

# LACERATION MANAGEMENT IN THE EMERGENCY DEPARTMENT

## PRACTICE GUIDELINE<sup>®</sup>

### DOCUMENT SUMMARY/KEY POINTS

- This guideline describes the initial management of a child presenting to the Emergency Department with a laceration or acute wound. Including:
  - Wound assessment
  - Pain & Analgesia
  - Wound cleaning
  - Appropriate referral
  - Closure Methods
  - Discharge and follow up

### CHANGE SUMMARY

- Inclusion of information on assessment, risk and application technique of skin glue around the face, eyes and mobile areas. Skin glue removal around eyes described
- Removal of information related to removal of Laceraine solution packing from wounds (Product updated)
- Soft tissue foreign body removal
- Inclusion of a Laceration/Puncture Wound Referral Diagram

### READ ACKNOWLEDGEMENT

- All ED clinical staff: nurses and medical officers need to be cognisant of the contents of this document.

This document reflects what is currently regarded as safe practice. However, as in any clinical situation, there may be factors which cannot be covered by a single set of guidelines. This document does not replace the need for the application of clinical judgement to each individual presentation.

<b>Approved by:</b>	SCHN Policy, Procedure and Guideline Committee	
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<b>Team Leader:</b>	Nurse Practitioner	<b>Area/Dept:</b> ED SCH

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## Policy Statement

Trauma related wounds and lacerations are a common reason for presentation to the Emergency Department (ED). Injury assessment and treatments selected for wound management should be undertaken in a manner that promotes optimal cosmetic and functional result and causes the least distress to the child and the family/ carer.

## Purpose and Scope

The purpose of this guideline is to provide guidance and act as resource to clinicians in the management of lacerations and acute wounds in the ED. The primary goals are to ameliorate pain/discomfort, suspend bleeding, reduce infection risk, protect the wound/injured body part, facilitate healing, minimise secondary trauma upon removal and minimise scarring.

## Responsibilities

The individual clinician is responsible for ensuring they possess the skills and knowledge to assess and manage acute wounds in the ED. Clinicians should seek guidance from experienced senior medical and/or nursing staff when appropriate or refer to specialty teams as necessitated by the specific injury

## Definition of terms

**Cut/ incision:** a break in the skin that has been incised by something with a sharp edge such as a knife, razor blade or glass<sup>3</sup>.

**Laceration:** a traumatic tear or opening in the skin surface caused by a blunt force: the skin has been torn or burst rather than cut<sup>3, 2</sup>.

**Abrasion/ graze:** occurs when skin is scraped off due to direct contact with a rough surface, often with friction, shearing the skin away: these wounds may have embedded debris or contain devitalised skin tissue<sup>5, 3</sup>.

**Contamination:** is any foreign matter or potential inoculation of high risk organisms in the wound<sup>2</sup>.

**Complex Wound/ Laceration:** These wounds may include the following features of concern: substantial ragged/devitalised margins, large skin flap with impaired blood supply, under tension, large or gaping, deep subcuticular closure required, significant skin loss, nerve/blood vessel/ tendon/joint capsule/structural damage, functional or cosmetic implications, requires exploration, possible deep/multiple foreign bodies or infection risk<sup>4</sup>.

**Puncture:** wound with a small point of entry caused by a sharp object. May be of variable depth.<sup>3, 4</sup> Wound may be discrete. Animal or human bites usually cause puncture wounds and are at risk of infection

## Assessment

A full assessment must be documented in the patient notes and should address the following:-

