

# SPOCUS

The Society of Point of Care Ultrasound

## THE ECHO CHAMBER

### From the President

The end of the year is approaching quickly, and I hope this finds all of you staying warm, happy, and healthy. The end of the 2022 also ushers in new leadership within our organization.



Aaron Inouye, PA-C  
President, SPOCUS

It has been an honor to work with and for all of you over the last few years, and I can't thank you enough for the time and energy you all put into our SPOCUS community. Dr. Cindy Bennett will be taking the reins as our sitting president starting in 2023. We'll be looking to all of you as our SPOCUS members to help us elect next year's Board of Directors as well as our new President-Elect. Watch your inbox for nomination and election emails to be coming your way soon.

On an entirely different note, as I'm writing this Morocco is facing off with France in the World Cup semi-finals, and I'll readily admit my attention is somewhat diverted by the run this underdog team has made so far.

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THE OFFICIAL NEWSLETTER OF THE SOCIETY OF POINT OF CARE ULTRASOUND

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Bringing it back around to something somewhat relevant, though, what do you all think the chances are that in 2026 we'll start to see medical responders running onto the field with a handheld US machine? Maybe they can offer a little therapeutic sonography in addition to the magic sponge treatment?

Speaking of the future, this May we're excited to be partnering with AAPA again to bring iScan to Nashville, Tennessee as part of the AAPA's 2023 National Conference (don't worry - we're still happy to accept students and instructors from all different professions). It's been a few years since we've officially partnered with AAPA for this, and I'm thrilled to be working together again. Check [here](#) for more information, to register a team, or to volunteer to help teach at iScan 2023 in Nashville. SPOCUS also plans on having a booth in the Expo, so plan on swinging by and saying hi. We'd love to see all your faces there.

Moving back to the present, in this issue of *The Echo Chamber* you'll find a holiday feast of musculoskeletal and procedural ultrasound as well as a great member spotlight on long-time SPOCUS member and former BOD member Sarah Winters. If you have suggestions for someone you'd like to see highlighted in a future issue, [send](#) us your thoughts.

Last thing before I sign off: a quick plug for the great work our team has been doing on the SPOCUS Focus Monthly Newsletter. Each month they're delivering us a nicely packaged summary of some of the latest and greatest POCUS literature. Their latest holiday delivery—as well as all the prior newsletters—are included as part of your SPOCUS membership. If you're appreciating these newsletters or have any interest in helping put them together in the future, reach out and let us know.

Stay well,



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.



# Member Spotlight



Nominate someone to spotlight [here!](#)



**Sara WINTER**  
PA-C, MS, SLP

**Sara Winter is a physician assistant practicing in family medicine. She is also a member of the ultrasound faculty at the New York Institute of Technology College of Osteopathic Medicine and School of Health Professionals. We asked her questions about how she uses ultrasound in her daily clinic 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?***

I was fortunate to have been exposed to ultrasound working as a speech language pathologist utilizing ultrasound biofeedback prior to becoming a PA. As a PA working in surgery and emergency medicine, ultrasound was an accessible modality for trauma and I used it on occasion. It was not until I started teaching at New York Institute of Technology that my fire for point of care ultrasound was ignited. Teaching ultrasound with my mentor, Barbara Piccirillo, PA-C, exposed me to a variety of applications and protocols. I took an interest in the various machines available and reimbursement capabilities of its use in practice. From there I was able to introduce and implement point of care ultrasound in my outpatient family practice offices, develop ultrasound curriculum, and enhance my delivery of medicine and medical education.

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

Day to day applications of POCUS in my practice consist of procedural and screening assistance for things like AAA and DVT. POCUS aides in diagnostics, increases procedural safety and adds to the patient experience. If a patient presents with a complaint, particularly GI-related, I will use as an adjunct to my physical exam. For instance I had a patient with right upper quadrant pain and I used POCUS after my physical exam as a reliable diagnostic tool to confirm my suspicion of hepatomegaly. Similarly, with a patient complaining of low back pain with positive CVA tenderness, I will do a kidney scan. It streamlines referral and furthers diagnostic testing, treatment and management.

I have the opportunity to work with osteopathic medical doctors who do IV clinic and injections and procedures in office. We use POCUS with IV placement, I&Ds, and joint injections, and for research with osteopathic manipulation pre- and post-treatment. I am currently conducting research on the effectiveness of osteopathic manipulation medicine and thoracic outlet syndrome. Using POCUS has increased my relative value units as well as patient satisfaction.

