Topical Local Anaesthesia

Comfort Kids Program 2017
Topical Local Anaesthesia (LA)

- How does topical LA cream works
- Misconceptions
- Cautions
- Preparation
- Application
- Alternatives
- Dosage
- Documentation
Basic Principles
Topical anaesthesia – is a drug mixture(s) that provide a local anaesthetic effect

Topical anaesthesia effects the dermal pain receptors and nerve endings in the epidermis and dermis layers of the skin.

Only the area in which the drug is applied will become "numb" at a depth of 3-4 mm.

Children and adults report feeling:
• **pressure** e.g. when the cannula is inserted
• **movement** e.g. vein rolls
• **sensations** e.g. tapping or palpating the skin
• **warmth or itchiness** (where drug applied)
Amethocaine 4% = AnGel

- Amethocaine is an ester type local anaesthetic.
- It has high lipid solubility and high affinity for neural tissue.
- A high protein binding capacity (76%) maintains the drug at the receptor site with formation of a long-lasting depot in the stratum corneum and clearance by esterases in the skin and bloodstream.
- It inhibits the initiation and transmission of nerve impulses by stabilising the neuronal membrane (by blocking sodium ion influx across the axon). Neuronal conduction is first blocked in the autonomic, then in sensory and finally in motor nerve fibres.
Lignocaine 2.5% / Prilocaine 2.5% Emla

• Lidocaine and prilocaine are amide-type local anaesthetic agents
• EMLA Cream provides dermal analgesia by the release of lidocaine and prilocaine from the cream into the epidermal and dermal layers of the skin and by the accumulation of lignocaine and prilocaine in the vicinity of dermal pain receptors and nerve endings
• Both lidocaine and prilocaine stabilize neuronal membranes by inhibiting the ionic fluxes required for the initiation and conduction of impulses, thereby effecting local anaesthetic action.
Misconceptions

• Topical medication can completely numb all of the nerves
  • Nerves located in the mid to deeper layers of the skin are not affected by topical anaesthetic drugs

• The child won’t feel anything or it’s pain-free is misleading

• Shorter application times are equally effective
  • Research shows ≤ 30-45 min is not enough time for blood sampling or injections
  • Depends on agent & procedure
Misconceptions

- **Emla** cream causes **vasoconstriction**
- Vasoconstriction **may** occur but it also can be caused by illness, dehydration & anxiety

- **AnGel** causes a **rash** this is an **allergic** response
- Mild transient erythema (redness) & itching due to the **vasodilatory** effect & may persist for hours
Caution

• Family & Patient keep away
  • eyes causes irritation
  • the mouth to prevent ingestion

• Health care professionals
  • apply with gloves
  • prevent accidental absorption or contact with eyes
Why is topical LA not used?

• Perceived **short duration** of procedure

• Perceived **insignificance** of pain/procedure

• Perceived alteration to vascular **accessibility**

• **Time** required for cream to work
Preparation – Child & Parent

• Age specific explanation - EPT

• Describe the type of drug

• For all patients use the name “AnGel” or “Emla” cream

• For parent & teenagers more information is OK
  • Explain local anaesthetic drug

• Consider what you would you tell a child
  How it will look & feel?
Preparation Tips

• How it looks & feels...
  • The cream on your skin helps to make your skin feel numb. Numb means that you can’t feel that part of your skin as much or at all
  • Angel or Emla Cream works by “numbing the top of the skin” like an icy pole numbs the top of your tongue
  • Angel or Emla is placed on your hands or arms or _____ (procedure site)
  • Other kids tell us “the numbing cream makes it more comfortable when you have the _______” (procedure)
  • some kids say it feels squishy
  • we use a clear band aid to keep the cream in place
  • We will let you know when it is time to take the band aid off
  • You can help by _______ & you can help take it off
  • We will then see how your skin feels
  • Other?
Communicating procedures to families

This guideline has been adapted for statewide use with the support of the Victorian Paediatric Clinical Network.

