

How to Implement Ultrasound-Guided Nerve Blocks in Your ED

July 18, 2018 by **Arun Nagdev, MD; Graham Brant-Zawadzki, MD; and Andrew Herring, MD**

Ultrasound-guided nerve block (UGNB) is an extremely useful technique for emergency physicians as a multimodal approach to the acutely injured patient. In the emergency department, UGNBs are an adjunct for pain management and can be an ideal way for clinicians to reduce the overreliance on systemic opioids.¹⁻³ In patients with contraindications to procedural sedation, UGNBs may also be the only suitable method for targeted analgesia. Recent end-point data indicate early ultrasound-guided femoral nerve blocks improve functional outcomes in patients with hip fractures, making the integration into emergency medicine practice imperative.⁴ Unfortunately, despite evidence indicating both the feasibility and utility of UGNBs in the ED management of the acutely injured patient, reports indicate poor penetration in emergency medicine clinical practice.⁵

In our 10-year experience with UGNBs, we believe that one of the major limitations for physicians is the lack of a simple location for all supplies needed to perform a UGNB. Using basic design thinking methodology to streamline the process for the clinician, we developed prearranged block bags that contain the basic supplies needed to perform a UGNB.

Our block bags contain the minimum supplies necessary for a basic ED-based UGNB. All anesthetics remain in our ED automated medication dispensing system until ordered by the clinician. **Weight-based dosing parameters and a preprocedural timeout checklist are not placed in the block bag but are easily located online to simplify the process.** Lipid emulsion (20%) is kept with our anesthetics, and all providers who are performing UGNBs are familiar with dosing if there is concern for local anesthetic systemic toxicity (see www.lipidrescue.org for details). A standard ED policy should be in place with dosing guidelines and references whenever anesthetics are used (ultrasound-guided or landmark-based).

Assembling the Bag

1. Each block bag contains (see Figure 1):
2. Two 20-cc syringes
3. 20-g 3.5-inch blunt-tip block needles
4. IV extension tubing
5. Two 10-cc normal saline (NS) flushes
6. 18-g needle
7. Tuberculin (TB) or insulin needle/syringe (for skin wheal)
8. Transparent dressing for probe
9. Alcohol pads and chlorhexidine swab
10. Body marking pen

