

# Critical connections

The Complete News Source for Critical Care Professionals

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Society of  
Critical Care Medicine  
The Intensive Care Professionals

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Does your ICU utilize ultrasound equipment at the bedside?

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## Purchasing an ICU Ultrasound: 5 Questions a Bedside Practitioner Should Ask

Aliaksei Pustavoitau, MD

Ultrasound-based technology has emerged as a useful tool in several areas of medical practice: cardiology, radiology, emergency medicine, surgery and anesthesiology. Though long-recognized as a useful adjunct to the practice of critical care medicine, ultrasonography made its way into intensive care units (ICU) only recently. Several manufacturers of ultrasound equipment have recognized this growing demand, and the market for the equipment is evolving rapidly. One must carefully consider a unit's needs, in addition to the direct cost of acquisition, prior to making decisions about buying a new ultrasound machine.

(see *Purchasing an ICU Ultrasound: 5 Questions a Bedside Practitioner Should Ask*, page 11)

## Ultrasound-Guided Percutaneous Drainage

Kazuhide Matsushima, MD  
Heidi L. Frankel, MD, FCCM

*At four a.m., you are called to evaluate a patient who underwent emergency surgery for perforated sigmoid diverticulitis one week earlier. The patient is febrile (39.5C°), and his blood pressure has dropped to 78/44 mm Hg. After resuscitation, you obtain a computed tomographic (CT) scan that shows an intraabdominal abscess in the left lower quadrant. The interventional radiologist is otherwise occupied and unavailable to drain the collection promptly. The patient is now profoundly confused. What is your next step?*

### Background

Bedside ultrasound performed by intensivists has been gaining popularity in the intensive care unit (ICU) setting.<sup>1</sup> In addition to its portability and efficiency, the accuracy and efficacy of intensivist-performed ultrasound has been demonstrated for a broad spectrum of indications.<sup>2,4</sup> Since the 1990s, the success rate for central venous catheter cannulation has improved significantly with the introduction of real-time ultrasound guidance.<sup>3</sup> This technique is now recommended in several procedures, especially internal jugular vein cannulation.<sup>5</sup> With the recognition of Focused Assessment with Sonography for Trauma (FAST) as an important modality in the trauma and critical setting,<sup>7</sup> ultrasound now is a diagnostic and therapeutic tool that is not limited to use by the radiologist or cardiologist. For example, echocardiography by intensivists can predict the hemodynamic status of critically ill patients accurately.<sup>8</sup> Pneumothoraces occurring in the patient requiring mechanical ventilation can be identified using bedside ultrasound without any exposure to ionizing radiation or transport to the CT suite.<sup>9</sup>

In addition to diagnostic and monitoring purposes, ultrasound can be used to guide interventional bedside procedures efficiently and safely. We describe several examples of such use.

(see *Ultrasound-Guided Percutaneous Drainage*, page 14)

## SCCM Members Provide Relief for Disaster Victims

Healthcare providers – and critical care professionals specifically – often feel a particular pull to help disaster victims, as they represent those most in need. Following the January 12 earthquake in Haiti, many Society of Critical Care Medicine (SCCM) members were moved to action. Several SCCM members shared their stories; some are moving, some are somber, others sparked life passions. Although these accounts highlight individual experiences, all members stressed the vital role of teamwork in ensuring the best possible care for those suffering under the worst circumstances.

### Stepping into an Intense Personal Moment

Providing care to thousands of injured patients is a task that, in the throws of disaster and confusion, can seem overwhelming. Elizabeth Lee Daugherty, MD, MPH, from Johns Hopkins Hospital, knew that would be the case when she arrived at King's Hospital in Port au Prince, Haiti on January 19. The hospital was not even scheduled to be opened yet; it had only intermittent generator power and limited staff, equipment and supplies. Initially, neither of the hospital's two operating rooms was functioning. While the scene was chaotic, Daugherty believed she had unique skill sets to help bring order.

