New radiology developments from Siemens

- Quiet examinations in magnetic resonance imaging
- Latest generation of ultrasound devices with larger monitor
- Plan for optimized interplay of radiography components

Using the motto “Answers for Life,” Siemens Healthcare is launching a package of new developments for imaging and IT at the European Congress of Radiology (ECR) in Vienna, Austria. Chief among these are improved diagnostic accuracy, faster examinations and a high level of flexibility.

MRI: New ways of liver imaging and quiet examinations

In the area of magnetic resonance imaging (MRI), Siemens has two main points of focus at this year’s ECR: abdominal imaging that is both fast and unaffected by motion, and significantly quieter MRI examinations.

MRI has previously been used mainly in neurological and musculoskeletal examinations thanks to its ability to show a high level of soft tissue contrast. The new “FREEZEIt” technology, however, also will enable faster dynamic measurements to be performed in the abdominal region with eliminated sensitivity to motion. This opens up MRI examinations to a much wider range of patient groups, such as children and the seriously ill. Because the technology is not sensitive to organ motion, it is now possible to generate high-resolution images of patients who cannot consciously control their breathing. As a result this allows a more meaningful diagnosis and a substantial improvement in patient comfort. FREEZEIt can help radiologists make more accurate diagnoses, which surgeons and oncologists can then use to better plan and decide on individual treatment paths.

To reduce noise during MRI examinations, Siemens will offer the “Quiet Suite.”
Optimized and intelligent switching of HF pulses during the MRI procedure significantly reduces noise level, with no loss of image quality and no prolonged examination times. Some measurements are entirely noiseless. Both patients and radiologists benefit from entire orthopedic and neurological examinations with all regularly performed contrasts using the quiet MRI procedure.

Both FREEZEit and Quiet Suite will be available on Magnetom Aera 1.5T and Magnetom Skyra 3T, which will be available with new 24-channel configurations. These new configurations grant a broader access to state-of-the-art MRI technology, also for hospitals and imaging practices with limited investment bandwidth.

**New generation of the Acuson S family for ultrasound**

The new generation of Siemens Acuson S family of ultrasound devices is now available in Europe for the first time. The name HELX Evolution is an umbrella term for ultrasound devices that feature newly designed computer hardware, new ultrasonic probes, HD image quality and a 21.5-inch LCD monitor, which offers a 60-percent larger screen than the previous models. The systems in the HELX Evolution series come with applications that measure and show tissue stiffness in a new way. As a result, physicians can obtain more information about patient anatomy for greater diagnostic confidence.

The Virtual Touch IQ (VTIQ) application, which is based on ARFI (acoustic radiation force impulse) imaging technology, enables physicians to quantify tissue stiffness in locations such as the breast or thyroid. Numerical values within a predefined range are shown against a qualitative color map, providing greater detail about abnormalities within tissue. Previously available exclusively on the premium Acuson S3000 system, VTIQ is now offered on the Acuson S2000 HELX Evolution as well. With a common architecture across the entire Acuson S family of systems, new pioneering technologies can easily be added as they become available.

**Multiple advances in X-ray for the radiology department**

X-ray systems have to meet many expectations. Radiologists demand high image quality at low dose levels and want the clinical images to be available on their monitors in no time. Medical technology assistants (MTAs) expect the systems to reduce their workload. For administrators, high patient throughput and highest uptime, resulting in an attractive return on investment, are important. As an answer
to the needs, Siemens has developed a new, intelligent concept for modern X-ray systems, called MAX (Multiple Advances in X-ray). It comprises functions that improve workflow (MAX assistance) and have a positive effect on image quality (MAX detection).

MAX assistance, for example, offers unique benefits in the alignment of the detector angle. If a patient, e.g. with a shoulder injury, lies obliquely on the bed in the scan room, the clinical staff first place the wireless detector behind the patient’s back, and then face the challenge of directing the tube at an angle of 90 degrees to the detector, which often is not even visible. Every degree of deviation worsens image quality and may even make a second image necessary. With MAX systems, the correct angle is shown on the touch screen on the X-ray tube – which just needs to be aligned accordingly. This accuracy prevents unnecessary repeat exposures.

