SonoSite

First Hand EXPERIENCE

Dr. Vincent Chan, M.D.
Professor of Anesthesiology
University of Toronto

Hand Carried Ultrasound Improves Delivery of Regional Anesthesia

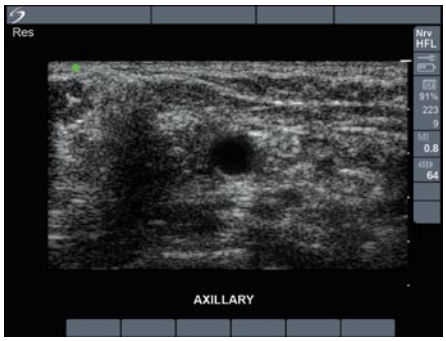
At home and abroad, Dr. Vincent Chan is an avid advocate for hand-carried ultrasound and its ability to improve the delivery of regional anesthesia – and the quality of patient care.

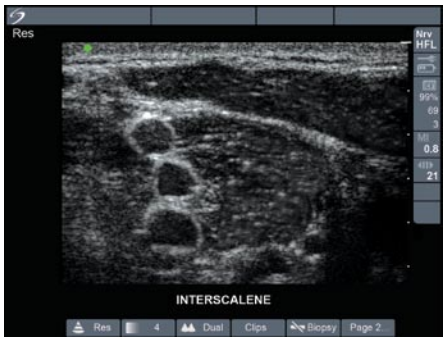
Dr. Vincent Chan is professor of anesthesiology at the University of Toronto and a leader in training anesthesiologists to use hand-carried ultrasound for pain management, in Canada and around the world. Shortly before being interviewed for this page, Dr. Chan had returned from a five day training tour of Hong Kong, where he taught classes on using ultrasound guidance for nerve blocks at nine hospitals. At home, Dr. Chan was the first anesthesiologist to start using hand-carried ultrasound at the University of Toronto in 2002, when the technology became available to make the benefits of ultrasound guidance practical for the anesthesiology department. Now the entire seven-physician regional anesthesiology team is using the technology and has placed more than 1,000 image-guided nerve blocks since adopting the practice. "Absolutely, the use of ultrasound will become standard of care for placing nerve blocks," Dr. Chan said, "particularly as more anesthesiologists here in Canada are stepping forward to be trained."

When Dr. Chan presents the reasons for using hand carried ultrasound (HCU) to administer regional anesthesia, he wastes no words. "Image guidance for nerve blocks increases patient comfort and safety, and makes the clinician more efficient."

- ***Comfort*** – The advantages of regional anesthesia versus general anesthesia for appropriate surgical procedures are well documented; used appropriately, nerve blocks reduce the requirements for general and other analgesic medicines, allowing the most effective pain control with diminished post-operative complications, such as nausea and vomiting.
- ***Efficacy*** – By improving the accuracy of nerve localization and needle placement with hand-carried ultrasound, Dr. Chan believes that hand-carried ultrasound decreases the time to perform the procedure and minimizes patient discomfort – and operator frustration – caused by multiple needle passes.
- ***Safety*** – But Dr. Chan points specifically to another very practical benefit for patients and clinicians alike – minimizing the likelihood of perioperative nerve damage. While evidence-based medicine on the reduction of nerve injury with HCU is still forthcoming, Dr. Chan points to some clear immediate benefits.

"When a patient suffers nerve damage during surgery, the cause is never certain," said Dr. Chan. "Not only does the ability to see inside the body improve the likelihood that the regional anesthesiologist will consistently achieve a successful outcome, but the ability to see can help the anesthesiologist avoid interfering with the targeted nerve structure. And if nerve injury does occur, a clear visual record of the nerve block can help to narrow the possible causes of the injury."



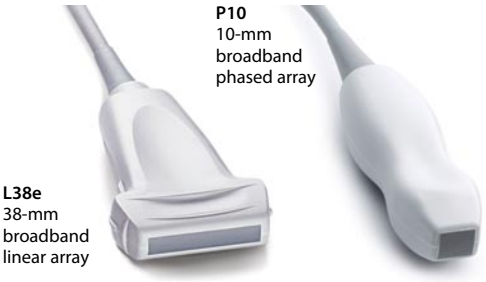


HCU in Regional Anesthesia

For these reasons, Dr. Chan deploys hand-carried ultrasound across his practice at the University of Toronto, and he notes as well the following practical applications of the advanced technology:

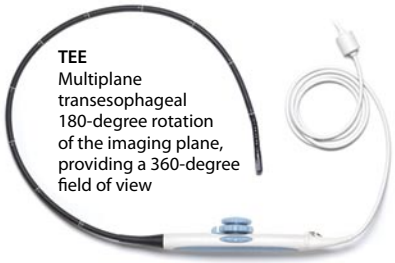
continued

SonoSite MicroMaxx with an HFL38/13-6 MHz transducer.



