FALL '22

SPOCUS

The Society of Point of Care Ultrasound

THE ECHO CHAMBER

A Message From the President

Aaron Inouye, PA-C

It's been a while since we sent one of these out, but welcome back to the soon-to-be-regular-again SPOCUS Echo Chamber Newsletter, where we share SPOCUS happenings, events, interesting cases, and more.

First off, I have to put out a huge thank you to Daniel Zebedeo, a recent graduate from Pacific University's PA program, and Erica Palmer, a second-year student at Duke's PA program, for spearheading the resurgence of The Echo Chamber. Without them…well…we would all still be waiting for this issue to come out.

We've also been lucky to have Taylor Fong, PA-S at Touro University Nevada, and Nyssa Seaton, PA-S at University of Washington, help reinvigorate our social media accounts. Be sure to check out what they're up to at @pocus_society.

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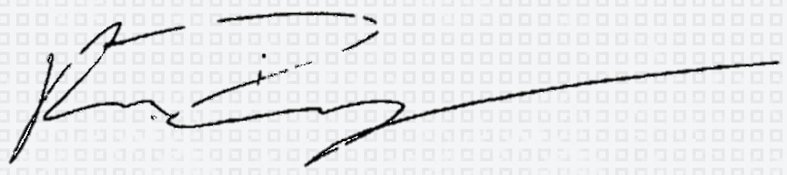
Along with bringing back The Echo Chamber, 2022 saw the return of a real-live, in-person iScan. While the last two years of Virtual iScan provided a much-needed opportunity to reconnect with old friends and make new ones, seeing all those smiling SPOCUS faces in real life again was even more rejuvenating than I remembered. As always, we had an amazing turnout of former and new faculty and an even more impressive turnout of PA and NP students who were excited to show off their skills and learn some new ones. There are already rumblings about plans for iScan 2023 in Nashville this coming year; since I've been sworn to secrecy all I can say is that you should start making travel plans now.

The last year has also seen the launch of SPOCUS's Train-the-Trainer program, spearheaded (like so many SPOCUS things) by past-President Patrick Bafuma. We have already had a number of successful graduates and are recruiting more trainers in hopes of continuing to promote high-quality ultrasound training for clinicians everywhere. We'll include a spotlight on Train-the-Train in a future issue of The Echo Chamber; you can also find more information on the SPOCUS website or by reaching out to us at info@spocus.org.

With all that said, welcome to the Fall 2022 issue of The Echo Chamber. In the pages following, you'll find a feature on iScan 2022, a Member Highlight on the dynamic duo that brings us Critical Care Scenarios, a nice review of an article detailing some easy and high-yield POCUS uses, and two new Echo Chamber features – Tips and Tricks and SPOCUS Saves.

Thanks again to all of you for being part of our SPOCUS community.



Aaron Inouye, PA-C

President, Society of Point of Care Ultrasound

After various careers as a baker, editor, ski patroller, pond-builder, and outdoor educator failed to lead him to fame, fortune and fulfillment, Aaron Inouye, PA-C finally buckled down and earned a degree from Pacific University's PA program. Since then he has been happily practicing emergency medicine in rural Idaho and Western Colorado.

Aaron is an Ultrasound Leadership Academy graduate. While he enjoys discussing all things ultrasound, he is currently particularly interested in incorporating musculoskeletal US into acute care settings and developing training and credentialing programs for both practice and educational settings.

iScan, You Scan...

Ultrasound waves were flying through the Indianapolis Art Garden in May as PA, NP, and medical students from around the country got together for some friendly POCUS competition.

The annual iSCAN competition, which took place during the American Academy of Physician Assistants conference, provided physician assistant (PA), medical, and nurse practitioner (NP) students a chance to put their bedside ultrasound skills to the test and get some hands-on learning experience.

This SPOCUS-sponsored event has grown in participation since the first iSCAN competition in 2018, with over 120 learners from 27 different programs participating this year.

“POCUS continues to be the future of medicine, and I really enjoyed having the opportunity to be a part of the larger US community via SPOCUS,” said Parya Samiei, a PA student from Pacific University. “It was such an inspiring and eventful competition.”

Students competed through various stations performing POCUS evaluations on live models, including cardiac, lung, abdominal, MSK, DVT, renal, aortic, and even ocular US. Teams received points for real-time image acquisition as well as for answering questions about clinical ultrasound skills. After each quiz session, the teams had the chance for some hands-on learning from providers who use POCUS in their daily practice.

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“I loved that it was team-based learning with quizzes on practical US education and hands-on experience,” said PA student Kevin Acosta from Wagner PA School.