- Primary assessment of airway, breathing and circulation, inclusive of neurological/neurovascular assessment and blood loss if indicated
- History of injury including time, place, mechanism, witnesses and risk assessment for non-accidental injury (NAI), last oral intake (Keep patient Nil By Mouth)
- Allergies
- Immunisation status (with specific regard to tetanus. Refer to: [Australian Immunisation Handbook](#) and the [NSW Immunisation schedule](#).)
- Previous relevant medical history
- Pain assessment with due regard to prior analgesia or initiation of appropriate analgesia or possible need for sedation
- Examination - exclude other injuries
- Pre-requisites to examination – ensure adequate lighting, safe positioning whilst maintaining patient comfort, privacy and dignity, family presence or Child Life Therapist involvement where available.
- Wound examination – include type, location, direction, depth, shape, length or presence of tissue flap, possible foreign bodies or contaminants.
- Assess for possible involvement of underlying structures i.e. tendon, nerve, bone, joint, muscle and assess motor function, sensation distal to the affected area prior to infiltration of local anaesthetic. Assess movement while exploring the wound (especially in palmar or hand wounds).
- Consider the need for investigations – imaging such as X-ray/ ultrasound or pathology if needle stick / risk of blood borne diseases or infection. Wounds that contain foreign bodies after careful exploration may require an ultrasound or x-ray. Radiopaque objects include metal, some glass, shell, grit and tooth. Radiolucent objects such as wood may be identified on ultrasound<sup>3, 14</sup>.
- Most clean, minor wounds do not require prophylactic antibiotics<sup>2</sup>.
- Identified high risk infective agents or human/animal bites will require a course of antibiotics<sup>2</sup>. Antibiotics are generally indicated<sup>2</sup> for puncture wounds /contaminated wounds on feet and/or hands. Refer to the electronic Therapeutic Guidelines (eTG) or consult Infectious Diseases team for advice.

## Potential Limitations to Practice and Special Considerations

- Associated with fracture – referral to specialist teams (orthopaedics, plastics, neurosurgery or other. See section on [Specialist Referrals](#))
- Deeper structural damage – muscle, bone, joint, ligament, tendon, nerve, blood vessel – requiring further debridement or exploration

- Embedded or suspected deep foreign body or inability to fully explore the wound base
- Animal or human bites, some puncture wounds, infected wounds or wounds that have dehisced
- General anaesthetic or sedation required to repair – developmental, patient distress, parental preference
- Concern regarding functional & /or cosmetic outcome
- Impaired blood supply to large tissue flap or the need for significant debridement
- Lacerations – crossing vermilion border with potential for mal-alignment, eyelid involving lid margin/ tarsal plate /lacrima apparatus, deep or long facial lacerations not parallel with relaxed skin tension lines, end arteriolar or cartilage involvement such as tip of the nose or ear pinna, genital area
- Injuries involving the nail bed
- Amputations: complete or partial
- Post-surgery dehiscence
- Burn wounds – this guideline does not cover burn management refer to [Burns Management Guideline](#)
- Co-morbidities or relevant medical history
- Department resources – activity level, staffing constraints, skill and expertise

The wounds listed above should be discussed with the senior Emergency doctor in order to plan appropriate treatment and consider specialist intervention/ referral if indicated (Refer to section below: [Specialist Referrals](#))

## Management

### Analgesia /Anaesthesia/ Sedation

Lacerations and wounds are often painful. Analgesia must be considered for children who are experiencing pain (with a pain score documented).

The wound or laceration may require a local anaesthetic agent in order to reduce the pain when cleaning and for procedural closure of the wound<sup>2</sup>. The anaesthetic agent may be local or regional infiltrated anaesthetic (with or without adrenaline) or topical [Laceraine](#)®.<sup>10, 16</sup> Refer to the [Laceraine Guideline](#) or the Australian Medicines Handbook (AMH) Children's Dosing Companion<sup>1</sup> for appropriate doses.

Nitrous oxide may be considered as an adjunct in managing pain and/or anxiety. Adequate analgesia and local anaesthesia minimises pain and distress thereby facilitating effective cleaning, irrigation and closure. If the patient requires additional sedation then discuss with the senior Emergency doctor and refer to the SCHN guidelines for [Procedural Sedation in the Emergency Department](#).

## Cleansing of the Wound and Surrounding Area

Ensure that the wound or laceration is thoroughly cleaned so that it is free of contaminants and debris. Evidence suggests that wounds are best cleansed with sterile isotonic saline or water. Use of PPE during wound irrigation is recommended. Flow, pressure and volume bear the greater influence over the effectiveness of wound cleansing and is a higher consideration than the choice of cleansing agent<sup>11, 12</sup>. It is important to clean the skin surrounding the wound in order to reduce risk of bacterial contamination.

