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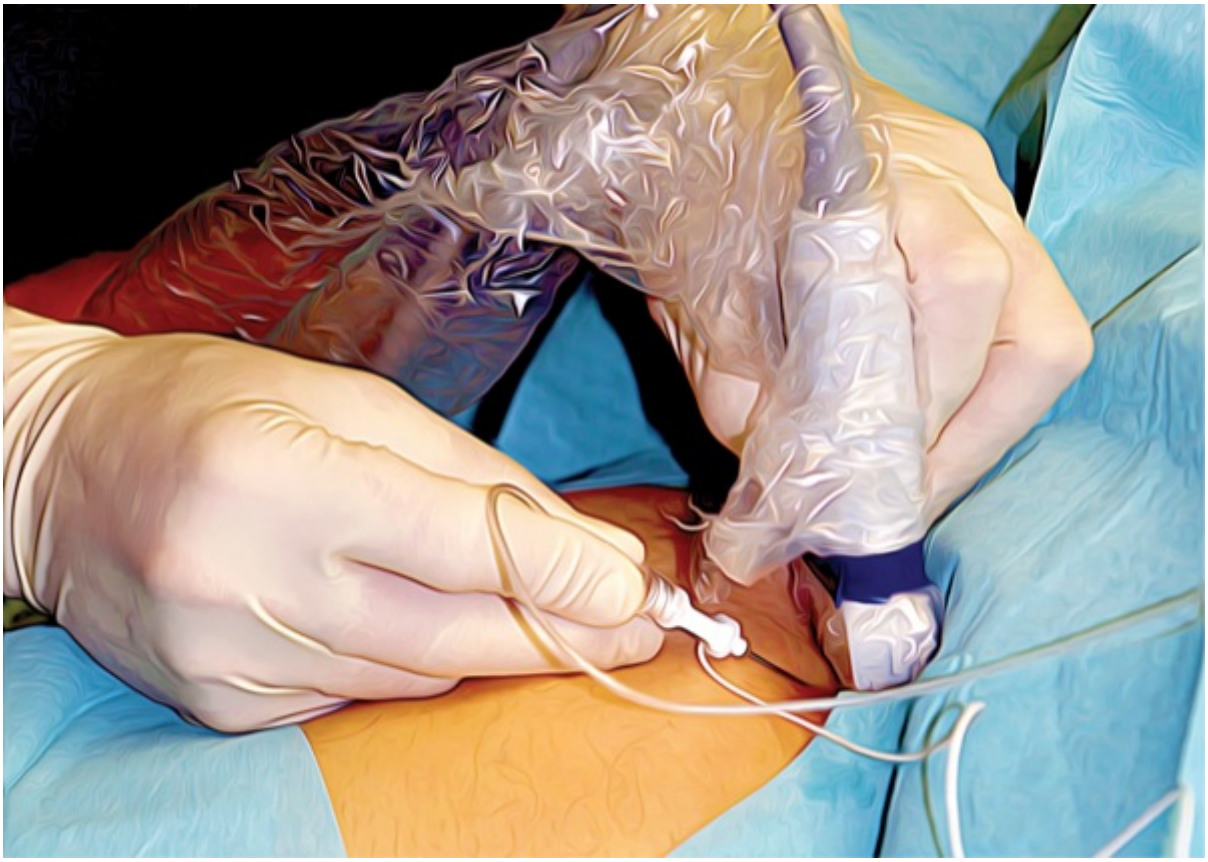
Ultrasound-Guided Nerve Block, an ED Opioid Alternative

By Alexis LaPietra, DO

Prescription opioid abuse has reached epidemic levels in the United States, affecting nearly two million Americans in 2014. Overdose deaths involving these drugs have quadrupled since 1999, and every day more than 1,000 patients are treated in emergency departments (EDs) for misuse of prescription opioids.[1] Yet prescribing has risen so sharply that in 2012, enough opiates were prescribed to supply every U.S. adult with his or her own bottle, according to the Centers for Disease Control and Prevention (CDC).[2]

As emergency physicians working with anesthesiologists to manage pain in the ED setting, we are on the frontlines of this urgent public health crisis. Pain, often severe, is the leading reason for ED visits, cited by 78% of patients.[3] For decades, we were encouraged to aggressively manage pain as a “fifth vital sign.” While emergency physicians write less than

5% of opioid prescriptions,[4] usually for short-term use, opioid-addicted patients often report their first exposure as being in the ED.[5] Indeed, a recent study of Medicare beneficiaries suggests that for every 48 patients prescribed a new opioid in the ED who might not otherwise use these drugs, one will become a long-term user.[6]



With the Surgeon General's recent call on physicians to sign a pledge to help "turn the tide" on this crisis,[7] how do we balance the priorities of providing compassionate care to patients with broken bones and other painful conditions with calls to limit use of potentially addictive painkillers? One solution, adopted by the 700-bed hospital where I practice, St. Joseph's Healthcare System in Paterson, NJ, is to develop a formal program focused on novel alternatives to opioids, such as nitrous oxide, trigger point injections, Lidoderm patches, anti-inflammatory medications, muscle relaxants and ultrasound-guided nerve blocks, whenever possible for appropriate patients. Here are some key takeaways from our experience.