A big congrats goes out to Emory’s PA students as they took the win and continue to show their depth of US knowledge throughout our iScan events!

We’d also like to thank our sponsors for all their help, including Mindray US, GE Healthcare, Butterfly Network, The POCUS Atlas, Philips, and Terason. We couldn’t have done this without them.

To see more from iScan 2022, check out our Instagram @pocus_society.

To get involved at the next iScan event in Nashville 2023, contact us at VirtualiScan@gmail.com. We are actively looking for fellow POCUSers to run our stations for next year. Scan on!

Member Spotlight

Brandon OTO
PA-C, NREMT

Bryan BOLING
CNP, ACNP, FCCM

Brandon Oto, PA-C, and Bryan Boling, DNP, are both critical care providers and the masterminds behind the podcast Critical Care Scenarios, which they started in 2019. We interviewed the two of them about their use of POCUS in their practice.

How were you first introduced to POCUS and did you have a "lightbulb" moment in which you recognized the value of POCUS in your practice?

Brandon: POCUS found a lot of its early traction in the emergency medicine world, and I was peripherally aware of it when I worked as an EMT. When I started training as a physician assistant, I realized POCUS was not only useful and valuable, it was the sort of skill that could become whatever you wanted to make of it—limited and directed only by your interests and degree of skill.

Bryan: I got interested in it early on, before I was even an nurse practitioner. I remember going to a conference and there was an optional workshop. I was the only student in the room. Everyone else was an attending physician. Haney Mallemet led the group and said, "The day is coming when med students will get handheld US machine as graduation gifts instead of stethoscopes. And they're going to show up on the wards and know more than you." I decided I was going to be that student.

How do you employ POCUS in your day-to-day practice, and which applications do you find most useful?

Brandon: It's a cornerstone of my procedural practice, used for nearly every percutaneous procedure. At this point most of us are both faster and safer with ultrasound guidance. Diagnostically, it becomes more and more useful the sicker a patient may be. With an ultrasound and some training, you can immediately rule out high-risk correctable problems like cardiac tamponade and pneumothorax, guide your interventions by following markers such as cardiac contractility and preload, and quickly ask and answer important questions like "Is there pleural effusion?" or "Is the bladder empty?" Much of this would be intrusive and difficult to accomplish without ultrasound, some would be impossible, and in a sick patient, most would take too long to answer by other means.

Nominate someone to spotlight here!

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Bryan: I use it nearly every day in the intensive care unit. The bedside echo is so valuable in terms of cardiac assess and in of differentiating shock, and has replaced the peripheral arterial catheter in my practice.

Of the applications you employ, are there any you believe would be valuable to clinicians in general practice or across multiple specialties?

Brandon: The earliest adopters were in the resuscitative specialties for the reasons mentioned (rapid information, direct assessment of life threats like hemodynamics), but the biggest room for growth is now in other areas. The most obvious benefit is the speed with which this safe bedside test can yield information. If incorporated into examination in the same way as a stethoscope, areas like outpatient medicine—which typically lack immediate access to advanced imaging modalities—could add tremendous utility to their bedside assessments. Specialists like cardiology and nephrology are seeing its the value in fluid management, and orthopedic and sports medicine providers are developing musculoskeletal and nerve applications. This was all limited by cost and access before, but less so each year.

Bryan: I'm going to go back to the bedside echo. I think there is SO much you can learn about your patient from a quick echo. A lot of people are intimidated by it, because echo can be super involved. But even just a quick subjective assessment can be super helpful. I'm also becoming a big proponent of using POCUS in primary care settings, particularly rural. I don't practice this type of medicine, so my first hand knowledge is limited, but I'm very interested in the delivery of critical care in austere environments (disasters, battlefields, developing nations) and I can imagine how POCUS could really make a difference in these areas where we don't have a whole hospital. Primary care clinics are like that. Think how much you could do without having to send your patient two counties over for imaging tests!

What barriers to POCUS employment have you encountered or have you seen others encounter and how did you overcome them?

Brandon: At first it was having machines, but they're lower cost and more widely available all the time now. Now in most cases, I think the barriers are individual. In many centers there is equipment and some kind of infrastructure that permits (although may or may not encourage or facilitate) POCUS use. However, in the clinical setting, whether you take five minutes to grab the ultrasound, put a probe on a patient, and use the images in your decision-making is up to you. If you haven't sought out the training, haven't cultivated the experience to develop comfort, and ultimately just can't be bothered, it won't happen. You need to recognize the value of the tool and be willing to invest the effort up front to get education, get practiced, and hone that toolset so it's second nature when you're in the mix on a busy service.