**Mechanical Cleaning:** Gauze moistened with water, isotonic saline or aqueous chlorhexidine solution is used to clean the wound of visible blood or debris or to clean surrounding intact skin<sup>12</sup>.

**Irrigation:** High pressure irrigation with normal saline (consider PPE) may be achieved using an irrigation shield (ZEROWet®), an 18G blunt needle attached to a 30mL syringe or irrigation tube/cannula in order to remove contaminants or debris<sup>11, 12</sup>.

**Surgical Scrub:** A surgical scrub may be used to clean abrasions containing embedded contaminants or particulate matter, however judicious application of pressure is warranted in order to avoid secondary trauma.

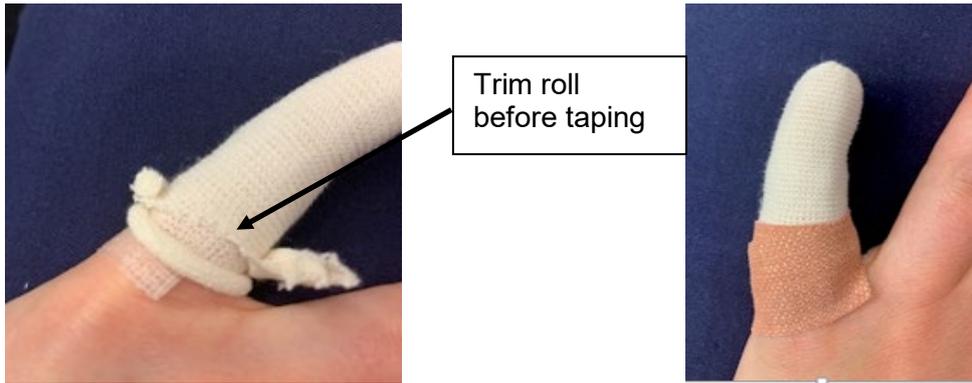
**Debridement:** Ragged or de-vitalised wound margins or extruding fat may be trimmed where viability or effective healing is potentially compromised.

## Closure Methods

### Adhesive strips

The laceration should be clean and dry, and bleeding should have ceased prior to application. Apply barrier wipe (such as Skin Prep® or Cavilon®) to intact skin parallel to the margins of the laceration to enhance the adhesion of strips and to minimise discomfort upon removal. Place adhesive strips (such as Steri-strips®, Leukostrips®, Leukosan Strips®) across the wound, perpendicular to the direction of the laceration.<sup>2, 13</sup> Ensure well apposed margins using a small amount of tension, allowing some space between strips for possible drainage of fluid.

To aid reinforcement additional adhesive strips may be placed over the previous strips parallel to the wound. Avoid circumferential application of adhesive strips or rigid tapes around digits in order to prevent constriction of circulation and potential secondary ischaemic injury. Strips should be applied obliquely or vertically over the digit. Commercial finger dressings are available however any excess dressing roll at the base of the finger must be trimmed to avoid constriction and risk of a pressure injury.



## Skin Glue (Topical Skin Adhesive)

Use of skin glue (LiquiBand®, Dermabond®, Histoacryl®, Surgiseal®, Glubran® or other) in the ED is suitable for closure of superficial, straight wounds, in areas of low skin tension, that are thoroughly cleaned and have well approximated skin edges<sup>15</sup> (usually less than 5cm in length and not gaping more than 5mm). Skin glue is ideally suited to non-mobile areas such as forehead and scalp. There should be NO penetration deep into soft tissues or cavities, significant haematoma, swelling or ooze as breakthrough bleeding or tension may render ineffective closure. Extruding fat lobules or devitalised skin margins will prevent good apposition and risk delayed healing or infection.

Prior to application of skin glue the laceration should have been thoroughly assessed. The patient should be positioned and secured appropriately to avoid runoff off or overspill of skin glue onto surrounding areas. Gauze +/- white soft paraffin ointment applied to the surrounding area may be used to protect the child's eyes or mouth from inadvertent runoff. If a gloved finger is adherent to surrounding tissue it should be eased from the skin surface in the direction of the wound ideally within the drying period or as soon as possible post closure.