Reducing ED Opioid Use by Nearly 50%

St. Joseph's ED ranks as the nation's second busiest with more than 158,000 patient visits annually. Launched in January 2016, our Alternatives to Opioids (ALTO) program mainly focuses on non-opioid treatment algorithms for five painful diagnoses frequently seen in the ED setting:

- renal colic or kidney stones;

- lumbar radiculopathy or sciatica;
- acute headache, including migraine and cluster headaches;
- musculoskeletal pain, such as back pain and shoulder pain; and
- joint and extremity fractures and joint dislocations.

To date, about 1,600 patients with these conditions have received alternative ALTO therapies in our ED. Compared to prescribing practices at St. Joseph's in the three months before the ALTO program was introduced, opioid use for patients with these diagnoses has decreased by 47.7% in our ED, with no significant difference in patients' pain scores and satisfaction for those who only received ALTO therapies, versus patients who received opioids.

In some cases, ALTO therapies can actually work better than opioids. For example, an 88-year-old woman brought to our ED after breaking her hip in a fall continued to scream in agony after receiving 20 mg of morphine (a substantial dose for a geriatric patient only weighing 98 pounds). Her entire family was crying, seeing her in such pain that she couldn't move or use the bedpan.

Multimodal Analgesia Options

The ALTO protocol for joint and extremity fractures and joint dislocations calls for ultrasound-guided regional anesthesia (UGRA), performed at the bedside, as one of our non-opioid pain management options. Using ultrasound as a visual GPS to locate the target nerve and surrounding structures—and advance the needle safely to the desired destination—we performed the block in 5 minutes. Three minutes later, the patient's sobs turned into smiles—and her family wept again, this time with tears of joy, because her pain was gone.

Recent randomized controlled trials demonstrate the efficacy of ultrasound-guided femoral nerve block for pain management in geriatric patients with hip fracture, with significant reductions in pain score, improved mobility while awaiting surgery, decreased use of opioids both pre- and post-operatively, and more frequent discharge home.[8-10] One study of such patients reported a 100% first-pass success rate with ultrasound-guided femoral nerve block, zero procedural complications, significant pain relief at 15 and 30 minutes, and a median procedural time of 8 minutes.[8]

These are important benefits, given that hip fracture accounted for 30% of all U.S hospitalizations in 2003. In a systematic review of 83 studies, UGRA was the only intervention found effective in controlling acute hip fracture pain when compared to multimodal pain management, traction, systemic analgesia and neurostimulation.[9] UGRA has also been shown to provide superior, longer-acting pain control for pediatric patients aged 16 months to 15 years with femur fractures, compared to IV morphine.[10]

Faster, Safer ED Care Without Risk of Addiction

One of the first publications to highlight the role of UGRA in emergency medicine described its use for successful pain management in patients with shoulder dislocation.[11] A subsequent study also found a dramatic reduction in length of ED stay when ultrasound-guided brachial plexus block for shoulder reduction was used, compared to procedural sedation (106 minutes for the nerve block group versus 285 minutes for those who received procedural sedation, which requires airway monitoring with a complete intubation setup and significant assistance by staff both before and after the procedure.)

Other research also has shown that ultrasound-guided nerve block is quicker and safer for ED patients with joint dislocations, with one study reporting that using this technique required an average of 5 minutes of one-on-one provider time, compared to 47 minutes for procedural sedation.[12]

A recent case in our ED illustrates another key benefit of UGRA for this often excruciatingly painful injury. A young man who had fallen off his skateboard was brought in with a shoulder dislocation and an extremity fracture. He was extremely relieved to learn that with our ALTO program his pain could be managed effectively with ultrasound-guided nerve block since he had a history of opioid abuse and understandably feared that any new exposure to these drugs would trigger a relapse.

With hundreds of thousands of Americans swept up in the rising tide of prescription opioid abuse—and many tracing their potentially lethal addiction to an initial exposure in the ED—his story is a powerful reminder of why we owe it to our patients to use non-opioid alternatives whenever possible.

As emergency physicians working with our anesthesiologist partners, our mission is to help our patients heal while striving to minimize potential harms from the treatments we provide. Our experience with the ALTO program—as well as published evidence—suggests that for patients with certain injuries, ultrasound-guided nerve block is an ideal technique to provide rapid relief when patients in pain turn to us for safe, compassionate care.

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