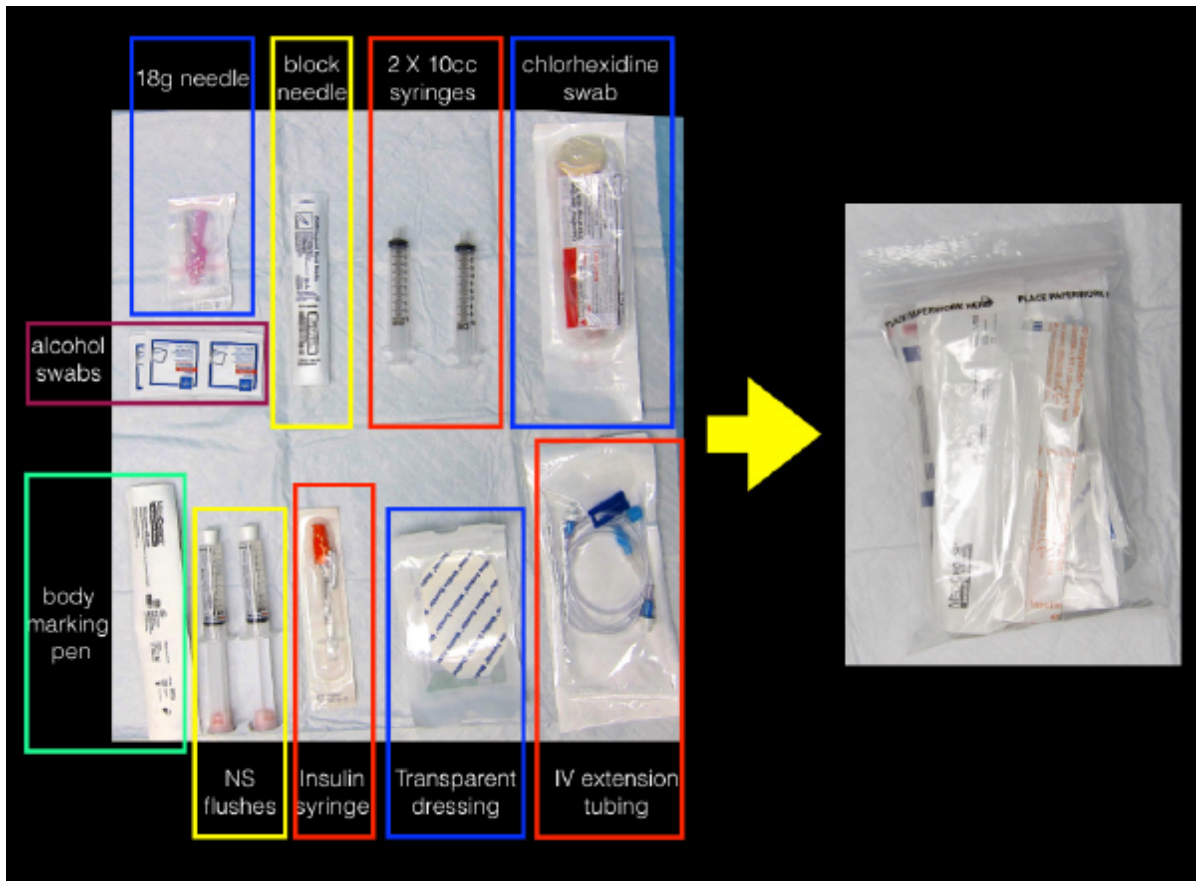


Figure 1: The various labeled components are placed in a specimen bag so that clinicians can quickly grab supplies for a UGNB. Anesthetic is ordered by the clinician and brought to the bedside by the nurse.

Procedural Tips

1. Consent should always be obtained before performing a UGNB.
2. A discussion with consulting services (orthopedics, general surgery, etc.) and determination of which injuries are (and are not) ideal for UGNBs should be performed in advance of performing the procedure.
3. Scan the patient to determine the location of the nerve. Position the patient and ultrasound screen to allow for optimal ergonomics. We recommend that the ultrasound screen and site of injection be in direct view of the clinician so that minimal head movement is needed to perform the block. In most cases, this would mean that the ultrasound system is contralateral to the site of injury.
4. The patient should be placed on a cardiac monitor for the duration of the block and for about 10 to 15 minutes after completion.
5. Once the ideal location and needle pathway has been determined, a skin wheal should be placed at the expected site of needle entry.
6. For a low-volume block (10 cc or less), a single operator technique can be used (needle on syringe), as shown in Figure 2.
7. For a higher-volume block (10–20 cc anesthetic), we prefer a two-operator technique (hand on needle), as shown in Figure 3.