Skin glue should only be applied when the laceration edges are well apposed. Adequate assistance should be recruited to ensure well apposed margins. A minimum of two clinicians are required to glue any facial laceration. Care must be taken to avoid instillation within the wound margins thereby acting as a foreign body and impeding healing. Skin glue is not to be used for closure of sub cutaneous tissue<sup>9, 13</sup>



## Application Technique

- Complete the wound assessment
- Clean and dry wound. Haemostasis achieved. Clean and separate hair as relevant
- Position patient to avoid overspill or runoff.
- Obtain an **assistant** who is responsible for protecting surrounding structures, securing the child's position and minimising movement or to protect closed eyes or mouth with gauze
- Ensure well apposed, clear wound margins
- Prime the device by squeezing to load the tip
- Apply skin glue along the wound **surface**, not within the wound margins
- Lightly deliver a thin, even, continuous film along the full length of the wound ensuring coverage of the margins. Avoid excessive amounts.<sup>15</sup>
- Maintain the position until glue dries spontaneously (10 to 30 seconds depending on the brand). Do not blow on the wound to hasten drying.

**Optional** adhesive strips may be applied as a protective or supportive adjunct after the glue has dried. Consider positioning the initial strip lengthwise along the wound so that risk of dehiscence is reduced when strips are removed as they start to lift over the following days or week/s.

## Special Areas:

### Chin

Use of skin glue on mobile areas such as chins carries increased risk and should be judiciously reserved for short, very superficial wounds.

Chin wounds often appear superficial however thorough assessment of depth, underlying structure and deeply embedded grit or debris may reveal factors that indicate deep mechanical cleansing or suture closure as more appropriate.

Toddlers and young children are particularly susceptible to contamination with food/drink/dribble, contact by the child's contaminated fingers or re-injury from falls which can contribute to the wound dehiscence or infection.

Suture closure should be carefully considered.



## Eye Region

Skin glue closure of brow hair into eyebrow lacerations risks delayed healing, wound breakdown and a poor cosmetic outcome. Consider suture closure. Do not trim eyebrows.

Application of tissue glue around the eye region (e.g. adjacent to eyebrow or nasal bridge) carries risk of leakage around the eyelids or into the eye.

- Ensure adequate assistance of another clinician who is responsible for protecting the eyes using gauze, which may be moistened with white soft paraffin.
- The child must be securely positioned so that any runoff is directed away from the eyelids or mucous membranes.
- In the event the eyelids are inadvertently glued then immediate moistening with 0.9% saline and manual gentle separation off the lashes should be commenced. A cotton bud and saline or white soft paraffin may assist in separation of lashes.
- Sedation may be required.
- If unsuccessful, lashes may need to be trimmed.
- Acetone must not be used as solvent.
- Once the eyelids are able to be opened, an eye examination with stain is required. Ophthalmology consultation may be considered.

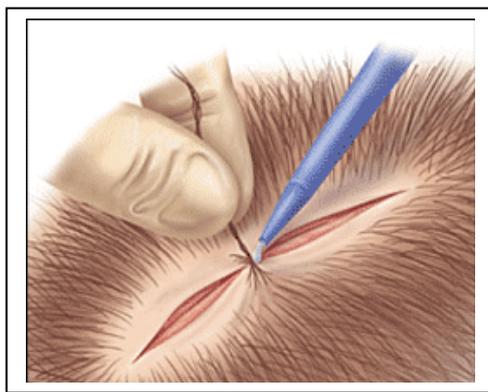
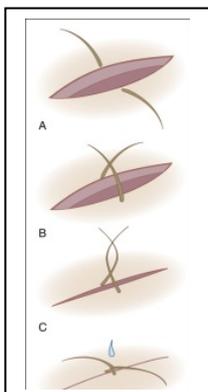