The following are some simple ways of enhancing communication with patients about procedures:

- Use clear and developmentally appropriate language.
- Speak at the child's eye level - this is less threatening.
- Avoid medical jargon - this can intimidate families.
- The use of negative words during procedure preparation can be minimised without being dishonest.
- Words like "needle", "burn" and "squeal" even when used with a modifier such as "little", "barely" and "not much" are negatively loaded and set up an expectation for distress.
- Use affirmative and positive language e.g. "Don't tense your arm" can be rephrased as "Keep your arm still and relaxed.
- The table below includes a list of child friendly explanations for equipment and procedures. Every child and family is different and explanation will need to be tailored accordingly.

Child friendly explanations for medical equipment

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topical anaesthetic cream</td>
<td>The cream on your skin helps to make your skin feel numb. Numb means that you can't feel that part of your skin as much or not at all.</td>
</tr>
</tbody>
</table>

Child friendly explanations for medical procedures

<table>
<thead>
<tr>
<th>Procedures</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaesthetic</td>
<td>Medicine we give you through the straw in your hand or with a needle that makes you go to sleep so the doctor can (name procedure). You will not feel anything. When it is finished you will wake up.</td>
</tr>
<tr>
<td>Blood test</td>
<td>A tube that goes under the skin to take a small amount of blood. Explain reason for blood test. It tells us information about how to make you better.</td>
</tr>
<tr>
<td>Fasting</td>
<td>You cannot eat or drink anything. Explain reason why in developmentally appropriate terms.</td>
</tr>
<tr>
<td>Flush VVC</td>
<td>Water goes into the straw with the syringe to make sure it is working.</td>
</tr>
<tr>
<td>Fracture</td>
<td>Broken bone.</td>
</tr>
<tr>
<td>Fracture reduction</td>
<td>Putting the broken bone back in the right spot so that it can get better.</td>
</tr>
<tr>
<td>Infusion</td>
<td>Medicine that takes a bit of time to go through the straw and into your body.</td>
</tr>
<tr>
<td>Injection</td>
<td>Medicine that we put into your body with a small needle.</td>
</tr>
<tr>
<td>Lumbar Puncture</td>
<td>A needle that goes into your back to take a small amount of fluid.  Describe positioning during lumbar puncture.  Explanation of cerebrospinal fluid and the purpose of the test depends on the age of the child and anomaly level.</td>
</tr>
<tr>
<td>Magnetic resonance imaging (MRI/Computer)</td>
<td>Takes a picture of the inside of you. Describe what the child will see, sounds they will hear, how equipment will move, what the child's role is.</td>
</tr>
</tbody>
</table>
Application - vascular access

Blood sampling or vascular access

• **Apply to unbroken skin**
  • in a *strip* like fashion
  • along the *length of the vein*
  • 3-4cm long x 0.5mm wide
  • allow the Proceduralist *choice of insertion site*

• **Apply to multiple sites**
  • Explain to the parent & child
  • So we can choose the best vein for the test

• **Apply a dressing over the drug**
  • Tip - write the application time on the dressing
  • What dressing will you use?
Application – Injections / Ports

• Following local clinical protocols (where available)
  • Port access
  • Botox injections
  • Joint injections
  • IM & S/C injections
  • Insuflon insertion

• Tips
  • Check site(s) with team – Oncology / Rheum / Dev Med
  • Apply to unbroken skin no > 50 cent coin to designated site(s)
  • Apply a dressing with application time
Alternatives Dressings & Devices

**Dressing** allergies, aversions or anxiety to removal
- LA + gauze square + cling wrap - secure with paper tape
- LA + gauze square + secure with crepe bandage
- LA + gauze square + Glad Press n Seal (TBA)

**Devices**
- Buzzy Bee (ice & vibration)
- Coolsense
## Recommendations

<table>
<thead>
<tr>
<th>RCH Topical Anaesthesia</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Topical LA creams</strong></td>
</tr>
<tr>
<td><strong>Recommended for</strong></td>
</tr>
<tr>
<td><strong>Recommended Application time</strong></td>
</tr>
<tr>
<td></td>
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<tr>
<td></td>
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<tr>
<td></td>
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<tr>
<td><strong>Effective for</strong></td>
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</tbody>
</table>

*How long Emla® and AnGel® are effective is dependent on: optimal application time, how it is applied and amount of drug applied to skin.

