**Attribution Key**

for more information see: http://open.umich.edu/wiki/AttributionPolicy

**Use + Share + Adapt**

{ Content the copyright holder, author, or law permits you to use, share and adapt. }

- **Public Domain – Government**: Works that are produced by the U.S. Government. (17 USC § 105)
- **Public Domain – Expired**: Works that are no longer protected due to an expired copyright term.
- **Public Domain – Self Dedicated**: Works that a copyright holder has dedicated to the public domain.
- **Creative Commons – Zero Waiver**
- **Creative Commons – Attribution License**
- **Creative Commons – Attribution Share Alike License**
- **Creative Commons – Attribution Noncommercial License**
- **Creative Commons – Attribution Noncommercial Share Alike License**
- **GNU – Free Documentation License**

**Make Your Own Assessment**

{ Content Open.Michigan believes can be used, shared, and adapted because it is ineligible for copyright. }

- **Public Domain – Ineligible**: Works that are ineligible for copyright protection in the U.S. (17 USC § 102(b)) *laws in your jurisdiction may differ

{ Content Open.Michigan has used under a Fair Use determination. }

- **Fair Use**: Use of works that is determined to be Fair consistent with the U.S. Copyright Act. (17 USC § 107) *laws in your jurisdiction may differ

Our determination **DOES NOT** mean that all uses of this 3rd-party content are Fair Uses and we **DO NOT** guarantee that your use of the content is Fair.

To use this content you should **do your own independent analysis** to determine whether or not your use will be Fair.
Laceration Care: State of the Art

Joe Lex, MD, FACEP, FAAEM
Temple University School of Medicine
Philadelphia, PA
Wounds Account For...

- More than 10,000,000 annual ER visits
- 27.4% of closed malpractice cases against emergency physicians annually
Treatment Goals

- Avoid infection
- Achieve acceptable scar
How Many Wounds Get Infected?

- Infection usually occurs with $10^5$ organisms per gram of tissue.
- Most wounds have $<10^3$ organisms per gram.
## How Many Wounds Get Infected?

<table>
<thead>
<tr>
<th>Study</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Galvin, 1976</td>
<td>4.8%</td>
</tr>
<tr>
<td>Gosnold, 1977</td>
<td>4.9%</td>
</tr>
<tr>
<td>Rutherford, 1980</td>
<td>7.0%</td>
</tr>
<tr>
<td>Buchanan, 1981</td>
<td>10.0%</td>
</tr>
</tbody>
</table>
What Is the ‘Golden Period’ for Repair?

- Roberts, 1977: no relationship between timing of suturing and subsequent infection
- Nylan, 1980: no relationship between timing of suturing and subsequent infection (up to 18 hours)
What Is the ‘Golden Period’ for Repair?

Berk, 1988: 204 patients

Mean time to repair: 24.2 ± 18.8 hours

- <19 hours → 92% satisfactory healing
- >19 hours → 77% satisfactory healing
- Exception: head and face
  → 95.5% satisfactory healing regardless of time
Do People Still Get Tetanus?

- >250,000 cases annually worldwide
- >50% mortality
- 100 cases annually in USA
- ~10% in patients with minor wound or chronic skin lesion
- ~20% of time, no wound implicated
- 2/3 in patients over age 50
Ruben, 1978: nursing home patients
  • 49% without protective antibodies

Crossley, 1979: urban Minnesota
  • Over age 60, 59% of women and 71% of women without protective antibodies
But Isn’t Everybody Already Immune?

- Scher, 1985: rural elderly
  - 29% without protective antibodies
- Pai, 1988: urban family practice
  - Only 5% without protective antibodies
  - All were women age 34 to 60 years
But Isn’t Everybody Already Immune?

Stair, 1989: ER patients
• 9.7% without protective antibodies

Alagappan, 1996: emergency patients
• 129 patients ages 65-97
• Prior immunizations unobtainable in 2/3
• 50% only with adequate titers
But Isn’t Everybody Already Immune?

Mullooly, 1984: HMO patients

- Routine immunization compliance fell off with age
- ~28% in patients over age 70
So How We Doin’?