Bryan: This idea that you need special credentialing or certification to use POCUS. Certainly we want you to know what you're doing, but a lot of people are intimidated by this and think, "Who am I to be doing this test and interpreting the results?" This is why I'm pushing for more and more POCUS in training programs. To give practitioners confidence and credibility.

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Can you share with us three educational/clinical POCUS pearls or some tips for those considering integrating POCUS into their practice?

Brandon: **Read and study.** While bedside and formal teaching is important early on, POCUS is an area amenable to self-directed education as well. There's a tremendous number of resources online to learn the views and structures they depict, look at images and clips to train your eye, and try your hand at practical cases. This kind of pre-study helps you not to be as beholden to the patient exposures you happen to encounter. Check out Core Ultrasound for some great examples.

Early on, learn POCUS like you learned the physical exam in school—that is, practice it on everybody. I would literally wheel the machine from room to room and examine every patient who didn't mind. You just need to get in your reps so you develop muscle memory and start to recognize normal. Then you'll gradually acquire the skill to recognize an abnormal study, and eventually to identify the specific pathology.

Remember that this is a fascinating, powerful, and flexible tool, but it's still just a tool. It doesn't have a brain (yet), any more than your stethoscope or hands or eyes; you supply that. The most resoundingly positive or reliably negative POCUS study won't contribute beneficially to your patient care unless you have a sound grasp of the overall clinical picture and use the POCUS findings to somehow improve it. Ultrasound waves don't take care of patients. You do.

Bryan: **Get some formal training.** There is a ton of stuff that you can teach yourself online, but really being able to learn and be comfortable with POCUS requires some hands on training and guidance by someone experienced.

Practice. The best way to learn and get better at POCUS is to do it over and over. People aren't widgets and no two are alike. I still have challenging patients where I can't obtain good views. One or two scans is not enough.

Keep a log. This goes along with practicing. Record clips of your scans on a jump drive (almost every US machine has a USB port). You can use them to review later and also to compare and see your progress as you do more and more. Interesting or rare pathology is always fun, but looking at lots and lots of normal clips are what's going to train your brain to see abnormalities.

Brandon Oto, PA-C, NREMT attended the PA program at the University of New England, completed a post-graduate critical care residency at Johns Hopkins Hospital, and now staffs the mixed adult critical care unit at UConn. He also runs the educational critical care blog Critical Concepts Find him on Twitter at @critconcepts or email him at oto.brandon@gmail.com.

Bryan Boling, DNP, ACNP, FCCM graduated as an acute care nurse practitioner from the University of Kentucky in Lexington. He currently practices in the Neuro, Surgical, and Cardiothoracic ICUs, serves as Director of POCUS and Simulation Center Training, and is an adjunct assistant professor at Georgetown University. He also runs the educational critical care blog Critical Care Notes. Find him on Twitter at @bryanboling or email him at bryanboling@gmail.com.

Article Review

"Five Easy-to-Master Uses for Point-of-Care Ultrasound"

Publication: Journal of the American Academy of Physician Assistants
Date: December 2017
Link: PubMed

Often referred to as "the new stethoscope" in fields from family medicine to critical care to orthopedics, point-of-care ultrasound is quickly becoming an integral part of medical education and clinical practice. In this 2017 article, SPOCUS' very own Fritz Fuller, PA-C and Francisco Norman, PA-C detail five simple uses for POCUS that can be a great start for clinicians looking to add this skill into their practice.

Moderate hydronephrosis. The POCUS Atlas.

