

LACERATION REPAIR GUIDE

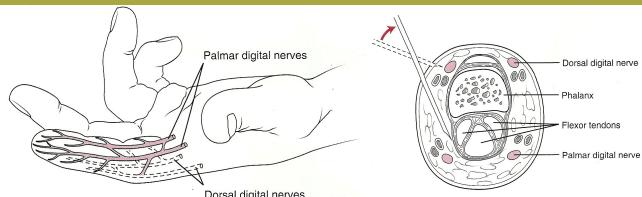
ANESTHESIA

Anesthetic	Route	Administration	Onset (min)	Duration (min)	Benefits	Contraindications/Disadvantages
LET (Lidocaine 4%+epinephrine 0.1%-tetracaine 0.5%)	TOP	Saturate cotton ball (2-5mL), secure with tape	20	20-30	Painless; Undistorted wound margins	Avoid mucous membranes, fingers, toes, nose, ear, penis
Lidocaine (1%; 2%; buffered with bicarb = less painful)	SC	3-5mL with 27G/30G needle through open wound	4-10	30-120	Fast onset	-Painful injection -Systemic injection can cause cardiac arrest and seizure -Vasodilatory effect causes local bleeding
Lidocaine +epi (1% + 1:100,000 epi)	SC	3-5mL with 27G/30G needle through open wound	4-10	60-240	↓bleeding; ↓length of action of lidocaine	Areas with terminal circulation, prone to ischemia: fingers, toes, tip of nose, pinna of ear, penis
Bupivacaine (0.25%; 0.5%)	SC	3-5mL with 27G/30G needle through open wound	8-12	240-480	Extended period of anesthesia post-repair	-Slower onset of action -2mg/kg max (0.25%=>2.5mg/mL) -Risk of cardiac arrest with systemic injection

SEDATION (*what you can do yourself in the ED without a fellow)

Drug	Dosage (mg/kg)	Route	Onset (min)	Duration (hr)	Complications	Reversal
Midazolam (Versed®)	0.25 - 0.75 (max 15mg)	PO	15-30	1 - 1.5	Anxiolytic, no analgesia	Flumazenil (0.01mg/kg; max 0.2mg). May repeat q1min to total dose 1mg
	0.3-0.5	Rectal	10-30	1-1.5		
	0.2-0.5	Intranasal	10-15	1		
Fentanyl (analgesia only)	1-2 mcg/kg per dose (max 100mcg)	IV or intranasal	Immediate	0.5 - 1	Rare hypotension or respiratory depression; uncommon neuromuscular blockade	Naloxone (10 mcg/kg/dose) IV/IM; full reversal 100mcg/kg

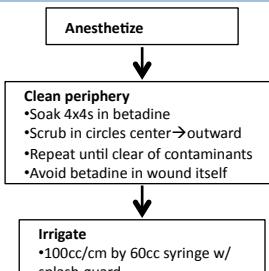
DIGITAL NERVE BLOCK



- Four digital nerves for each digit (2 palmar (dominant), 2 dorsal); all must be blocked.
 - Two needle sticks, 4 small injections of anesthetic
 - 25-30G needle with 2-4mL 1% lidocaine.
 - Insert into dorsolateral aspect of digit in the web space at the MCP.
 - Direct needle dorsally toward dorsal nerve, inject 0.5mL.
 - Redirect needle without withdrawing from skin, toward the volar (palmar) nerve and inject 0.5mL.
 - Repeat on opposite side of digit to complete the block.

WOUND ASSESSMENT/PREPARATION

Primary survey: hemostasis
Secondary survey: other injuries
History
<ul style="list-style-type: none"> Mechanism of injury Age of wound Possible FB? Environment of injury Health status: last tetanus, meds, allergies
Physical Exam
<ul style="list-style-type: none"> Location Muscle function Tendon involvement Vascular injury Nerve injury Foreign material
Imaging
<ul style="list-style-type: none"> Xray if FB or fracture suspected



SUTURE CHOICES

Suture Material	Knot security	Tensile Strength	Security (days)	Tissue Reactivity	Anatomic Site
Nonabsorbable					
Ethilon (nylon)	Good	Good	N/A	Minimal	Most skin closures
Prolene (polypropylene)	Fair	Good	N/A	Minimal	Most skin closures
Absorbable: Natural					
Surgical gut	Poor	Fair	5-7	Most	Face (rarely used)
Chromic gut	Fair	Fair	10-14	Most	Mouth, tongue, nailbed
Fast absorbing gut	Poor	Least	4-6	Medium	Face
Absorbable: Synthetic					
Monocryl (poliglecaprone)	Good	Fair	7-10	Minimal	Face; deep closure
Vicryl (polyglactin)	Good	Good	30	Minimal	Deep closure, nailbed, mouth
Vicryl RAPIDE	Good	Fair	5-7	Minimal	Face, scalp, trunk/extremities, dorsum of hand
Dexon (polyglycolic)	Best	Good	30	Minimal	Deep closure
PDS (polydioxanone)	Good	Good	45	Minimal	Deep closure needing high security (v. stiff)