Brand, 1983: 6 ERs
- 6% undertreatment
- 17% overtreatment

Giangrasso, 1985: 3 ERs
- 1.5% undertreatment
- 11.9% overtreatment
Simonsen, 1984: 418 patients age 25 – 30 years not revaccinated since primary series

- ~1 in 8 unprotected
- 4 weeks after tetanus toxoid, all had protective antibody levels
Simonsen, 1987: 24 patients, last immunization 17 to 20 years prior

- 1 unprotected, 15 minimally protected
- 4 days after booster shot, all had protective antibody levels
- Incubation period for tetanus: 14 – 21 days
Why Do We Use dT Instead of Toxoid?

- Pre-dT: 100,000 annual cases of diphtheria, mortality >10%
- 1977: <100 cases / year
- Now creeping up: >300 / year
- 1966: USPHS recommended dT
Why Do We Use dT Instead of Toxoid?

Harnisch, 1989

- Three diphtheria outbreaks: 1972 – 1982
- Most among indigent alcoholics in Seattle’s Skid Road
- >1100 cases, >80% skin only
- Significant morbidity / mortality if Native American or over age 60
Jacobs, 1982: 740 chart review

- 33% local edema & tenderness
- 15% fever
- 33% had ‘anaphylactoid’ reactions
Middaugh: 1979

- 87,000 doses by jet injector
- 697 / 2000 postcards returned
  - sore arm: 42.7%
  - local swelling: 34.8%
  - local itching: 24.2%
  - abscess/infection: 0.7%
Isolated case reports of anaphylactic reaction

- Zaloga, 1982: 20 year-old male received 0.5cc toxoid, immediately developed wheezing, stridor, lost consciousness, BP 70/40 → attempt to intubate → laryngeal edema → recovered with epinephrine
How Do I Find a Foreign Body?

- Pond, 1977: 6 varieties of glass buried in roast beef
- Tandberg, 1982: 66 types of glass embedded in chicken legs (some fragments as small as 0.5 mm)
- de Lacey, 1985: 15 types of glass buried 2cm deep in pork
How Do I Find a Foreign Body?

ALL GLASS SEEN ON X-RAY, REGARDLESS OF DEPTH OR COMPOSITION
How Do I Find a Foreign Body?

- Gooding, 1987: ~15% of wooden foreign bodies seen on x-ray
- de Flaviis, 1988: splinters, sea urchin spines, sand in veal → ultrasound found them all
- Bodine, 1988: CT & MRI found wooden foreign bodies
How Do I Find a Foreign Body?

- Ginsberg, 1990: 2 mm fragments between strips of steak, then plain x-ray, xerography, CT and US
  - Glass: visible in all
  - Wood: visible only by ultrasound
  - Plastic: visible only by ultrasound
Does It Help to Ask the Patient?

Montano, 1992: 438 patients

- Patient who said, “it feels like there’s some glass there” right in 15 / 41
- Retained glass highest in puncture wounds, stepping on glass, or MVCs
Avner, 1992: 226 patients with lacerations due to glass

- 10 → obvious glass contamination
- 160 → bottom of wound seen and no glass identified → x-ray showed glass in 11 (6.9%)
- 56 → bottom of wound NOT seen → x-ray showed glass in 12 (21.4%)
Well If I Miss a Foreign Body, So What?

Anderson, 1982: 200 patients with retained foreign body

- Average time to removal → 7 months
- 16 patients had infection (8%)
- 4 had neuropraxias (2%)
- 75 seen by prior physician (37.5%)
What If a Tendon Is Partially Cut?

Wray, 1980: 34 with partial flexor tendon lacerations

- 1/3 were 75% to 95% disrupted
- Mobilization one week after injury
- NO TENDONS RUPTURED
How Do I Sedate a Screaming Kid?

No longer in the scope of this talk, as any standard Pediatric Emergency Textbook will give you plenty of good insight and information.
What Local Anesthetic Should I Use?

Esters

- Cocaine
- Procaine (Novocain®)
- Benzocaine (Cetacaine®)
- Tetracaine (Pontocaine®)
- Chloroprocaine (Nesacaine®)
What Local Anesthetic Should I Use?

Amides = 2 i’s

- Lidocaine (Xylocaine®)
- Mepivacaine (Polocaine®, Carbocaine®)
- Bupivacaine (Marcaine®)
- Prilocaine
- Levobupivacaine (Chirocaine®)
I’m Allergic to ‘caines.

Fischer, 1997: 208 patients with ‘allergies’ to local anesthetics
- Intradermal testing or progressive challenge with 3 or 4 agents
- 4 immediate response, 4 delayed responses
- Remaining 200 – no response
I’m Allergic to ‘caines.