* AnGel® deteriorates if not stored correctly. Store in the refrigerator and protect from light. Once removed from the refrigerator store at room temperature for no more than 30 days. Mark the date on the tube when it is first opened.

* AnGel® may cause a mild transient erythema (redness) & itching due to the vasodilatory effect. This may disappear within 20 minutes after removal of the gel or persist for several hours. Emla® may also cause a transient, local blanching followed by a transient, local redness or erythema.

**Action**

- EMLA provides dermal analgesia by the release of lidocaine and prilocaine from the cream into the epidermal and dermal layers of the skin and by the accumulation of lignocaine and prilocaine in the vicinity of dermal pain receptors and nerve endings.

- Both lidocaine and prilocaine stabilize neuronal membranes by inhibiting the ionic fluxes required for the initiation and conduction of impulses, thereby effecting local anaesthetic action.

- AnGel® inhibits the initiation and transmission of nerve impulses by stabilising the neuronal membrane (by blocking sodium ion influx across the axon). Neuronal conduction is first blocked in the autonomic, then in sensory and finally in motor nerve fibres.
### Topical Anaesthesia Agent

<table>
<thead>
<tr>
<th>Description</th>
<th>Angel®</th>
<th>EMLA®</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Recommended for children</strong></td>
<td>&gt; 1 month (corrected age)</td>
<td>&gt; 37 weeks (corrected age)</td>
</tr>
<tr>
<td><strong>RCH practice points</strong></td>
<td>Preferred drug of choice at RCH due to a more rapid onset of action and extended duration of action (O’Brien, Taddio et al. 2005, Lander 2014).</td>
<td>Use on children with allergies to Angel®</td>
</tr>
<tr>
<td><strong>Application time</strong></td>
<td>60 minutes</td>
<td>60 minutes</td>
</tr>
<tr>
<td><strong>Max time on skin</strong></td>
<td>1 hour</td>
<td>1 hour</td>
</tr>
<tr>
<td></td>
<td>Remove topical anaesthesia @ 60 mins</td>
<td>Remove topical anaesthesia @ 60 mins</td>
</tr>
<tr>
<td><strong>Duration of anaesthesia</strong></td>
<td>4-6 hours</td>
<td>2-4 hours</td>
</tr>
<tr>
<td><strong>Expected response</strong></td>
<td>Mild transient erythema (redness) and itching are common due to the vasodilatory effects of Angel®</td>
<td>Emla® may also cause a transient local blanching followed by local redness or erythema.</td>
</tr>
<tr>
<td><strong>Adverse reactions</strong></td>
<td>Severe erythema, oedema, itching or blistering should be treated by removing the gel immediately. Always record and report adverse events.</td>
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</tr>
<tr>
<td><strong>Storage</strong></td>
<td>Angel® deteriorates if not stored correctly. Refrigerate unopened tubes to maintain shelf life (up to 6 months). Do not freeze.</td>
<td>Store below 25°C, do not freeze or refrigerate.</td>
</tr>
</tbody>
</table>
RCH Pharmacy AnGel

What is Local AnGel?

AnGel is a topical local anaesthetic used prior to minor procedures such as IV cannulation and venepuncture. 5g or 30g tubes of Amethocaine 4% in a white, opaque gel base.

- How is Local AnGel applied?
- Do NOT use Local AnGel on
- Storage
- Contact Us
- Sales & Distribution
- Product Information
- Consumer Medicine Information

How is Local AnGel applied?

Bring the gel to room temperature (for ease of application and spreadability).
- Select ONE or TWO sites over a visible vein under intact, healthy skin (eg. back of hand, cubital fossa).
- Apply 0.5g as a thick layer of gel (approximately the size of a $2 coin).

Cover with an occlusive dressing. Record time of application.

Leave in place for 30-60 minutes (maximum).
- Remove dressing and wipe-off gel prior to commencing procedure.
- DO NOT LEAVE ON FOR MORE THAN 60 MINUTES

Other important information

Adequate anaesthesia is usually achieved after:
- 30 minutes for venepuncture
- 45 minutes for venous cannulation

Anaesthesia persists for 4-6 hours after the gel is removed.