"The most valuable skill I had was probably my understanding of disaster organization. I understood how a disaster incident command system was supposed to work and how to get things organized," she recalled.

Daugherty has been involved with the Society's Fundamental Disaster Management (FDM) program since taking the course as a second-year fellow. She provides FDM lectures annually and wrote several chapters in the latest companion textbook. These experiences, in addition to her regular work for Johns Hopkins Office of Emergency Management, helped her assess the situation quickly. She helped organize a rudimentary, but effective, system for tracking patients and orders, established surgery schedules and took charge of several administrative duties. "Critical care skills obviously are essential, but in a lot of situations, you just need to know how to get organized," she said.

(see *SCCM Members Provide Relief for Disaster Victims*, page 17)

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# SCCM Members Provide Relief for Disaster Victims

(continued from page 1)

When asked what inspired her to spend a week in Haiti with the non-governmental organization World Relief, her answer was straightforward: “I was motivated by my faith first and foremost. I felt compelled to help and was grateful that I had the skills, through FDM and through my work at Hopkins, to do something meaningful.”

Her standout moment in providing the Right Care, Right Now™ came while trying to coax a frightened patient back into the hospital for surgery. “Patients were afraid to go inside the building following aftershocks, and this young man was scheduled for surgery. He wailed and beat his head with his hands because he was so afraid,” she said. “It was such an intense thing. We spent a long time with him; we stepped into that space with him and talked him through it to get him the care that he needed.”

## A New Mission

Seeing the relative deficit of critical care in the Dominican Republic and the challenges within that country’s healthcare system to provide timely and adequate care of the seriously ill patients transferred from Haiti, inspired one member of the SCCM Disaster Field Team to go beyond volunteerism. Marie Baldisseri, MD, FCCM, left the Dominican Republic with a clear sense that she “wanted to do something on a global perspective based on her experiences with the SCCM Disaster Field Team.”

She explained that most of the organizations and groups in Haiti were there for the immediate medical and surgical treatment of the earthquake victims. “However, few groups are devoted solely to education of the local healthcare providers. When the medical volunteers leave, care of the patients will be in the hands of the Haitian healthcare professionals, and they must be trained,” she said.

She was inspired to start the Critical Care Disaster Foundation, an organization whose mission is two-fold: first, to educate healthcare providers in developing countries about disaster medical management, and secondly, to develop an infrastructure of critical care services empowering local institutional organizations and governments in the event of a disaster or humanitarian crisis. The foundation will seek to enable readiness and preparation among healthcare institutions either before a disaster strikes or immediately after an event. Programs will integrate the complete spectrum of care in the disaster cycle, from prevention and mitigation to response and recovery. For more information on this organization, contact Baldisseri at [baldisserimr@ccm.upmc.edu](mailto:baldisserimr@ccm.upmc.edu).

## The Definition of ICU

James Geiling, MD, FCCM, and Dennis Amundson, DO, FCCM, who have worked closely on the Society’s FDM Subcommittee, departed to Haiti on different missions:

Amundson served as an intensivist aboard the *USNS Comfort*, while Geiling volunteered at a city hospital. Although each describes his setting as an “ICU,” their experiences underline how preparedness often may trump ample resources in mass-casualty situations.

Amundson set out aboard the *Comfort* on January 16, leading a team of 15 nurses and three respiratory therapists. The ship, equipped with high-tech equipment such as computed tomography scanner, mechanical ventilators and dialysis machines, served as the most sophisticated facility in Haiti when it docked in Port-au-Prince seven days after the earthquake. Although their arrival came as a relief to many on the ground struggling with very few resources, it proved challenging from a resource allocation standpoint.

“There was a decision to triage patients who weren’t necessarily the sickest, but who had the best opportunity for long-term survival,” said Amundson. “You had to change your mind-set.” The first patient was a crush injury victim who arrived by helicopter before the ship even docked, and the patients never stopped coming. The 40-bed intensive care unit (ICU) operated at or near capacity for three weeks.