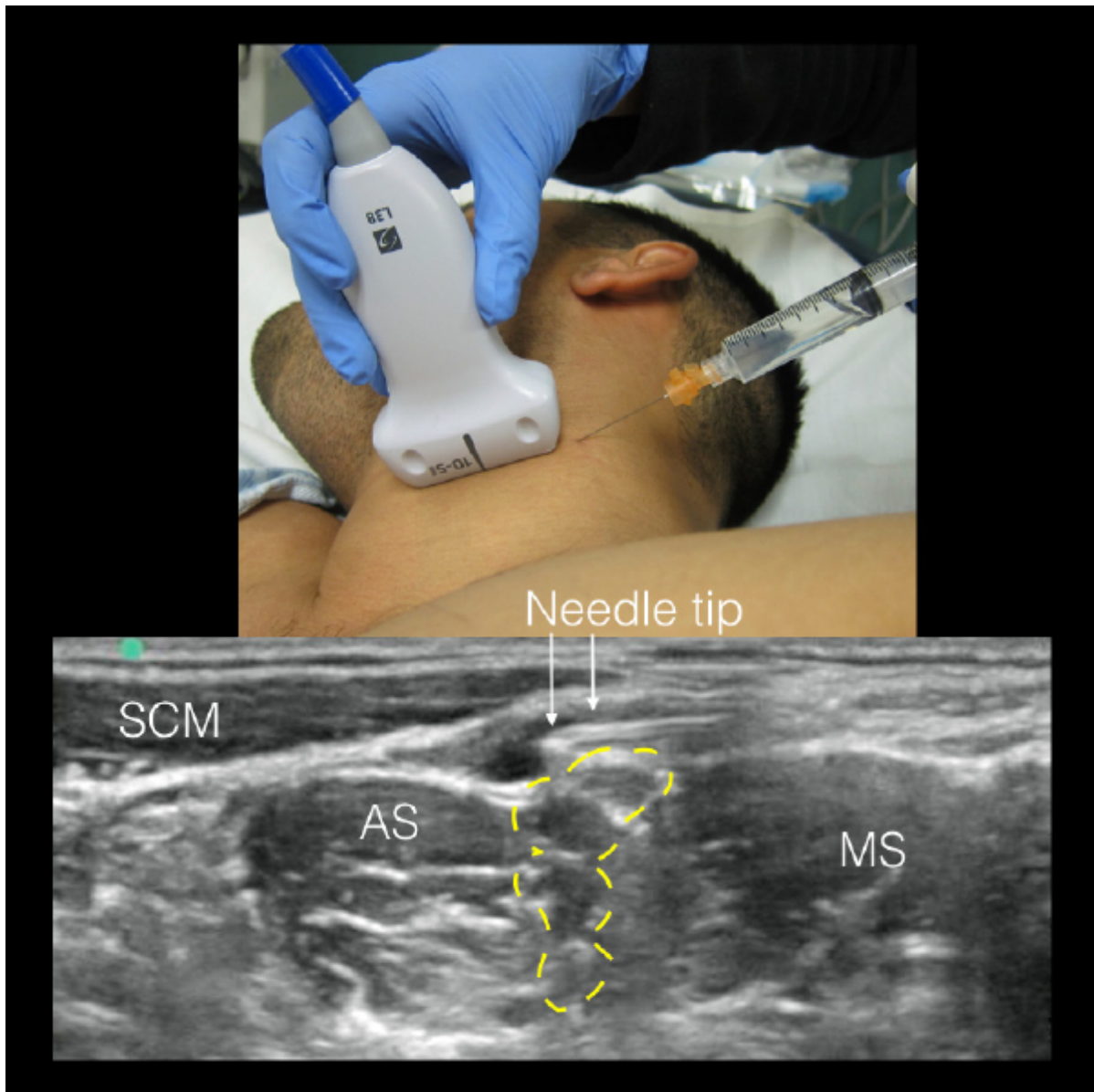


Figure 2. For low-volume blocks (less than 10 cc), we recommend a single-operator technique. A two-operator technique (see Figure 3) can be used if the operator is a novice and would benefit from normal saline (NS) hydrodissection to ensure proper needle visualization. The operator is using an in-plane technique to perform an interscalene brachial plexus block. SCM: sternocleidomastoid muscle; AS: anterior scalene muscle; MS: middle scalene muscle; yellow dashed line: brachial plexus at the level of the interscalene muscles.

Figure 3. For higher-volume blocks (more than 10 cc), we recommend a two-operator technique. The operator is using an in-plane technique to perform a distal sciatic nerve block in the popliteal fossa. A) NS flush is attached to the IV tubing and block needle. Fluid is flushed to remove air from the circuit. B) After scanning the area and placing a skin wheal (with the insulin or TB syringe), hydrodissect the tissue with NS gently until the needle tip is in the ideal location for anesthetic placement. Remove the NS flush and attach the 10-cc syringe of local anesthetic. Inject slowly (aspirating after every 1–2 cc to ensure lack of vascular puncture) with clear needle tip visualization.

Conclusion

Putting systems in place that allow clinicians to optimize clinical care is crucial to maintaining best practices and efficient flow in the emergency department. Simple design solutions reduce barriers, increase compliance, and ideally improve patient care. Our simple block bag, which is composed of common items found in most emergency departments, may increase the number of UGNBs performed in your department. With more emergency departments attempting to reduce overreliance on opioids for acute pain management, this design innovation can aid in facilitating the integration of UGNBs into clinical care.

Dr. Nagdev^L is director of emergency ultrasound at Highland General Hospital in Oakland, California.

Dr. Brant-Zawadzki^L is a fellow in wilderness medicine at the University of Utah in Salt Lake City.

Dr. Herring^L is associate director of research at Highland General Hospital.

References

1. Tirado A, Nagdev A, Henningsen C, et al. **Ultrasound-guided procedures in the emergency department-needle guidance and localization.** *Emerg Med Clin North Am.* 2013;31(1):87-115.
2. Herring AA. **Bringing ultrasound-guided regional anesthesia to emergency medicine.** *AEM Educ Train.* 2017;1(2):165-168.
3. Beaudoin FL, Haran JP, Liebmann O. **A comparison of ultrasound-guided three-in-one femoral nerve block versus parenteral opioids alone for analgesia in emergency department patients with hip fractures: a randomized controlled trial.** *Acad Emerg Med.* 2013;20(6):584-591.
4. Morrison RS, Dickman E, Hwang U, et al. **Regional nerve blocks improve pain and functional outcomes in hip fracture: a randomized controlled trial.** *J Am Geriatr Soc.* 2016;64(12):2433-2439.
5. Amini R, Kartchner JZ, Nagdev A, et al. **Ultrasound-guided nerve blocks in emergency medicine practice.** *J Ultrasound Med.* 2016;35(4):731-736.

ACEP Now - <https://www.acepnow.com/article/how-to-implement-ultrasound-guided-nerve-blocks-in-your-ed/>

Filed Under: **Pain & Palliative Care, Sound Advice**

Tagged With: **Imaging and Ultrasound, Nerve Blocks**