Mild transient erythema (redness) and itching are common due to the vasodilatory effect of Local AnGel and may persist for some hours.

Severe erythema, oedema, itching or blistering should be treated by removing the gel immediately.

Always record and report adverse events.

Do NOT use Local AnGel on

- Broken skin
- Eyes
- Ears
- Inflamed skin
- Mucous membranes
- Premature infants and full-term infants less than one month of age
- Patients with known hypersensitivity to ester-type local anaesthetics or hydroxybenzozates

Storage

- Refrigerate unopened tubes to maintain shelf life (up to 6 months)
- Do not freeze
- Upon opening, mark the tube with date of opening
- After opening may be kept at room temperature
- Discard 30 days after opening
Improving the quality use of Local AnGel (Amethocaine 4% gel) for prevention of procedural pain in children undergoing venepuncture procedures

Christine Plover
Pharmacy Department, The Royal Children’s Hospital, Melbourne

Background
Venepuncture procedures are a common source of pain and anxiety for hospitalised children. Despite abundant evidence that local anaesthetics are useful in the prevention of procedural pain, children often undergo venepunctures without their benefit. This quality improvement study was designed to improve the use of topical AnGel (Amethocaine 4% gel) Local AnGel for venepuncture pain at The Royal Children’s Hospital (RCH), a major paediatric teaching hospital in Melbourne, Australia.

Aims
The primary aim of this study was to increase the use of Local AnGel for venepuncture procedures in the outpatient pathology department, in the hope of decreasing venepuncture pain in children, and reducing related fear and anxiety states.

The specific aims of the study were:
- To assess the frequency of use of Local AnGel in venepuncture procedures at RCH.
- To investigate staff knowledge, attitudes and perceived barriers towards use of Local AnGel.
- To implement an awareness and education campaign on appropriate use of Local AnGel and to assess the impact of these implemented awareness and educational strategies on the frequency and appropriateness of use, on staff knowledge and attitudes towards use of Local AnGel.

Method
The study targeted the pathology collection department of the hospital (the main site of outpatient venepuncture procedures), as well as the main referring outpatient clinics. A clinical audit was performed to access the frequency of topical anaesthetic use. Staff knowledge, attitudes and perceived barriers towards the use of topical anaesthetics were assessed via a focus group discussion and questionnaires. A variety of promotional and educational interventions were then implemented, based on the outcomes of the initial investigations. The frequency of topical anaesthesia use, in addition to staff knowledge, attitudes and perceived barriers towards its use, were reassessed following these interventions.

Interventions
Informational posters on the availability of Local AnGel were displayed in outpatient clinic waiting areas and pathology collection waiting areas. The posters informed readers of the system of Local AnGel available to prevent venepuncture pain.

An educational campaign was run with in-service education sessions. These education sessions were designed to inform the staff of the availability of Local AnGel and its appropriate use, including time and site of application. The sessions also included information on expected side effects and potential contraindications.

Local AnGel packets were also created for clinics. These packets were designed to assist staff in correctly ordering Local AnGel, and to ensure the timely delivery of this medication to the ward. The packets contained:
- Blank pathology request slips for ordering Local AnGel
- Local AnGel Oxford for pathology request slips for doctors to record the time of application of Local AnGel (so that the pathology staff would be aware of Local AnGel having been applied)
- Local AnGel stickers for children’s clothing
- Printed information sheets on Local AnGel previously produced by pharmacy department

Results
Of the 10 patients in the initial audit, 6 patients received Local AnGel (60%). In the post-intervention audit, Local AnGel use was increased to 91.0% (294/324), with a significant improvement of 34.0% (Fisher exact test: p = 0.006, 95% CI 21.8% to 46.7%). The proportion of patients in the initial audit who experienced pain was 40% (4/10) with Local AnGel applied in 20% of cases (2/10). In the post-intervention audit, the proportion of patients experiencing pain was 6% (2/32) with Local AnGel applied in 84% of cases (27/32).

Conclusions
The use of local anaesthetic for prevention of venepuncture pain in paediatric patients is low, despite strong evidence in the literature for its use. Our results show that introducing local anaesthetic application and education can increase the use of Local AnGel, and reduce the incidence of pain in children undergoing venepuncture procedures.

