

CSEN Ultrasound Kits: Instructions for use

The CSEN Ultrasound kits consist of a Tuohy needle 18G, with the lengths of 90 mm or 60 mm, CSEN nerve block catheter 20G, with 3 lateral holes or end hole, a Tuohy Borst catheter adapter, a flat filter 0.2 micron and an Assist thread guide for introducing the catheter into the Tuohy needle.

The CSEN Ultrasound kits are intended for single (without the catheter) or continuous peripheral nerve blocks.

The CSEN Ultrasound kits are for slowly infusing local anesthetic near a nerve for effective pain relief. It is for intraoperative as well as postoperative use. It can decrease complications associated with narcotics.

The CSEN Ultrasound kits is to be used by the guidance of an Ultrasound and by a physician with such an experience.

Use strict aseptic technique.

Monitoring and Consent

Before doing the peripheral nerve block with the CSEN Ultrasound kit apply standard monitors (Pulse oximeter set to audible volume, ECG leads, blood pressure cuff). Verify correct operative side to be blocked. Ensure that the anesthesiologist gains informed consent for the procedure on the proper side and gets the consent form signed.

Administer an IV sedative in accordance with anesthesiologist's order. Position the patient according to the type of block. Draw-up 30ml of local anesthetic into 30ml syringe.

Ultrasound Guided Injections

Once the anesthesiologist punctures the patient's skin with the block needle, aspirate continuously until the anesthesiologist tells you to inject. When the anesthesiologist tells you to inject, ALWAYS ASPIRATE FIRST, then inject the amount that he or she orders, which should not be more than 5ml at a time.

18G Tuohy needle

A larger calibre blunt needle (e.g. 18G Tuohy) reduces the potential for significant complications for three main reasons:

1. Reduced risk of intraneural needle placement, and in particular intrafascicular injection – a well recognized predictor of prolonged neurological deficit following peripheral nerve block.
2. Reduced risk of inadvertent subarachnoid needle placement (total spinal anesthesia and possibly devastating spinal cord syrinx formation).

3. Reduced risk of inadvertent intravascular injection (systemic LA toxicity – central nervous system and cardiac).

Preoperative evaluation

There are no differences regarding the assessment of a patient between a general anesthesia or a regional anesthesia technique. The same care and considerations must be taken into account, with a history and relevant clinical examination. Special drug history is necessary with regards to anticoagulant and antiplatelet drugs, such as the type, dose, and the time when the anticoagulants were taken.

It is necessary to explain to the patient what he/she will experience: Some paresthesias and involuntary movements during needle insertion; Intraoperatively, the patient may feel movement, touch, and pressure while having adequate analgesia, and he or she will have to be reassured that if the analgesia is inadequate, there is a strong possibility of being given general anesthesia; Postoperatively the patient will have to wait for a few hours for movement and sensation to return completely, but he or she can eat a meal straight away.

Contraindications

Contraindications for peripheral nerve block: Patient refusal; Coagulation disorders; Infections at the site of injection; Pre-existing neurological deficits: check previous documentation and make your own brief examination before planning regional anesthesia to avoid being blamed for any undocumented neurological deficits.

Toxicity

Toxicity avoidance when using local anesthetics: Always respect maximum doses: for bupivacaine the maximum dose is 2 mg/kg for a single injection technique (daily maximum 8 mg/kg for continuous techniques); In case of toxicity symptoms (slurred speech, tingling in the ear, loss of consciousness, convulsions, or arrhythmias) stop the injection, and administer oxygen and support ventilation to avoid acidosis; Stop seizures with intravenous penthotal, benzodiazepines, or propofol; If cardiac symptoms are present, give circulatory support (antiarrhythmics such as amiodarone or amrinone); If arrhythmias persist, use direct current (DC) cardioversion and cardiopulmonary resuscitation (CPR) for as long as needed (which may be much longer than for other causes of arrest); Use lipid infusion (Intralipid) to "antagonize" local anesthetic toxicity (a bolus of 1.5 ml/kg body weight of Intralipid 20%, followed by 0.25 ml/kg body weight/ minute for 1 hour).

Avoid joint spaces

Avoid placing the catheter in joint spaces. Although there is no definitive established causal relationship, some literature has shown a possible association between continuous intra-articular infusions (particularly with bupivacaine) and the subsequent development of chondrolysis.

Catheter handling

Advance the catheter through the needle until the infusion segment is within the nerve site. It is recommended to place catheter so that obstruction will not occur and catheter removal will not be impeded. Ensure that catheter is not in a vein or artery. While holding catheter tip withdraw the needle from puncture site and slide back over catheter and remove. Attach the catheter luer lock adaptor to the end of the catheter. This is achieved by unscrewing the adaptor to have two components, then inserting the end of the catheter into the threaded component until the end of the catheter protrudes slightly past the thread (3-4mm). Then the adaptor is screwed tightly together to secure the catheter. The catheter is then primed with 1 ml of anesthetic solution to ensure patency and as a test dose to avoid intravenous or intra-arterial injection. The catheter is then secured to the patient by coiling it and fastening down with two steristrips. An occlusive dressing is then placed over the coiled catheter, steri-strips and insertion site.

Catheter removal

Remove the dressing covering and loosen the steri-strips at the catheter site. Grasp the catheter close to the skin and gently pull the catheter. The catheter should be easy to remove and not painful. Do not tug or pull quickly during removal. If resistance is encountered or the catheter stretches, STOP. Reposition the patient and try again as this may relieve the catheter. If catheter is difficult to remove an Ultrasound is recommended. Once a catheter is removed, check that it is intact.

Catheter hazards

Do not withdraw the catheter through the needle, because of danger of shearing the catheter.

Do not insert the catheter more than needed, because of kink and/or malposition.

The catheter does not always go at the intended direction (cephalad or caudad).

Position the catheter using the Ultrasound guidance.

Withdrawal of the catheter after anesthesia, analgesia or several post-operative days, should be done slowly and gently.

Inspection of the catheter completeness should be done after its withdrawal.

Caution

Law restricts this device to sale by, or on the order of a physician.