With MAX detection, Siemens has integrated two new detectors into the current X-ray systems: the extra-compact MAX mini detector measuring 24 x 30 cm can be used for example for a shoulder examination. MAX wi-D is lighter, thinner and faster than the proven wi-D detector and with its convenient handle is easy to transport. Swapping detectors between Siemens radiography and fluoroscopy systems is efficient and extremely simple: a sensor recognizes the detector and automatically notifies the X-ray system that it has been registered.

MAX functions are currently available on the premium systems Ysio Max (radiography), Luminos dRF Max and Luminos Agile Max (fluoroscopy) and Uroskop Omnia Max (urology).

**New xSPECT modality and PET/CT system with continuous table motion**

Siemens is premiering two new systems for molecular imaging on the European market: Symbia Intevo and Biograph mCT Flow. Symbia Intevo is the first xSPECT system, a new modality that integrates the full datasets of both single photon emission computed tomography (SPECT) and computed tomography (CT). The resulting level of detail helps differentiate clinical conditions more precisely, for instance distinguishing degenerative bone loss from malignant disease such as bone cancer. Symbia Intevo is also the first system of its kind to allow easy, accurate and reproducible quantification, making treatment follow-up possible. The complete integration of these modalities is achieved using new hardware and an
iterative reconstruction algorithm that accounts for parameters such as detector motion and the distance of the patient from the detectors.

Biograph mCT Flow is the world's first positron emission tomography / computed tomography (PET/CT) scanner that can record PET data without interruption while the patient passes through the gantry. This eliminates the usual “stop and go” process in which the table has to stop to enable a sequence of images to be recorded. With Biograph mCT Flow, physicians benefit from the finest image resolution in every organ and every scan. Furthering the ability to understand disease, now they can also confidently rely on molecular imaging with accurate and reproducible quantification in all dimensions. FlowMotion also enables users to reduce CT radiation dose because the scan range can be selected precisely. The continuously moving table is also more comfortable than the stop-and-go movement of conventional acquisition, which can lead to motion artifacts when the patient is startled by the sudden table movement of stop-and-go imaging.

**Syngo: New versions improve efficiency and diagnostic confidence**

Siemens further developed its imaging software Syngo.via and the corresponding picture archiving system (PACS), Syngo.plaza. The new version of Syngo.via (VA30) has been enhanced to simplify and speed up the radiologists' work. A new package of software applications, the Syngo.via General Engine, contains applications that provide a high level of automation and standardization.

Also included in the package is the "Anatomical Range Presets" application, which can be used to identify individual regions of the body area that require diagnosis, quickly and accurately. Syngo.via Advanced Reporting – part of the Syngo.via General Engine – also makes it very easy for radiologists to create clear and well-structured diagnostic reports. The mobile solution, Syngo.via WebViewer, which is now always included with each new Syngo.via system, helps radiologists access images flexibly and rapidly even while on the go.

The newest version of Syngo.plaza (VB10) also helps users achieve a rapid and efficient workflow: a key element is the high throughput loading tool for routine reading, in which up to 200 images can be loaded per second. Using Syngo.via and Syngo.plaza in combination opens up further new innovative applications. For example, users can access the required 3D applications with a single click during
layered imaging diagnosis. Relevant data are displayed in 2D or 3D, depending on requirements. The modular, scalable design means that hospitals can add to the hardware and software components at any time to suit their budget and changing needs.

Contact for journalists:
Kathrin Palder, Tel.: +49 9131 84 5337
E-mail: Kathrin.Palder@siemens.com

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1 The product is still under development and not commercially available yet. Its future availability cannot be ensured.
2 Syngo.via can be used as a stand-alone device or together with a variety of Syngo.via-based software options, which are medical devices on their own right.
3 Diagnostic reading of images with a web browser requires a medical grade monitor. For iPhone and iPad country-specific laws may apply. Please refer to these laws before using for diagnostic reading/viewing.
4 Prerequisites include: wireless connection to clinical network, meeting recommended minimum hardware requirements, and adherence to local data security regulations.
5 Results may vary. Data on file.