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

Across multiple specialties, the use of POCUS enhances the patient physical examination and assessment. POCUS provides reliable imaging aiding in injections and procedures commonly performed in outpatient practices.

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

The largest barrier encountered is the fear of the unknown. This includes having providers comfortable using ultrasound and investing in the machinery. Overcoming this barrier can take time but is well worth the efforts. Understanding how use of ultrasound can enhance reimbursement and patient care is often the first step.

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

- 1. Practice.** Have an idea of what you are looking at and what you are looking for (know the anatomy and correlations with history and physical exam). Practice working with and handling the probes and machines (be familiar and comfortable with your equipment and know what it takes to maintain it). Practice scanning whenever you can. Scan scan scan!
- 2. Enhance.** Remember that POCUS enhances the patient assessment, examination, and diagnostics; it does not replace it. Utilizing ultrasound in practice will enhance your diagnostic skills, practice, patient safety, and patient experience.
- 3. Invest.** Investigate which machine is right for you and your practice, and invest time and energy into learning how to use the machines, probes, equipment, software, and components of each scan needed for reimbursement. All these elements will increase the value of ultrasound and the return on investment into the equipment.

Sara Winter, PA-C is a full-time faculty member at the New York Institute of Technology School of Health Professions in Long Island, New York. She is a graduate of the NYIT Physician Assistant program and has been a practicing PA for 15 years. She has worked in the fields of neurosurgery, interventional radiology, emergency medicine, and family practice. She is a proud member of the ultrasound faculty for NYIT College of Osteopathic Medicine and School of Health Professions. She is currently a clinically practicing PA in family medicine who successfully utilizes POCUS in her daily practice.



# REVIEW

## Article Review

### Abscesses: To scan, or not to scan?

**Publication:** Annals of Emergency Medicine

**Date:** January 2019

**Link:** [Abscess Incision and Drainage With or Without Ultrasonography](#)

**Written by:** Daniel Zebedeo, PA-C

No matter the specialty, abscesses are a common occurrence. Providers rely on the physical exam findings such as size, color, induration, and fluctuance to assess where to incise and drain. We rely on these skills because they are fast, easy and produce good outcomes—meaning, the abscess gets drained. I would speculate that the majority of the time, especially for ER providers, there is limited way of knowing if our initial drainage was sufficient because we don't always see the patient for their follow up visit. How can adding point of care ultrasound in routine practice reduce the need for repeated abscess I&Ds?

Fortunately for us, Annals of Emergency Medicine has published a randomized controlled clinical trial with the hypothesis that POCUS for I&Ds can lower clinical failure rates when compared to I&Ds of abscesses with physical exam alone. The primary outcome was clinical failure of therapy as defined by repeated instances of incision and drainage that produced purulence. Cases in which follow up I&D produced only blood or serosanguineous fluid were not considered failure of therapy.