Ernst, 1994, 98 adults

- 48 got 1% lidocaine
- 50 got 0.5% diphenhydramine
- Equianalgesia in all areas except face
How Do I Make the Injection ‘Painless’?

Christoph, 1988

- 1% lidocaine pH = 5
- Add 1 cc of standard bicarbonate (8.4% = 1 mEq/ml) to each 10 cc of anesthetic
- Pain of injection significantly reduced without compromising anesthesia
How Do I Make the Injection ‘Painless’?

Confirmation done by:

- Larson, 1991
- Bartfield, 1992
- Mader, 1994
- Brogan, 1995
- Martin, 1996
- Colaric, 1998
- Fatovich, 1999
How Do I Make the Injection ‘Painless’?

Edlich, 1988

- 30-gauge hurts less than 27-gauge
- 27-gauge hurts less than 25-gauge
- 25-gauge hurts…but you’ve got the idea
How Do I Make the Injection ‘Painless’?

- Edlich, 1988
- Krause, 1997
- Scarfone, 1998

- Slow injection (given over 10 seconds or more) hurts less than rapid injection (less than 2 seconds)
How Do I Make the Injection ‘Painless’?

Arndt, 1984: injecting into deep tissues hurts less than injecting into superficial tissues, BUT full anesthesia takes up to 6 minutes.
How Do I Make the Injection ‘Painless’?

- Kelly, 1994
- Bartfield, 1998

Injecting into wound edges hurts less than the skin around the wound and does NOT increase the infection rate.
How Do I Make the Injection ‘Painless’?

Robson, 1990: digital block hurts less than direct injection into digit, and gives better anesthesia.

Ellis, 1993: jet injection for digital blocks hurts less than syringe and needle injection.
How Long Does the Local Anesthetic Last?

- 30-60 min
- 45-90 min
- 120-240 min
- 30-90 min
<table>
<thead>
<tr>
<th>Local Anesthetic</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lidocaine (Xylocaine®)</td>
<td>30 – 60 min</td>
</tr>
<tr>
<td>Mepivacaine (Carbocaine®)</td>
<td>45 – 90 min</td>
</tr>
<tr>
<td>Bupivacaine (Marcaine®)</td>
<td>120 – 240 min</td>
</tr>
<tr>
<td>Prilocaine</td>
<td>30 – 90 min</td>
</tr>
</tbody>
</table>
What About Topical Agents?

TAC

- Tetracaine: 25 cc of 2% solution
- Adrenaline: 50 cc of 1:1000
- Cocaine: 11.8 gm

Must be mixed by pharmacist
Not approved by FDA
Expensive – up to $35 / dose
Does TAC work?

Hegenbarth, 1990: TAC vs. lidocaine, face and scalp wounds

- TAC adequate in 171 of 212 children (80.7%)
- 1% lidocaine adequate in 136 of 157 children (86.6%)
Is TAC safe?

Daya, 1988: 5 yo female with buccal mucosa laceration
- 2 cc TAC on wound >20 minutes
- “Unremitting” seizures
Is TAC safe?

Dailey, 1988: 7½ mo male with lip laceration, observed licking lips

- Discharged ‘wide eyed’ and ‘tense’
- Found dead in crib at home 3 hours later
What About XAP / LET?

- Xylocaine: 15cc of 2% viscous
- Adrenaline: 7.5cc of 1:1000 topical
- Pontocaine: 7.5cc of 2% topical
  - Also called LET or LAT or LAP
  - XAP more fun to say or write
Does XAP work?

Ernst, 1995 (Pediatrics and AJEM within a month of each other)

Blackburn, 1995

Ernst, 1997

All show effective anesthesia if left in place for 15 to 20 minutes
Don’t Vasoconstrictors Affect Healing?

Barker, 1982
“In our experimental study, exposure of wounds to ...(TAC)… damaged host defenses and increased susceptibility toward infection.”

Martin, 1990
“TAC does not increase bacterial proliferation more than lidocaine infiltration in contaminated experimental wounds”
Bodiwala, 1982: randomized 337 patients to ‘gloves’ or ‘careful hand-washing, no gloves’

<table>
<thead>
<tr>
<th>Infection</th>
<th>Gloves</th>
<th>No gloves</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>167 (82.7%)</td>
<td>170 (82.5%)</td>
</tr>
<tr>
<td>‘Mild’</td>
<td>27 (13.4%)</td>
<td>27 (13.1%)</td>
</tr>
<tr>
<td>‘Severe’</td>
<td>8 (4.0%)</td>
<td>9 (4.4%)</td>
</tr>
</tbody>
</table>
How Much Is Sterile Technique Necessary?

