



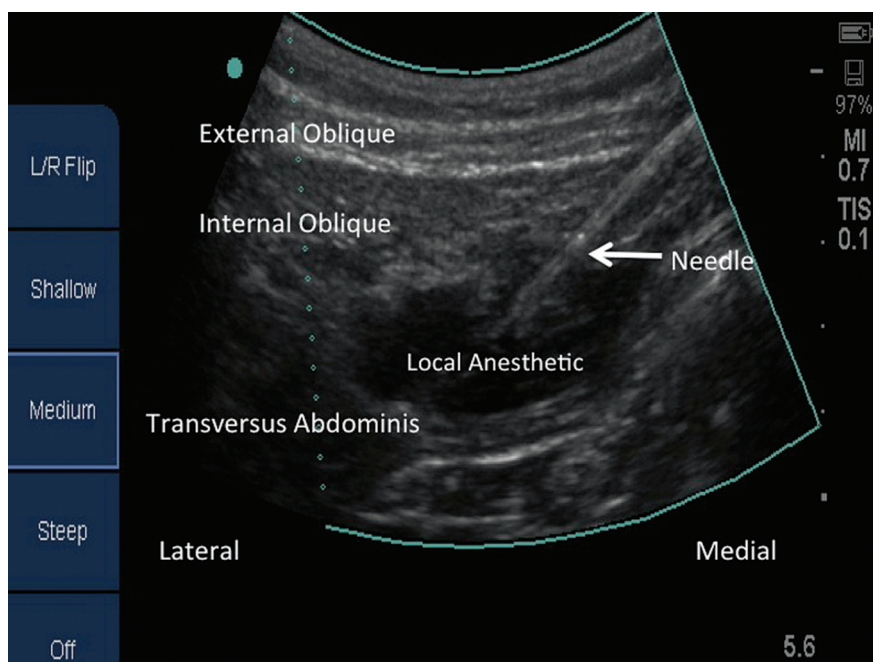
ANESTHESIA ALERT

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TAP Blocks for Abdominal Surgery

This nerve block preserves lower limb motor and sensory functions.

A relatively new peripheral nerve block that anesthetizes the nerves supplying the anterior abdominal wall is a great adjunct for post-operative pain control in abdominal, gynecologic or urologic surgery. It's called the transverse abdominis plane



▲ ON TARGET Ultrasound confirms that the needle has advanced through the muscle layers and reached the TAP.

(TAP) block. We perform TAP blocks daily at our facility. Our TAP blocks are more accurate, more consistent and lower-risk than before thanks to ultrasound, which lets us identify the appropriate tissue plane and perform this block with greater accuracy under direct visualization.

Advantages of ultrasound

TAP blocks involve injecting a local anesthetic solution into the neurofascial plane between the internal oblique and transversus abdominis muscles. The TAP block targets the thoracolumbar nerves T7-L1 and provides somatic pain relief to the skin, muscles and parietal peritoneum of the anterolateral abdominal wall.

The procedure was first described in 2001 in the journal *Anesthesia*. The author had been using a “landmark” technique — using anatomi-

cal landmarks to locate the proper needle insertion site on the lateral abdominal wall — then inserting a needle through it and advancing it until 2 *pops* were felt, indicating the needle had passed through the fascial layers of the external and internal oblique muscles. Ideally, the needle was then within the TAP and could deposit local anesthetic.

But the landmark technique was challenging and the results were variable and unpredictable. By using ultrasound, which shows in real time the needle advancing through the muscle layers, we can improve the safety and effectiveness of needle placement. And we can confirm that the needle tip has reached the TAP by injecting 1 to 2ml of normal saline or local anesthetic. This appears on ultrasound as a hypoechoic or dark area between the fascial layers, as you can see in the ultrasound image. We can also see the remaining local anesthetic as it's administered.

3 common injection sites

The distribution of the block depends on the injection site and the volume of local anesthetic. The 3 most common methods for accessing the TAP are the subcostal, mid-axillary and ilioinguinal-iliohypogastric (II/IH) approaches.

- **Subcostal.** The subcostal injection site is inferior to the costal margin near the linea semilunaris. This approach targets nerves T7-12, and is best for upper abdominal surgeries.

- **Mid-axillary.** The mid-axillary injection site is near the mid-axillary line between the costal margin and iliac crest. This approach is ideal for abdominal surgeries below the umbilicus, because it targets nerves T10-L1.

