Bedside Ultrasound
A Tool for Assessment of IV Functionality

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Bedside ultrasound has numerous applications for the anesthesiologist in the perioperative setting. Frequently, especially in the pediatric population, patients arrive with small IV catheters that either do not flush or flush with considerable discomfort causing concern for infiltration. Patients with excessive subcutaneous fat or edema can mask IV infiltrations until considerable volume has extravasated. IV catheters that are properly intravenous often elicit pain on injection.

The subcostal four-chamber view or inferior vena cava view allows for identification of turbulent flow within the right heart after a small bolus of saline (5 to 10 ml). The figure shows the subcostal and inferior vena cava views presaline bolus (figs. A and B) and post-saline bolus (figs. B and E; yellow star; Supplemental Digital Content 1, video, http://links.lww.com/ALN/B224). The figure (figs. C and F) illustrates the correct placement of the probe for optimal image acquisition. Imaging should be done with a phased array (cardiac) probe, which is available for most portable ultrasound machines. In obese patients or parturients, the scanning depth should be increased. Alternatively, the parasternal short- and long-axis views may be substituted to allow for qualitative assessment of fluid entry. Turbulence should be assessed with 2D ultrasound, and color Doppler may be applied especially when scanning at larger depths in adults.

The importance of identifying IV infiltration before induction of anesthesia with potentially irritant medications cannot be overstated. IV infiltration is a significant cause of morbidity according to the closed claims reports of the American Society for Anesthesiologists. Despite this, best practice guidelines for intraoperative IV assessment are lacking. This simple technique using bedside ultrasound provides some reassurance for the anesthesia provider as to the location of the IV catheter. With the availability of ultrasound in anesthesia practice, this rapid assessment tool may provide an increased measure of patient safety.

Competing Interests
The authors declare no competing interests.

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References

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