Meanwhile, not far away, Geiling was operating under very different conditions, but still facing similar triage challenges. Dartmouth College and Medical Center had, for the first time, aligned itself with the non-governmental organization Partners in Health to deploy several care teams; Geiling led a group of eight nurses who arrived on January 19. All multi-story buildings once part of the Port-au-Prince University Hospital were collapsed or deemed unsafe, forcing his team to set up a postoperative/ICU area in an outside tent. In addition to crush wounds and infection, Geiling’s team also saw patients with gunshot wounds as violence erupted throughout the area. Although the team had some antibiotics, an “H” tank of oxygen and a blood pressure cuff (until it was stolen), the facility was in many ways an ICU in name only. “My ICU management was how strong was their pulse, how pale was their tongue and how fast were they breathing. It was more physical diagnosis and basic wound care.”

Both SCCM members are very involved in the FDM program, serving as regular instructors and textbook authors; Geiling is a former subcommittee chair. They both passed along lessons from the FDM course to their colleagues before arriving in Haiti; information on the expected demographics and injury patterns was taken directly from FDM. “I wanted to ensure they were prepared for what we were about to see, both clinically and mentally,” Amundson recalled.

Amundson said FDM information on tetanus helped save lives. “Tetanus was a success story for us. If you know it, and you know it’s going to be there, it’s in your differential. Others were not looking for it and when they sometime missed it, we were able to make the diagnosis in the ICU.

We had eight cases and five survived. That would have been something we would have to learn the hard way without some of the training offered by the Society.”

## Achieving Zero Mortality

“They were having a mortality problem: two to three people a day were dying,” recalled Ian Butler, MD, from Cooper University Hospital. It was the issue he focused on upon arriving in the Dominican Republic border town of Jimani on January 19. The basic clinic, school and orphanage there had been augmented to handle the surge of Haitian patients, but critical care was not yet being administered in an organized fashion. After surgery, no one was designated to monitor patients closely.

Butler’s first day was spent observing the situation and investigating the best way to organize and help. On his second day, he met with Alejandro Baez, MD, MPH, a fellow SCCM member whom he recognized from his involvement in the SCCM Emergency Medicine Section. Baez, who was working with the Dominican government, helped Butler establish an ICU with limited resources.

“I was given the authority to set up an ICU, so we carved out a space that wrapped around the outdoor operating area and made it a closed unit,” Butler recalled. “I would troll the other wards to identify critically ill patients and bring them in. We were able to bring mortality to zero and keep it there, and that was pretty exciting.

“The Right Care, Right Now story was definitely the early recognition of sepsis. It was a big problem when I got there. We were giving fluids and antibiotics to keep everyone out of shock,” he recalled. “I remember the first night, finding a young boy with a leg wound that had been operated on a few days prior. He had a heart rate of 130 and a temperature of 102 degrees. It wasn’t dramatic. I remember him because he was the first one we were able to identify and say ‘this person gets a higher level of care or he is going to develop full-blown sepsis.’ That was a great feeling.”

## Preparation Tips for Volunteers

Barbara McLean, ACNP, CCNS-NP, has travelled to Haiti three times with Project Medishare, and recently recounted her experience in an iCritical Care Podcast, SCCM Pod-122 Disaster Management in Haiti. It is not the first time she has travelled to disaster-stricken areas; in 2005, she volunteered in the wake of Hurricane Katrina. Given her various experiences in providing direct patient care during disaster scenarios, she is especially inclined to promote safety and preparation to future volunteers. She generously provided the Society with a thorough list of pack and preparation tips for the critical care volunteer. Visit the Disaster Resources section of [www.sccm.org](http://www.sccm.org) to access the checklist. Visit [www.sccm.org/icriticalcare](http://www.sccm.org/icriticalcare) to hear her podcast. ▲