

Point-of-Care Ultrasound in Urgent Care: A Game Changer for the Practice—and the Practitioner

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nowledge, wisdom, and passion were key players in my pursuit of a career in medicine. As point-of-care ultrasound (POCUS) incorporates both the science and the art of medicine, it has rekindled my passion for medicine, greatly expanding my clinical knowledge.

A few weeks ago, a young man presented complaining of 24 hours of shortness of breath and chest pain. His triage painted the picture of a panic attack. After completing the history and physical exam, I rolled the small ultrasound cart into his room. Within 90 seconds evidence of focal pneumonia was seen on the ultrasound image, despite a clear chest x-ray.

Talk about a game changer.

The Knowledge

Ultrasound has been used to promote informed medical decision-making for over 7 decades. Dr. John Wild, regarded as the father of medical ultrasound, was driven to advance diagnostic imaging as he sought a different approach to evaluate bomb victims with suspected bowel injury. At the time, the military was interpreting sound wave patterns to identify armor defects on battle tanks. He transposed this technology to collect information from high-frequency sound waves hitting the small bowel and echoing back to the device.

By the 1950s, Wild was implementing his sonographic device to distinguish normal from abnormal soft tissue in cancer diagnostics. Now fast forward to 7 years ago, when the World Health Organization [WHO] published its second edition of the *Manual of Diagnostic Ultrasound*. It states, "Ultrasound is a core



Chelsea Burgin MD is the Medical Director of MD₃60 Boiling Springs and the Director of MD₃60 Ultrasound, Prisma Health and Assistant Clinical Professor, University of South Carolina School of Medicine Greenville. technology for diagnostics and remains one of the safest. Clinical effectiveness is enhanced when [it is] used properly."

The focused assessment with sonography in trauma (FAST) was one of the first widespread applications of bedside ultrasound; today its utilization is saving lives worldwide. Since the innovation of the FAST exam in the 1990s, emergency clinicians have been using ultrasound for safe and immediate diagnostic information when evaluating for conditions ranging from retinal detachment to renal colic.

There is power in this knowledge. As urgent care clinicians, we know when a patient complains of shortness of breath, there is a broad differential. A few of the potentially critical differential diagnoses include pneumonia, pneumothorax, and congestive heart failure, just to name a few. And ultrasound offers *yes* or *no* answers to each of these specific diagnoses.

The Wisdom

It is rewarding to have the wisdom to embrace innovations in science and apply them within an appropriate clinical context. Adopting bedside ultrasound in the urgent care environment affords answers to daily questions like: Is there an abscess? Is there a foreign body? Knowing the presence or absence of these conditions offers considerable guidance toward the next step in care. It is a relief for clinicians and patients alike to avoid I&D on cellulitis. The gratification is high when a nonpalpable splinter is visualized. This provides clarity regarding the utility of pursuing procedural removal ourselves vs referral to a specialist or watchful waiting.

The Passion

I can only speak for myself, but after a decade of urgent care life, I feel the need to learn new techniques to feed my clinical passions. Ultrasound fosters this. Three core concepts can encapsulate my journey of learning, incorporating, and teach-

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ing bedside ultrasound: Innovation. Perseverance. Integrity.

- Innovation. Ironically, ultrasound, though long-established technology, is actually modernizing medicine. Rationing ionizing radiation as a value is on the rise. As medicine changes, I too must change. It is quite possible that as the electronic medical record has reformed medicine in the last decade, ultrasound will prove to be a transformative force in this decade. The growing proficiency among firstyear medical students in the use of ultrasound was my initial inspiration to put a focus on POCUS.
- Perseverance. Ultrasound is not like learning a new language; it is a new language. In essence, supersonic sound waves come in contact with tissues and bounce back to the probe where they are measured and reformatted to create a twodimensional image out of 256 shades of gray. The interpretation of these images and elucidation of patterns can become quite sophisticated.
- Integrity. Ultrasound provides images of what is within our patients. With these pictures comes tremendous information. Information invites interpretation. Our interpretation then adds nuance to the care plan. The reality is, although I am passionate about ultrasound and teach it to medical students, residents, and colleagues, and use it in clinical care most shifts, it is not always the right tool. It is equipment-, operator-, and patient-dependent. The

utility of POCUS is limited and not designed to replace a comprehensive radiology tech ultrasound with radiologist interpretation. Two clinical examples of natural limitations of ultrasound in general: it will not differentiate cellulitis from soft tissue edema, nor will it decipher pulmonary edema from a nonfocal pneumonia. The limitations of POCUS must be kept in mind.

