Emergency Department Guideline
Laceration Repair

Inclusion criteria:
- Patient who presents with:
  - Large or gaping laceration deemed likely to require repair OR
  - Larger than trivial wound from an animal bite, whether or not repair is expected

Triage considerations:
- Apply pressure to wound during triage process if actively bleeding
- Apply LET (Lidocaine-epinephrine-tetracaine) to wound at the time of triage
  - Usually best to mix with methylcellulose to form gel
  - To be effective, LET requires ongoing contact with the cut edges of the wound.
  - Avoid use of gauze, as it wicks LET away from wound.
    - If the wound is widely gaping, may apply gel to inside surface of wound and cover with Tegaderm only
    - If the wound is closed or partially closed at rest, completely soak a small piece of cotton ball, the tip of a swab, or a small piece of gauze and insert it into the wound, then apply more LET on top and cover with Tegaderm
    - If wound is on scalp, it may be possible to apply LET as above and leave uncovered. If necessary to cover to keep LET in place and limit bleeding, avoid dressings that will wick LET away from the wound
  - Do not use LET on lips or in the mouth.
  - Use on fingers and toes IS generally acceptable, but check with attending if questions.
- If significant pain, offer pain medication as appropriate:
  - Acetaminophen 15 mg/kg PO/PR OR
  - Ibuprofen 10 mg/kg PO OR
  - Fentanyl 1-2 mcg/kg IN
- If concern for open fracture or radio-opaque foreign body, may order x-ray of the area per protocol

Laboratory studies:
- Rarely indicated in uncomplicated lacerations
Imaging:
- X-ray of the site if concern for open fracture or radio-opaque foreign body, including glass fragments
- Ultrasound may be used as adjunct to identify non-radio-opaque foreign bodies

Medications/interventions:
- **Preparation**
  - Engage Child Family Life Specialist for preparation and distraction if available
  - Assess tetanus status; provide prophylaxis as directed in Red Book if needed
- **Sedation/anxiolysis**
  - Nitrous Oxide
  - Intranasal Midazolam (0.4 mg/kg IN given approximately 5 minutes before procedure)
  - Propofol (generally requires two physicians, one to sedate, one to repair wound)
  - Ketamine, 1-1.5 mg/kg IV or 4 mg/kg IM (better choice if sedating physician is also repairing wound)
- **Anesthesia**
  - LET and pain medications as noted in triage considerations
    - LET needs to be in place for at least 20 minutes
    - LET continues working until it is removed from the wound
    - After removal, the effect will wear off within an hour or less
  - If LET contraindicated or not completely effective (numbing effect is often incomplete on sites below the neck), provide additional anesthesia with:
    - Injected 1% lidocaine (with epi if not in area of terminal circulation or on lip); buffered if available
      - Max dose 4 mg/kg, 7 mg/kg if used with epi
      - Inject slowly, using 27 gauge needle, to limit pain
      - Inject through cut edge of wound
    - Digital block or other regional block if appropriate
- **Wound preparation**
  - Irrigation:
    - Ensure any planned sedation, anxiolysis, and anesthesia have been provided BEFORE irrigation, and engage CFL for distraction if available
    - Check with the provider who will be repairing the wound prior to irrigation to ensure they will be ready to repair the wound promptly
    - Irrigation can be done by EDS or by the provider
    - Most wounds can be irrigated with lukewarm tap water
      - Consider sterile saline if near the eye
    - Generally irrigate with a 30-60 ml syringe with a splash shield
    - Rule of thumb is 60 ml per cm of wound length, although this may vary by wound type
Site preparation:
- May use betadine swab sticks around the wound; avoid use IN the wound
- Drape area to provide clean work surface, but may balance sterility against patient experience (e.g., avoid draping eyes in young children)
- May use sterile or non-sterile gloves as preferred

Wound closure
- OK to close clean, minor wounds up to 18 hours after injury, and up to 24 hours after injury on face
- Steri-strips – may be appropriate for very minor, low-tension wounds
  - Use with tincture of benzoin
- Dermabond tissue glue – consider for non-gaping, low-tension wounds
  - Becomes quite hot with polymerization; use of LET has been shown to reduce pain
  - Often requires two people, one to hold wound closed
  - Apply in "patch" covering and surrounding wound
  - Apply 3-4 thin layers if possible
  - Avoid getting glue into wound; prevents epithelialization
- Staples – generally used on scalp only
- Sutures – better for higher tension or gaping wounds
  - Face or neck: 5-0 or 6-0 fast absorbing gut, or 5-0 or 6-0 Nylon or Prolene
  - Scalp (if not stapling): 5-0 Vicryl Rapide
  - Extremities, trunk, back: 4-0 Nylon or Prolene
  - Deep sutures: 4-0 or 5-0 Vicryl
- Special considerations for animal bites:
  - Consider leaving open to minimize infection risk in areas with low cosmetic impact
  - If closure deemed necessary for cosmetic outcome
    - Never use tissue glue
    - Consider suturing somewhat more loosely than usual or using Steri-strips alone
    - Consider prophylactic antibiotics (Augmentin for cat or dog bites); likely not necessary for simple wounds on head or neck
    - Assess risk of rabies exposure; may consult MN Department of Health if questions

Discharge instructions
- Use dot phrases for wound care recommendations
  - .PEMDCLAC (sutures to be removed)
  - .PEMDCLACABS (absorbable sutures)
  - .PEMDCLACABSSTERI (absorbable sutures with steri-strips over them; need to send home with Unisolve wipes)
  - .PEMDCLACSTAPLES (staples)
Recommended removal times:
- Face – 3-5 days
- Scalp – 7-14 days
- Trunk, upper extremities – 7-10 days
- Lower extremities – 10-14 days

Consultations:
- Facial trauma service (usually ENT or OMFS) for complex facial or intra-oral wounds
- Ophthalmology if concern for involvement of eye structures
- Orthopaedics for open fractures
- Surgery/trauma for retained foreign bodies, patients requiring admission
- Center for Safe and Healthy Children if concerns about abuse, neglect, or delay seeking treatment

Reassessments:
- Evaluate pain control during procedure
- Consider increasing level of anxiolysis/sedation if significant distress

Differential diagnosis:
- Simple laceration
- Complex laceration
- Retained foreign body
- Animal bite

Discharge or Admission criteria:
- PICU
  - Rarely indicated unless severe trauma
- Inpatient floor
  - Concern for child abuse/neglect without safe discharge plan
  - Oversedation
  - Other medical or trauma concerns requiring observation
- Discharge home
  - Most cases

Quality measures:
- LET applied in triage
- All sedation, anxiolysis and anesthesia given prior to irrigation