



# Managing painful paediatric procedures

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## Summary

**Prevention of procedural pain in children reduces the risk of subsequent morbidity including pain sensitisation. The primary emphasis for reducing pain should be on appropriate distraction and rapport-building strategies, however the doctor's technique can also assist. Topical anaesthetic preparations supplement the painless suturing of wounds. They can also reduce the pain of injections, including venepuncture. Studies of mass vaccination show that injections into the buttock cause less irritability than injections into the thigh. If the thigh is used then an injection at right angles is preferred to angulation.**

Key words: anaesthesia, immunisation, injections, wounds.

(*Aust Prescr* 2006;29:94–6)

## Introduction

The treatment of painful procedures in children requires special consideration and planning because pain preventive measures reduce both short-term and long-term morbidity. Current evidence indicates that pain and distress in children is poorly managed and children continue to suffer unnecessarily.<sup>1</sup> This can lead to anticipatory anxiety, needle phobia and the avoidance of health care. Obviously, it is impossible to make many basic procedures such as immunisation and other injections painless, but there are strategies to minimise the pain. Before inflicting pain on a child always consider if the procedure is justified.

## General distracting and rapport-building techniques

The strategies used will depend on the age of the child and the support of the parents. For most children, but particularly those of school age, it is wise to establish rapport through showing a genuine interest with considerable eye contact. Make favourable comments including complimentary remarks about their name, a clothing item or a toy or book that they may be carrying. It is good to take time to converse or play games with them including placing stickers on their shirts or transfers on the back of their hands.

A recommended technique for infants (especially under three months) is the 'three S' method:

- swaddling for firm containment
- swaying (where appropriate)
- sucking using a pacifier with 15–50% sucrose.<sup>2</sup>

Practical examples of distraction techniques include the use of novel interactive toys such as a small duck with a rattle or a small animal that plays a drum at the press of a button. Have a bubble-blowing kit on hand to blow bubbles. Party blowers or pinwheels/windmills encourage slow controlled breathing which is relaxing and calming. Another technique when giving an injection is to get the child to take a deep breath followed by a series of rapid blowing, during which the injection is given.<sup>3</sup>

## Wound repair

Wherever possible it is worth using a simple painless technique without compromising good healing.

## Scalp lacerations

If lacerations are small but gaping, use the child's hair to tie the wound together. This, of course, only applies to children with long hair. **Do not** use this method for large wounds.

## Method

- make a twisted bunch of the child's own hair of appropriate size on either side of the wound
- tie a reef knot across the wound and then an extra holding knot to minimise slipping
- as you tie, ask an assistant to drip compound benzoin tincture solution (friar's balsam) or plastic skin on the hair knot
- as this congeals, the knot is further consolidated against slipping.

Leave the tied hair long. The parents can cut the knot about five days later when the wound has healed. The whole procedure is painless unless an injection of tetanus toxoid is indicated.

## Reinforced paper adhesive strips (for example, steri-strips)

These strips should be used only for very superficial epidermal wounds or in conjunction with sutures. Despite the temptation, avoid using them in children with open wounds, especially on the forehead. They will merely close the dermis and cause a thin, stretched scar.

## Skin glues – an alternative to sutures

Cyanoacrylate tissue adhesives are available for wound closure. These glues act by polymerising with the thin water layer on the skin's surface to form a bond.

### Precautions (see box)

The glue should be used only for superficial, dry, clean and fresh skin wounds. It must not be applied for deep wounds or wounds under excessive tension. Contact with the cornea or conjunctiva must be avoided, as this can cause adhesions. It is important that the wound is clean and dry and the wound edges are precisely opposed. No gaps are permissible with the glue method of wound repair.

## Wound anaesthesia

There are several methods of achieving relative or absolute anaesthesia of wounds for suturing or debridement. The more important less painful strategies include the use of topical anaesthetic drugs and wound infiltration.

### Topical local anaesthesia

Topical anaesthetic drugs that can be used for instilling in minor wounds in children are listed in Table 1. The preparations include a variety of drugs, so toxicity and safety factors have to be considered. Cocaine is very effective, but it is relatively toxic and as a rule should be avoided in open wounds. Adrenaline-containing preparations should be avoided in wounds in end-artery areas such as digits, pinnae, tip of the nose, penis, or on mucus membranes such as inside the mouth where rapid absorption may occur. The recommended topical combinations are ALA and LAT (see Table 1), but these may have to be

#### Skin glues

- Useful for wounds less than 3 cm
- Must not be used on mucosal surfaces
- Topical anaesthesia helps
- Clean wound with normal saline or aqueous chlorhexidine and let dry
- Apply a small amount to the wound edges with the fine end of the tapered plastic ampoule – squeeze out gently
- Do not allow it to enter the wound
- Hold wound together for 30 seconds
- Apply steri-strips to prevent access to the wound, e.g. picking by the child
- Do not wash the wound for 3–4 days

Follow instructions in product data sheet

Caution: bonds skin and eye tissues in seconds. If spilt on skin, remove with acetone as soon as possible.

prepared by a hospital or compounding pharmacy. A variation of LAT and ALA is the readily available preparation EMLA cream. However, this requires at least 60 minutes of skin contact to be effective and is not recommended for open wounds.

