# Episode 27: POCUS

The sun rises over the San Joaquin Valley, California, today is **September 11, 2020**.

Today we honor those who lost their lives during the deadliest terrorist attacks in the history of the world, which happened in 2001. Today, nineteen years later, there are many tears to wipe off, hearts to comfort, and many unanswered questions. Our fight against evil is still unfolding, especially during this time of pandemic. Humans will continue their search for happiness and hopefully good will prevail.

How is the air quality where you live today? In Bakersfield, this week our air quality has been worsening, and asthma exacerbations will likely be on the rise. Recently, the American Family Physician journal published a practice guideline update issued by the Global Initiative for Asthma (GINA). GINA now recommends against using short-acting beta2 agonist (SABA) as sole therapy for patients with mild intermittent asthma (Step 1). A low-dose inhaled corticosteroid (ICS) and formoterol combination used as needed is the preferred treatment in adults and adolescents in the Step 1 group. If ICS/formoterol is not affordable, then a low dose ICS and SABA as needed is recommended, basically it is recommended to avoid prescribing SABA alone[1,2].

This is Rio Bravo qWeek, your weekly dose of knowledge brought to you by the Rio Bravo Family Medicine Residency Program, from Bakersfield, California. Sponsored by Clinica Sierra Vista, Providing compassionate and affordable care since 1971.

**“To cure sometimes, to relieve often, to comfort always,” Dr. Edward Trudeau**

As doctors, we always want to heal our patients. I think that’s the reason all of us went to medical school. However, we have to recognize our limitations, and the limitations of modern medicine, even with all the advances of our era. Some patients may not be cured, and that can be devastating for some physicians, but even when we cannot cure, we can often offer relief, and always provide comfort. What a great teaching for us!

Today we have Dr Verna Marquez. She is a faculty in our program who is always involved in new and exciting projects. Today, she will talk about POCUS. Dr Marquez, please introduce yourself.

1. **What is POCUS? Why is it important?**

POCUS stands for Point of Care Ultrasound. It is a goal-directed, bedside ultrasound examination performed by a healthcare provider to answer a specific question or to guide performance of an invasive procedure.

History: In 1940s Diagnostic ultrasounds was first developed and used in medicine, but POCUS has been integrated into diverse areas of clinical practice since the early 1990s.

Impact in primary care: Many professional societies and national organizations nowadays have recognized the potent impact of POCUS and have endorsed its routine use in clinical practice. POCUS improves clinical outcomes, reduces failure rates during procedures, rapidly narrows differential diagnosis, shortens time to definitive treatment, lower costs, and reduces the use of ionizing radiation of CT imaging. It is especially empowering and critical for front line providers in rural, underserved, or resource-constrained environments where advance imaging and specialists are in scarce supply. Family physicians are often the providers in these key clinical contexts. Because Family medicine physicians have a strong background in obstetric ultrasound, family physicians are well positioned to learn other applications of POCUS.

1. **When can we use POCUS?**

POCUS can be used to assess most body systems. Generally, the rule is to “rule in” or “rule out” a specific condition or answer a “yes or no” question.

Clinical applications:

* + As a FM physician, we perform it mostly for diagnostics –and the most commonly performed ones are evaluation of GB, liver, kidneys, bladder, gravid and non-gravid uterus, joints, LE veins, breast, soft tissues, scrotal and since our program just started the curriculum, heart and lungs are other applications we can do as well. POCUS can narrow down our differential diagnosis based on the presenting signs and symptoms. It will guide additional investigations, especially in urgent or emergent situations.
	+ We can also use POCUS for Procedural guidance – it has been shown to reduce complications and improve success rates of invasive bedside procedures.
	+ We are also utilizing it for Screening such AAA. Screening with US is potentially advantageous because it is non- invasive and avoids ionizing radiation.
	+ Others are for Monitoring and resuscitation commonly performed in the hospital setting like in the ED and ICU. Example include monitoring for volume status on patients with CHF or dehydration so scanning for IVC distention and collapsibility, monitoring LV contraction in responses to inotrope initiation, and monitoring for resolution or worsening of pneumothorax or pneumonia on lung US.
	+ Bedside US can direct emergent interventions by rapidly detecting tension PT, cardiac tamponade and massive PE with acute RVF.
1. **What are important considerations when using POCUS?**

There are at least 3 things to consider while performing POCUS:

