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Interview with Dr. Eichenberger and Prof. Kellenberger at the Zurich Children's Hospital (Kinderspital), Switzerland.

Aplio i800 Enhances Ultrasound Capabilities for Specialist Pediatric Applications

The Zurich Children's Hospital (Kinderspital) is the largest center of excellence in pediatrics and pediatric surgery in Switzerland. It is considered to offer the country's leading medical facilities for children and adolescents, as well as one of the best in Europe. With a total of 2,300 staff, the Radiology Department comprises of 20 radiologists with wide-ranging expertise. The acquisition of two Aplio i800 ultrasound scanners from Canon Medical enables the hospital to meet its growing needs. Prof. Christian J. Kellenberger, Head of Diagnostic Imaging and his colleague, Dr. Andre Eichenberger, Head of Sonography, explain how the new systems have already surpassed the performance of any others.

The Zurich Children's' Hospital provides sophisticated services in acute care, emergency medicine and rehabilitation, as well as outpatient care. It is also active in many cutting-edge research projects, including Elastography.

"We strive daily for the well-being and swift recovery of sick children. Our hospital provides the first, and as yet, only, research center in Switzerland that is solely dedicated to pediatric research," said Prof. Kellenberger. "Patients are referred to us from all areas of Switzerland and abroad. Alongside carrying out the normal tasks of a university hospital, we also train doctors to become specialists in their field."

Future modality in pediatrics

"Ultrasound is, and will remain for the foreseeable future, the primary advanced diagnostic modality in children," said Prof. Kellenberger. "We needed additional ultrasound capacity and particularly wanted portable, high-end systems."

"We bought two systems, because we needed considerable additional capacity. and we selected the Aplio i800 systems because they provided the best image quality of all the systems that we tested."

"The Aplio i800 has exceeded my expectations. The image quality possible with the Aplio i800 is so exceptional that we

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from left to right: Roman Rechsteiner (Canon Medical Systems AG/SA), Dr. Eichenberger, Prof. Kellenberger.

simply do not need to use several of the other techniques, such as fluoroscopy, or other systems for clinical diagnosis," added Dr. Eichenberger. "Sonography has made great strides in recent years. It is already the gold standard in diagnostics. It is already an adequate alternative for many MRI and CT examinations, especially in pediatrics."

"The new Aplio i800 systems are capable of achieving a higher rate of successful studies than our older generation machines," continued Prof. Kellenberger. "The advanced Matrix technology means that the systems can provide beautiful images and offer consistently better image quality than any other machines. The images are like painted masterpieces!"

Dr. Eichenberger, Head of Sonography at Kinderspital.

The high image quality of the systems supports higher diagnostic accuracy, shorter imaging times, and allows for a greater work load.

"One example that we have noticed is in suboptimal visualization of structures in the rectovesical pouch are no longer as problematic, as with the older machines." noted Prof. Kellenberger.

"While we currently do not use the Aplio i800 systems for Interventional Radiology (IR) procedures, because we have other systems that are habitually utilized for interventions, as we expand our experience with the Aplio i800, it will be routinely applied to IR," said Prof. Kellenberger.

User-friendly

Ease of use of all appliances and applications is very important at the Children's Hospital.

"We instruct new doctors on ultrasound applications on a monthly basis. The Aplio i800 is easy to learn and it's very simple to get diagnostic quality images within a very short training period," he added.

New techniques for soft tissue diagnoses

Canon Medical has established a clinical cooperation with the hospital to develop software and hardware in Shear Wave Elastography (SWE) for use in pediatric imaging, as well as the use of Superb Micro-vascular Imaging (SMI).

Elastography methods work through variations in the elasticity of soft tissues that result from specific pathological or physiological processes. SWE relies on acoustic radiation force pulse sequence to generate shear waves that are perpendicular to an ultrasound beam, causing transient displacement. SWE is a promising technique in determining the severity of disease and identifying the most appropriate treatment and follow-up options of a variety of soft tissue conditions including musculoskeletal issues including problems with tendons, muscles, nerves and ligaments.