#### **Approach to this study**

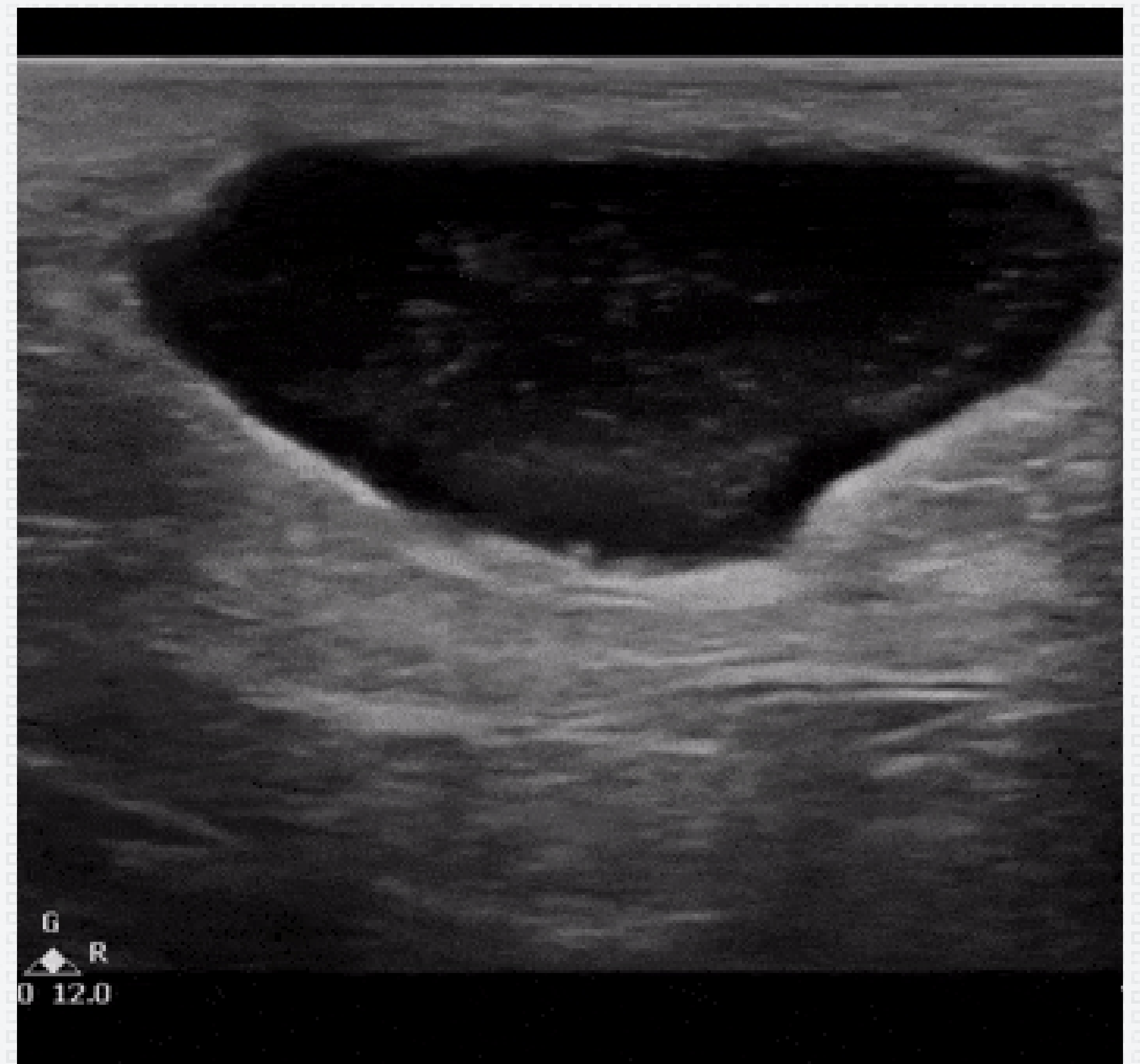
Patients who were seen at the UMass Memorial Medical Center's emergency room with an uncomplicated soft tissue abscess requiring I&D were eligible for participation - 107 participants total. Patients were randomized into two groups, those with I&D using physical exam and POCUS (n=54) and those who had I&D with physical examination alone (n=53). The inclusion criteria was atraumatic swelling, pain, or erythema consistent with an abscess cavity. The exclusion criteria was patients who were critically ill (fever, hypotensive, or appearing critically ill based on physical exam), or patients with associated foreign body, trauma, or animal bite. There was no clear ultrasound standardization; the clinicians (ER providers and residents) who performed POCUS were experienced with soft tissue US as defined by having an average of 65 scans. Based on the clinician's discretion, POCUS fell into one of three categories: images obtained prior to the I&D, images obtained before and during the procedure, or images attained before and after I&D.

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### Outcome measures

Patients were evaluated in person by clinical staff two to three days after initial I&D of their abscess in order to determine if repeat I&D was indicated. Clinical staff were blinded to research data at this time. Repeat I&D was performed at this follow-up visit if the patient had continued or new fluctuance on exam or if they were found to have a retained abscess pocket that was not draining on US evaluation. All patients then had a telephone call from clinical staff and were asked standardized scripted questions to assess improvements on day ten after initial I&D from the ER. Treatment failure was defined as requiring repeated incision and drainage that produced purulence after initial I&D.



