



Frictionless Healthcare Delivery

The role of POCUS in our COVID-19 Emergency Room

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**POCUS helped me to to streamline detection, and
inform effective treatment**

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Introduction

COVID-19 has changed care in the emergency department in many ways. Greater time, resources, and effort are spent donning and doffing PPE properly. Patients present with higher acuity illnesses, necessitating more time and attention from staff. Even while acuity has increased, patient volume has declined such that physician coverage has been reduced in many emergency departments. This decrease in staff, combined with increased time needed for each patient, has altered workflows, presenting providers with new challenges. Handheld ultrasound has proven invaluable in improving efficiency during the COVID-19 pandemic.

The utility of handheld ultrasound is evident as we evaluate patients for COVID-19. Prior to COVID-19, clinicians might typically see the patient at the bedside with an ultrasound probe in hand to collect information by history, exam and ultrasound at initial evaluation. By contrast, suspected COVID-19 patients are placed in isolation rooms, and all people entering the room must wear PPE for contact and airborne precautions. Bringing a large ultrasound machine to the bedside of such a patient is a lengthy procedure, involving a plastic cover for the machine, a probe cover, bleach wipes, and difficulty controlling knobology through the PPE and plastic cover. The threshold for bringing imaging to the bedside has been raised in a time when patients need it most.

Hand-held ultrasound helps to lower this threshold for including POCUS in patients' workups, even in isolation. They are easily transportable and quickly cleaned, and disinfected. This allows us to save time and resources, while still being able to perform lung ultrasound, shown to be more sensitive than CXR¹ for COVID imaging markers. Since purchasing the Butterfly iQ, my workflow for potential COVID-19 patients has been streamlined. I have become accustomed quickly to bringing the probe and my iPhone (in a waterproof, shockproof case) into the room with me. In a single PPE donning, I am able to quickly work through an initial dyspnea assessment protocol and, if needed, extend my exam to a RUSH protocol or perform an ultrasound-guided procedure.

Case History

A 58-year-old male with a significant past medical history of multiple sclerosis (MS), cerebrovascular accident, chronic obstructive pulmonary disease, lung cancer status post radio ablation therapy, coronary artery disease status post multiple stenting, heart failure with reduced ejection fraction, and polysubstance abuse presented with cough, headache, persistent dizziness, falls and diplopia. He was normothermic, tachycardic and hypertensive with a normal blood oxygen saturation. The patient was brought directly from triage to an isolation room pending COVID-19 workup.

The dyspnea evaluation was reassuring, but the neurological exam was concerning, given the patient's history of MS and a recent stroke, headache, diplopia and falls. However, the nurse in the room was not able to draw labs or gain IV access for a CT angiogram of the head and neck. A runner outside the room quickly brought a 2.5 inch 18g IV needle. Under dynamic ultrasound guidance, I was able to quickly and easily draw labs and obtain IV access. Upon leaving the room, I safely doffed and quickly cleaned the Butterfly iQ probe and iPhone with a disinfectant wipe. Next door, a hypotensive patient with a cough had just been roomed, and I was able to quickly go to her bedside with the same ultrasound, to evaluate and treat.

Imaging and Outcome

After preparing the medial upper arm with chlorhexidine and placing a tourniquet, the patient's right basilic vein was identified. A 2.5-inch 18g needle was guided easily into the vein on the first attempt. After threading the catheter into the vein, the ultrasound was used to confirm catheter placement. The catheter was then secured. The patient expressed surprise at the rapidity and ease of the procedure compared to previous hospitalizations.

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US-guided catheter insertion into the right basilic vein.

Ultimately, the patient was SARS-CoV-2 PCR negative and was admitted to the hospital for further neurological testing. After a thorough inpatient evaluation, the workup revealed no changes from previous evaluations, his symptoms resolved, and the patient was discharged with his outpatient medication regimen and instructions to follow with his primary care providers. The IV remained in place throughout his entire three-day hospitalization.

Conclusion

The COVID-19 pandemic has affected many aspects of care in the emergency department. The need for decision-making at scale and speed has made our previous workflows more challenging and time-consuming. The Butterfly iQ is a portable, versatile and easily cleaned ultrasound device that provides high-quality imaging. It has enabled frictionless diagnostic and therapeutic POCUS evaluation, the value of which has been emphasized in the workup of patients suspected to have COVID-19. As we reflect on the impact of the pandemic on our long-term healthcare delivery, the role of POCUS in fast triage and ongoing patient monitoring and safety is becoming a standard of care.

References

1. Weinstock B.M. et al (2020) Chest Xray Findings in 636 Ambulatory Patients with COVID-19 Presenting to an Urgent Care Center: A Normal Chest X-Ray is no Guarantee The Journal of Urgent Care Medicine



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