failure
- Stroke
- Arrhythmias
- Death
Opportunistic Screening

- There are 50 million chest and abdominal CTs per year in the U.S.

- Opportunistic screening for cardiomegaly on routine chest or abdominal CT could help reduce major CVD events and.

- This adds no patient cost or radiation.
The heart and inner chest were segmented on a multi-institutional set of CT exams (N=1500) to train the AI Cardiomegaly algorithm.

The AI Cardiomegaly algorithm extracts the cardiothoracic ratio (CTR) and was validated in a large single center study (N=14,299).

The fully-automated AI algorithm was installed on a local server to process all chest and abdominal CTs.
• AI Cardiomegaly output includes a PDF report with patient and exam data, segmentation images, and measurements.

• CT exams processed = 220/day or 80,000/year.

• Severe cardiomegaly (CTR >0.56) is found in 10.3% = 22/day or 8,000/year.

• Severe cardiomegaly is unmanaged in >50% = 11/day or 4,000/year.
Cardiomegaly: Care Coordination

- Patients with severe cardiomegaly are directed to cardiology for an echocardiogram and complete workup.
- Effective management of cardiomegaly is expected to save lives and markedly reduce the public health burden of cardiovascular disease.

Clinical Value:
- Detects reversible heart diseases
- Improve quality of life & survival

Return On Investment (ROI):
- Echocardiogram
- New clinical visits
- Reimbursable procedures
Conclusion

A fully-automated AI algorithm to opportunistically screen for cardiomegaly has the potential to significantly improve the identification and management of patients at risk for preventable cardiovascular disease events.

*UAB data

22 patients/day with Cardiomegaly (8,000 patients/year)

11 patients/day with Unmanaged Cardiomegaly (4,000 patients/year or 5% of all CT exams)

Management:
- Echocardiogram
- Lifestyle modification
- Medications
- Coronary interventions
- Valve replacement
- Pacemaker
- Defibrillator

Improved Health & Financial ROI

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