*A well-circumscribed fluid collection in soft tissue consistent with an abscess. Note the scattered punctate echogenic densities moving within the abscess fluid which suggest high cell/protein content of the fluid.  
From: (Photo Credit: 5 Minute Sono via The Pocus Atlas, [thepocusatlas.com](http://thepocusatlas.com). Accessed 12/1/2022.)*

### Data analysis/results

Eleven participants out of a total of 107 were identified as having treatment failure and underwent additional I&D which produced purulence. Those who underwent initial I&D with physical exam alone were more likely to have repeated I&D at follow up which produced purulence. Those in the POCUS group were less likely to fail initial treatment. There was a 3.7% failure rate from the POCUS group and a 17.0% failure rate from the group who had only a physical exam, which equates to a difference between the two groups of 13% (95% confidence interval 0.0% to 19.4%). Researchers took into account ways in which primary outcome could have been biased, such as history of IV drug use, use of antibiotics at time of initial I&D, and abscess size. Multivariate logistic modeling showed no significant difference in primary outcomes based on these factors. In fact, it bolstered the results demonstrating that the overall largest predictor of treatment failure was lack of POCUS during initial I&D. The 11 participants who required repeat I&D were more likely to have failed treatment within the first three days after initial I&D.

### Application

This study demonstrates that the use of POCUS when draining abscess can lead to less treatment failures and decrease the need for repeated I&D. If used before I&D, there can be a better initial evaluation of pocket size, depth, complexity, and presence of deeper, non-palpable abscess. The use of POCUS during and/or after the procedure can aid in appropriate removal of more purulent material and/or better assessment of residual pockets of purulence. The researchers from this study suggest, “ultrasonographic guidance improves drainage through better planning for the initial incision, better execution of the procedure, and/or more accurate assessment for residual purulence.”



If you are not currently using POCUS for abscess evaluation and have the ability to do so, adding this into your routine practice can be incredibly beneficial for patients. It can be a tough transition, because one can still receive the satisfaction of expressing purulence with just a physical exam alone and not using POCUS. One can even argue that if the abscess is uncomplicated enough based on a physical exam, then using US would be of minimal value and not change the overall procedure. But based on this study, even in uncomplicated abscess there is a potential for around 17% of patients to need repeat drainage if POCUS guidance is not incorporated in the initial evaluation and procedure. Simple or complicated, US can change management of abscesses and benefit the patient. Using US at the initial I&D can decrease overall cost burden and improve patient satisfaction as the rate of repeated I&Ds is lower. Though more studies like this should be performed, we can assume that there is a lower chance of treatment failure when we use point of care ultrasound guidance for incision and drainage of abscesses compared to physical exam alone.

### **While we're on the topic, here's a cool trick!**

Injecting 5-10cc or more of lidocaine into an already tight space is usually incredibly painful, and also runs the risk of putting you in the splash zone. If you have a pilonidal cyst or big IVDA abscess, consider injecting a 0.5-1cc wheal of lidocaine, then using ultrasound guidance to needle aspirate a good bit of the fluid. After you've released some of the pressure, you can go back in and inject the appropriate amount of lidocaine to numb it thoroughly for the blade.

### **Source**

Gaspari RJ, Gleeson T, Sanseverino A. (2019). Abscess incision and drainage with or without ultrasonography: a randomized controlled trial. *Annals of Emergency Medicine*, 2019;73(1), 1-7.

<https://doi.org/10.1016/j.annemergmed.2018.05.014>.

To review this article, find it [here](#). To review more articles like this, see the [Annals of Emergency Medicine](#).

If you would like the SPOCUS Newsletter to feature a specific topic, case, technique, etc., please fill out [this form](#) or email us @ [info.spocus.org](mailto:info.spocus.org).



# TIPS

# POCUS Tips and Tricks



*US-guided MTP arthrocentesis. (Photo credit: The Pocus Atlas, thepocusatlas.com. Accessed 12/1/2022.)*

## Pearls and Pitfalls for Ultrasound-guided Joint Injections

by: James Wilcox, MD, RMSK, FAAFP

**Why would you spend the additional time needed for ultrasound guidance for procedures? One study found that sonographic guidance of the knee resulted in 48% less procedural pain, a 183% increase in the volume of aspirated synovial fluid, and improved outcomes at two weeks. Over the years, I have collected some pearls and pitfalls I will share to enable you to perform safer, more accurate ultrasound-guided procedures.**

When performing an ultrasound-guided procedure like a joint arthrocentesis, preparation is key. First, do an initial survey scan before prepping the joint for injection. Ultrasound is much more accurate than a physical exam in detecting joint effusions, even in the knee. Select the proper probe for the procedure and make sure all landmarks are identified. You can even mark them with a marking pen on the skin for better visualization. Make sure your device has been cleaned appropriately and you have a sterile probe cover and sterile gel.