1. Provider training- the amount of training required to achieve competency in POCUS applications varies by provider skill and exam type. Those with prior experience greatly facilitates learning new applications and no big deal. While those that are novice needs more exposure and more practice scanning to be comfortable with POCUS. Also, the skills required relate to provider’s scope of practice. For example, a Rheumatologist may be proficient with MSK US but less proficient in cardiac or abdominal US, while the opposite maybe true for critical care physicians. For us as FM physician, we can do a lot which requires more time to practice scanning to be able to proficient.
2. Patient factor – body habitus, positioning, and acute illness are important considerations when imaging patients. Similar to x ray, US waves are attenuated by adipose tissue, and US has limited penetration in morbidly obese patients. Lower frequencies US probe must be used for deeper penetration, resulting in lower resolution of images. Positioning can limit US examination; for example, apical cardiac US images is often limited in patients who cannot be placed in left lateral decubitus position.
3. US equipment- Lack of familiarity with the equipment can present a barrier to its use. Fortunately, many machines nowadays are designed specifically for POCUS applications with ease of use as a primary feature. Providers must be familiar with basic operations including entering patient information, selecting the appropriate imaging mode, and adjusting the image depth and gain. Transducer availability is an important consideration because certain exams can be performed with multiple transducer types, whereas others can be performed only with a single transducer type. For example, and curvilinear or phased array can be used to evaluate the abdomen but only a phased array can be used to evaluate the heart.
4. **How are we going to learn POCUS in our residency?**

Our program has incorporated a formal POCUS curriculum this academic year. We have been actually applying Obstetrical POCUS for the last 5 years to our pregnant patient using our first US machine. The PGY2 and PGY3 residents have 2 weeks POCUS rotation under my direct supervision. During this rotation, residents have one on one hands on training with image acquisition and interpretation with the actual patients.

Our program also provides each resident the SonoSim probe and online courses while simultaneously learning the proper scanning method. We conduct POCUS lecture didactics every 2 weeks with US demo of actual patients or volunteers. All residents at all levels are encouraged to scan their own patients on their own continuity clinic time when time allows for practice under my direct supervision.

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**Espanish Por Favor:** **Hígado**
by Hector Arreaza

The Spanish word of the week is *hígado*. This is a vital organ in the human body, the giant of detoxification in the abdomen. Yes, *hígado* means liver. The hígado is culturally relevant because people generally know that the *hígado* will get sick if you drink too much alcohol, and as doctors we know that the *hígado* once is lost, here is no way back. Some patients will die if their hígado does not perform its function. So, counsel your patients to drink with moderation to preserve their *hígado*. “Señor, evite tomar alcohol para cuidar el hígado”. *Hígado de res* (cow’s liver) is commonly used in folk medicine to cure anemia, yes, it´s iron rich, but not very tasty for most people. Remember the word *hígado.*

**For your Sanity: Nerdy Jokes**

Conjunctivitis.com – that’s a “site” for sore eyes

“I tried playing hide and seek in the hospital, but they kept finding me in the ICU.”

“My doctor handed me a baby and tells me my wife didn’t make it. So, I politely returned the baby and asked for the one my wife made.”

--“What do you fill out when an employer asks who to notify in case of an emergency?

--I always write “a very good doctor.”

--Doctor: “Ma’am, your test results are back. I’m afraid your DNA is backwards.”

--Patient: “AND?”

Now we conclude our episode number 27 “POCUS.” Dr Marquez explained how an ultrasound done in clinic may answer many questions to facilitate patient care. POCUS may give you the answers you are looking for in those patients with abdominal pain, pelvic pain, and more. The word *hígado*, Spanish for liver, was explained this week because the liver is one of the main organs you can ultrasound in clinic, and we finished this episode with some nerdy jokes.

Thanks for listening to Rio Bravo qWeek. If you have any feedback about this podcast, contact us by email RBresidency@clinicasierravista.org, or visit our website riobravofmrp.org/qweek. This podcast was created with educational purposes only. Visit your primary care physician for additional medical advice. This week we thank Hector Arreaza, Lisa Manzanares, Verna Marquez, and Li Liang. Audio edition: Suraj Amrutia. See you next week!

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References:

1. Asthma: Updated Diagnosis and Management Recommendations from GINA, Am Fam Physician. 2020 Jun 15;101(12):762-763. <https://www.aafp.org/afp/2020/0615/p762.html>
2. Global Initiative for Asthma (GINA). Global Strategy for Asthma Management and Prevention, 2020. Available from: [www.ginasthma.org](http://www.ginasthma.org/)