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See more, Work More Efficiently: Siemens Solutions for Cardiology

To support patients, physicians and clinical staff, Siemens has developed products and solutions especially tailored to the diagnosis and treatment of cardiovascular diseases. These include a new cardiac catheter, clinical IT, applications for computed tomography and magnetic resonance imaging and a new system for cardiac molecular imaging. The World Health Organization (WHO) estimates that the number of people dying of cardiovascular diseases will increase to about 23.3 million world-wide by 2030. These diseases, which include coronary heart disease (CHD) and stroke, are already the number one cause of death world-wide. Siemens has developed many new solutions for cardiology and demonstrates its innovative power as part of the "Agenda 2013" sector initiative at this year's European Society of Cardiology (ESC) congress in Amsterdam, the Netherlands.

New intra-cardiac catheter for echocardiography

Siemens is the first to offer real-time volumetric intra-cardiac echocardiography (ICE) with the Acuson AcuNav V ultrasound catheter. Real-time ICE delivers high-quality, radiation-free imaging during interventional procedures. The Acuson AcuNav V catheter is particularly useful during transcatheter aortic valve replacement (TAVR) surgery – a high-risk procedure often performed on patients who cannot tolerate the risks and complications associated with general anesthesia and mechanical ventilation. By using the volumetric ICE catheter, the physician can perform TAVR procedures while the patient is under conscious sedation rather than general anesthesia. This potentially saves up to two hours in total procedure time and improves patient outcomes with faster recovery. The Acuson AcuNav V catheter is also useful during electrophysiology (EP) ablation procedures.

New release of Acuson SC2000 System with HD transducers

Siemens' high-end Acuson SC2000 ultrasound system enables new abdominal vascular imaging capabilities. The Abdominal Vascular Release of the echocardiography platform is equipped for the first time with a high-density curved array probe – the 6C1 HD. This new feature combines the benefits of HD transducers and IN Focus coherent imaging technology to provide high-quality images with enhanced detail resolution and ease of use in abdominal vascular imaging. In combination with Clarify vascular enhancement (VE) technology, the transducers improve image quality in tissue boundary detection and contrast resolution. The available NTEQ technology automatically and intuitively optimizes the image for easier, more consistent images. Furthermore, new workflow enhancement features are available on the latest version of Acuson SC2000 system. The Trace Assist Tool enables users to easily trace spectral waveforms for quick vascular measurements. The system's workflow applications and automated measurement tools, including eSie Left Heart (LH) measurement package, can now be quickly accessed through the new eSie Access menu.
Premiering at this year's ESC is the improved 4V1c transducer. Featuring a significantly smaller contact area than the previous model, the 4V1c transducer enables easier access to rib spaces for faster exams on difficult-to-image patients.

Full cardiac MRI exam possible in less than 30 minutes

Magnetic resonance imaging of the heart, or cardiac MRI (CMR), supplies detailed information about the morphology and function of the heart. It also provides a visualization of myocardial blood supply, edemas or scar tissue in the context of diagnosing coronary heart disease or various myocardial inflammations. The Cardiac Dot Engine enables physicians to examine the heart thoroughly in a very short period. It provides standardized clinical examination protocols that are adapted to suit each individual patient to shorten the examination time. This includes breathing tests, pulse monitoring, planning the examination and adjusting the volume of contrast agent to the patient's weight and age. The standardized examination protocols make the results highly reproducible. This means that a full heart examination can be performed in less than 30 minutes, compared to the usual hour. The AutoAlign Heart expansion in the new version of the Cardiac Dot Engine plans diagnostically relevant sectional planes through the longitudinal axis of the heart fully automatically.
To enable efficient diagnosis of vascular diseases based on MR angiography datasets, Syngo.via offers the new application Syngo.MR Vascular Analysis. It enables physicians to identify vascular diseases such as stenoses, automatically quantify the vascular changes and thus diagnose them swiftly and efficiently, with just three clicks of the mouse.

