



SCCT2023 | BOSTON

July 27 - 30 | Abstract Submission Site

[Print this Page for Your Records](#)

[Close Window](#)

Control/Tracking Number: 2023-A-457-SCCT

Activity: Abstract

Current Date/Time: 3/20/2023 10:06:41 AM

AI-enabled Cardiac Chambers Volumetry In Non-contrast Cardiac CT Scans Detects HFrEF Vs. HFpEF

Author Block: Emily Jaalouk, MD¹, Venkat Sanjay Manubolu, MD¹, Anthony Reeves, PhD², Kyle Atlas, BS³, Chenyu Zhang, MS³, Thomas Atlas, MD⁴, Matthew Budoff, MD¹, Morteza Naghavi, MD³.

¹The Lundquist Institute, Torrance, CA, USA, ²Cornell University, Ithaca, NY, USA, ³HeartLung Technologies, Torrance, CA, USA, ⁴Tustin Teleradiology, Tustin, CA, USA.

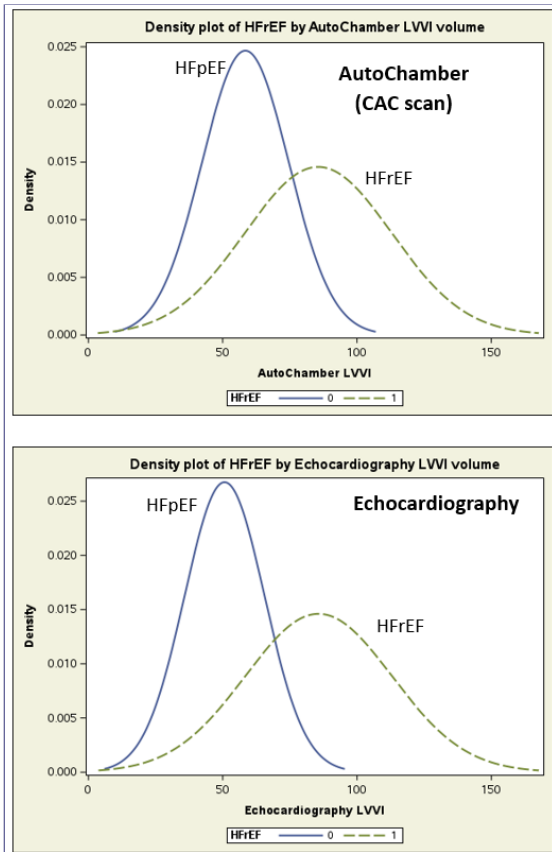
Abstract:

Introduction: We have developed an AI-enabled automated volumetry of cardiac chambers (AutoChamber) that works both on non-contrast and contrast-enhanced cardiac CT scans used for coronary artery calcium (CAC) score and coronary CT angiography (CCTA), as well as lung cancer screening CT scans. We have previously reported the agreement between AutoChamber measurements in CAC vs. CCTA, CAC vs lung scans, and cardiac MRI measurements. Here we report echocardiography-based ejection fraction (EF) data showing the ability of AutoChamber in distinguishing heart failure with reduced ejection fraction (HFrEF) versus heart failure with preserved ejection fraction (HFpEF).

Methods: Data from 75 patients who underwent both cardiac CT scan and echocardiography at Harbor UCLA medical center were obtained. AutoChamber was applied to all cases and reported estimated volume for left atrium (LA), left ventricle (LV), right atrium (RA), and right ventricle (RV). Body surface area (BSA) was calculated to create LV volume index (LVVI) by dividing LV volume by BSA to create echocardiography LV volume (E-LVVI) and AutoChamber LV volume (A-LVVI). HFrEF and HFpEF were defined as EF<40% and EF>50% respectively. Average EF was 57.5 ± 7.0 in males and in females 59.7 ± 8.1 respectively. were cases to find the volume of cardiac chambers. which is a measure of the size of the body. This allows for a more accurate assessment of the size of the left ventricle relative to the size of the individual. BSA for male and female were 1.59 ± 0.3 and 1.29 ± 0.2.

Results: Average EF was 58.9±10.3. AutoChamber volume for HFpEF vs HFrEF were LA (84.8+35.3 vs 113.2+32.8 p=0.002), LV (109.9+36.7 vs 170.7+65.9 p=0.0007), RA (97.5+58.3 vs 117.2+51.1 p=0.18), RV (135.6+52.1 vs 176.2+70.8 p=0.008), LVW (116.1+39.1 vs 170.6+56.9 p=0.0005). Density plots below show a clear distinction between HFpEF and HFrEF and comparable results.

Conclusions: AI-enabled automated cardiac chambers volumetry can correlate well with echocardiography based LVVI and detects HFrEF vs HFpEF. Further studies are needed to evaluate the ability of AutoChamber for prospective detection of patients at risk of HFrEF vs HFpEF.



Category (Complete): LV/RV Function, Chamber Dimensions ; Artificial Intelligence/Machine Learning

Abstract Type (Complete):

* **Would you like to be considered for the YIA program?:** N/A

Status: Complete

Society of Cardiovascular Computed Tomography (SCCT)

Telephone: 703.766.1706

e-mail: education@scct.org

Helpdesk:

Phone: 217-398-1792

Email: scct@support.ctimeetingtech.com

💡 [Feedback](#)

Powered by [cOASIS, The Online Abstract Submission and Invitation System](#) SM

© 1996 - 2023 [CTI Meeting Technology](#). All rights reserved. [Privacy Policy](#).