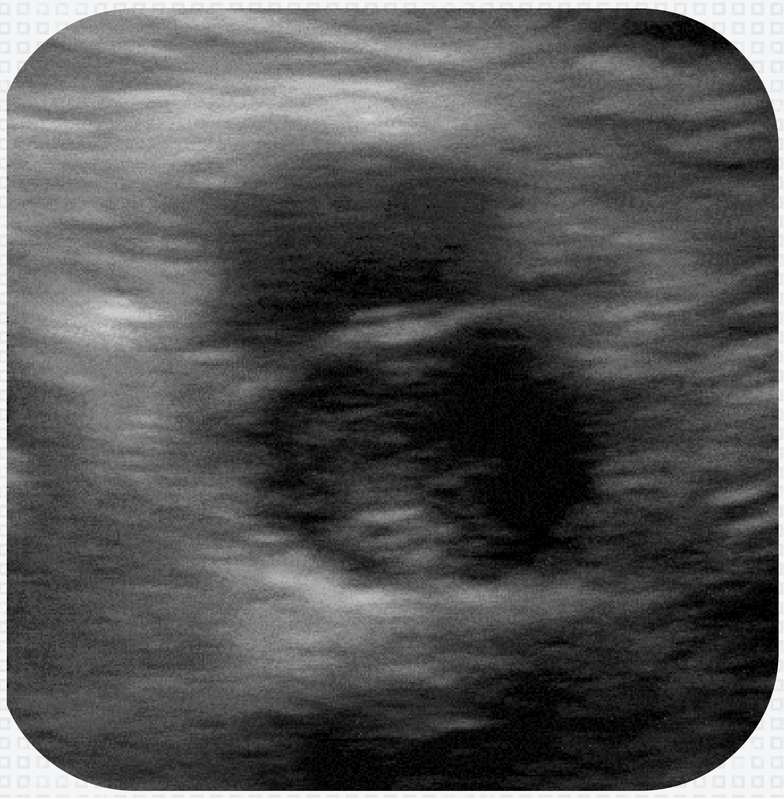
KIDNEY & BLADDER

POCUS can be used as a precursor to CT scan in patients suspected of having nephrolithiasis. It can be especially helpful as an alternative to CT for patients with frequent stones in order to limit radiation exposure. A finding of unilateral hydronephrosis in the right clinical setting is highly supportive of an obstructive stone in the renal pelvis or urethra.

In addition to kidney stones, a quick scan of the bladder can easily identify urinary retention or post-void residual volume. From a practical standpoint, it can be useful in pediatric populations to ensure that there is urine in the bladder prior to catheterization.

DEEP VEIN THROMBOSIS

When used in conjunction with clinical presentation and risk factors, POCUS can be incredibly helpful in supporting or ruling out a deep vein thrombosis. Although it is not yet a part of any formal recommendations, a recent meta-analysis on ER physicians showed that POCUS had sensitivities and specificities in the high 90s for diagnosing DVT.



Femoral DVT. The POCUS Atlas.

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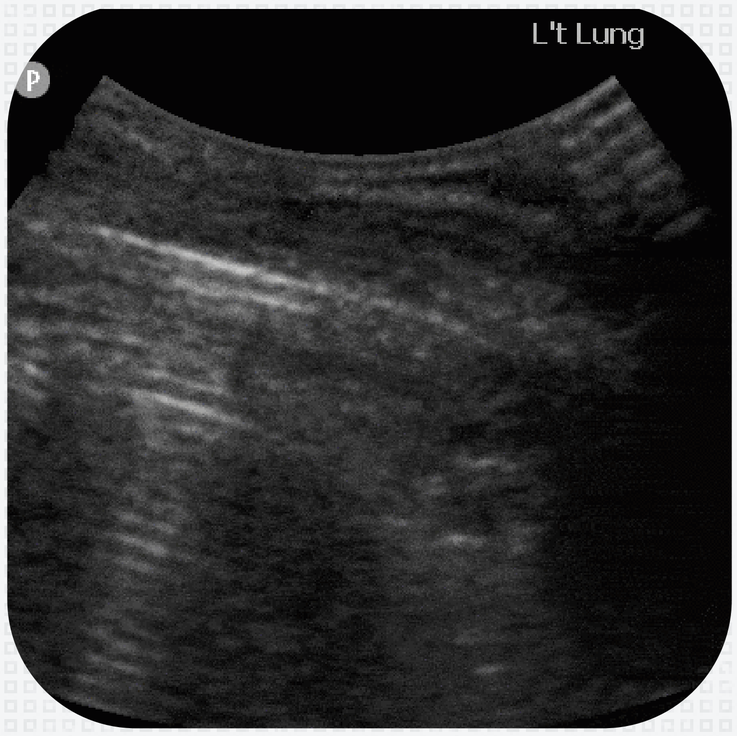


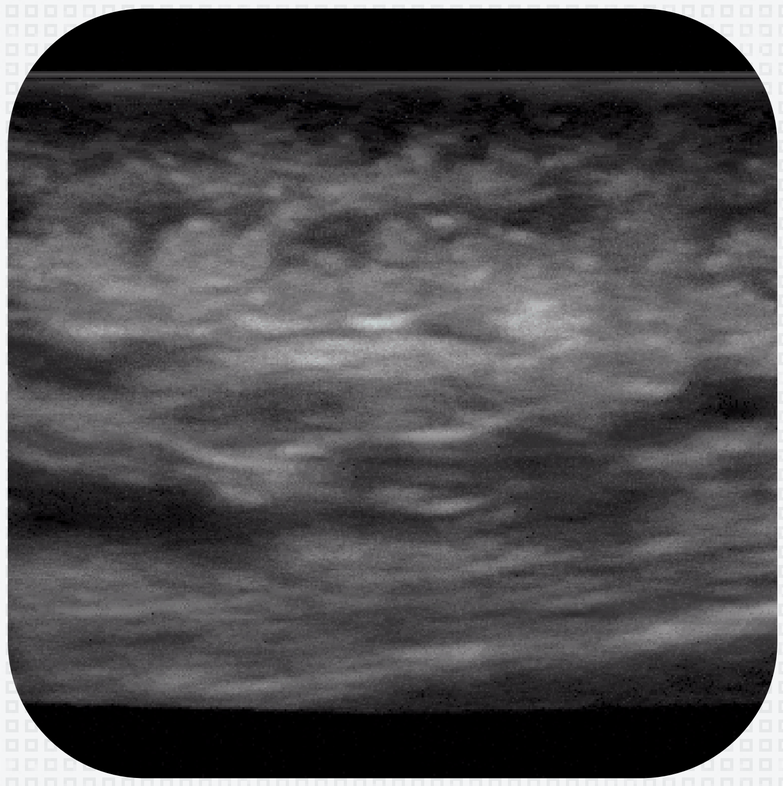
Pneumothorax with lung point. The POCUS Atlas.