ALTERNATIVE WOUND CLOSURE

Material	Advantages	Disadvantages	Uses	Application	Removal
Dermabond (tissue adhesive)	Fast, painless, no removal needed, excellent cosmesis	Should only be used to close skin of superficial wounds; not for large gaping wounds or areas of tension, not for use on joints	-Face lacs under low tension/easy to approximate, clean edges, little oozing;	-Clean wound -Squeeze to crush plastic applicator, purple glue covers tip -Approximate wound gently w/ fingers or forceps. -Apply thin layer of adhesive; overlap wound edge 5mm. -Hold for 20 sec -Repeat x 3 layers, hold 20 sec between for bonding.	Naturally sloughs 7-10 days
Steri-Strips (1/4 or 1/2 in wide)	Easy to apply, no suture marks, painless, less infection risk than sutures	Does not work on oily/greasy skin, joints; gaping wounds w/ high tension, or young children, high risk of dehiscence	-Adjuactive adhesives for facial lacs -Old, contaminated wounds (dog bites) -Very superficial lacs through dermis -Lacs in steroid-dependent pt w/ thin skin	-Apply benzoin to adjacent skin -Use forceps to place tape on one side of wound perpendicular to wound, appose wound edges w/ finger of opposite hand, secure across wound. -Repeat, leave 3mm between -Place cross-stay to prevent lifting of tape ends.	Last up to 7 days
Staples	Rapid application, lower rate of infection, less foreign-body reaction, great tensile strength	More painful to remove than sutures, less cosmetically-pleasing repair	Linear sharp lacerations of scalp, trunk, extremities	-Use forceps to approximate and evet wound edges. -Place the stapler gently on the skin without indenting. -Squeeze trigger gently. Ensure there is space between the staple and the skin (if not, you pushed down too hard when triggering). -Repeat	Remove with staple remover in 5-7 days

TETANUS PROPHYLAXIS (>7yo)

Prior tetanus toxoid immunization (doses)	Clean minor wound	All other wounds
Uncertain (or <3)	Td or Tdap	Tdap or Td and TIG
3 or more (most recent >10 yr ago)	Td or Tdap	Td or Tdap
3 or more (most recent <5yr ago)	None	None
3 or more (most recent >5 and <10yr ago)	None	Td or Tdap

*If < 7 years old, DTaP preferred

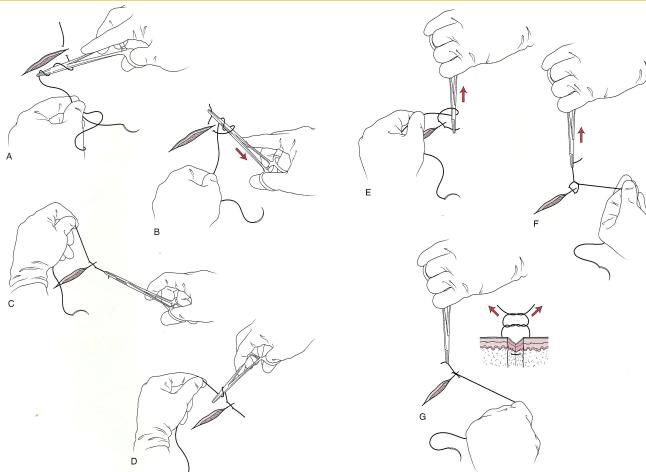
ANTIBIOTIC PROPHYLAXIS

Only rarely necessary, consider in the following situations:

Wound age	<ul style="list-style-type: none"> Delay in presentation (hand/foot: 8hr; face: >24hrs; all other: >18hr)
Wound condition	<ul style="list-style-type: none"> Crushing mechanism with devitalized tissue, extensive debridement; Puncture wounds Large wounds (>5cm)
Contamination	<ul style="list-style-type: none"> Gross contamination not able to be adequately cleaned Presence of foreign body
Anatomic Location of wound	<ul style="list-style-type: none"> Intraoral, foot, hand, perineum Open fractures; wounds into joints; tendon involvement Wounds of cartilage (ear, nose)
Immunocompromised states	<ul style="list-style-type: none"> Poorly controlled diabetes Renal/hepatic dysfunction HIV Chemotherapy Chronic steroid use
Bite wounds (**NEARLY ALWAYS used despite controversial evidence**)	<ul style="list-style-type: none"> Dog, cat, human bites