Table 1: Baseline and post-intervention audit results

<table>
<thead>
<tr>
<th>Audit</th>
<th>Local AnGel Use (%)</th>
<th>Pain Experience (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>60%</td>
<td>40%</td>
</tr>
<tr>
<td>Post-intervention</td>
<td>91.0%</td>
<td>6%</td>
</tr>
</tbody>
</table>

Table 2: Questionnaire results: participants claimed to have used the gel previously, although some staff members did not know the correct site or time of application of the gel.

<table>
<thead>
<tr>
<th>Questionnaire Results</th>
<th>Participants Claimed to Have Used the Gel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff Knowledge</td>
<td>Yes</td>
</tr>
<tr>
<td>Attitude</td>
<td>Strong</td>
</tr>
<tr>
<td>Barriers</td>
<td>Low</td>
</tr>
</tbody>
</table>

Figure 1: Informational poster

Figure 2: Local AnGel collection tool

Figure 3: Local AnGel stickers

The project achieved a more than 100% increase in the overall use of Local AnGel for preventing venepuncture pain in paediatric outpatients, and was an important quality improvement project for the hospital.
<table>
<thead>
<tr>
<th>Age</th>
<th>Dosage</th>
<th>Maximum dosage</th>
</tr>
</thead>
</table>
| 37 weeks (corrected age)           | Use a syringe to measure 1 g = 1 mL                                    | Maximum 1 g for up to 1 hour  
No more than 1 dose in 24 hours                                                 |
| Babies (at term) – 3 months of age | Apply 0.5–1 g of cream                                                 | Maximum 1 g for up to 1 hour  
No more than 1 dose in 24 hours                                                 |
| 4-12 months                        | Estimate a 1 g dose by applying a thick layer of cream the size of a $2 coin | Maximum 2 g for up to 4 hours  
No more than 2 doses (separated by at least 12 hours) in 24 hours.             |
| 1-6 years                          | Estimate a 1 g dose by applying a thick layer of cream the size of a $2 coin | Maximum 10 g for up to 4 hours  
No more than 2 doses (separated by at least 12 hours) in 24 hours.           |
| 7-12 years                         | Estimate a 1 g dose by applying a thick layer of cream the size of a $2 coin | Maximum 20 g for up to 4 hours  
No more than 2 doses (separated by at least 12 hours) in 24 hours.           |
| 13-18 years                        | Estimate a 1 g dose by applying a thick layer of cream the size of a $2 coin | The usual maximum dose is 60 g on intact skin for up to 5 hours.                |
Inpatients

• Topical anaesthetic agents are able to be order as a Nurse Initiated Medication. This will be captured on the MAR. Please refer to maximum dosing in the Procedural Pain Management CPG.

Outpatients

• Pathology Collectors managing inpatients in A6 require the RN to order topical anaesthesia as a Nurse Initiated Medication.
• Pathology Collectors are endorsed by the Director of Laboratory Services/ Haematologist in the application of AnGel, as requested by carers.
Documentation MAR output
Documentation MAR inpt
Documentation MAR inpt

lignocaine-prilocaine (EMLA) cream

Reference Links:
1. Australian Medicines Handbook - Children's Dosing Companion
2. RCH Pharmacy Medicines Information

Route: Topical

Frequency:
- When required
- Once
- PRN

PRN reasons: ☑ prior to procedure
PRN comment: Applied to left cubital fossa

For: [ ] Doses [ ] Hours [ ] Days

Starting: 9/05/2016
Today
Tomorrow
At: 17.29

Show Additional Options

Admin. Inst.: Apply 45-60 min before procedure.
Prod. Admin.
Inst.

Apply at least 60 minutes prior to procedure.

Priority:
- Routine

Additional Order Details

Next Required

Accept Cancel
Resources

• RCH Medication procedure
• Procedural Pain Management CPG
• Comfort Kids Website
• Communicating procedures to children CPG
• Pharmacy – Local AnGel
  • http://www.rch.org.au/pharmacy/business_development/Local_AnGel/