How to administer lidocaine in wounds

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None declared

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Rationale and key points
Before a wound can be cleaned and/or closed, the use of a local anaesthetic such as lidocaine is often required to enable the nurse to assess the wound thoroughly and plan the optimal method of repair. This article explains how to administer lidocaine safely and effectively, including how to infiltrate a wound with lidocaine before cleaning or suturing. There are potentially serious consequences associated with the use of local anaesthesia, but careful preparation will ensure patient safety and contribute towards a positive patient experience.

» The nurse should have an understanding of how lidocaine functions, the speed at which it will take effect, and the duration of the mode of action.
» The nurse should have knowledge and awareness of the risks associated with the use of lidocaine to ensure patient safety.
» The nurse should prepare the equipment and the patient for the procedure.

Reflective activity
How to articles can help to update your practice and ensure it remains evidence-based. Apply this article to your practice. Reflect on and write a short account of:
1. How this article might improve your practice.
2. How you could use this information to educate your patients and colleagues on the appropriate technique for administering lidocaine in wounds.

Keywords
clinical procedures, clinical skills, infiltration, lidocaine, local anaesthesia, wound care, wound cleaning, wound closure

Preparation
Patient
» Lidocaine is a prescription-only drug, and therefore must be prescribed either by a doctor or non-medical prescriber, or provided under a patient group direction (PGD), which permits healthcare professionals to administer specified medicines to predetermined groups of patients without requiring a prescription. If it is provided under a PGD, the nurse administering the lidocaine should ensure that all the criteria in the PGD have been met and that they have signed it to confirm they are authorised to administer lidocaine in the trust where they are employed (Department of Health 2000, National Institute for Health and Care Excellence (NICE) 2017a).
» The nurse must ensure that the maximum dose for the patient has been calculated and checked with another registered nurse or a doctor and documented clearly in the patient’s notes. The maximum dose of lidocaine is calculated according to the patient’s weight and the nature of the procedure. If the nurse is administering the injection under a PGD, they should check carefully which strength of solution is
specified and whether a secondary check by another healthcare professional is required, in accordance with local policy.

» If it is apparent that the maximum calculated dose of lidocaine will be insufficient to adequately anaesthetise the wound, for instance if the wound is too large, the nurse should refer the patient to the surgical department for the wound to be cleaned and/or closed under general anaesthetic. The patient should be informed about why this is necessary.

» Before administering lidocaine, the nurse must confirm the patient’s identity and discuss the procedure with them. The nurse must obtain informed consent for the procedure from the patient, and should ensure that the patient’s expectations of the procedure are realistic. Some healthcare organisations will require verbal consent, while other healthcare organisations will require written consent signed by the patient or, in the case of a child, their parent. If the patient is unable to provide consent, lack of mental capacity must be proven and documented in accordance with the Mental Capacity Act 2005, before a decision can be made in the patient’s best interests.

» The nurse should ensure that the patient understands the treatment that is being proposed and why, any benefits that are expected, and what constitutes a typical experience of the procedure. In the author’s experience, many patients expect to feel nothing at all during a procedure under local anaesthesia; however, while lidocaine should ameliorate any pain, the sense of touch is not blocked. Therefore, the patient should be prepared for the sensation of ‘pulling’ or ‘tugging’ during any subsequent procedures, such as wound cleaning and/or suturing. In addition, the patient should be aware that lidocaine often stings on administration.

» The patient should be advised to let the nurse know immediately if they experience any tingling around the lips, which is the first sign of local anaesthetic toxicity, so that the antidote, a lipid emulsion, can be administered as quickly as possible. The nurse should have immediate access to cannulation equipment, an intravenous administration set and the lipid emulsion, in the event that it is required. The administration of lidocaine should not proceed without these measures being in place.

» The patient should be asked whether they would prefer a relative or carer to remain with them during the procedure. The nurse should establish whether any individual witnessing the procedure is likely to feel faint, nauseous or distressed at the sight of blood or the internal structures revealed by open wounds.

» The nurse should ensure that they and the patient are positioned comfortably. Furniture should be arranged ergonomically, with angles and heights adjusted to provide the optimal position for the procedure.

» The nurse should ensure that there is optimum lighting to undertake the procedure.

**Equipment**

Ensure that the necessary equipment is available, checking any packaging is intact, including:

» A disposable apron.
> Non-sterile gloves.
> Eye goggles or a visor.
> Absorbent sheets.
> Lidocaine solution. This comes in a 0.5%, 1% and 2% solution in glass or plastic vials. The nurse must check the expiry date before use.
> Drawing-up needle.
> 5mL or 10mL syringe, depending on the maximum dose to be administered.
> Long subcutaneous needle (23G blue).
> Gauze.
> Tap water or saline, depending on local policy.
> Clinical waste bag and a sharps bin.

**Procedure**

1. Wash your hands. Put on personal protective equipment, including a disposable apron, non-sterile gloves, and eye goggles or a visor, since it is common for lidocaine or
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wound contents to ‘spray’ during the procedure.

2. Place absorbent sheets under the affected part of the patient’s body, to prevent damage to their clothes and fluids leaking onto the floor.

3. Attach a drawing-up needle to an appropriate size syringe; this will be either a 5mL or 10mL syringe depending on the maximum dose to be administered. Using a non-touch technique, draw up no more than the maximum dose of lidocaine solution (Figure 1).

4. Wipe any blood and dirt away from the wound edges using gauze and either tap water or saline, in accordance with local policy. This should provide enough visibility to begin the injection procedure.