The gestalt I apply to determining if ultrasound has clinical utility involves asking the following questions: 1) Is the question answerable by ultrasound? 2) Do I understand the medical literature for this ultrasound application? 3) Can I capture quality images and interpret them? 4) Will I be able to responsibly integrate these findings into patient management?

The versatility and clinical utility account for the recent rise in bedside ultrasound, especially in acute care settings. Bedside ultrasound has become an extension of my physical exam as a UC clinician. It is incredibly gratifying to ultrasound patients; it offers an opportunity to spend more time at the patient's bedside, and improves the patient experience.

As my knowledge, wisdom, and passion grow toward the utility of POCUS in urgent care, I am compelled to share my experience. It is my hope that this issue of *JUCM* will demystify POCUS and that you will begin to understand my enthusiasm for new applications of this old technology.

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Dealing with an Epidemic of Information in the Midst of a Pandemic

We are in an unprecedented time in medicine as we face a pandemic of an emerging viral disease spreading rapidly across the world. Information regarding the COVID-19 pandemic is also expanding at lightning speed. This leads to an overabundance of information which can alter our decision-making abilities. This editorial will help the reader develop a plan to manage excessive information and misinformation.

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e've all about had it. Too many patients, too many worried well, not enough PPE, testing kits, and the never-ending, ever-changing flow of information.

We are at an unprecedented time in the information age. News travels faster than light speed, traversing the globe in the blink of an eye. We hear of celebrities, professional athletes, and politicians testing positive for coronavirus seemingly every hour. The latest count of total infected and deceased pops up on my Twitter every few hours.

Journalists, politicians, medical professionals, business leaders, family members, and even the guy next door have a take on the pandemic. The latest and (not so greatest) news is pounding your brain from TV, email, social media, your employer, your neighbors, and overheard conversations 24/7. It's like trying to take a sip of water from Niagara Falls.

How do we sort through it all?

Information overload, also referred to variously as infobesity, infoxication, information anxiety, and information explosion, can be defined simply as a situation when one receives too much information about a subject. Although getting *enough* infor-



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mation to make informed decisions is a good thing, getting *too much* information can result in a significant reduction in decision-making quality.

Imagine the process of deciding where to have dinner. If there are two local restaurants, the choice is easy. You go to the one with the best reviews. But what if there are 400 local restaurants with five-star reviews? This makes the decision harder and it's easy to get frustrated and just resort to the easier choice of fast food.

Misinformation is also running rampant right now. By the strictest definition, misinformation means that the giver of information is deliberately giving wrong information for some sort of secondary gain. However, inadvertent misinformation can also occur in situations when the accuracy of information is difficult to verify. Before you know it, even with the best of intentions, well-meaning people pass along incorrect information.

Here are a few examples of misinformation I have heard from both patients and healthcare providers:

- You can get coronavirus from popping bubble wrap because it was made in China by infected workers.
- You can get a rapid test for coronavirus for \$50 from a person who is going door to door testing people.
- Children don't get the disease, but they carry it, so stay away from all children.
- The virus doesn't like heat, so as soon as the weather warms up, we'll be good.

So how do we deal with the massive influx of information about COVID-19 when the science, and therefore societal consequences, of this pandemic are evolving so rapidly?

The first and most critical step one can take to determine if information is accurate is to *consider the source*. Information that comes from word of mouth, social media, 24-hour news outlets, and even our own government officials should be confirmed with a reputable (and, ideally, peer-reviewed), source and not assumed to be accurate.

You can likely trust information coming from a high-ranking clinician in your healthcare organization, especially if that information is in print, such as a protocol. Be sure the information references organizations like the CDC, WHO, a state or local health department, or randomized controlled, peer-reviewed studies from reputable institutions. Use the internet to confirm the information on multiple platforms to ensure it is accurate.