Next, select the appropriate needle gauge and length for your procedure. I typically use 22 gauge 1.5 inch needles for many of my procedures, but adjust to a smaller bore needle for smaller joints (25 gauge typically) or a larger needle for aspirations (18-20 gauge). Joint fluid and septic fluid are very viscous and difficult to aspirate with a needle smaller than 18-20 gauge. Additionally, remember that thinner needles bend more easily and can make dynamic ultrasound guidance tricky. If your target is deep, like in the shoulder or hip joint, you will likely need a longer needle. When first starting with procedure guidance, you can also consider using lidocaine in a separate syringe to help with anesthesia while placing the needle. Once the needle is at the target of interest the syringe of lidocaine can be removed and replaced with the injectable material of steroid or other treatment.

Now you are ready for the procedure. Make sure to prep the joint or target of interest with a cleaning solution. There are currently no studies which show the best agent; I use chlorhexidine because one study showed less infection rates in needle punctures for hemodialysis patients. Line up your screen, patient, needle, and ultrasound so everything is in the same plane. Sit down if possible. You want to easily visualize your hands and screen during the procedure to make appropriate adjustments. Insert the needle with the bevel up into the skin first, then use the ultrasound to find your needle. Always make sure to visualize your needle tip while advancing to prevent damage to nearby structures.

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You can “jiggle” the needle to help you see the tip or tissue movement to signify where the tip might be. You can also perform a small injection of lidocaine initially, which will help visualize the needle. Try to keep the ultrasound as perpendicular to the needle as possible to improve visualization. This may require a gel standoff, rocking the probe to improve the angle, or using a needle guidance software package on your ultrasound, if available. When you have finished the procedure, make sure to clean and dress the puncture site. Clean the ultrasound probe appropriately, as some machines and some institutions require specific cleaning processes after a procedure.

- 1 Anchor your ultrasound to prevent slippage.
- 2 Use your dominant hand to hold the needle.
- 3 Don't move the ultrasound and the needle at the same time.

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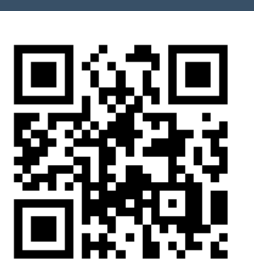
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James Wilcox, MD, FAAFP, RMSK is a Family Medicine and Sports Medicine physician who practices at Eskenazi Health, Outpatient Care Center. He is trained in point of care ultrasound and has an ultrasound clinic for musculoskeletal and general ultrasound examinations. He is an Assistant Professor of Clinical Family Medicine at the Indiana University School of Medicine and the Health Resources and Services Administration PRIME Grant Point of Care Ultrasound Thread Director for Indiana University School of Medicine. Outside of the clinic, he enjoys providing medical care to marathons, the Iron Man Triathlon, mud runs, and local sporting events.



Submit your own tip [here!](#)



# POCUS Saves

Where we discuss real-life-inspired cases where POCUS made a positive impact on patient outcomes.