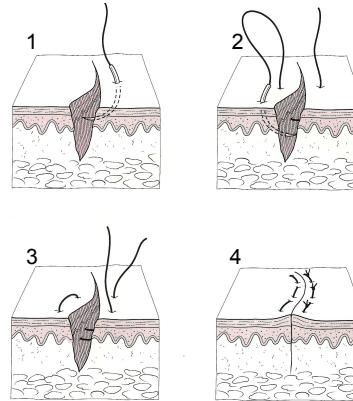
Wound Type	Antibiotic Coverage
Uncomplicated non-bite wounds meeting criteria for prophylaxis	Anti-staph and strep, Keflex (cephalexin) 3-5 days (clindamycin for PCN/Ceph allergic pts)
Bite wounds	<ul style="list-style-type: none"> Human Dog Cat
Extensive wounds with soil contamination	Cover GNRs and Clostridium spp. Aminoglycosides

INSTRUMENT TIE



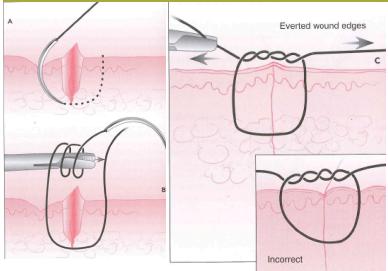
HORIZONTAL MATTRESS SUTURE

Indications: reinforcement of SC tissues, relief of wound-edge tension, wound eversion; less accurate approximation than w/ vertical mattress but closes greater length of wound



1. Needle enters skin at 90° deeply into wound
• Pass through opposite side @ same depth
2. Turn needle, take 2nd bite 0.5cm adjacent to 1st exit, pass backwards across wound parallel to initial suture
3. End with both ends of suture on initial side of entry
4. Tie knot

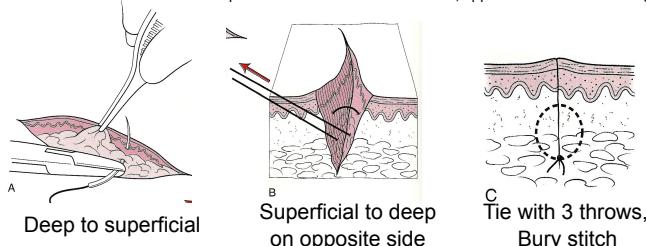
SIMPLE INTERRUPTED SUTURE



1. Needle enters skin at 90° angle
2. Pronate wrist to take bite
3. Evert edges by placing suture with depth>width
4. Match depth and width of bite on opposite side
5. Tie with surgeon's knot

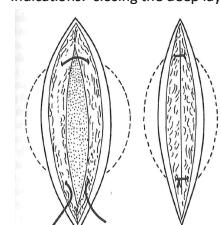
DEEP SUBCUTANEOUS SUTURE

Indication: reduce tension of deep wounds & decrease width of scar; approximation of wound edges



BURIED HORIZONTAL DERMAL SUTURE

Indication: closing the deep layer in shallow lacerations and in areas with little SC tissue



Place a simple stitch in a horizontal (rather than vertical) plane at the level of the fat-dermal junction

**knot cannot be buried

OTHER WOUNDS

ABSCESS I&D



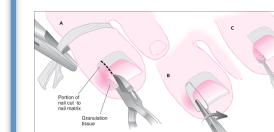
1. Clean and Drape
2. Anesthetize wheel of surrounding skin w/ 1% lido
3. Lance roof with No. 11 blade, extend incision 2/3 length
4. Probe cavity w/ blunt spreading hemostats, break up loculations
5. Copious irrigation to remove pus & necrotic tissue
6. If cavity remains, pack w/ 1/4 or 1/2 in. gauze strips. Leave 1cm tail.
7. Remove packing in 24-48hr
8. Consider need for antibiotics (Keflex + Bactrim), send wound Cx!

PARONYCHIA & INGROWN NAILS



Simple paronychia

1. Anesthetize locally w/ EMLA or freeze spray
2. Insert No. 11 blade between nail plate & eponychium
3. Gently sweep the blade laterally to drain
4. Antibiotics usually unnecessary if good drainage
5. Warm soaks BID



Lateral nail excision (paronychia, ingrown nails)

1. Digital block 1% lido without epi. Apply tourniquet.
2. Advance hemostat or nail scissors between nail plate and nail bed to free nail from matrix
3. Use scissors to cut lateral wedge
4. Remove wedge using hemostats (pulling)
5. Debride granulation tissue
6. Bacitracin + dressing

References and Further Reading

Figures adapted from Trott, AT. *Wounds and Lacerations, emergency care and closure*. 3rd editions. St. Louis, MO: Mosby. 2005. Reprinted with permission.

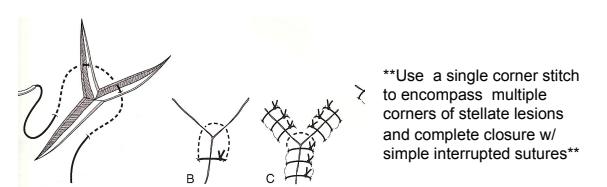
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Use a single corner stitch to encompass multiple corners of stellate lesions and complete closure w/ simple interrupted sutures