UNIVERSITY OF MARYLAND MEDICAL CENTER | UNIVERSITY of MARYLAND MEDICAL SYSTEM

Innovation Challenge

Project Overview

Decreased IV Contrast Dose CT Imaging

Decreasing iodine-based intravenous contrast has helped alleviate supply shortages and benefits both patients and imaging providers. This project seeks to obtain diagnostic quality dual energy CT abdomen TAVR studies at <50% reduced dose of IV contrast in >90% of patient images. The team hopes to achieve this by imaging patients with 1/3 to 1/4 of the conventional dose of IV contrast combined with dual energy image reconstruction algorithms.

Cohort 2
January 2023 - July 2024

$125,000 Award

Primary Outcome
IV contrast cost savings and patient experience

Project Team

- Vikas Kundra MD PhD., Diagnostic Radiology
- Barton Lane MD, Diagnostic Radiology
- Guang Li PhD, Diagnostic Radiology
- Kristina Mcelwee BS RT (R), Diagnostic Radiology (CT)
- Nikita Rednam, Diagnostic Radiology

Midpoint Progress Updates

(June 2023)

The team began the recruitment of participants after gaining IRB approval in the last week of August. Following recruitment, two patients have been successfully scanned with a 1/3 dose of contrast agent which delivered quality diagnostic images. Pending results (images of diagnostic quality) of greater than 60% of the first ten patients, they plan to scan an additional 72 patients with the same parameters to make up the first cohort.

Final Report Summary

July 2024

The team was able to successfully recruit and scan an initial cohort of 40 TAVR patients with a 33 ml dosage protocol. These images were ranked and rated by three blinded radiologists for visualization of the aorta to femoral arteries. The team found that a 2/3 (69%) dose reduction resulted in clinically adequate imaging in >90% of patients.

Based on the statistical considerations from analysis of the first cohort's data, evidence has been sufficient to suggest an even lower dosage of contrast agent can be used to image TAVR patients. The next steps for the team's study are to begin the process of initiating the 25 ml dosage cohort by submitting a follow up IRB and consent form, and meeting with the CT staff to discuss logistics.