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

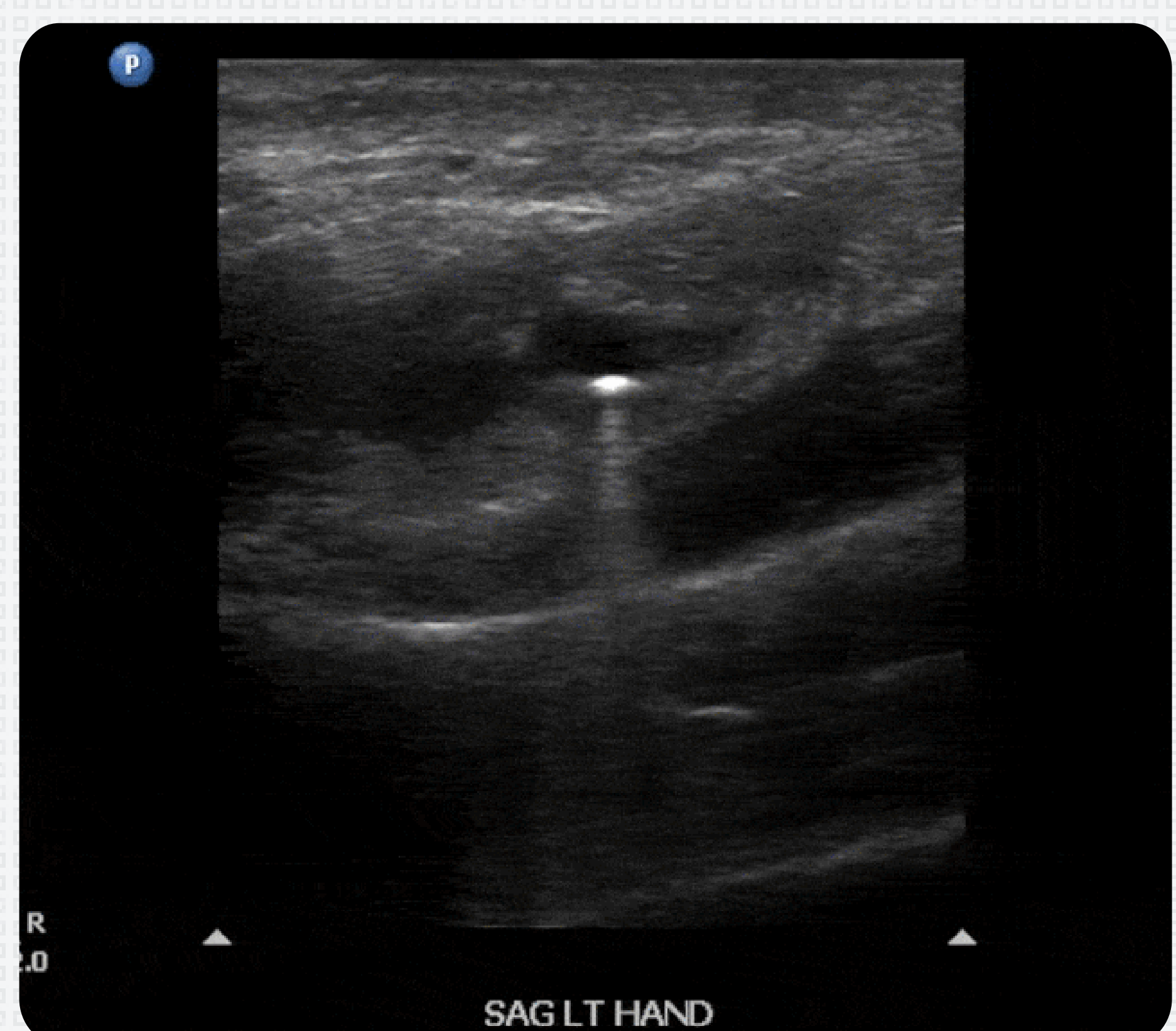
## A Case of a Foreign Body

**History:** A 63-year-old female comes into a primary care office with a chief concern of back pain. Upon taking a history, you find that she was the victim of a gunshot wound to the R lower flank after an armed robbery a year ago. She received medical attention at the time, but was told the bullet had caused minimal internal damage. She tells you that the bullet was not removed at that time. She says she has been experiencing progressive pain in her R lower flank region over the past few weeks and visited the emergency department last week due to the pain. They were unable to locate any retained foreign bodies with the use of X-ray and physical exam. She was sent home with muscle relaxants for presumed MSK strain and instructed to follow up with a primary care provider.

**Physical exam:** The physical exam is largely negative. The area of concern is not erythematous or indurated or with any obvious signs of abscess or infection. There is tenderness to palpation.

**Imaging:** An X-ray in the EMR from the recent ED visit was negative for any retained bullet fragments. A CT scan was not performed in the ED.

**POCUS:** The primary care provider ~just so happens~ to be a user of POCUS in their practice, and decides to take a look. Sure enough, they see a solid object in the soft tissue of the patient's right flank area with comet tail artifact underneath (similar to the image on the right). They prep the patient in a sterile fashion, perform an ultrasound-guided foreign body removal, and remove an intact 9mm bullet from the patient's soft tissue. They throw in a couple stitches, pass the bullet on to a local law enforcement officer, and send the patient home with a small scar and immense relief.