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Prof. Kellenberger, Head of Diagnostic Imaging at Kinderspital.

It has already been used in several clinical studies to evaluate all kinds of other soft tissue conditions including tumors.

SMI is another complementary imaging technique for qualitatively confirming suspected lesions. However, additional research is still required to evaluate the added diagnostic value of elastography and SMI in children. SMI actually competes with Contrast Enhanced Ultrasound (CEUS) in many applications.

A big step forward

"The research is fascinating and is progressing fast. There are already many research papers exploring these techniques published," said Dr. Eichenberger. "Many of these papers explore the techniques in conditions that are found in older people and not in children."

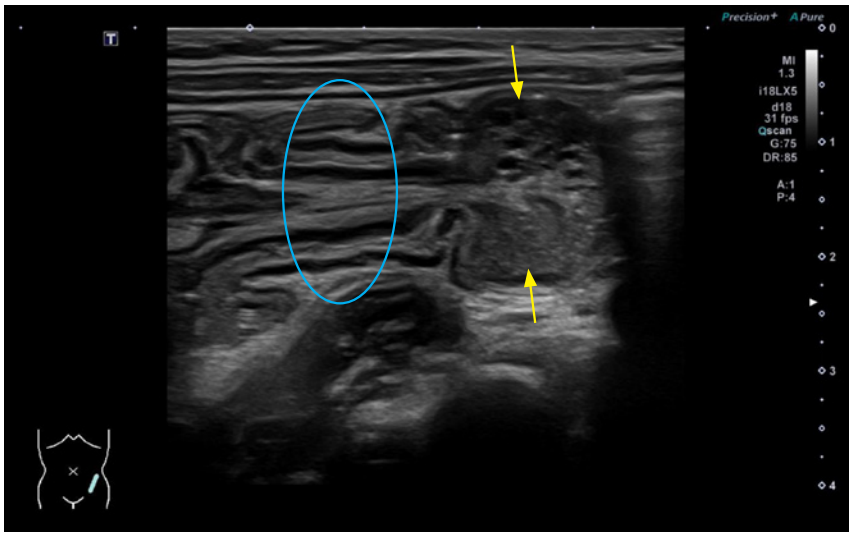
"With such quality, the staff at the Radiology Department consider the Aplio i800 a great advantage."

"Our experience with the Aplio i800 has been very good so far," remarked Prof. Kellenberger. "For routine clinical work, I would never return to our old systems."

Case study:

The advanced technology of the Aplio i800 was used at the Hospital to diagnose a rare condition in a young boy, which had not been successfully diagnosed with other clinical examination techniques.
A three year-old boy with recurrent abdominal pain and diarrhea without bleeding. He had no fever, nausea or vomiting. The clinical examination was unremarkable. An ultrasound examination with Canon Aplio i-series Matrix i18LX5 transducer showed an extremely rare presentation of descending colonic–colonic intussusception with a 2 cm large polyp as a pathological leading point.

The patient underwent colonoscopy, which confirms the ultrasonic diagnosis. This polyp was removed endoscopically. //



Colonic Polyp as Lead Point for Intussusception

A 3-year-old boy with recurrent abdominal pain and diarrhea without bleeding. He had no fever, nausea or vomiting. The clinical examination was unremarkable. A ultrasound examination with Canon Aplio i-series Matrix i18LX5 transducer showed an extremely rare presentation of descending colonic–colonic intussusception (encircled) with a 2 cm large polyp (yellow arrows) as a pathological leading point. The patient underwent colonoscopy confirming the ultrasonic diagnosis. This polyp was removed endoscopically.

Five reasons why the Aplio i800 is so well suited to pediatric applications:

1. Ultrasound is the future modality for pediatric medicine.
2. Image quality is exceptional.
3. Diagnoses can be carried out safely with minimal or no contrast required.
4. Training is easy with the system. The Zurich Children's Hospital has found that the new users of the system can get up to speed with it extremely quickly.
5. The 24 MHz transducer enables every detail to be easily detected by the system.

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