## Scalp Lacerations

Scalp lacerations may be deep and involve injury to underlying bone. Mechanism of injury and impact forces must be considered e.g. strike by surfboard/skateboard/snowboard, bat/club/racquet. Wounds must be assessed for possible underlying fracture (linear or depressed) and if indicated warrants investigation and/or referral. Concussion/mTBI must also be considered. If considering suture closure for a scalp laceration, hair may be trimmed, not shaved. Otherwise mat down hair with water or white soft paraffin ointment.<sup>13</sup>

## Hair Ties or Hair Apposition Technique (HAT)

These techniques require hair length of approximately 3 cm or longer. Separate the hair on each side of the laceration. Use several hair strands and twist to form opposing ropes of hair on either side of the laceration. These hair ropes are then crossed over several times in 360° rotation, or alternatively a knot can be tied into the hair and skin glue applied at the hair junction or knot. This process is repeated until the wound is well apposed and optimal closure is achieved<sup>6, 7, 8, 13, 17</sup>.



## Sutures

The location, size and depth of the wound should be considered when selecting the type, gauge, size and number of sutures. The clinician closing the wound should be proficient in appropriate suture techniques<sup>2</sup>. The wound should be well anaesthetised and analgesia /sedation considered. Ensure adequate procedural support. A Child Life Therapist may help ease the anxiety of the child and family.

Non – absorbable, synthetic sutures (e.g. Ethilon®) are generally used for skin closure<sup>14</sup> and are available in a variety of sizes.

Absorbable sutures: should be used when the clinician is confident that use is appropriate and of benefit to the overall outcome. Absorbable sutures may be used for mucosal or subcutaneous suturing<sup>14</sup> or where suture removal is likely to be problematic at follow up.



Sutures Location	How many days for suture removal
Face	5 days
Scalp, anterior trunk, arms, legs and hands	7 days
Mobile areas, i.e. joints, backs	10-14 days

## Soft tissue foreign body

Removal of superficial foreign bodies in wounds or soft tissue can be painful and challenging. These include objects such as splinters, glass, vegetative matter, sea urchin spines or oyster shell. Adequate sedation and local anaesthesia or regional block facilitates effective removal. Generally, opening the tract at the site of entry enables visualisation and probing. Plain x-ray may be useful in identifying the presence or number of some foreign bodies however some objects may not be radiopaque e.g. some types of glass, and ultrasound may be indicated.

Fine scissors, forceps (e.g. jewellers or splinter) or the bevel of a blade are useful in grasping or scraping embedded objects. Splinters embedded under the nail may require cutting of a “V” shaped notch in the nail above the splinter and lifting with forceps.

Care must be taken to avoid breaking foreign bodies into fragments or driving deeper into tissues.

Deep soft tissue foreign bodies, particularly involving hands, feet and over joints, may require investigation by ultrasound prior to referral to specialist teams.

Some embedded foreign bodies are at risk of infection e.g. oyster shell and sea urchin. Prophylactic antibiotics may be indicated.

## Dressing

There is a variety of dressings available that support the natural healing process to occur within the principles of moist wound healing<sup>2</sup>. Prior to the application of a dressing, the clinician should ensure the skin is clean and dry thereby minimising risk of secondary bacterial contamination of the wound. Refer to: [Wound Assessment and Management](#) guideline for explanation of the different types of dressings available such as Bactigras®, Duoderm®, Mepitel®, Comfeel®, Mepilex®, Jelonet®. Dressings have variable functions including retention, antibacterial properties, moisture delivery and protective elements. These properties should be considered to achieve optimal outcome and security. It is important that the correct type of dressing for the wound is selected whilst considering durability, retention and the patient's age and activities.

**COBAN®** tape must **NOT** be used as a retention or protective dressing due to risk of ischaemic injury.

Digits should have padding placed between the digits if being wrapped together. When whole hands require a dressing, fingers should be wrapped in extension ('mitten') rather than as a 'boxing glove' to maintain optimal resting position.

## Discharge Documentation

Appropriate follow up should be arranged when indicated e.g. for suture removal, wound review or dressing change. This may occur through Local Medical Officer (GP) referral, Outpatient appointment or review in the ED. Wound care information should be discussed and the ED Laceration and Wound Care Information sheet provided. (See 'For Parents' tab on the landing page of this guideline).