An ultrasound image of a BB lodged in a patient's hand, showing the comet tail artifact commonly seen deep to echogenic structures. (Photo credit: The POCUS Atlas, [pocusatlas.com](http://pocusatlas.com), accessed 12/23/22.)



## Takeaways:

- Don't forget that POCUS has both diagnostic and therapeutic capabilities! Here the benefit was two-fold: not only did POCUS allow for detection of the retained without the use of more invasive imaging, it also was able to provide real-time procedural guidance for foreign body removal. Every patient will give a big YES to less cost, less radiation, and less scarring.
- Remember all imaging has its limitations, even X-rays and CT scans. In this case, something about the positioning or location of this radiopaque bullet prevented it from showing up on X-ray. Don't let "negative" imaging deter you from pulling out your ultrasound probe. Remember, POCUS is an augmentation of the physical exam. You wouldn't refrain from doing a physical exam on a patient with abdominal pain just because they had a negative CT, would you?
- If a patient has already been evaluated in the ED, don't assume that you and your probe won't find something in the clinic. In case you haven't gotten the gist of this issue of *The Echo Chamber* yet, ultrasound can be a **huge** asset in fields such as primary care, especially with regards to procedures or MSK/soft tissue complaints.

## In the Literature:

- Ultrasound can be particularly useful in the detection of non-radiopaque foreign bodies, which won't be picked up on X-ray. **All foreign bodies will show up as echogenic on ultrasound, even if they are not radiopaque on X-ray or CT.** A [2011 study from BMC Medical Imaging](#) explains the evaluation of different types of foreign body material on ultrasound and concludes, "Sonography can be used effectively to locate radiolucent FB with high certainty, and should be considered for patients suspected of having a FB in the setting of negative X-rays." *Better yet, pull out that probe while you're waiting for the X-ray.*
- A [2020 CME article in RadioGraphics](#) describes the sonographic detection of different types of foreign body materials and a step-by-step approach to ultrasound-guided foreign body removal. It concludes that "US is the technique of choice not only for detecting but also for guiding removal of foreign bodies." *Talk about a two-for-one.*
- A [2021 phantom study in the European Journal of Radiology](#) tested the ability of different imaging modalities to detect different types of material implanted within gel, including wood, plastic, and glass. It found that X-ray only had a 61% sensitivity in detecting these materials, with CT at 86%. *Who wants to re-do this experiment and add ultrasound?*
- A [2012 case report from the Wilderness and Environmental Medicine Journal](#) discusses the use of POCUS to remove foreign bodies in the wilderness medicine setting. They conclude that "...with the advent of portable and handheld ultrasound units, foreign body removal in the field has become feasible and may decrease the morbidity of soft tissue injuries, particularly in austere and wilderness environments with limited access to immediate medical care." *As if we needed another reason to justify carrying our portable probes around with us at all times!*



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# 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.



# FOAM

## Free Open Access to Medical Education

The FOAM resource spotlight from this Newsletter is Core Ultrasound—the home of the Ultrasound Podcast, 5MinSono, Ultrasound of the Week, and more ultrasound tools than you can put in your toolbox. After reading our articles about the use of POCUS with abscess I&Ds, joint aspirations, and foreign body removals, check out these resources, podcasts, image reviews, and guides on soft tissue and MSK POCUS! These resources will help introduce, reinforce, and solidify our soft tissue US evaluation.