LUNGS

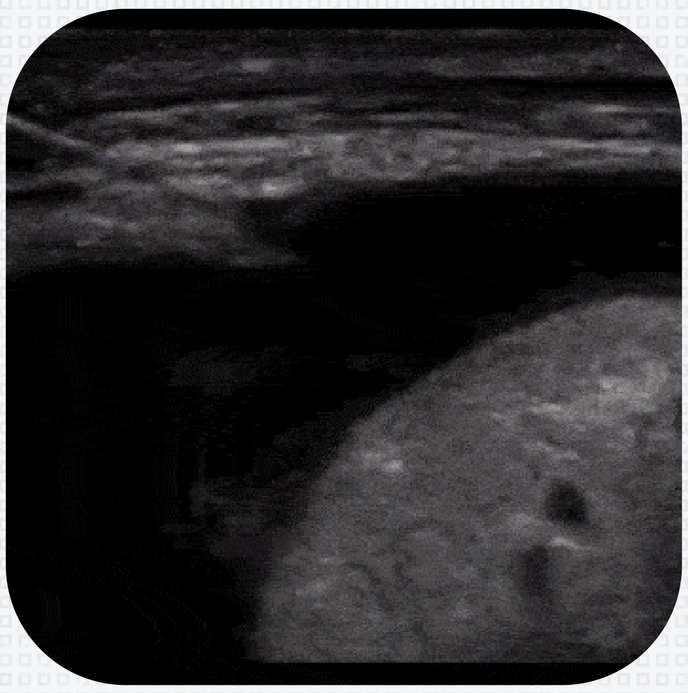
A three-minute bedside ultrasound of the lungs can aid in the diagnosis of pneumothorax, pneumonia, and acute decompensated heart failure, even before the chest x-ray shows up. It can be particularly useful in patients with trauma or severe dyspnea with whom the ability to gather a thorough history and physical exam can be extremely limited. In fact, POCUS has been shown to be far more sensitive in pneumothorax when compared with a conventional supine chest X-ray.

SOFT TISSUE INFECTIONS

Bedside ultrasound has been shown to be more sensitive and specific in diagnosing abscesses than physical exam alone. In addition to abscesses, other dermatologic conditions such as necrotizing fasciitis and cellulitis have fairly specific sonographic findings associated with them. Although physical exam has traditionally been the mainstay of diagnosis in these conditions, a quick point-of-care ultrasound can help ensure their accurate diagnosis and timely treatment.



Cellulitis with cobblestoning. The POCUS Atlas.



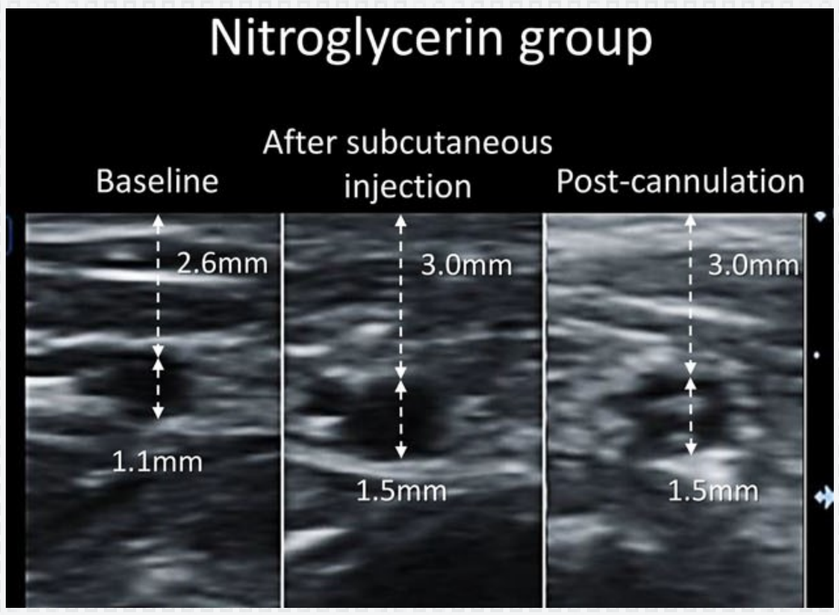
Pericardiocentesis. The POCUS Atlas.

