



# Minimum Dose/ Maximum Speed

Two of the most challenging issues facing healthcare today are the dual mandates to improve patient safety and increase productivity. From a patient care and economic perspective, each is critically important. Siemens Molecular Imaging is meeting both of these core needs, at the same time, through its commitment to minimizing radiation exposure and increasing workflow.

By Justine Cadet

Since Siemens is committed to the ALARA principle, (As Low As Reasonably Achievable), a comprehensive approach to all areas of diagnostic imaging called CARE – Combined Applications to Reduce Exposure, has long been applied. Physicians and administrators around the globe have been discovering the benefits of deploying Siemens innovative technologies for the purposes of reducing radiation exposure to patients while simultaneously increasing speed of acquisition times for these procedures.

## Reducing Radiation Dose Protects Patients

Imaging is integral to caring for patients as it provides a less invasive and more accurate method of diagnosis, and helps measure the efficacy of treatment. Reducing radiation exposure for patients today means reducing the risk of acute and potential long term damage. "There is no doubt that imaging saves lives, and because of that, its utilization has increased immensely in a short time period. Molecular imaging examina-

tions, specifically, are proliferating faster than any other imaging tests. For this reason, Siemens is taking the forefront in embracing the responsibility of minimizing radiation dose for purposes of patient safety in molecular imaging," says Alexander Zimmermann, vice president global marketing and sales for Siemens Healthcare, Molecular Imaging. With its variety of molecular imaging technologies, Siemens is proving the benefits of its CARE technologies. For instance, IQ•SPECT technology on the Symbia® SPECT•CT is pioneering dose savings for patients. It enables routine cardiac SPECT scans using half the dose and double the speed. Along with a 50 percent reduction in radiation dose, a cardiac SPECT acquisition with the IQ•SPECT, for example, can be completed in one half of the time. Its collimators center on the heart, collecting up to four times more counts than parallel-hole collimators. Using step-by-step protocols, IQ•SPECT allows clinicians to perform a four-minute protocol for a cardiac examination and just 60 seconds more for CT-based attenuation correction and

calcium scoring, instead of a 20-minute protocol, while achieving the same image quality, notes Zimmermann. "The reduction in radiation dose translates into a reduction of risk for the patient," says Torsten Kuwert, MD, chairman of the Department of Nuclear Medicine, Universitätsklinikum Erlangen in Erlangen, Germany. "By reducing dose, we are reducing the potential risk of excess cancer, which is particularly important in the pediatric population." Under the umbrella of the Siemens CARE initiative, the scanners are designed to reduce the radiation dose for all exams, simplifying the scanning process considerably and yielding optimal image quality at the lowest possible dose level, even for obese and pediatric examinations. To achieve lower radiation exposure during complex molecular imaging examinations, Siemens employs a CT iterative reconstruction technique – Iterative Reconstruction in Image Space (IRIS) – which allows a dose reduction by half, according to Kuwert. Enrique Estrada Lobato, MD, of the Instituto Nacional de Cancerologia in the Distrito Federal, Mexico, points out that dose considerations are particularly important for the cancer population, because of the commonality of recurrence rates in these patients and need for repeat exams to monitor treatment. "With

the deployment of Siemens Biograph PET•CT with CARE Dose, we perform studies with better image quality and a reduced radiation dose by at least 40 percent, leading to improved patient care," Lobato says. "Clinicians can now be more self assured that we are not causing any increased damage to our patients."

The Biograph® mCT system offers a range of flexibility in patient dose reduction and scan acquisition speeds, including routine, five-minute whole-body imaging, and provides increased patient comfort via quick scan times. Optimum patient care solutions are supported by features, such as TrueV extended field of view, ultraHD•PET, time of flight, Adaptive CT technologies, and the revolutionary IRIS reconstruction technique that can reduce dose by more than 50 percent. There are multiple benefits of the newer Siemens Molecular Imaging technologies, including superior attenuation correction, according to Zimmermann.

### Increased Speed for Improved Workflow

"In this changing global environment with more economical pressures, we are supporting our customers by allowing them to improve patient access and

throughput via shortened acquisition time and improved workflow," says Zimmermann.

Due to a reduction of patient exam time with Siemens Molecular Imaging's Biograph PET•CT, Instituto Nacional de Cancerologia has been able to increase the number of patients imaged in a single day significantly, without reducing the quality of the study, Lobato reports. Also, these reduced exam times equate to improved patient experiences. "The ability to maximize speed translates to patient comfort," says Kuwert. "The shorter period of time that the patient has to be on the bed of a scanner, the better he or she will feel, and the examination will be met with more acceptance."

In pediatric patients, particularly, Kuwert says the speed of examinations with Siemens Molecular Imaging technologies overcomes the necessity of using sedation. "Therefore, reducing dose and quickening acquisition time is very important in the pediatric population," he says. "Siemens is driving the technological progress in minimizing dose and maximizing speed and efficiency, and this progress in the last decade has been enormous."

Justine Cadet is a medical and technology writer who writes regularly for magazines focused on molecular imaging, radiology, cardiology and healthcare informatics.



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Enrique Estrada Lobato, MD, Instituto Nacional de Cancerologia Distrito Federal in Mexico City, Mexico