CT scanner software improves accuracy for TAVI procedures

Computed tomography provides support for minimally invasive Transcatheter Aortic Valve Implantation (TAVI). Siemens Healthcare has developed new software that helps physicians determine the right valve size for the patient and establish the precise angle at which the new valve must be inserted even before the intervention in the cardiac catheterization laboratory. This saves time and reduces the dose of contrast agent required for the patient during the intervention, since the important information is already available.

To select an appropriate artificial heart valve, the physician must determine the precise dimensions of the target location, the aortic annulus. This

elliptical structure was previously measured manually using ultrasound, which was subject to an elevated risk of error. The Syngo CT Cardiac Function – Valve Pilot application, in combination with 3-D CT imaging, automatically detects the annulus plane and determines the precise measurements of the annulus as the case is opened. The cardiologist can then select the correct size for the implant. This further establishes TAVI as a lower-risk alternative to open thoracic surgery. The combination with the Somatom Definition Flash scanner offers a further major benefit for older and weaker patients in particular. They often suffer from impaired renal function and may experience renal failure in a worst-case scenario if relatively large doses of contrast agent are used. With the Somatom Definition Flash, a scan using only 40 ml of contrast agent is enough to provide the cardiologist with all necessary information. Traditional scanners may require more than one scan and up to 150 ml of contrast agent. Contrast agent can also be saved by using preliminary CT examinations when determining the approach angle. If the cardiologist has the information needed to determine the best angle before surgery in the cardiac catheterization laboratory, less contrast agent has to be injected to find the correct annulus plane. The Syngo CT Cardiac Function - Valve Pilot application offers a further advantage here, since it automatically determines the ideal angle, which can be transferred directly to the catheterization laboratory.

New cardiology information system for faster workflow

A new version of the Syngo Dynamics cardiology information system supports physicians in streamlining the workflow and making improvements in clinical use. Whereas a report previously had to be fully completed before another user could access it, Syngo Dynamics now allows numerous users to call up the documentation on a single study simultaneously. This means that physicians, medical staff and technicians can work more effectively together, which benefits the patient, since reports can now be completed more quickly than was previously the case. Users now have access to new, additional documentation options that cover the entire reporting process, e.g. earlier studies. This saves a step in the process.
As soon as the documentation is completed, improvements included in the new version of the software ensure that reports can be completed in a shorter time than before. Using Syngo Dynamics also permits physicians to better monitor the radiation dose. It thus warns physicians automatically about excessive doses when they are planning an examination. The new "Automatic Study List" feature from Syngo Dynamics helps draw up reports more quickly. Physicians can thus navigate through the clinically relevant information to complete their reports. A simple drop-down menu replaces the need to call up patient data and older additional information one item at a time.

New system for molecular imaging

Myocardial perfusion scintigraphy is a typical exam in the field of molecular imaging. Questions such as 'How healthy is the heart tissue?' and 'How efficiently it is pumping blood to the rest of the body?' are crucial here. The new positron emission tomography/computed tomography (PET/CT) scanner, Biograph mCT Flow, comes with two features to support cardiovascular care.

The feature HD•Cardiac enables physicians – for the first time ever – to correct for both respiratory and cardiac motion in the heart using single-trigger dual gating. HD•Cardiac relies on an electrocardiography (ECG) lead to account for the heart motion, while software using a special extraction algorithm developed by Siemens, searches the scan data for waves created by respiratory motion and corrects it to account for lung movement motion without the use of a second trigger. The result is reduced respiratory motion blur, which can provide physicians with improved visualization of myocardial tracer distribution, wall thickness and defect definition over non-respiratory motion corrected images.

The feature One-Click phase-matched gating provides automatic accurate phase registration and quantification of PET and CT cardiac phases. This software aligns and synchronizes PET and CT images with just one click even when animated. Previously, when performing gating exams, physicians would experience images that were not images not always lined up when fused or overlaid.

Launched in November 2011, Agenda 2013 is an initiative of the Siemens Healthcare Sector to further strengthen its innovative power and competitiveness. Specific measures, which will be implemented by the end of 2013, have been defined in four fields of action: innovation, competitiveness, regional footprint, and people development.

For more information please visit: www.siemens.com

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