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## **ARTIFICIAL INTELLIGENCE GUIDES NOVICE USERS TO OBTAIN DIAGNOSTIC QUALITY ECHOCARDIOGRAMS**

Durham, NC, August 7, 2020 – Two research studies being presented at the [ASE 2020 Virtual Experience](#), August 8-10, 2020, highlight the use of artificial intelligence (AI) software to provide real-time guidance to users with no prior training in ultrasound acquisition.

In a landmark study, eight nurses without prior ultrasound experience each acquired 10 standard transthoracic echocardiography (TTE) views in 30 patients (for a total of 240 total patients) guided by a novel, deep-learning (DL) algorithm that was developed using more than five million observations relating the impact of probe movement to the appearance of the echocardiogram. On the same day, cardiac sonographers obtained the same 10 TTE views without using the DL algorithm.

Five highly-trained echocardiographers blindly assessed each nurse and sonographer study in its entirety for 10 specific clinical parameters. The outcomes showed that the nurses were able to obtain diagnostic quality studies that were comparable to sonographers for most of the assessed parameters with the exception of the tricuspid valve and inferior vena cava.

First author on the research, Arvind Nishtala, MD, from Northwestern Medicine, Chicago, IL, said, "To date, the application of AI in echocardiography has largely been limited to image analysis post-acquisition. We have found that deep learning technology developed by Caption Health can actually enable healthcare providers without prior ultrasound experience to acquire diagnostic-quality exams by providing real-time guidance and automated quality assessment." Senior author James Thomas, MD, FASE, also from Northwestern, added, "This has the potential to greatly expand access to echocardiography at the point of care, such as on the front lines of the COVID-19 pandemic and in rural settings."

Additional researchers on the study, "*Acquisition of Diagnostic Echocardiograms by Novices: Results from A Multicenter Pivotal Prospective Clinical Trial Using Artificial Intelligence*" include: Akhil Narang, Northwestern Medicine, Chicago, IL; Richard Bae, Minneapolis Heart Institute, Minneapolis, MN; Ha Hong, Yngvil Thomas, Sam Surette, Charles Cadieu, Ali Chaudhry, Randolph Martin, Caption Health, Brisbane, CA; David Rubenson, Scripps Clinic, La Jolla, CA; Steven Goldstein and Neil Weissman, MedStar Health, Washington, DC; Stephen Little, Houston Methodist DeBakey Heart and Vascular Center, Houston, TX; Roberto Lang, University of Chicago, Chicago, IL. The poster will be presented as a part of the ASE 2020 Virtual Experience online, August 8-10, 2020.

A separate analysis, from the same research study, aimed to compare the quality of the individual images acquired by novice imagers (nurses) after a one-hour, didactic training session and 12 practice scans, with those acquired by experienced sonographers. Adult inpatients (n=240) with a wide range of cardiac pathology and body type underwent 2D echocardiography imaging that included 10 views.

Imaging was performed by the nurses using a hand-held device with AI guidance. On the same day patients were scanned by experienced cardiac sonographers using the same equipment without AI guidance.

Each echo clip was reviewed in a random order by five different expert echocardiographers, also blinded to the identity of the patient and the imager. First author, Michael Main, MD, FASE, from Saint Luke's Mid America Heart Institute, Kansas City, MO, said "Artificial intelligence guidance enabled novices to obtain diagnostic quality images in almost 80% of cases. This technology may be particularly applicable in settings which lack trained sonographers, including rural critical access hospitals in the U.S. and throughout the developing world." On the basis of these studies, the FDA has granted authorization for clinical use of this AI-guided ultrasound acquisition.

Additional researchers on the study, "*Artificial Intelligence Guidance of Novices to Obtain Diagnostic-Quality Echocardiographic Images*" include, Richard Bae, Minneapolis Heart Institute, Minneapolis, MN; Charles Cadieu, Ali Chaudhry, Ha Hong, Randolph Martin, Sam Surette, Yngvil Thomas, Caption Health, Brisbane, CA; Kerry Esquitin, Columbia University Medical Center, New York, NY; Jennifer Liu, Kameswari Maganti, Issam Mikati, Akhil Narang, James Thomas, Northwestern University, Chicago, IL; Victor Mor-Avi, University of Chicago, Chicago, IL; Muhamed Saric, New York University Langone Medical Center, New York, NY; Dinesh Thavendiranathan, Toronto General Hospital, Toronto, ON, Canada; Neil Weissman, MedStar Health, Washington, DC. The poster will be presented as a part of the ASE 2020 Virtual Experience online, August 8-10, 2020.

To schedule an interview with Dr. Thomas, Dr. Nishtala or Dr. Main, please contact [Angie Porter](#).

### **About ASE**

ASE is the Society for Cardiovascular Ultrasound Professionals™. Over 17,000 physicians, sonographers, nurses, veterinarians, and scientists are members of ASE, making it the largest global organization for cardiovascular ultrasound imaging and as such the leader and advocate, setting practice standards and guidelines for the field. The Society is committed to *advancing cardiovascular ultrasound to improve lives*. For more information about ASE, visit: [ASEcho.org](http://ASEcho.org) and follow us [@ASE360](https://twitter.com/ASE360). For more information about the ASE 2020 Virtual Experience visit: [ASEScientificSessions.org](http://ASEScientificSessions.org). All ASE 2020 abstracts can be viewed online [here](#).

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