

# Common local anaesthesia techniques

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Topical anaesthesia /uni25CF EMLA (eutectic mixture of local anaesthetics) This is a mixture of lidocaine and prilocaine for application to the skin for venepuncture in children. Johann Friedrich Horner, 1831–1886, Professor of Ophthalmology, Zurich, Switzerland, described this syndrome in 1869. Major A. J. Moffett of the Royal Army Medical Corps first described its use in 1941. He modified it in 1946 to include 2 mL of 8% cocaine, 2 mL of 1% sodium bicarbonate, and 1 mL of 1:1000 adrenaline. - added mixture of adrenaline and sodium bicarbonate) and used in nasal surgery for anaesthesia and vasoconstriction. /uni25CF - Lidocaine 2/4/10% . Spray to anaesthetise the airway during awake fiberoptic intubation. Nerve blocks - An interscalene approach to brachial plexus for shoulder - surgery produces excellent postoperative analgesia. Complications include phrenic nerve block, Horner's syndrome and accidental intravascular and spinal injection. Supraclavicular, infraclavicular or axillary approaches to the brachial plexus can be used as the sole anaesthetic technique for upper limb surgery ( Figure 23.7 ). Femoral and sciatic nerve blocks are often used for anaesthesia and analgesia for lower limb surgery . Local anaesthetic blocks have been described that block the nerves closer to the joint so that motor blockade of the whole lower limb can be minimised. An example of this type of block is the iPACK (infiltration between the popliteal artery and capsule of the knee) block, which targets the genicular nerves supplying the knee joint by using ultrasound-guided injection posterior to the knee joint. Transversus abdominis plane/quadratus lumborum and erector spinae plane block are examples of fascial plane blocks, which have grown rapidly in popularity . Local anaesthetic is injected in the fascial planes containing the nerves from abdominal or chest wall structures. Transversus abdominis plane (TAP) block has been claimed to provide effective - . -

(a) (b) Figure 23.7 (a, b) Ultrasonic picture of brachial plexus block.

segmental nerves enter the plane between the internal oblique muscle and the transversus abdominis muscle just medial to the anterior axillary line. Injection of local anaesthetic into the fascial plane between the internal oblique and transversus abdominis muscles allows a block of all these nerves, and excellent anaesthesia of the anterior abdominal wall. Quadratus lumborum block also aims to target abdominal nerves as they pass in front of the quadratus lumborum muscle. Erector spinae block aims to block the spinal nerves at various sites, depending on the site of injection. Local anaesthetic is deposited underneath the erector spinae group of muscles as they lie over the transverse process of the vertebra. Intravenous regional anaesthesia (Bier's block) Bier's block produces excellent anaesthesia for short surgery, particularly for the upper limb (e.g. carpal tunnel release). In this technique local anaesthetic is injected intravenously to produce anaesthesia of the upper limb. A double tourniquet is used on the side of surgery . An intravenous

cannula is sited into a vein on the back of the hand on the side that is being operated on. The upper limb is then exsanguinated using an Esmarch bandage. The proximal cuff of the double tourniquet is inflated, followed by intravenous injection of prilocaine into the cannula. After 20 minutes the distal cuff of the tourniquet is inflated and then the proximal cuff is deflated. Even if surgery is finished, the tourniquet should be left inflated until the local anaesthetic has bound to tissues (20 minutes) so that release of local anaesthetic into the systemic circulation does not occur. Lidocaine can be used with caution (consider the safe dose of lidocaine and the time of tourniquet inflation) but bupivacaine should never be used for Bier's block. Spinal anaesthesia Spinal anaesthesia alone or in combination with general anaesthesia or sedation is used extensively for lower limb, obstetric and pelvic surgery. Injection of a 'single-shot' local anaesthetic agent intrathecally produces intense and rapid block for surgery. The addition of opioids provides prolonged postoperative analgesia but carries the risk of late respiratory depression. Autonomic sympathetic blockade produces hypotension, particularly if the level of block is above the T10 spinal dermatome. Caution is needed in patients with hypovolaemia and cardiovascular disease. The incidence of dural puncture headache can be minimised by limiting the number of punctures and using fine-bore pencil-tip needles that are designed to split rather than cut the dura. Epidural anaesthesia Epidural anaesthesia is slower in onset than spinal but has the advantage of prolonged analgesia by multiple dosing or continuous infusion through a catheter placed in the epidural space. Being slower in onset, the resulting hypotension from sympathetic blockade can be better controlled and can reduce blood loss. August Karl Gustav Bier, 1861–1949, Professor of Surgery, Bonn (1903–1907) and Berlin (1907–1932), Germany. weak local anaesthetic combined with opioids (such as fentanyl) is routinely used for postoperative analgesia. Placement of an epidural catheter in the high thoracic region provides excellent analgesia for a wide variety of upper abdominal and thoracic surgical operations, enabling early mobilisation and reducing respiratory complications. Epidural anaesthesia is technically more difficult than spinal anaesthesia; it has a higher failure rate and carries the risk of nerve damage, spinal injuries, accidental spinal injection - of a large volume of local anaesthetic, infection and epidural haematoma. Summary box 23.9 Local anaesthetics

EMLA cream for children needing injections Regional and nerve blocks for limb surgery Spinal anaesthesia offers a quick onset and a short duration of anaesthesia Epidurals are more difficult but can then be topped up postoperatively and used as a continuous infusion

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