

Topical local anesthetics interrupt the transmission of action potentials from peripheral pain receptors to the spinal cord. They can diminish the pain associated with various procedures such as venipunctures. Lidocaine 4% cream, L.M.X. 4, is one of the products available. EMLA is another topical local anesthetic formulation, but is not the topic of this Fast Fact.

L.M.X. 4 can be used to prevent pain due to venipunctures, lumbar punctures, circumcisions and abscess drainage and is effective for the treatment of post-herpetic neuralgia (shingles pain). L.M.X. 4 should only be used on intact skin as there may be significant absorption through “broken skin.”

The natural oils in the skin facilitate the absorption of lidocaine. Therefore, it is best not to cleanse the skin prior to application. However, if the skin is visibly dirty, washing with soap and water prior to application of L.M.X. 4 is appropriate.

L.M.X 4 application instructions:

1. While wearing gloves, rub a small amount of cream into skin for ~30 seconds, at the location of the proposed venipuncture or procedure.
2. Add a “bubble” of L.M.X. 4 on top of this area of skin. (1cm x 1cm area is equal to approximately 1 gram of L.M.X. 4).
3. An occlusive dressing is recommended to keep the medication in place for the 20-30 minutes needed to maximally anesthetize the skin, but the medication will work without it. Application of a warm pack to cause vasodilatation can ease cannulation and decrease time to maximally anesthetize the skin, but can result in increased lidocaine absorption.
4. Remove the dressing, wipe the medication off with a tissue or gauze pad and prepare the site as you normally would for venipuncture or other procedure.
5. L.M.X. 4 can be left on the skin for up to 60 minutes, onset is within 30 minutes, and duration is approximately 60 minutes after removal of the cream. L.M.X. 4 can cause erythema at the application site.

Maximal Recommended Dosage*

Body Weight	Max total dose
Less than 5 kg	1 gram
5-10 kg	2 gram
10-20 kg	10 gram
Greater than 20kg	20 gram

The area that L.M.X. 4 is applied to should be limited in children less than 10kg; do not apply to area greater than 100cm² or for children 10-20kg not greater than 200cm². EMLA, which contains both prilocaine and lidocaine, is also available and commonly used. The onset of action for EMLA is 1 hour with duration of action 1-2 hours after removal of the cream. EMLA can cause erythema at the application site. It can also cause methemoglobinemia in infants less than 3 months old or in conjunction with sulfonamides. Methemoglobinemia can result in decreased oxygen binding and cyanosis.

Even though tissues are anesthetized, a younger child may be afraid of a needle and be frightened by the procedure. For optimal outcome, it is recommended that additional measures to comfort and distract the patient while performing venipuncture are implemented. Parents can provide comfort and distraction. The use of simple techniques such as singing with the child, reading to the child, or having the child blow bubbles can distract him/her until or while the procedure is being completed. This can increase the chance of success of the procedure and decrease the distress of the child and caregiver. Praising the child at the completion of the procedure will help build self-esteem and decrease the fear of future needle related procedures.

References

- *Lyon, V.B. 2005 Approaches to procedures in neonates: Dermatologic Therapy, Vol 18, 117-123
- * Wong, D. 2003 Topical local anesthetics: two products for pain relief during minor procedures. Am J Nursing 2003; 103: 42-45.