5. Remove the drawing-up needle and attach a long subcutaneous needle (23G blue). A 23G blue needle has a wider bore than a 25G orange subcutaneous needle; therefore, it minimises any pain for the patient, since there is a higher pressure of infiltration in needles with narrower lumens.

6. Insert the needle into one end of the wound (Figure 2) and draw back the syringe plunger slightly to ensure that the needle has not entered a blood vessel (Figure 3). If blood is drawn, withdraw the needle entirely and insert it again in a slightly different place. If no blood is drawn, inject the lidocaine into the end of the wound. Ensure that the lidocaine is injected at a steady rate to minimise any pain experienced by the patient.

7. Inject sufficient lidocaine to cause a small swelling (‘bleb’) under the skin. Some blanching of the skin may be visible. Repeat this process at each end of the wound. Use gauze to absorb any blood or excess lidocaine and prevent it leaking into the patient’s orifices, eyes and skin creases.

8. Return to the end of the wound initially injected. Insert the needle into the small swelling and tunnel along one side of the wound with the needle until it is almost entirely inserted (Figure 4).
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Draw back the syringe plunger slightly to confirm that the needle is not in a blood vessel, then inject the lidocaine while simultaneously withdrawing the needle from the wound. This should cause the wound edge to swell (Figure 5). Repeat this process for the other side of the wound (Figure 6), and then from the opposite end of each side of the wound, until all the wound edges are slightly swollen with lidocaine.

9. If any area along the edges of the wound remains flat, tunnel the needle through a swollen area to the flat area, draw the needle back slightly and inject the lidocaine while simultaneously withdrawing the needle from the wound. Repeat until all the wound edges are slightly swollen with lidocaine.

10. Wait for up to five minutes for the lidocaine to take effect, then test the efficacy of the anaesthesia by lightly touching several areas of the wound. The patient should be able to feel the touch without experiencing any pain. If the patient experiences pain, inject additional lidocaine – not exceeding the maximum calculated dose for the patient – until they experience no pain during testing.

11. The wound is now ready for cleaning and/or closure.

12. Dispose of clinical waste and sharps carefully in accordance with local policy, for example using a clinical waste bag and sharps bin.

The patient’s aftercare will depend on the nature of the procedure that necessitated the administration of lidocaine. For example, if the wound was cleaned, it might require dressing and follow-up by a practice nurse. Alternatively, if the wound was sutured with staples, these would need to be removed at a later date. Any anaesthetic effect will wear off after 20 minutes; therefore, consider whether the patient requires further analgesia before they are discharged from your care or transferred for further treatment (Health Products Regulatory Agency 2015).

**Evidence base**

Lidocaine works by reversibly blocking the conduction of pain impulses along the nerve fibres. The onset of action occurs in 1-2 minutes and it has a duration of up to 20 minutes (Health Products Regulatory Agency 2015).

There are two ways to administer local anaesthetic before the cleaning and/or closure of a wound: infiltration into the wound edges, as described in this article; or field block, which is used for advanced suturing and small operative procedures, such as cyst removal, and involves the local anaesthetic being used to block all of the nerves surrounding an operative area (Crouch et al 2017). Nurses may also encounter ring blocks, which are used in wounds that affect the fingers and toes; however, explanation of this procedure is beyond the scope of this article.

Widespread evidence indicates that inadequate preparation of the patient and the environment before the administration of lidocaine, as well as inaccurate drug calculations, result in suboptimal patient care and safety concerns (NHS England 2013, NHS Improvement 2016). In any clinical situation, if the human factors, such as communication, safety culture,
stress and work environment, are not adequately addressed in advance, mistakes are increasingly likely to occur (Royal College of Nursing 2017).

Local anaesthetics can be divided into two groups: esters and amides. Patients may be allergic to either group, but usually not both. Lidocaine is in the amide group and fewer than 1% of patients will demonstrate true hypersensitivity to lidocaine; patients who think they are allergic to lidocaine are often allergic to the preservative methylparaben (Press 2015).

The maximum dose of lidocaine is calculated according to the patient’s weight and the nature of the procedure that will be undertaken (British National Formulary (BNF) 2017, NICE 2017b). Therefore, the patient will need to be weighed or asked for their weight in kilograms. In many trusts, the maximum dose of lidocaine is 3mg/kg (Nottingham University Hospitals NHS Trust 2015); however, in the author’s experience, some directors of pharmacy require PGDs for lidocaine to be written to a maximum of 2mg/kg to allow a margin of error. The BNF (2017) states that the absolute maximum dose for adults is 200mg lidocaine, which would be 20mL of 1% solution. A reduced dosage is required for young children and older people because they do not metabolise medicines as efficiently as adult patients.

Lidocaine can have systemic adverse effects when the maximum dose is exceeded or if a major blood vessel is accidentally pierced. Initial adverse effects of local anaesthetic toxicity include tingling around the lips, tinnitus and slurred speech (Christie et al 2015), before the patient begins to experience symptoms such as arrhythmia, seizures and potential cardiac arrest. Therefore, the maximum dose for the patient must be calculated and checked with another registered nurse or a doctor and documented clearly in the patient’s notes.

Local anaesthetic toxicity can develop at any time within one hour of a bolus injection being given. Although lipid emulsions are administered intravenously, it is not necessary to cannulate the patient in advance as a precaution. The initial dose of lipid emulsion would be administered as a bolus, followed by an infusion with the dosage based on the patient’s weight in kilograms (Association of Anaesthetists of Great Britain and Ireland (AAGBI) 2010). Nurses should consider keeping a copy of the AAGBI (2010) Patient Safety Guideline: Management of Severe Local Anaesthetic Toxicity alongside their ward or unit’s store of lipid emulsion.

References


