Clinical sites value SmartExam benefits in workflow, study quality

Scan automation improving many aspects of the MRI examination

Increasing numbers of imaging centers are experiencing the benefits of complete MRI exam automation as they relate to workflow, inter- and intra-patient scan consistency and even the relationship between technologist and patient. Clinicians at three medical centers: Saint Barnabas Ambulatory Care Center (Livingston, New Jersey), Maggiore della Carità Hospital (Novara, Italy) and Saint-Luc University Hospital (Brussels, Belgium) – all experienced SmartExam users – report that SmartExam is fulfilling its promise as a critical tool in enhancing scanning efficiency and scan reproducibility.

SmartExam combines the automated MR protocol execution and push to automatic post-processing of ExamCards with sophisticated anatomy recognition and localization software. The result is completely automated planning, scanning and post-processing of brain studies, with knee and spine examinations on the immediate horizon. SmartExam is available for Achieva 3.0T, Achieva 1.5T, Intera 1.5T and Panorama 1.0T scanners. It also is available as an upgrade for most Philips MR systems installed since 1994.

Three representative SmartExam sites in the United States, Italy and Belgium recently provided assessments of the impact of SmartExam in their clinical environments.

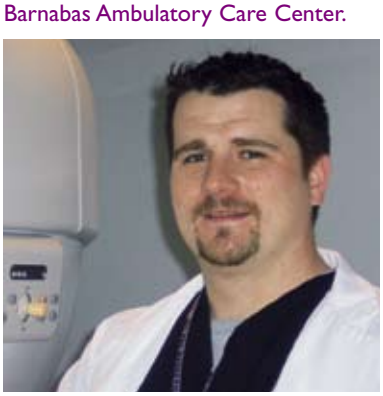
Saint Barnabas realizes major operational gains with SmartExam

"We've performed over 1,000 brain scans using SmartExam on our Panorama 1.0T system," says Robert Smith, MRI Supervisor at Saint Barnabas Ambulatory Care Center (Livingston, N.J., USA). "SmartExam easily enables identical scanning parameters and slice positioning – even multiple angulations – for the patient's follow-up scan. This kind of reproducibility is a clear advantage, because it takes the guesswork out of slice positioning and setting parameters."

Reproducibility between different patients having the same type of study also is a SmartExam advantage, Smith adds. "SmartExam works consistently – from normal brains to some of the most severe cases, in which pathology can alter the anatomy," he says. "This capability to recognize anatomical landmarks and position each and every sequence correctly – despite the presence of gross pathology – is what amazed us most."

Training technologists has been greatly facilitated with SmartExam, Smith observes. Specifically, he notes that the PC-Windows environment enables technologists to work the controls by using a simple click-and-drag method. "The ExamCards are optimized by the more experienced technologists," he says. "The less experienced staff members simply follow instructions and click-and-drag the correct protocols to the scanning menu. My part-time and weekend technologists are now able to consistently produce the quality of work our physicians demand. Moving forward, we plan to use SmartExam on our other Philips systems, the Achieva 3.0T, two Intera 1.5T systems and an Achieva 1.5T."

Robert Smith, MRI Supervisor at Saint Barnabas Ambulatory Care Center.



Saint-Luc University Hospital, validates SmartExam for knee studies

Clinicians led by Frederic Lecouvet, M.D., Ph.D., professor of radiology at Saint-Luc University Hospital (Brussels, Belgium) were the first to evaluate SmartExam for automated geometry planning in the knee on their Achieva 3.0T system. The results have been very positive, with SmartExam performing as well as manual planning by technologists in a blind study conducted during September and October 2006, Dr. Lecouvet reports.

"We took 50 examinations acquired with SmartExam and 50 examinations acquired manually by technologists of varying experience levels and I scored anatomical coverage and angulation of the sequences while blinded to the examinations' origin," Dr. Lecouvet explains. "There was no significant difference between the manual and automated studies.

"We were impressed by the speed of SmartExam," he continues. "It begins with a sub-minute 3D 'SmartSurvey,' during which SmartExam recognizes laterality and anatomical landmarks and positions the stack of slices. The process was quick, reproducible and reliable."