### Method of use<sup>4</sup>

- thoroughly clean the wound (should be less than 5 cm)
- use LAT or ALA in a dose 0.1 mL/kg bodyweight
- apply this solution on a piece of gauze or cotton wool placed inside the wound and hold in place with an adhesive clear plastic dressing
- leave for 20–30 minutes (an area of blanching about 1 cm wide will appear around the wound).

Anaesthesia is obtained about 20 to 30 minutes after instillation. Test the adequacy of anaesthesia by washing and squeezing the wound or prodding it with forceps – if this is pain-free, suturing will usually be painless.

### Improvised topical 'anaesthesia'

It is worth considering the use of a block of ice to chill the lacerated site in children. The child or parent is asked to hold the ice then lift it while a suture is rapidly inserted. Another variation that is especially useful in older children is to use a vapocoolant spray on the skin where anaesthesia is required, such as incising a small abscess.

### Injectable local anaesthetic

Injectable lignocaine 1% can be used:

- when LAT or ALA are contraindicated such as areas of end-arteriolar supply
- in adolescents
- to supplement topical anaesthesia if adequate anaesthesia has not been achieved.

Table 1

#### Topical preparations for local analgesia

Topical preparation	Contents
ALA	adrenaline 1:2000, lidocaine*, amethocaine
LAT	lignocaine 4%, adrenaline 1:2000, tetracaine <sup>†</sup> 2%
TAC	tetracaine <sup>†</sup> 0.5%, adrenaline 1:2000, cocaine 11.8%
AC gel	adrenaline, cocaine
AnGel	amethocaine 4%
EMLA	lignocaine, prilocaine

\* lidocaine = lignocaine

<sup>†</sup> tetracaine = amethocaine

## Wound infiltration

For a larger wound requiring suturing, infiltrate lignocaine 1% into the wound edges using a small 27 gauge (or smaller) needle with a 3 mL syringe. The pain of injection can be reduced by:

- using topical anaesthesia first
- injecting slowly
- placing the needle into the wound through the lacerated surface, not through intact skin
- passing the needle through an anaesthetised area into an unanaesthetised area
- buffering the acidic solution with 8.4% sodium bicarbonate in a 9:1 ratio, that is 9 mL lignocaine 1% with 1 mL sodium bicarbonate.

## Immunisation

Controversy surrounds the optimal method of mass immunisation involving intramuscular injections. An Australian study showed that fewer adverse effects, in terms of irritability and local reactions, resulted from the gluteal approach compared with the anterolateral thigh approach.<sup>5</sup> The Australian Immunisation Handbook does not recommend the gluteal approach because of the theoretical risk of sciatic nerve damage. However, this method is officially recommended in countries such as Japan and Croatia and is widely used in Belgium, Germany, Italy and Denmark.

The World Health Organization (WHO) advises an anterolateral thigh injection with a 25 gauge/16 mm needle inserted at 90° to the skin, while the Australian and USA techniques use a longer and larger bore 23 gauge/25 mm needle inserted at 45° and 60° respectively. The Australian study found that the WHO method 'appears to be the optimal technique for anterolateral thigh injection in children – it ensures that the injection is intramuscular, results in fewer adverse reactions, and is the easiest technique to perform as it does not require angling of the needle to the long axis of the femur'.<sup>6</sup> However, the Australian Immunisation Handbook continues to recommend a 23 gauge/25 mm needle inserted at 45°.

The use of topical drugs such as EMLA has been shown to reduce pain scores in infants receiving immunisation. However, the slow onset and the need to inject into several sites at once may make this approach impractical.

## Other procedures

Consider the following strategies for painful and distressing procedures such as venepuncture, intravenous cannulation and lumbar puncture:

- distracting and relaxation skills
- pacifier with 15–50% sucrose in infants up to 3 months
- swaddling and containment of infants

- topical anaesthetic drugs such as EMLA cream or AnGel applied at the recommended time before needling.

There is evidence to suggest that using topical anaesthesia does not make cannulation more difficult. A painless procedure may be more successful than a painful one.<sup>7</sup>

More painful procedures will require the use of sedation involving anaesthetic drugs such as nitrous oxide and midazolam. Ketamine may be used in children over 12 months by staff who are experienced in its use, are able to manage children with compromised airways and are working in an appropriately set up environment.

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## Further reading

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*Conflict of interest: none declared*

See **Dental notes** page 108

## Self-test questions

*The following statements are either true or false (answers on page 115)*

1. Neonates exposed to painful procedures may later develop neurobehavioural dysfunction.
2. The use of topical anaesthesia before an injection of local anaesthetic is contraindicated.