Summary

The ideal in the practice of regional anaesthesia is the ability to deliver to the target nerve exactly the right dose of local anaesthetic without incurring any risk of damage to the nerve or its related structures. Currently, this aim is achieved by using needles and catheters, guided mostly by knowledge of anatomy supplemented by electrical nerve stimulation or the elicitation of paraesthesia. Knowledge of anatomy takes the needle to the general area of the nerve and helps avoid other structures. The specific nerve location technique allows a close approach, hopefully without the risk of nerve damage. Unfortunately, this is essentially a blind process, but modern imaging techniques might be used to overcome this.

So, technical aids like radiography, thermography, and photoplethysmography were tried to visualize the target nerve. The limitation of all these techniques has always been the unsatisfactory success rate as well as the specific involved risks. The introduction of the peripheral nerve stimulator into clinical practice was a major advance. Unfortunately, even with this tool, the performance is still far from perfect.

Ultrasonography seems to be most suitable for regional anesthesia. Perhaps the most significant advantage of ultrasound technology is the ability to provide anatomic examination of the area of interest in real-time. Ultrasound imaging allows one to visualize neural structures (plexus and peripheral nerves) and the surrounding structures (e.g., blood vessels and pleura), navigate the needle toward the target nerves, and visualize the pattern of local anesthetic spread.

Ultrasound-guided approach to peripheral nerve block has many advantages. It appears to be associated with a high success rate, short

onset time, easy placement of catheter, low complication rate, and excellent analgesia even when a tourniquet is used. It is well tolerated by patients.

Ultrasound-supported regional block provides a diagnostic approach for identifying the needle trajectory for regional block procedures. Using this technique, it is possible to reduce puncture attempts and to enhance the quality of ultrasound-guided neuroaxial blocks. Knowledge of the optimum or ideal puncture point, the expected puncture angle and the expected depth of placement of the needle helps to optimize the puncture processing.