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The World Leader in Hand-Carried Ultrasound

First Hand EXPERIENCE

Professor Peter Marhofer M D
Department of Anaesthesia and Intensive Care Medicine, Medical University of Vienna, Austria.

Avoiding complications related to regional anaesthetics in paediatric patients.

The General Hospital Vienna (AKH) opened in 1994 and today comprises a university, its partner hospital, and Austria's largest medical research centre. University Prof Peter Marhofer is a staff member of the Department of Anaesthesia and Intensive Care Medicine of the Medical University Vienna and specialises in paediatric and trauma anaesthesia. In addition to his many clinical responsibilities, he also actively conducts scientific research, particularly with respect to techniques for ultrasound-guided regional anaesthesia in paediatrics.

Pioneers of ultrasound in regional anaesthetics

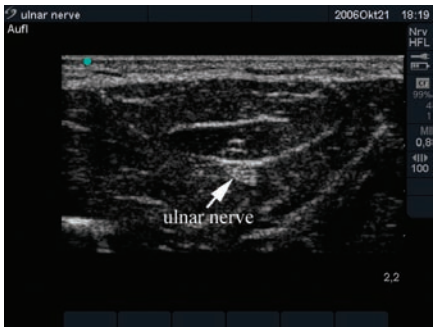
"We've been performing ultrasound-guided regional anaesthetics at our hospital for about 10 years and are therefore considered to be among the pioneers in this field," Prof Marhofer says. "Applying blocking techniques to paediatric patients is much more difficult than it is with adults, because the anatomical structures are much smaller and located closer together than in adult patients and because these structures are relatively vulnerable. Interestingly enough, most of the techniques we use on children are described in a "blind manner" only, using anatomical landmarks. The estimated success rates lie between 50 % and 80 %. In our opinion, this is completely unacceptable. Using ultrasound, we have one great advantage in that we are able to visualise everything we do."

Over the last two years, Prof Marhofer and his research team have been working closely with the University of Cape Town and the Red Cross Children's Hospital that is part of the university in performing ultrasound studies on children. During the course of this research, Prof Marhofer has made significant progress, specifically in peripheral and central nerve blocking techniques.

"Working with children allows us to make full use of the immense potential that ultrasound guided blocks offer. The results of our South African studies have also been put to use back in Vienna and have identified numerous advantages with children," Prof Marhofer explained. "Narcosis on children should ideally use combined methods, in other words, general anaesthesia with an appropriate type of block. This is much better because it means children no longer experience any painful sensation, neither during the operation itself nor on the days that follow which is often the result from using conventional nerve stimulation guidance techniques."

A high performance level from SonoSite ultrasound systems

"To begin with, we made use of a larger cart-based system, but, over time, our research encouraged us to switch over to a SonoSite hand carried ultrasound system. Their reliability and robust design, together with the fact that they are not



Ulnar Nerve captured using the MicroMaxx® and HFL38 high frequency transducer

PC-based, has really impressed us. We put them to use on a daily basis in our hospital and have also used them in foreign countries, under what might be considered third world conditions, and we have not once experienced technical difficulties," he explains.

According to the Prof, the fact that SonoSite systems are not simply modified laptops proves to be a very important advantage. "Systems that are based on PCs require just as long to boot as laptops. This is much too long for us; we need to get on with our work quickly and effectively. The TITAN® and the MicroMaxx® ultrasound systems, on the other hand, are ready for use within seconds. At the same time, I find the fact that they are so robust simply incredible. Although the TITAN system we use was once dropped from a height of 2.20 metres*, it experienced no damage whatsoever! We have also used these systems in India in the midst of dust and

continued

> ***The General Hospital Vienna (AKH),*** *Austria, relies on portable ultrasound systems from SonoSite for ultrasound-guided regional anaesthetics in children.*

sand and temperatures that reached +50° Celsius* and they continued to function perfectly," Prof Marhofer says.

The doctors in Vienna have already had excellent experience in the past using both the SonoSite 180PLUS™ and the SonoSite TITAN and now Prof Marhofer is extremely pleased with the substantially better image quality and the higher frequency transducers on the MicroMaxx system. "Using the newly developed 13 MHz transducers, we are able to examine the nerves that lie close to the surface much better than ever before. The image quality is so good that we have no difficulty whatsoever in imaging nerves that were previously extremely hard to see. In fact, these portable devices are now the only systems that we work with. The TITAN hockey stick transducer (HST) and MicroMaxx SLA transducer are also very good because they have a very small surface footprint of only 25 mm, which is so much easier to use when working with children. Having devices like this that are so easy to carry is a great benefit in a hospital as large as the AKH. Today we perform a significant number of central venous procedures directly at a patient's bedside using ultrasound, moving around constantly, and so a system that weighs only 3.7 kg is extremely convenient," he added.

The economic benefits of point of care ultrasound

Many different techniques used in anaesthesia have focused solely on specific positions on bones or vessels, however, they can easily result in severe complications, such as perforation of the intestines during blocking of the abdominal wall, etc. Ultrasound guided local anaesthesia also offers one very obvious, yet important, economic benefit. Prof Marhofer says, "Taking Vienna as an example, not a single complication has occurred during the ten years that this technique has been used to guide regional anaesthesia. If one considers that many legal cases involving anaesthesia focus on complications that result from regional anaesthetics, this has saved the hospital significant amounts of money, let alone the impact of patient satisfaction which, though hard to quantify, is definitely a key consideration.

Another factor that helps hospitals to control costs is that smaller doses of local anaesthetic agents are needed and take effect extremely quickly, allowing for more effective blocking."

*SonoSite drop-tests their ultrasound systems from 1 metre and they are tested to operate up to 40° C. Use of the system outside of these specifications is not recommended.

Clinical references for use of hand-carried ultrasound in regional anaesthesia in children

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www.sonosite.com/anesthesia/

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INTERNATIONAL HEADQUARTERS
SonoSite Ltd, Alexander House, 40A Wilbury Way, Hitchin, Herts SG4 0AP, United Kingdom
Tel: +44 (0)1462 444800 Fax: +44 (0)1462 444801
E-mail: europe@sonosite.com

WORLDWIDE HEADQUARTERS
SonoSite, Inc., 21919 30th Drive SE, Bothell, WA 98021-3904
Tel: +1 (425) 951-1200 or +1 (877) 657-8050 Fax: +1 (425) 951-6800
E-mail: admin@sonosite.com

SonoSite Worldwide Offices

SonoSite Australasia Pty Ltd – Australia	1-300-663-516
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