Basic Suture Skills for Primary Care

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Objectives

- Acute Wound Evaluation and Appropriate Treatment Strategies
- Tetanus Prophylaxis
- Anesthesia Modalities
- Suture Selection
- Wound Closure Techniques
  - Staple, Dermabond, Simple Interrupted, Deep Dermal and Corner
- Discharge Instructions and Follow Up
Acute Wound Evaluation

- Full Wound Evaluation:
  - Size, Shape, Location
  - Time Since Injury in Hours
  - Cleanliness of Wound
    - Odor, Contamination, Debris, Foreign Body
  - Bone / Fracture, Joint, Muscle, Tendon Involvement
  - Vascular Injury
  - Neurologic Injury
  - Viability of Tissue
Tetanus Prophylaxis

- Tetanus-Prone Wounds:
  - > 6 hours since time of injury
  - > 1 cm depth
  - Contaminated—soil, feces, compost, saliva
  - Puncture / Crush / Avulsion
  - Infected
  - Animal or Human Bite
  - Burns or Frostbite
Anesthesia

– Topical
  • Eutectic Mixture of Local Anesthetics (EMLA)
    – 2.5% Prilocaine or Lidocaine Cream
    – Apply to Wound, Cover with Tegaderm
    – Wait > 45 minutes for maximum effect
Anesthesia

– Local Injection
  • Lidocaine Plain
    – Maximum Safe Dose = 4 mg / kg
    – Duration of Anesthesia = 120 minutes
  • Lidocaine with Epinephrine
    – Maximum Safe Dose = 7 mg / kg
    – Duration of Anesthesia = 240 minutes
      » Aids with Hemostasis
      » Wait 10 – 15 minutes for maximum effect
      » Prolongs Anesthetic effect
Lidocaine Injection Video

Local anesthetic for wound closure

TCH APP Wound Closure Project
Before the Procedure

– **Irrigation – COPIOUS**
  - Normal Saline
  - Tap Water
  - Repeat until no visible debris

– **Debridement**
  - Trim jagged skin edges

– **Hemostasis**
  - Direct Pressure, Silver Nitrate
  - Surgicel, GelFoam (if available)
Sterile Technique
Instrument Handling Video

Instrument Holding
Wound Closure Options

– Closure
  • Staple
  • Tissue Adhesives – Dermabond / Histoacryl
  • Simple Interrupted
  • Deep Dermal and Corner
Staple Indications

– Common use for closure of thick skin
  • Scalp
  • Not on face, neck, hands, feet
– Quick closure
– + / - Anesthesia required
– Require removal – usually painful in pediatric population
Staple Video
Tissue Adhesive Indications

- Quick closure
- No anesthesia required
- Superficial wounds
- Clean wounds
Tissue Adhesive Tips

- Must dry completely before application of dressings
- Some patients develop contact dermatitis from tissue adhesive usage
- Adhesive sloughs off in 5 – 10 days
  - Instruct patient to let adhesive slough off on its own
Tissue Adhesive Contraindications

– Do NOT use tissue adhesive with:
  • Contaminated, jagged wounds
  • Infected wounds
  • Mucosal surfaces
  • Surfaces with dense body hair
  • Wounds close to eye
  • High tension surfaces – joints
  • Animal bites and puncture wounds
Tissue Adhesive Care

- Keep covered and dry for 48 hours
- Change dressing daily or as needed if soiled or saturated
- Avoid submersion for until adhesive sloughs off
- Do not apply ointments or lotions over adhesive
- Instruct patient to notify provider if develops:
  - Redness, swelling, and increase in pain
Tissue Adhesive Video

Tissue Adhesive Technique
TCH APP Wound Closure Project
Suture Material

• Dependent upon
  – Age of patient
  – Tension
  – Location
  – Depth
  – Surgeon preference!
Suture Sizing