## Specialist Referrals: Refer to Diagram

In complex cases with major tissue loss, neurological or vascular injury or other elevated concerns, consider consultation with senior ED MO and the relevant the teams.

Consider consultation with the Infectious Diseases (ID) team in the following circumstances:

- Injury sustained overseas
- Bites or scratches from bats, human or animal.
- Marine injuries involving fresh (river) or sea water
- Patients with allergies/reactions to the recommended antibiotics
- Infected wounds associated with sepsis

Or any other case where the clinician needs or would like ID advice, for example, very late presentation with chronic wound infection, complex co-morbidities etc.

## LACERATION/PUNCTURE REFERRALS

### DENTAL

- Involving dentition and gingiva

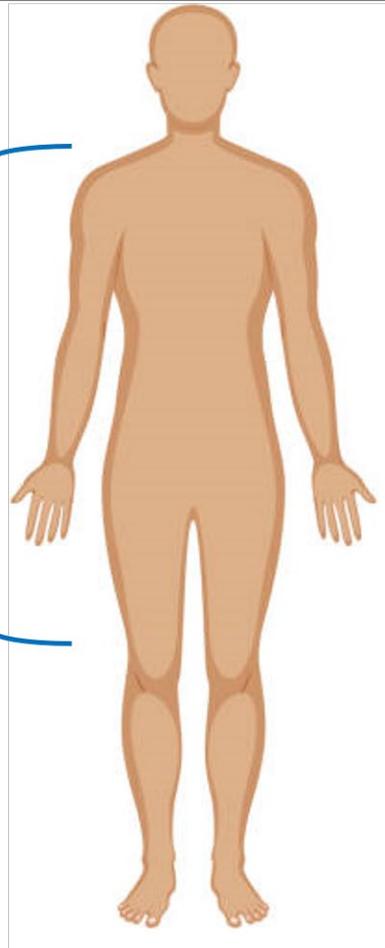
### GENERAL SURGERY

- Scalp and neck
- Isolated intra-oral lacerations\*
- Torso
- Upper half of upper and lower limbs

### PLASTIC SURGERY

- Face, lips and ears
- Any nerve/arterial injury in the limbs  
(Gen/TP/Vascular surgeon for large vessels)
- Extensive tissue loss/degloving
- Mandibular/Maxillary/TMJ fractures\*\*

\*ENT/Plastics at SCH  
 \*\*Maxillofacial at SCH  
 \*\*\*Plastics at SCH



### NEUROSURGERY

- Skull fractures
- CSF leaks

### OPHTHALMOLOGY

- Involving eye/lids

### HANDS

- Elbow and below\*\*\*

### ORTHOPAEDICS

- Knee and below
- INTO any joint
- Any underlying fractures
- Tendon injuries
  - Lower limb
  - Upper half of upper limb

## Outcomes

Acute wound and laceration management in patients presenting to the ED is performed in a timely, competent and safe manner.

Optimal cosmetic and functional outcomes are achieved and care is provided with a family centred approach.

## Related Documents

### **Network Documents**

- Wound Assessment and Management  
<http://webapps.schn.health.nsw.gov.au/epolicy/policy/2956>
- Laceraine Topical Wound Anaesthetic – Application – ED  
<http://webapps.schn.health.nsw.gov.au/epolicy/policy/5471>

### **CHW Documents**

- Laceraine Topical Wound Anaesthetic Solution, Standing Order – CHW  
<http://webapps.schn.health.nsw.gov.au/epolicy/policy/4821>

### **SCH Documents**

- Laceraine Topical Wound Anaesthetic Solution Standing Order – ED – SCH  
<http://webapps.schn.health.nsw.gov.au/epolicy/policy/5408>
- Minor Wound and Tissue Glue (Clinical Initiatives Nurse) – ED – SCH  
<http://webapps.schn.health.nsw.gov.au/epolicy/policy/5276>
- Plastic Surgery – ED – SCH:  
<http://webapps.schn.health.nsw.gov.au/epolicy/policy/3419>

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