

Procedure to detect fetal heart defects is first automated use of 3-D ultrasound

December 7 2007

GE Healthcare, the leading manufacturer of 3D/4D ultrasound systems, has licensed a technique patented by an Eastern Virginia Medical School (EVMS) obstetrician that can automate the acquisition of ultrasound images used by physicians to diagnose fetal heart defects. GE Healthcare has licensed the software for exclusive use in its 3D/4D ultrasound systems.

Alfred Abuhamad, M.D., chairman of obstetrics and gynecology at EVMS – recognized worldwide for his skills in using ultrasound to detect fetal heart defects – developed the automation protocol, called Sonography based Volume Computer Aided Diagnosis (SonoVCAD).

“This is going to change the way ultrasound is practiced,” said Abuhamad. “With some heart defects, infants can die without surgery soon after birth. With an earlier diagnosis months before birth, clinicians and the mother can plan delivery in tertiary care centers with surgeons prepared.”

GE has incorporated Abuhamad’s automation protocol in the Voluson E8, the next generation of the GE Voluson ultrasound platform for women’s healthcare. This new 3D/4D ultrasound system includes a number of new tools to help improve clinical workflow, including SonoVCAD.

This paves the way for the future of advanced volume ultrasound and image quality, enabling GE to continue its leadership role in consistently

delivering clinically relevant technologies that transform healthcare.

According to the American Heart Association, congenital heart defects rank as the most common birth defect and the number one cause of death during the first year of life. Nearly twice as many children die from congenital heart disease in the United States each year as die from all forms of childhood cancers combined.

“Diagnosing defects in the fetal heart requires one of the most challenging diagnostic protocols. It requires a view of the dime-sized heart that shows all four chambers, as well as several precisely angled views of other planes of the heart. If one plane is unobtainable by conventional sonography on the moving fetus, diagnosis is extremely difficult,” Abuhamad said.

Abuhamad’s protocol automates the acquisition of images to display the planes that are needed for a complete ultrasound evaluation of the fetal heart.

“Even for well-trained personnel, manipulation of these planes can be difficult to perform, particularly with relatively complex anatomic organs such as the fetal heart,” said Abuhamad.

This proprietary SonoVCAD technology displays all of the 2D planes, which complies with the recommended standard screening exam of the fetal heart, as outlined by the American Institute of Ultrasound in Medicine (AIUM), the American College of Obstetrics and Gynecology (ACOG), the American College of Radiology (ACR) and the International Society of Ultrasound in Obstetrics and Gynecology (ISUOG). This includes identification of the four-chamber, left outflow tract and right outflow tract views of the fetal heart.

With the software, an ultrasound clinician identifies a standard starting

point, for the four-chamber view of the fetal heart. Abuhamad has created algorithms that allow the other planes to be generated from that four-chamber view. Those views allow physicians to identify the type and severity of fetal heart defects.

“With the insight of healthcare’s top physicians, GE is developing innovative ultrasound systems that address some of today’s most pressing healthcare issues,” said Terri Bresenham, vice president of GE Healthcare’s Diagnostic Ultrasound and IT business. “The Voluson E8 is yet another example of ultrasound’s potential to unlock the future of advanced imaging by helping detect diseases early, when they can be more effectively treated.”

“SonoVCAD introduces standardization into ultrasound imaging and helps to reduce the risk of operator exam misinterpretation. By simplifying the technical aspects associated with a fetal ultrasound exam, the detection of fetal heart abnormalities should also be enhanced,” said Abuhamad.

Citation: American Heart Association Web site, 2007, “Congenital Heart Defects: How Serious is the Problem”:

www.americanheart.org/presenter.jsp?identifier=12012

Source: Eastern Virginia Medical School

Citation: Procedure to detect fetal heart defects is first automated use of 3-D ultrasound (2007, December 7) retrieved 26 April 2024 from <https://medicalxpress.com/news/2007-12-procedure-fetal-heart-defects-automated.html>

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