PROCEDURAL GUIDEANCE

In perhaps its most practical application, POCUS can be added to an increasing number of procedures to augment success and patient comfort, and reduce the amount of failed attempts. It can be applied in procedures such as central and peripheral venous access, abscess incision and drainage, thoracentesis, paracentesis, and joint aspiration to help the provider locate anatomy and visualize the procedure in real time.

So there you have it. If you have been wanting a new way to add POCUS in your daily practice, give one of these a try and let us know how it goes. Check out the full article to see details on how to put these skills into practice. And of course, be sure to visit our website, SPOCUS.org for some of our favorite SPOCUS resources and further tips and tricks.

U/S Tips and Tricks



Subcutaneous Nitroglycerin for Radial Artery Catheterization in Pediatric Patients. American Society of Anesthesiologists.

Nitro Paste for Art Line Placement

by: Patrick Bafuma, APP, SPOCUS Past-President

First off, I want to be clear that this tip is a good bit off-label, and you should definitely not pull out this trick willy-nilly. And you should definitely consider discussing this with colleagues before attempting. I also realize that anecdotes do not equal data, but I will say what I'm about to suggest has worked for me in the past.

When you think about an arterial line a bit too late–i.e. you have a patient on multiple presssors–consider a dab of nitro paste to vasodilate the radial artery. One paper showed that 30mg of nitroglycerin ointment yielded a 16.5% increase in artery size vs -5.6% for placebo at 30 minutes for patients undergoing cardiac catheterization. A second study, done on healthy volunteers, placed a placebo on one arm and nitroglycerin on the other. While BP was essentially unaffected, 30mg of nitro increased the radial artery size by 11% at 30 minutes and up to 22% at 2 hours versus essentially no effect on the contralateral artery. It should also be pointed out that a number of papers demonstrate similar results with subcutaneously injected nitroglycerin, though opening a bottle for a milliliter or less seems a bit excessive.

Admittedly, these studies were not done in critically ill patients. And there is no guarantee that topical nitro is able to overcome the one-two punch of vasopressin and norepinephrine. Fortunately, if and when you try this, these are patients that are well-monitored, and ideally, you have a bit of wiggle room to go up on vasopressors if necessary.

Getting into the technical aspects, I affix the ointment by way of a Tegaderm first. Then I gather consent, supplies, set up the saline bag/transducer, and get the field ready to go. Generally, that takes at least a few minutes to do, that way I'm not wasting too much time standing there “waiting for it to work.” In a perfect world, I would love to see a trial on this in a critically ill patient that already has an art line in place – just place nitro or placebo on the opposite side for 30 minutes and see if there is a meaningful effect on blood pressure and on the radial artery.

Again, this is somewhat off-label, and I rarely pull this out unless the radial is tiny and I can't place a femoral for whatever reason. Perhaps better yet, talk to your teammates about femoral or axillary art lines.

