



Diku Mandavia

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Discussing the use of point-of-care ultrasound for evaluating COVID-19 patients

Increasingly, hospitals are using point-of-care ultrasound to evaluate patients with COVID-19.

To learn more, HealthCare Business News spoke to Diku Mandavia, chief medical officer and senior vice president of FUJIFILM SonoSite, Inc and FUJIFILM Medical Systems U.S.A. in Bothell, Washington. Dr. Mandavia is also clinical associate professor of emergency medicine at the University of Southern California. He is a founding member and past chair of the American College of Emergency Physicians (ACEP) Ultrasound Section and the co-author of the ACEP Ultrasound Guidelines.

HCN News: How can ultrasound be utilized most effectively in the COVID-19 patient?

Dr. Diku Mandavia: COVID-19 is a respiratory virus that causes acute inflammation in the lungs, primarily seen as a patchy, interstitial infiltrate. Therefore, the point-of-care lung ultrasound exam is highly valuable and has already been shown in early clinical use to be very beneficial in recognizing these findings. For example, a small study by emergency physicians at Ospedale Guglielmo da Saliceto in Piacenza, Italy, published in *Radiology*, reported “strong correlation” between lung ultrasound and CT findings in patients with COVID-19 pneumonia, leading the investigators to “strongly recommend the use of bedside [ultrasound] for the early diagnosis of COVID-19 patients who present to the emergency department.” So, I would say that lung ultrasound is the top application, but these patients are also very sick: They may need venous access under ultrasound guidance to administer fluids and medications or they may be in shock and need a shock assessment, for which point of care ultrasound is also very useful.

HCN News: Why is point-of-care ultrasound better than computed tomography (CT) in the context of COVID-19?

DM: CT is a good test, but obviously is not a resource that is as readily available and often requires transport of a critically ill patient. Many of these patients are very hypoxic and ultrasound can identify the findings of COVID-19 at the point of care without having to transport an infectious patient out of isolation through hallways to a CT scanner, potentially leading to the need to disinfect the CT scanner, which the American College of Radiology has recently stated can take “approximately one hour.” All of these considerations mean that point-of-care has a convenience factor that is important in the context of COVID-19.

HCN News: What are the dominant lung ultrasound findings in the patient with COVID-19 pneumonia or other lung complications?

DM: What we are seeing right now is involvement of both lungs with basically patchy findings. What is distinctive is typically ultrasonographic B lines, wide bands of hyperechoic artifact that are often compared to the beam of a flashlight being swung back and forth. In addition, if there is a significant consolidation, you may see hepatization of the lung. Right now, in what we are seeing, pleural effusions seem to be very uncommon.

HCN News: What type of US equipment or features are best for COVID-19 applications?

DM: First, starting with the transducer, typically a phased array is used for this exam of the lung. Remember, this is a highly infectious patient, so ideally the device itself should have fewer buttons

and knobs to disinfect, touchscreens are preferred, smooth surfaces that are easy to clean are preferred. Any peripherals that are on the device should be disconnected so that there are fewer things to wipe down and clean. Those are the most important elements.

HCN News: What are the special challenges around infection control for ultrasound equipment when treating patients with COVID-19?

DM: The device needs to be properly cleaned before the clinician enters the room—a complete wipe-down with a disinfectant agent, plus proper transducer probe covers, as well as covering the entire system with a sterile cover or drapes. The key idea is to keep everything covered to minimize contact with infectious droplets from the patient. Then likewise, after the exam, everything has to be removed and cleaned again. In an ideal situation, a department that has multiple devices would have an ultrasound device dedicated to COVID-19 or suspected COVID-19 cases to minimize the possibility of cross-contamination. If you were a patient going to the emergency department with suspected appendicitis, would you want to be imaged with a machine that had previously been used on a COVID-19 patient? That is why hospitals without multiple devices are asking for additional devices to be reserved for use with COVID-19 patients.

HCN News: What is the recommended protocol for cleaning & disinfecting US equipment after an exam on a COVID-19 patient?

DM: Some manufacturers have device-specific resources to help users identify appropriate cleaners and disinfectants that have been evaluated for compatibility for their systems. For

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example, we have the SonoSite Cleaner and Disinfectant Tool on our website as well as information on COVID-19 infection control resources and educational content on lung ultrasound to support healthcare providers who are preparing for the challenge of protecting providers and patients against SARS-CoV-2, the virus behind COVID-19. The EPA has recently published List N: Disinfectants for Use Against SARS-CoV-2, which is another helpful resource to identify appropriate products.

HCN News: In the context of COVID-19, are there any other applications of POCUS for evaluating, triaging, monitoring or treating patients that you would like to highlight?

DM: Point-of-care ultrasound is like a Swiss Army knife in healthcare, particularly for the critical patient, encompassing everything from the initial assessment to obtaining venous access with a peripheral IV or central line to rapidly initiate treatment, airway assessment, evaluation of the lung, and a full shock assessment. Point-of-care ultrasound is a device that has long been

just as important as the monitor, the defibrillator, even the ventilator in critical care. The COVID-19 pandemic further accentuates the value of this technology. Right now, we have an excess of critically ill patients over the resources that we have and we need imaging devices that can be deployed in a lot of different locations for a range of purposes. New York, California and the state of Washington are setting up combat hospitals—250-bed hospitals that will be fully functional hospitals for COVID-19 patients—and point-of-care ultrasound can be used there in situations where it would be much more difficult to put a CT scanner.