L38e
38-mm
broadband
linear array

P10
10-mm
broadband
phased array



TEE
Multiplane
transesophageal
180-degree rotation
of the imaging plane,
providing a 360-degree
field of view

- ***Patients with Special Needs*** – Diabetes often causes peripheral neuropathy, which can render a nerve stimulation device useless and require visualization to safely localize the targeted nerve. Similarly, HCU can help an anesthetist localize nerves in patients with amputated limbs, particularly for acute pain management with patients who have suffered severe trauma.
- ***Patients of Different Sizes*** – The use of tactile and anatomical cues for localizing a nerve may be helpful in typically sized adults. But obese patients and children require placing the needle at different depths, which can be extremely difficult to gauge without ultrasound imaging.
- ***For Avoiding Adjacent Structures*** – HCU improves accuracy when placing a needle near a targeted nerve, but also helps the clinician avoid blood vessels. Damaging a vessel in a patient on anticoagulants can cause excessive internal bleeding. Dr. Chan also points out that as the intercostal nerve is located very close to the lung, a misplaced needle risks causing a hemothorax. HCU is a critical tool for safely placing blocks near delicate structures.

Further, Dr. Chan uses hand-carried ultrasound to train other anesthesiologists in regional techniques and procedures.

"With ultrasound guidance a resident can, for instance, recognize an intra-neural injection," he adds, "and therefore learn how to avoid a potentially damaging complication."

Why the MicroMaxx™ System?

Dr. Chan has used SonoSite's MicroMaxx system since its launch in June 2005 and he likes the device's clear, precise images of the nerves of the body. "Among the portable ultrasound systems now available, the MicroMaxx system is the top machine," he said. With its light weight and small footprint -- at just under eight pounds it is the size of a laptop computer -- he can use it easily in pre-op or the operating room, disinfect it and move from case to case.

He also appreciates the system's transesophageal and transthoracic echo probes, an uncommon feature among portable ultrasound systems, which are used to monitor patients' heart function during surgery.

Dr. Chan views the price of the MicroMaxx system as more than reasonable given its high image quality and full range of features. Affordability is key, he believes, to more widespread adoption of HCU by regional anesthesiologists across Canada. The cost of ownership is improved further by the MicroMaxx system's standard five-year warranty, the only warranty of its kind available on a hand-carried ultrasound product.

Medical Citations

- Gray et al, Ultrasound-guided regional anesthesia, Anesthesiology 2006; 104: 368-73.
- Chan et al, Ultrasound examination and localization of the sciatic nerve, Anesthesiology 2006; 104:309-14.
- Awad et al, Ultrasound imaging of peripheral nerves: a need for a new trend, Regional Anesthesia and Pain Medicine 2005 Jul-Aug; 30(4):321-3.
- Marhofer et al, Ultrasound guidance in regional anaesthesia, British Journal of Anaesthesia 94 (1): 7-17 (2005).
- Greher et al, Ultrasonographic assessment of topographic anatomy in volunteers suggest a modification of the infraclavicular vertical brachial plexus block, British Journal of Anaesthesia 88 (5): 632-6 (2002).

www.sonosite.com/anesthesiology

SonoSite www.sonosite.com

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

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

SonoSite Worldwide Offices

SonoSite Australasia Pty Ltd – Australia	1-300-663-516
– New Zealand	0-800-888-204
SonoSite KK - Japan	81-3-5304-5337
SonoSite SARL - France	31-1-69-18-96-30
SonoSite - Germany	49-(0) 91-31-97-79-29-0
SonoSite - India Liaison Office	91-124-402888
SonoSite Iberica SL - Spain	34-91-640-49-11
SonoSite Ltd - China - Shanghai	86-21-523-966-93
SonoSite Canada Inc. - Canada	1-888-554-5502