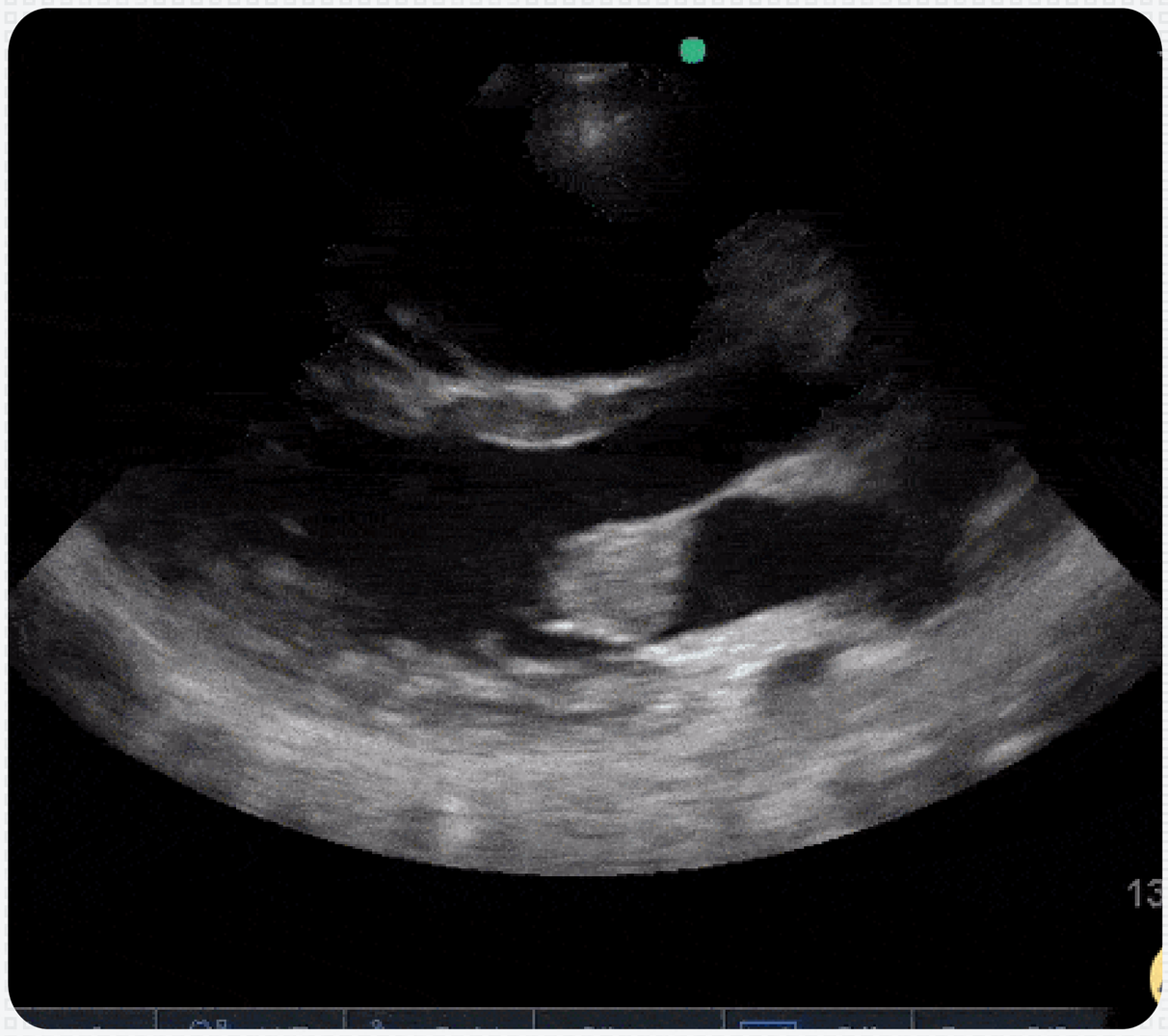
With over a decade in emergency medicine from tertiary to rural settings, Patrick Bafuma, APP has been in critical care since COVID descended on the northeast. Patrick has spoken at numerous state and national conferences, is the past-president of SPOCUS, and was co-engineer of iScan alongside many incredible educators. As a firm believer that ultrasound should be in every clinician’s armamentarium, Patrick hopes to arm both new and seasoned clinicians with a desire to learn and obtain a new skill set that rejuvenates a career.

Submit your own tip here!

POCUS Saves

The Case:

A 59-year-old patient with a history of an NSTEMI, type 2 diabetes mellitus, and hypertension came into the emergency room complaining of two weeks of 10/10 neck pain and shortness of breath. The patient was a known opioid user who had visited the ED five times over the past several months with a similar complaint.



Mitral valve vegetation due to infective endocarditis, a similar finding to this case. The POCUS Atlas.

Vitals

Pulse 112 | Respiratory Rate 26 | Temp 100.8 | BP 104/54.

Significant labs

WBC 16.6 | ESR 117 | Troponin 0.05 and stable | Blood culture (+) for Staph aureus

Physical exam

Unremarkable

Imaging

CXR negative

In the ED, he was given a dose of vancomycin for sepsis from suspected osteomyelitis and admitted. After deteriorating overnight and becoming increasingly hypotensive, tachycardic, febrile, and lethargic, Zosyn was added and a stat MRI of the neck and CT of the abdomen were ordered. The CT was unremarkable. The MRI showed: "multilevel discogenic and uncovertebral joint degenerative changes resulting in moderate spinal canal stenosis at C5-C6. No concern for infectious process."

Infectious disease was consulted, and determined that his neck pain was due to degenerative disease, his leukocytosis was reactive due to recent outpatient steroids, and his blood culture was likely contaminated. They ordered a second round of blood cultures, DC'd the patient's antibiotics, and signed off.

