



Advancing ultrasound in the ED

Highland General Hospital at the forefront

Who/where

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Challenge

Integrate ultrasound in a busy emergency department with users of varying scanning experience

Solution

Sparq, ultrasound for emergency medicine

Approximately 100,000 patients come through the doors of Highland General Hospital emergency department every year. While receiving care, patients may encounter any of 19 emergency medicine physicians, 42 residents in Highland's emergency medicine resident program, or two physicians pursuing an emergency medicine ultrasound fellowship. In addition, they might be seen by critical care or pediatric emergency medicine fellows, as well as a variety of medical students at various points in their education.

Many of these patients also encounter Philips Sparq, an ultrasound system uniquely suited to meet the needs of all these users with diverse ultrasound scanning experience. Sparq is helping the ED physicians reduce test delay, as well as develop new approaches to using ultrasound in the ED.

Emergency ultrasound borrows and adapts

"Emergency medicine initially copied other fields – taking surgical aspects, for example – to see if they would be useful in the ER. Emergency ultrasound does the same thing," explains Arun Nagdev, MD, director of emergency ultrasound.

"We look at gallbladder studies, echo studies, or OB studies, and we try to find a shorter version that will help us. As we develop

our own exams and protocols, we're finding more and more utility in ultrasound for our patients."



Arun Nagdev, MD

He adds that, while abdominal pain is the classic indication for ultrasound in the ED, he and his colleagues use ultrasound frequently for other diagnostic and therapeutic needs as well, including detection of deep venous thrombosis in patients with leg swelling, focused echo to assess cardiac function or to determine the cause of hypotension, and ultrasound guidance for central venous or peripheral vascular access, nerve blocks for pain management, and joint aspiration procedures.

PHILIPS



Sparq's large screen on an articulating arm facilitates communication with patients by making it easy to show them their ultrasound images.

Designed for emergency medicine

As the clinical practice of emergency ultrasound has evolved, so has the development of ultrasound systems designed for the emergency medicine environment. While some early systems focused primarily on portability, Sparq is a leader in a new generation of point-of-care ultrasound systems that offer advanced clinical utility and outstanding ease of use.

"Most ultrasound systems sacrifice image quality for ease of use. Sparq does not leverage one for the other," Dr. Nagdev says. "From a design standpoint, the large mobile screen, the touch control panel, and high level of image quality is beautiful.

"I think another important feature is the ability for a system to begin imaging immediately." He notes that Sparq's "immediate on" feature from the sleep mode is highly valued.

In addition to Sparq's mobility and quick start-up, Dr. Nagdev has come to appreciate many of Sparq's features that enhance image quality, improve workflow, and encourage compliance with department best practices.

System accommodates varied experience

The emergency medicine ultrasound program at Highland has a strong practical aspect, and emergency ultrasound fellows are an integral part of the department, fulfilling scanning shifts in the ED as well as learning didactically with video review.

In addition, EM residents, other residents, and medical students rotate through the ED, and consequently, Sparq is used by clinicians and students with a vast variety of ultrasound experience.

"Having over 40 residents, ultrasound fellows, ICU fellows, and medical students use the system has been a true test of the thought that went into the product," Dr. Nagdev says.

Simplicity Mode aids learning

Sparq has features that make even the most novice scanner comfortable with ultrasound. Simplicity Mode presents only the ultrasound functions that are used most often, and the Exam Dashboard walks users through the steps to start an exam.

"When I started training others in ultrasound, we would spend a day reviewing physics and how to use the machines, and we stopped doing that. I realized that as much as really clear didactics make a difference, sometimes the best way to get clinicians and students involved is to get them on a machine and say, 'Start scanning,'" Dr. Nagdev says.

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“So having Simplicity Mode really does make a difference for us. The control panel on Sparq is touch-based and the medical students seem to intuitively know what to do, so a lot of fear is eliminated. As opposed to a keyboard and fourteen buttons, they have only a few options to choose, and those are obvious to them. So I can have them running basic scans in less than 15-20 minutes.”

In contrast, the fellows can choose to turn off Simplicity Mode for more complex studies. “This is why I think Sparq fits our department so well,” Dr. Nagdev adds. “My fellows and my med students can use the same machine, and it adapts to their needs and experience.”

Users of all experience levels benefit from AutoSCAN, which continuously adjusts the image gain while scanning, and Anatomical M-mode, which allows the user to keep the M-mode line perpendicular to the anatomy, even in abnormally shaped or positioned hearts. “The M-mode capabilities are by far the best M-mode capabilities that we have,” Dr. Nagdev notes. “If you can’t steer your M-mode, you get inappropriate cuts of the heart. When we look at the motion of the mitral valve, our ability to steer the M-mode makes a big difference.”

Temporary ID matches pace of ED

Trauma patients and patients in cardiac arrest who are brought into the ED by ambulance may not have an identifiable medical record number during the first 30 minutes of their evaluation and treatment. Before Sparq, there was no method for storing patient information in the ultrasound system when performing emergent scans.

Sparq features a Temporary ID function that assigns a unique temporary number to a patient. “When I was told about the Temporary ID, I didn’t recognize the utility,” Dr. Nagdev comments. “But with Temporary ID, I can do the scan first and add the patient information later, which makes it really convenient to archive our data.”

When using a ultrasound system other than Sparq, ultrasound exams done without patient identification are seldom saved. “I would love for everybody to save every scan they’ve done in our department, but it just doesn’t happen that way,” Dr. Nagdev admits. “Having methods for physicians to do things with the least amount of friction in their day reduces noncompliance. With Temporary ID, they probably will save a scan, because they can do it at the touch of a button, and add patient information later.”

Screen benefits trauma team, students, patients

Another feature which serves a variety of purposes in the ED at Highland Hospital is Sparq’s large screen on an articulating arm. Dr. Nagdev notes that when he is using laptop ultrasound systems, trauma service members might be present during scans, but they can’t see what he is doing. With Sparq’s large screen, everyone can see the images.

The screen also makes teaching in the ED more effective. “With Sparq, we can show both the patient and other learners clear images simply by rotating the large screen. Instead of huddling around a small screen, various providers can see the images and video, making teaching easier,” Dr. Nagdev says.

For patients, the large screen is a useful communication tool. “Showing patients their ultrasound images is empowering for them, and makes the interaction between provider and patient really much nicer. It is less classic paternalistic medicine and it becomes a conversation with the patient,” he says. “We treat a broad spectrum of patients at Highland. Showing them the images is also really empowering for me as a provider, because it allows me to show them that I’m comfortable with what I’m seeing, and it makes them comfortable with their care. I think showing patients their images is more important than many might think.”

Future-ready

Dr. Nagdev expects that as emergency medicine ultrasound continues to evolve, he will find new value in the Sparq system. “I think there is a fear when it comes to buying an ultrasound system, that you’re going to outgrow it very quickly,” he says. “But Sparq is very malleable. It can be a simple system for a provider in a department that just looks at gallstones, and then also be a complex echocardiography machine for a group that is doing very high-end echocardiography. You have the option to download images via a jump drive, but you also can send them wirelessly to a PACS.”

He adds that he sees Sparq’s role changing as the department moves forward. “It is nice to know that if I want to try something, or if I learn something new from our cardiologists, I can try it, and the system is going to have enough capability for what I want to do, even with high-level sonography,” he says. “When I got the machine, I used it for basic applications, but I’ve come to recognize that there is a lot more that I could learn and use.”

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