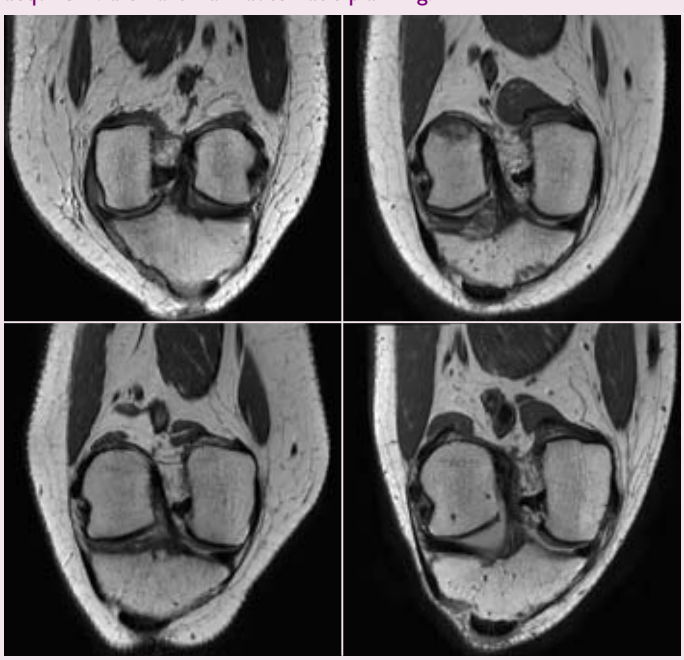
All MRI studies included five routine sequences obtained at Saint Luc University Hospital for knee studies: oblique coronal T1 and proton density (PD) with fat suppression (FS), oblique sagittal PD and T2, and an axial PD with FS of the patella and patellar tendon.

The SmartExam training phase for knee planning entailed just five studies for the scanner to be capable of planning the scan. In our study maximum reproducibility was realized after 15 scans, he adds. "We were surprised that beginning with the 16th knee, SmartExam performed virtually perfectly," Dr. Lecouvet notes. "Even with the most complex angulations or sequences, the SmartExam-guided system repeated almost exactly what we expected.

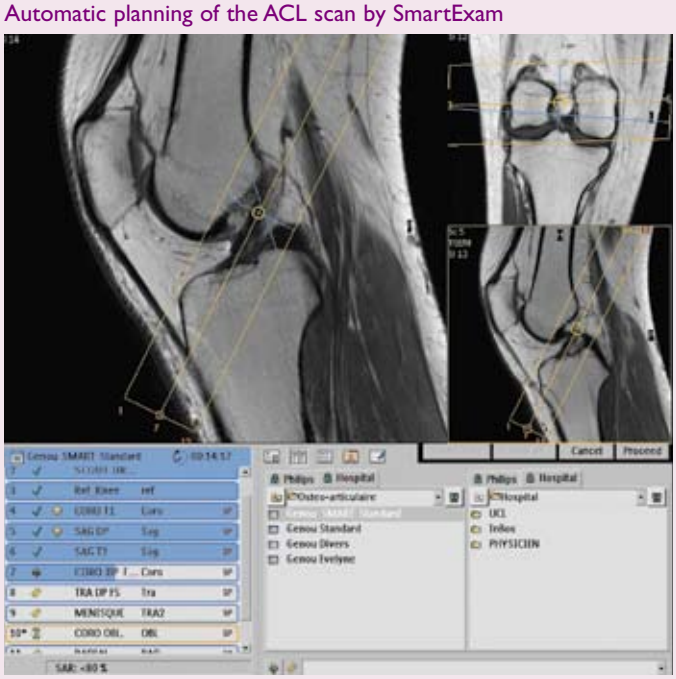
"Moreover, it was very impressive that SmartExam was able to obtain good imaging planes in a wide variety of patients, including not only children and adults, but also normal and traumatized knees – those in which bones were slightly displaced or post-surgical knees containing metallic artifacts, which were expected to make image analysis difficult," he says. "Despite this, SmartExam was able to obtain satisfying planes."

