

# A Closer Look at 4D Imaging Capabilities

Demand for the new *fourSight* 4D ultrasound imaging technology on the SONOLINE Antares ultrasound system continues to increase since the 4D imaging capabilities started shipping earlier this summer.

By Amy Cook

During an 11-city symposium tour throughout the United States, the *fourSight*™ 4D technology was demonstrated to the medical community where it received overwhelming positive feedback. Clinical evaluators presented their experience with the *fourSight* 4D technology on the SONOLINE Antares™ system to more than 1500 attendees in total, and highlighted how the advent of real-time 4D imaging enables interactive examination of internal structures from any viewpoint, and can assure better accuracy of measurements, detection of potential abnormalities and improved diagnostic assessments, all at the push of a button. Additionally, evaluators felt the *fourSight* 4D technology is perfectly suited for the premium performance Antares system because it already offers state of the art 2D, 3D and Doppler performance, and it provides a full range of advanced imaging capabilities for a broad range of diagnostic applications.

Frank Craparo, M.D., chief of Maternal Fetal Medicine at Abington Memorial Hospital in Abington, PA, was one of the early evaluators of the new 4D capabilities on the Antares system. In an interview, Dr. Craparo says that the *fourSight* 4D technology really helps physicians and sonographers to clarify exactly what they are seeing in 2D imaging for prenatal diagnosis. And, because the SONOLINE Antares system has excellent image quality with high contrast and detail resolution, his staff is able to enhance the images already obtained in 2D imaging at the push of a button, and in real-time, have a diagnostic 4D image. “We use the 4D imaging for fetal evaluations, primarily for facial and digit abnormalities, as well as imaging the fetal spine,” he says. Dr. Craparo adds that the new *fourSight* 4D imaging capabilities on the Antares system are also helpful in demonstrating to parents the stages of fetal development. Additionally, the pediatric surgeons find the new technol-



**4D IMAGING HELPS** physicians and sonographers to clarify exactly what they are seeing in 2D imaging. In addition, it helps to demonstrate the stages of fetal development and may contribute to fetal-maternal bonding.

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Jiri D. Sonek, M.D., RDMS, Medical Director for the Perinatal Ultrasound Department at the Miami Valley Hospital, Dayton, Ohio.

ogy useful for counseling parents about their baby's surgery and post-natal repair.

## Wider Range of Applications

Because diagnostic imaging modalities such as Ultrasound, MRI and CT have become essential in identifying, diagnosing and localizing structures and abnormalities, it's not surprising that 4D ultrasound is being adopted by the medical community as an easy and accurate way to diagnose certain conditions for obstetrics, gynecology, abdominal and vascular imaging, some of which were only done before by other modalities.

The Antares ultrasound system offers the combination of 3-Scape™ real-time 3D imaging and *fourSight* 4D imaging, and provides physicians access to both free-hand 3D and 4D imaging to accommodate a wider range of clinical applications. Additionally, the *fourSight* 4D capabilities on the system feature two ergonomically designed 4D transducers with MultiHertz™ multiple frequency imaging for greater sensitivity and imaging bandwidth. This technology incorporates a complete set of 3D and 4D imaging features, including flexible image formats that enable a one-to-one, two-to-one or four-to-one display to facilitate surface rendering, as well as intuitive volume editing, data storage and retrieval with DIMAQ-IP study management programs.

Clinical evaluators believe the *fourSight* 4D technology may be especially helpful in high risk obstetrics because physicians can use it to facilitate diagnosis of fetal malformations, such as cranio-facial abnormalities, and to improve communication with neonatal specialists and parents. Additionally, 4D imaging may also provide physicians with a more complete view of the uterus and breast, and could be used during interventional procedures such as 4D needle-guided biopsies.

Indeed, a sharper picture of a fetus is nice for expectant parents, but more importantly, it serves as a powerful tool that can help physicians study the fetus' motion and behavior, as well as its surface anatomy. Jiri D. Sonek, M.D., RDMS, the medical director for the Perinatal Ultrasound Department at the Miami

Valley Hospital concurs with Dr. Craparo in that *fourSight* 4D imaging is both easy to use and has been very helpful for communication with expectant parents. Dr. Sonek had one case where the fetus had an extremely depressed nasal bridge and it was hard to show or explain the image in 2D to the expecting parents. "With 4D we were able to show the parents exactly what the fetus looked like, as well as show them what the baby would look like after being born."