Carefully review any published data. Remember that this is an emerging disease, and any scientific studies or findings are likely preliminary. In normal situations, changes in treatment and evaluation of disease processes require years of study, with multiple randomized-controlled studies that are prospective, and data that are reproducible. There simply has not been enough time for this to occur with COVID-19. Most studies available at this time are retrospective, with small numbers of participants, and are therefore difficult to draw reliable conclusions from.

In most cases, years of clinical trials are necessary to determine if a therapy is safe and effective. One example would be estrogen for perimenopausal women. Many studies showed benefit and the science made sense, but ultimately it was determined that routine estrogen therapy was actually more risky than beneficial.

Also recall the case of Oxycontin. Early publications suggested that this was the end to chronic pain and, seemingly miraculously, without any addiction issues. Those studies, however, were sponsored by the manufacturer who had a vested interest in their product's success. This is a prime example of misinformation.

Remember that desperation and *stress can affect your decisionmaking*. Excessive cognitive load, ie, excessive information, can worsen the stress already inherent in a pandemic situation. We are already overstressed, anxious, and wary of what the future will bring. We are worried about our families and friends, our patients, and the economic aspects of this pandemic.

Excessive information can add to that stress. When making decisions based on newly acquired information, stop and think for a minute about the basis for that decision. Again, consider the source, vet it carefully, take a deep breath, then make the decision.

Consider *unplugging from social media*. Although it's great to hear how everyone is doing, to see an uplifting dog or cat video, or a humorous meme, you are likely to get more misinformation from social media than anywhere else. If you do stay plugged in, don't add to the information overload. Avoid pandemic information altogether and stick to making connections with family and friends, especially those who are isolated. This will improve your emotional well-being without adding to information overload.

Uncertainty can lead to heightened tension and stress, in any scenario. A pandemic is a situation of tension and stress on steroids! Most of us have not lived through anything like this before and have no basis for comparison. Remember, everyone is as fearful of the unknown as much as you are. Be a voice of reason. Filter the information, review it carefully, and adopt a reasonable approach.

Above all, don't panic. We will get through this, and like every human crisis before, we will rise to the challenge, and overcome.

Editor's Note

As Dr. Davidoff noted, there are *reliable* sources of information about the COVID-19 pandemic. The Centers for Disease Control and Prevention, for one, offers a robust menu of documents to help educate both clinicians and patients (most of which are downloadable for your use). We offer a sampling below.

For healthcare providers

- Non-COVID-19 Care Framework
 Available at: https://www.cdc.gov/coronavirus/2019 ncov/hcp/framework-non-COVID-care.html
- Potential Exposure at Work Available at: https://www.cdc.gov/coronavirus/2019ncov/hcp/guidance-risk-assesment-hcp.html
- Infection Control Guidance Available at: https://www.cdc.gov/coronavirus/2019ncov/hcp/infection-control-recommendations.html
- Coronavirus Disease 2019: Ten Clinical Tips Available at: https://www.cdc.gov/coronavirus/2019ncov/hcp/clinical-tips-for-healthcare-providers.html

For patients

- Prevent the Spread of COVID-19 if You Are Sick Available at: https://www.cdc.gov/coronavirus/2019ncov/downloads/sick-with-2019-nCoV-fact-sheet.pdf
- Important Information About Your Cloth Face Covering Available at: https://www.cdc.gov/coronavirus/2019ncov/downloads/cloth-face-coverings-information.pdf
- How to Safely Wear and Take Off a Cloth Face Covering Available at: https://www.cdc.gov/coronavirus/2019ncov/downloads/cloth-face-covering.pdf
- CDC Protects and Prepares Communities Available at: https://www.cdc.gov/coronavirus/2019ncov/communication/print-resources.html?Sort=Date%3A%3Ad esc
- How to Protect Yourself and Others Available at: https://www.cdc.gov/coronavirus/2019ncov/prevent-getting-sick/prevention-H.pdf
- What You Should Know About COVID-19 to Protect Yourself and Others
- Available at: https://www.cdc.gov/coronavirus/2019ncov/downloads/2019-ncov-factsheet.pdf