SonoSite

First Hand EXPERIENCE

Convenient bedside scanning minimizes complications and saves lives in the ICU

Dr. Yanick Beaulieu
Cardiologist, Echocardiographer, Intensivist
Director of Bedside Ultrasound
Hopital Sacre-Coeur de Montreal

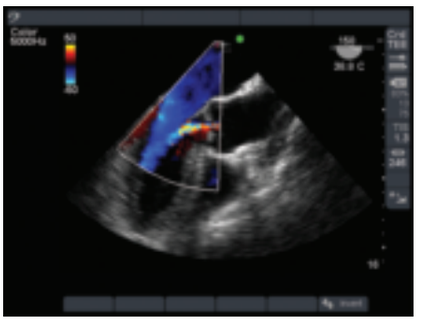
Dr. Yanick Beaulieu started using hand-carried ultrasound during his critical care fellowship, and he quickly came to view hand-carried ultrasound as an invaluable tool to determine, on-the-spot, why an ICU patient is not doing well.

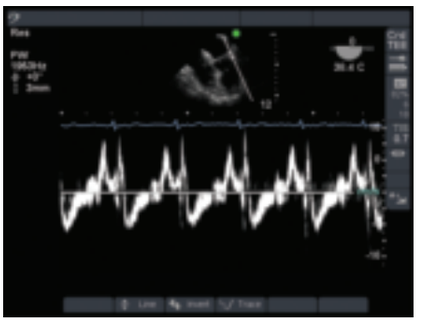
Dr. Beaulieu has since developed a complete curriculum on the use of bedside ultrasound in the ICU for the intensivist, centered on teaching the use of bedside ultrasound to do point-of-care-examination. This curriculum is in the process of being adopted as the official University of Montreal bedside ultrasound program. Intense, voluble, and passionate about critical care, Dr. Beaulieu relayed the following first-hand experiences with hand-carried ultrasound in his earnest and rapid-fire style:

A 52-year old smoker was admitted to the emergency room complaining of shortness of breath for half a day. After a chest x-ray, the patient was diagnosed with pneumonia in the right lung, and admitted to the intensive care unit. Eight hours later the patient went into shock. With a bedside hand-carried ultrasound examination, Dr. Beaulieu found a flail leaflet in the patient's mitral valve and asymmetrical pulmonary edema. The patient went directly into cardiac surgery. Within eight hours of admission, bedside ultrasound enabled a completely different and more accurate diagnosis and management plan for this patient, and the patient was treated successfully.

Another patient was rushed to emergency after shooting himself in the heart with a nail gun in a botched suicide attempt. Surgeons immediately opened the chest and repaired the heart, but couldn't find the nail. Back in the ICU, the patient presented with persistent internal bleeding. There was no space in the ICU to accommodate a cart-based ultrasound system, and the patient was rapidly deteriorating. Dr. Beaulieu performed a bedside transesophageal echocardiogram with a hand-carried ultrasound and found the nail in the left atrium, sticking into the aorta. After follow-up surgery and recuperative therapy, this patient was discharged seven days later.

In another case, an elderly patient had developed a catheter infection after cardiac surgery. With a hand-carried ultrasound, Dr. Beaulieu looked for the best location to place a line. He found clots in the left and right internal jugulars, making them unsuitable and dangerous for line insertion. As a result, he placed a PICC line with ultrasound guidance, and was able to remove the infected catheter, saving the patient from a complication.





Ultrasound Guidance in Critical Care

As Dr. Beaulieu's experience demonstrates, ultrasonography has become an invaluable tool in the management of critically ill patients. Hand-carried ultrasound systems, in particular, can provide immediate diagnostic information at the bedside that is not assessable by physical examination, and enable certain proce-

continued

dures that previously required transport to the radiology suite. These are vital, time saving advantages for the critically ill patient.

Dr. Beaulieu points to the following specific applications of hand-carried ultrasound in the ICU and other critical care departments:

- ***Monitoring Cardiac Function*** – With patients who have unexplained hemodynamic instability, assessing right and left ventricular function is integral to medical management, as is assessment of the pericardial space to rule out presence of a tamponade, and assessment of the patient's volemic status by examining biventricular dynamics and right atrial pressure.
- ***Cannulation*** – Ultrasound guidance during central venous catheterization has been documented to reduce risk of complications, especially for the internal jugular route. It also speeds catheter placement and improves the rate of successful placement on the first try.
- ***Guiding Delicate Procedures*** – When performing certain procedures that have been traditionally performed blindly, such as thoracentesis and paracentesis, the use of ultrasound guidance should be considered standard of care, particularly with patients on a ventilator.
- Diagnosing Trauma – In the ER, bedside ultrasound can determine the presence of intra-abdominal injury after blunt trauma. It also plays an important role with patients who present with unexplained abdominal pain, particularly to confirm or rule out an abdominal aortic aneurysm.

"Equipping critical care physicians with HCUs and training them to perform point-of-care examinations will most likely translate into improved patient care," said Dr. Beaulieu. "The utility and impact of HCU at the bedside of critically ill patients is here to stay."

Why the MicroMaxx™ System?

Dr. Beaulieu uses the MicroMaxx, SonoSite's third generation hand-carried ultrasound device. The MicroMaxx system represents the technology crossover point between hand-carried and cart-based systems. Weighing in at approximately eight pounds, the size of a notebook, the hand-carried device can be battery powered and delivers image resolution and performance comparable to costly, conventional cart-based ultrasound systems weighing over 200 pounds.

The MicroMaxx system fits Dr. Beaulieu's strict criteria:

- It reliably boots up within 15 seconds, a great improvement to Windows-based systems that can take over a minute to start-up, spending a critically ill patient's precious time.
- It is extremely rugged. When care is being delivered quickly, instruments are subject to abuse. Dr. Beaulieu particularly appreciates the five-year warranty and service guarantees for this reason.
- The MicroMaxx system's portability allows the intensivist to travel easily from room to room and assess critically ill patients in the ICU, OR, ER, or wherever they may be, without compromising image quality. He also likes the broad selection of transducers, including the TEE probe, which is available with the system.

Dr. Beaulieu recalls how, during his cardiac residency, his efforts to use big, cart-based ultrasound in critical care departments were stymied by a lack of space. Now, he carries a MicroMaxx system with him throughout the day. The ultimate endorsement of its portability and reliability, Dr. Beaulieu doesn't hesitate to, as he says, "grab the MicroMaxx and run to assess a patient in cardiac arrest wherever they may be located in the hospital."

Clinical citations for use of hand-carried ultrasound in bedside applications.

Milling T et al, Randomized, controlled clinical trial of point-of-care limited ultrasonography assistance of central venous cannulation: The Third Sonography Outcomes Assessment Program (SOAP-3) Trial, Critical Care Med 2005 Vol. 38, No. 8:1764

Barclay et al, Point-Of-Care Ultrasound May Be Better Than Landmark Identification to Place Central Venous Cannulas, Medscape Today, August 24, 2005

Beaulieu Y et al, Bedside Ultrasonography in the ICU: Part 1, Chest. 2005 Aug;128(2):881-95

Beaulieu Y et al, Bedside Ultrasonography in the ICU: Part 2; Chest 2005 Aug, 128 (3): 1766-1781

de Groot-de-Laat LE et al, Impact of hand-carried cardiac ultrasound on diagnosis and management during cardiac consultation rounds, Eur J Echocardiogr. 2005 Jun;6(3):196-201. Epub 2004 Dec 18

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

EUROPEAN 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 GmbH - Germany	49-(0) 91-31-97-79-29-0
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