- **Ilioinguinal-iliohypogastric.** The II/IH injection site is medial and superior to the anterior superior iliac spine, which more reliably blocks the 2 branches of L1 (ilioinguinal and iliohypogastric nerves),

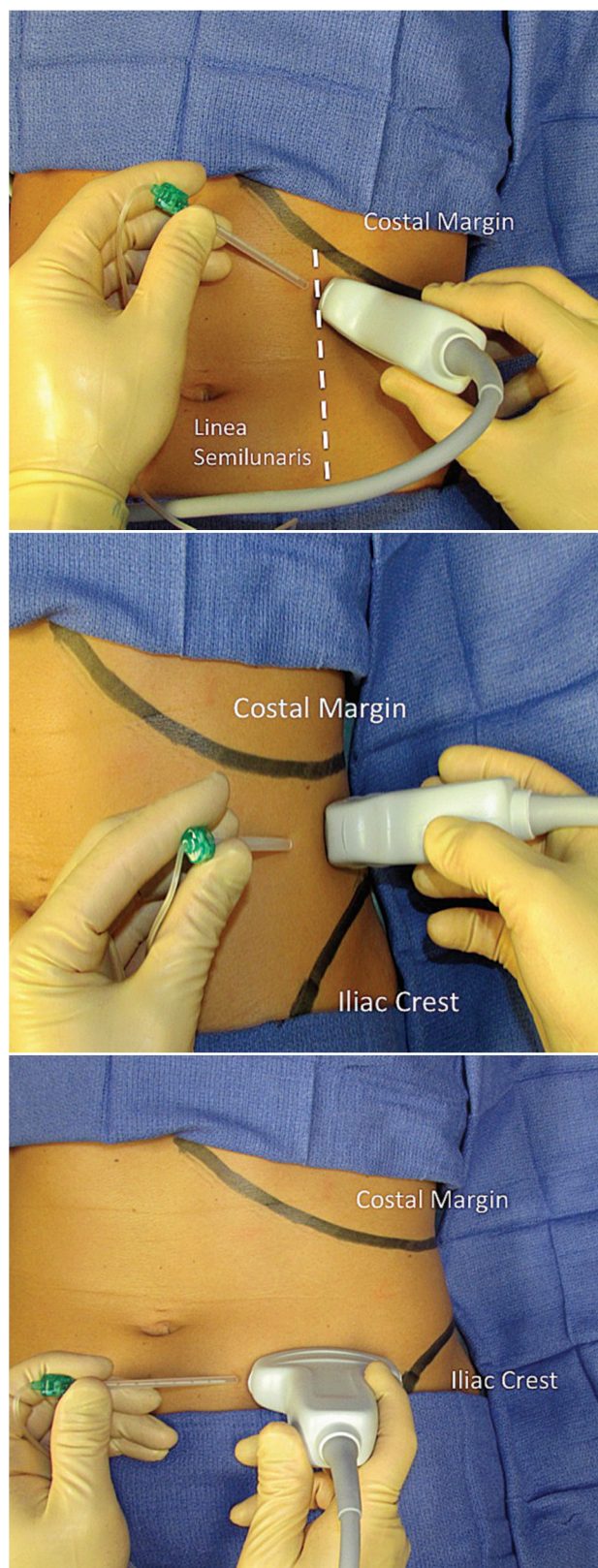
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making it the best approach for patients undergoing surgery along the inguinal crease, including inguinal herniorrhaphy.

Adapt according to need

There's no clear consensus regarding the optimal local anesthetic type, dose or volume. According to a 2010 article (tinyurl.com/opkzj2k) by Peter Hebbard, MBBS, FANZCA, the typical dose of ropivacaine in adults is 200mg diluted with 0.9% normal saline. In numerous studies, the volume of local anesthetic administered at each injection site has been 15 to 25ml. A larger volume can be used to facilitate hydrodissection of the neurofascial plane and improve the spread of the block.

Depending on the type of abdominal surgical procedure, you can perform TAP blocks as either unilateral or bilateral blocks in both pediatric and adult patients. You can administer them in pre-op, after induction of general anesthesia or in recovery as a



▲ THREE CHOICES The subcostal injection site (top) is the best approach for upper abdominal surgeries. The mid-axillary site (middle) is ideal for abdominal surgeries below the umbilicus. And the II/IH site (bottom) works well for patients having surgery along the inguinal crease.

rescue block. Onset may require up to 60 minutes before reaching maximum effect. The duration varies and is influenced by the volume and concentration of the local anesthetic. You can place a continuous indwelling catheter when longer duration is required.

Mitigating risks

TAP blocks don't relieve visceral pain when the surgical procedure crosses the peritoneum into the abdominal cavity. But despite this limitation, they've been able to significantly reduce both morphine consumption and post-operative nausea and vomiting. There are risks and potential complications — including vascular, visceral and nerve injuries — but, as noted, ultrasonography can help reduce the risks and improve the success rate. **OSM**

TAP BLOCKS

3 Main Benefits

- reduce the need for post-op opioids while decreasing opioid-related side effects;
- increase the time to first request for further analgesia; and
- preserve motor and sensory functions of the lower limbs so that patients can get up and around sooner and be discharged faster.

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