The patient improved slightly, and then worsened again. The hospitalist who came in the next morning decided to do a cardiac POCUS, *just in case.* He saw something that looked similar to the POCUS clip above. BINGO.

The patient immediately received a formal TEE showing a 3.2cm vegetation on the aortic valve, spanning multiple leaflets. The patient was immediately transferred to a tertiary care facility where he underwent open heart surgery, aortic valve replacement, and a total aortic arch reconstruction.

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Takeaways:

- Don't let your differential diagnosis be confined by the textbooks. This patient had essentially no risk factors for bacterial endocarditis; he did not have an artificial valve or a history of IV drug use. However, thanks to the hospitalist thinking out of the box and taking a few minutes of time for a quick POCUS, the patient was given the correct diagnosis and treated in time.
- This goes without saying but is still worth emphasizing: every patient deserves the best care you can offer and a thorough diagnostic workup, no matter how many times they have been to the ER recently or what their history of medication use looks like.
- It never hurts to take a few minutes for a POCUS scan if you are suspicious of something, have some unanswered questions, or the clinical picture just isn't fitting the diagnosis. In fact, it might just very well be the best thing you can do for your patient.

In the Literature:

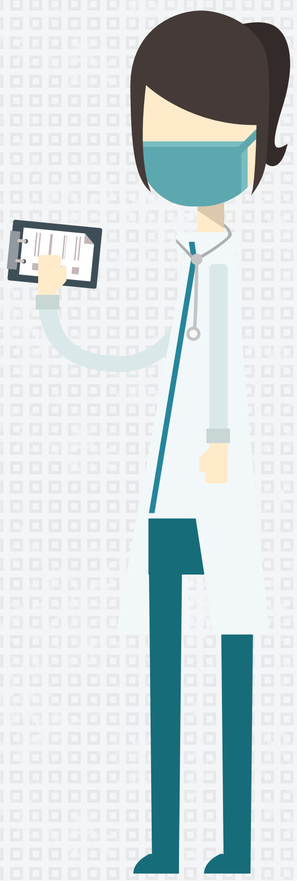
- This 2019 article in the American Journal of Case Reports discusses a similar case in which a hospitalist used POCUS to make a diagnosis of infective endocarditis in a patient with non-specific rheumatologic symptoms. “The use of cardiac POCUS in patients presenting with non-specific symptoms, and in whom infective endocarditis cannot be excluded by the modified Duke criteria, has the potential to have a major impact by accelerating appropriate care and reducing morbidity from embolic events.” *You mean cardiac POCUS isn’t just for the EM and ICU peeps??*
- This 2018 article in the Journal of Emergency Medicine discusses a case in which POCUS of the heart, lungs, and inferior vena cava was used to diagnose a patient with acute septic pulmonary embolism secondary to bacteria endocarditis. “[C]ombining clinical suspicion with a robust knowledge of fundamental bedside ultrasound may allow emergency physicians to rule in a rare and otherwise difficult-to-diagnose disease.” *Way to make two diagnoses in one.*
- And this 2022 article (which we shared on our monthly SPOCUS FOCUS email last week that you should also subscribe to) reviews the medical malpractice cases from 2012-2021 regarding POCUS. “The most common primary allegation was failure to perform an ultrasound. No cases clearly alleged misinterpretation of a point-of-care ultrasound.” *Pretty cool to see some of this data start to come out.*

Presented by: Erica Palmer, PA-S2, Duke University

We want to hear from you!

Have a POCUS save or interesting case? Have a POCUS tip you'd like to share? Know of an interesting SPOCUS member we should spotlight? We'd love these sections of our newsletter to be filled with member contributions. Please fill out this this form (or scan the QR code) to submit your POCUS Saves or Tips and Tricks to be featured in future editions of The Echo Chamber.

Want to bring some POCUS into your #meded?



The Society of Point of Care Ultrasound's Train the Trainer program is a FREE, self-paced clinical ultrasound education program designed to help you integrate point-of-care ultrasound into your students' medical curriculum. We pair PA/NP/UME faculty members with experienced POCUS mentors and remotely teach ultrasound applications in an asynchronous fashion. The goal is that these faculty members can decide how best to implement ultrasound into the curriculum of their PA/Medical school/NP program and further POCUS education. Learn more here and sign up!

Get Connected!

Like and connect with SPOCUS on social media where you can stay up to date on the latest workshop opportunities and catch great cases, the latest lit, and educational material from across the web.

Web: spocus.org
Email: info@spocus.org
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Facebook: Society of Point of Care Ultrasound
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Or, submit an interesting tip, case, or member spotlight nomination here.

SPOCUS Leadership

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