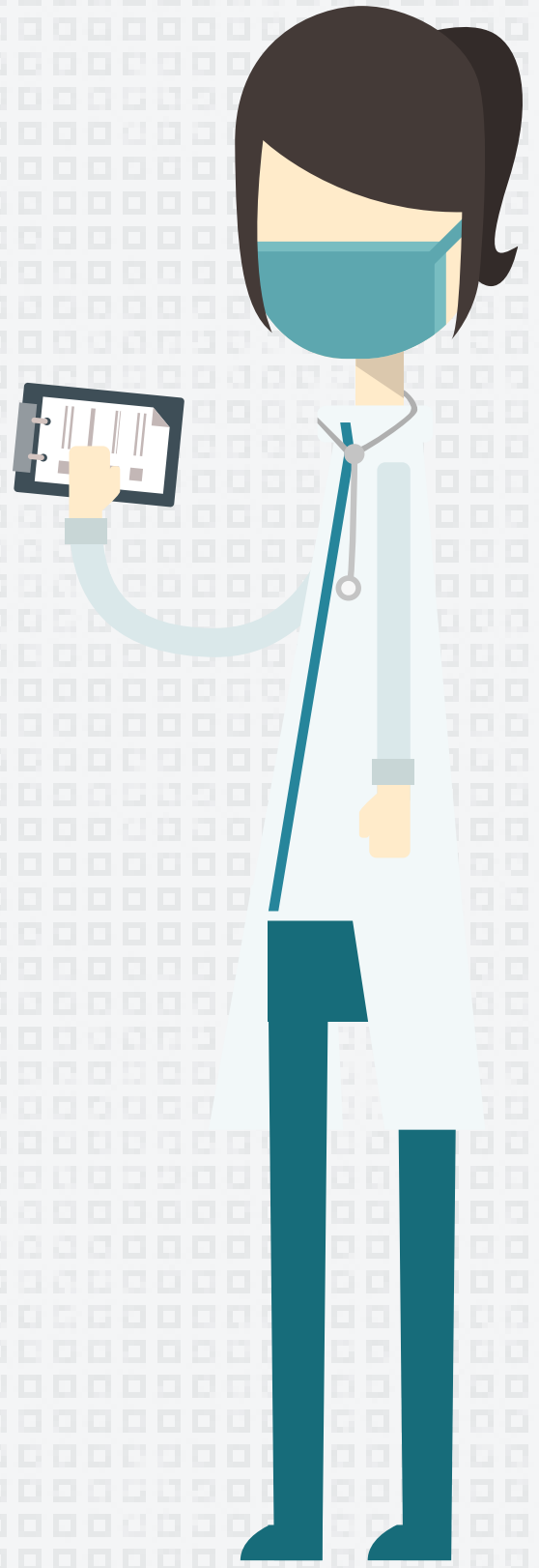
- ➔ [Core Ultrasound Image Review, Episode 8 – Core Ultrasound](#)  
A review of various MSK & soft tissue cases.
- ➔ [Cellulitis vs Abscess – Core Ultrasound](#)  
A quick guide to differentiating these two common soft tissue complaints.
- ➔ [Core Ultrasound Image Review, Episode 4 – Core Ultrasound](#)  
An image review of cellulitis and foreign bodies.
- ➔ [Soft Tissue Ultrasound with Jacob Avila – Core Ultrasound](#)  
A dive into differentiating cellulitis, abscess and necrotizing soft tissue infections.
- ➔ [Foreign Body Removal - Core Ultrasound](#)  
A 2-minute video on the logistics of POCUS-guided foreign body removal.

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Ready to nerd out on more FOAMed resources? Visit our [FOAMed page](#) on the SPOCUS website to connect with 30+ sites we've compiled that all offer FREE POCUS resources.



# 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](http://spocus.org)

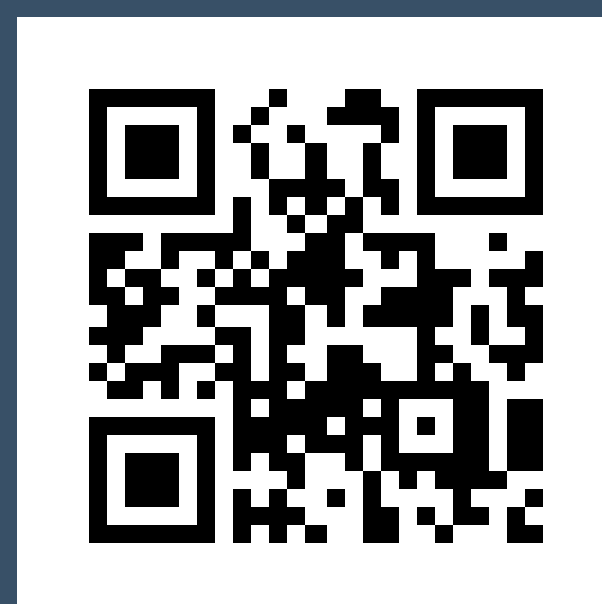
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Or, submit an interesting tip, case, or member spotlight nomination [here](#).





# SPOCUS Leadership



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