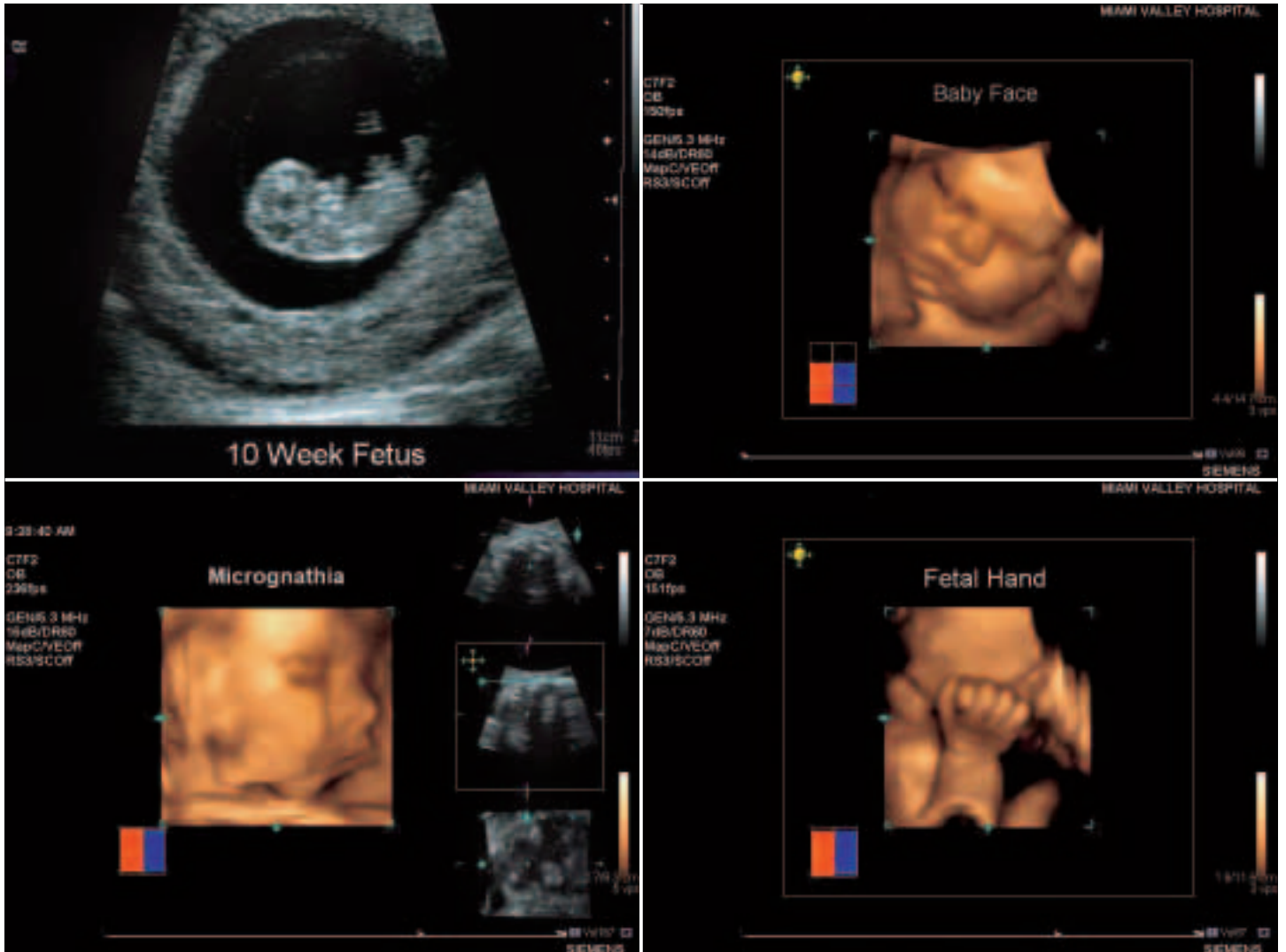
## Easy Understanding

"Another example was a case where the fetus had micrognathia (small chin), so in order to provide the parents an accurate picture of their fetus, we were able to use *fourSight* 4D technology to show the parents what the baby would look like," he continues. "This has been quite useful for pregnancy management and may contribute to parental bonding with their unborn child."

Dr. Sonek also finds the *fourSight* 4D imaging to be very useful when discussing a patient's exam with referring physicians or physicians outside the field of radiology due to the fact that the 4D reconstructions can be easily downloaded and forwarded to referring physicians from the Antares system or workstation.

As an example, one of Dr. Sonek's patients had a complicated defect affecting the lower extremities of the fetus. She wanted to see an orthopedic doctor before the birth of the baby. "We were able to show the orthopedic surgeon the anomalies in much better detail using *fourSight* 4D imaging, and we could talk about what they might need to correct after birth in much more detail versus discussing the details while simply viewing a 2D image," says Dr. Sonek.

At Miami Valley Hospital, Dr. Sonek and his staff do not subscribe to the use of ultrasound as entertainment, or unnecessary medical exams for patients to determine the sex of their unborn baby. It is the same for Dr. Craparo and the department of Maternal Fetal Medicine at Abington Memorial Hospital. But both colleagues agree there are definitely valid and exciting diagnostic uses for the new



THE SONOLINE ANTARES ultrasound system provides best-in-class Doppler, 2D and 3D imaging, and for real-time premium performance 4D studies, new *fourSIGHT* 4D ultrasound imaging technology.

technology when it is part of a premium ultrasound system such as the Antares platform.

### Benefits for Physicians and Patients

In the future, physicians like Dr. Craparo and Dr. Sonek believe 4D ultrasound will play an even more important role in diagnostic ultrasound. It may help to assess fetal well-being by allowing physicians to view movement and breathing more easily than with 2D. Additionally, in 2D imaging there are aspects of the fetus that cannot be seen, but if taken

in 4D and reconstructed, physicians may be able to see more fetal activity, or certain aspects not obtained in a 2D exam. Finally, as genetic sonograms or expanded ultrasound exams that look for characteristics associated with chromosomal defects are requested prior to making a decision regarding amniocentesis testing, 4D imaging can offer very practical benefits to physicians and patients, and may make a significant difference in definitive diagnoses.

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