• Sizing refers to diameter of the suture and is denoted as zeros.
• The more zeros, the smaller the diameter.
  – For example, 4-0 has a larger diameter than 5-0 suture.
Suture Selection Indications

**Absorbable Sutures**

- **Fast Gut**
  - Absorbable, Monofilament
  - 3 – 5 day Half Life; Absorption at 2 months
  - Used commonly pediatric skin closure on the face

- **Plain Gut**
  - Absorbable, Monofilament
  - 7 – 10 day Half Life; Absorption at 2 months
  - Used commonly pediatric skin closure

- **Chromic**
  - Absorbable, Monofilament
  - 2 week Half Life; Absorption at 3 months
  - Used commonly mucosal closure
Suture Selection Indications

Absorbable Sutures

- Vicryl
  - Absorbable, Braided
  - 2 -3 week Half Life; Absorption at 2 months
  - Used commonly deep dermal and muscle fascial closure

- Monocryl
  - Absorbable, Monofilament
  - 1 - 2 week Half Life; Absorption at 3 - 4 months
  - Used commonly deep dermal and subcuticular
Suture Selection Indications

**Permanent Sutures** – must be removed

- **Nylon**
  - Nonabsorbable, Monofilament
  - Permanent
  - Used commonly skin closure
  - Requires treatment room sedation for removal in younger patients

- **Prolene**
  - Nonabsorbable, Monofilament
  - Permanent
  - Used commonly skin and tendon closure
  - Requires treatment room sedation for removal in younger patients
Simple Interrupted

- For surface closure
- Everts wound edges
- Spacing depends on location and type of laceration
- Better eversion if needle inserted at 90 degrees
Simple Interrupted

- Correct method
- Unequal distance
- Excessive tension
- Skin inversion
- Skin overlap

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Simple Interrupted Suture Video

Simple Interrupted Suture
TCH APP Wound Closure Project
Deep Dermal / Buried

- Absorbable suture
- Deep – Superficial – Superficial – Deep
Deep Dermal Video

Deep Dermal Technique
TCH APP Wound Closure Project
Corner Stitch

- Needle introduced through skin—not flap of skin
- Corner flap anchored horizontally through dermis
After Procedure

• Age-appropriate dressing for wound
• Communicate wound care instructions with patient & family
  – Daily cleaning regimen—Soap and Water ONLY
  – Bacitracin (not with tissue adhesive)
  – Bandaging
  – Do not Submerge
  – Sunscreen
Wound Follow Up

• Suture Removal
  – Face: 3 – 5 days
  – Scalp: 7 days
  – Chest / Extremity: 8 – 10 days
  – Joints / Hand: 10 – 14 days
  – Back: 10 – 14 days
Suture Removal Video

Suture Removal Technique

TCH APP Wound Closure Project
Scarring

- Scarring is an inevitable outcome of any full thickness injury or surgery
- Typically, scars take one year to heal completely
- Scar strength begins to increase at 4-5 days and peaks at 60 days
- During healing the scar may appear red and raised, this will subside over time with proper care
- Genetic factors influence scar appearance (i.e. keloid)
Scar Care Tips

• Closed wounds are water tight at 48 hours
  – Ok to wash area gently after 2 days
  – Do not immerse in water for >14 days

• Sunscreen is very important to help to reduce scarring and darkening of the tissue.
  – Use SPF 35+ with UVA and UVB protection daily
  – A new scar is more fragile than the surrounding skin and will react differently to the sun than the surrounding skin.
Scar Care Tips

• Scar massage
  – Softens fibrous/hard scar tissue
  – Aid in flattening tissue to same level as surrounding skin
  – Usually able to start at 14 days after repair
  – Use lotion, coco butter, or sunscreen to prevent friction with massage
Scar Care Tips

• Silicone Sheets
  – Reduce redness
  – May aid in prevention of keloids / hypertrophic scars
  – Purchased on Amazon
  – Application
    • Apply square sheet directly over scar, covering
    • Daily wear for greater than 12 hours