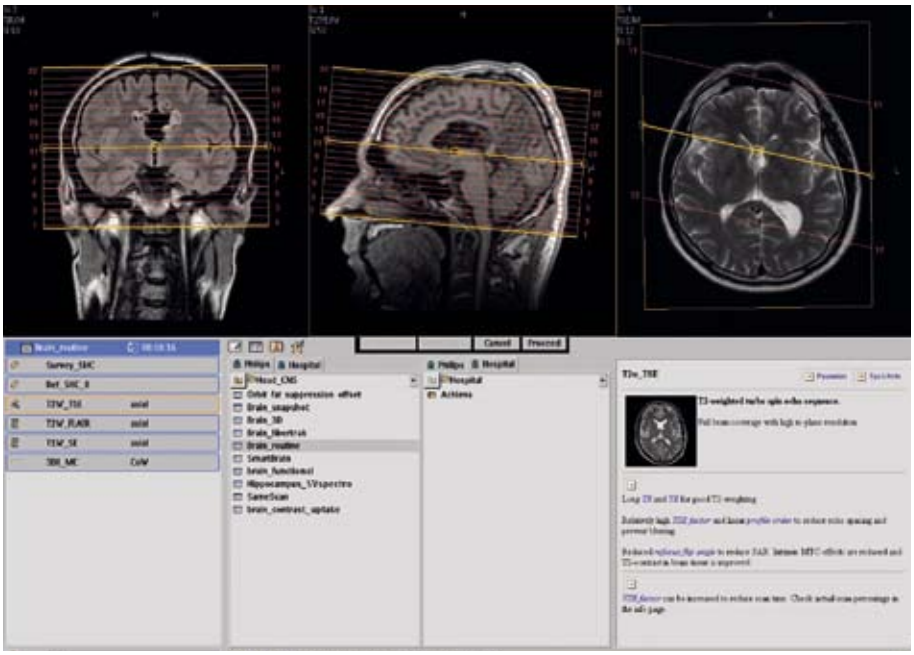
MRI technologist Patrick Schmitz and Dr. Lecouvet, Saint-Luc University Hospital.

ACL images from four different patients acquired via SmartExam automatic planning.

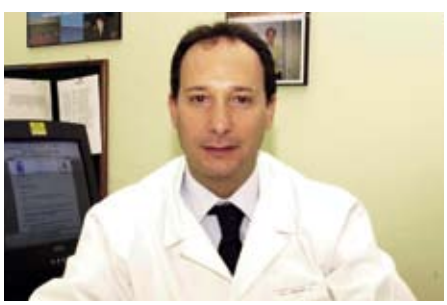


Automatic planning of the ACL scan by SmartExam





Automatic planning in the brain by SmartExam.



Prof. Alessandro Carriero, Maggiore della Carità Hospital.

Italy center's study proves major efficiency gains with SmartExam

Clinicians at Maggiore della Carità Hospital (Novara, Italy) recently conducted a 400-patient study to determine the operator efficiency gains possible with SmartExam for neuro studies.

"We found an average reduction in examination time of 5.2 minutes, which translates into a 30 percent decrease in exam time," says Alessandro Carriero, M.D., professor of radiology at Amedo Avogadro Eastern Piemonte University (Novara, Italy), in Maggiore's department of diagnostic and interventional radiology. "With SmartExam, examinations are now less dependent on operator skills and subjective interpretation. And, there is no need in most cases to review images before proceeding with the examination."

Maggiore's Marco Di Terlizzi, M.D. and technologist Gerardo Di Nardo were instrumental in the study.

Prof. Carriero echoes what many SmartExam users have been saying about how the technologist-patient relationship has improved. "SmartExam allows the technologist to spend a few more minutes interviewing the patients, making them more confident and relaxed during the study," he observes. "It also dramatically decreases the training time for each technologist to become an independent user."

Scan reproducibility also has improved between patients and in follow-up studies, he adds. "SmartExam makes MRI studies highly reproducible and facilitates the comparison of lesions during treatments or follow-up, because image analysis is not hindered by the acquisition of even slightly different planes."