- Caliendo, 1976: alternated face mask / no mask for 99 wound repairs
  - Mask – 1 / 47 infected
  - No mask – 0 / 42 infected

- Ruthman, 1984

- Whorl, 1987
Shouldn’t I Shave or Clip the Hair?

- Seropian, 1971: 406 surgical wounds
  - Shaved pre-op, 3.1% infection
  - Depilated, 0.6% infection

- Howell, 1988: 68 scalp lacerations repaired without hair removal → no infection at 5-day follow-up
How About Disinfecting the Skin?

- An ‘ideal agent’ does not exist – either tissue toxic or poorly bacteriostatic
- Simple scrub with soap and water AROUND wound should be sufficient
What If the Wound Is Contaminated?

Haury, 1978: debridement is the most important step, as it...

...removes tissues contaminated with bacteria

...removes devitalized tissues which impair wound’s ability to resist infection
What If the Wound Is Contaminated?

Dimick, 1988: Delayed Primary Closure

- Wound left open 4 or 5 days until edema subsides, no sign of infection, and all debris and exudates removed
What If the Wound Is Contaminated?

Dimick, 1988: Delayed Primary Closure

- >90% success rate in closure without infection
- Final scar → same as primary closure
How Do I Clean the Wound Before Sewing?

NEVER PUT ANYTHING IN AN OPEN WOUND THAT YOU WOULDN’T PUT IN YOUR OWN EYE
How Do I Clean the Wound Before Sewing?

- Mulliken, 1980: 1% povidone-iodine did not decrease wound tensile strength
- Roberts, 1985: povidone-iodine powder did not decrease rate of wound infections (except in the hand)
How Do I Clean the Wound Before Sewing?

Lineaweaver, 1985 – looked at…

...povidone-iodine 0.01, 0.001, 0.0001%
...sodium hypochlorite 0.05, 0.005, 0.0005%
...hydrogen peroxide 3.0, 0.3, 0.03, 0.003%
...acetic acid 0.25, 0.025, 0.0025%
How Do I Clean the Wound Before Sewing?

Lineaweaver, 1985

The ONLY antiseptic not harmful to fibroblasts yet still bacteriostatic was…
How Do I Clean the Wound Before Sewing?

Rodeheaver, 1982: povidone-iodine surgical scrub (NOT solution) caused significant increase in infection if used in fresh wounds.
How Do I Clean the Wound Before Sewing?

Lammers, 1990

- Soaking fresh wounds in 1% povidone-iodine did not decrease bacterial count
- Soaking in normal saline INCREASED bacterial count
How Do I Clean the Wound Before Sewing?

Gross, 1972: 200 rats with face wounds experimentally contaminated

- Bulb syringe vs. jet lavage
- All bacteriologic loads less with lavage
Wheeler, 1976: experimental contaminated wounds

- Irrigated with 35cc syringe and 19g needle (~7psi)
- Fluid went into tissues, bacteria did not follow
How Do I Clean the Wound Before Sewing?

Singer, 1994

“Both 35ml…and…65ml syringes with a 19-gauge needle are effective in performing high-pressure irrigation in the range of 25 psi to 35 psi. The use of IV bags and plastic bottles should be discouraged.”
Angeras, 1992: 617 patients with wounds less than 6 hours old

- 295 irrigated with tap water → 5.4% infection rate
- 322 irrigated with NSS → 20.3% infection rate
How Do I Clean the Wound Before Sewing?

Kaczmarek, 1982: cultured open bottles of saline irrigating solution
  • 36/169 1000cc bottles contaminated
  • 16/105 500cc bottles contaminated

Brown, 1985: “…one in five of the opened bottles used for irrigation were contaminated…”
How Do I Clean the Wound Before Sewing?

Hollander, 1998:

- Clean face wounds
- Half irrigated, half left alone
- No difference in infection rate
How Do I Clean the Wound Before Sewing?

What about splatter??

- Pigman, 1993: Zerowet® Splashield and Irrijet® Irrigation Systems effective in preventing splatter of irrigation fluid
Do All ERs Follow This Protocol?

Howell, 1992: 151 surveys, >60% Board Certified

- 38% soaked wounds, didn’t irrigate
- 21% used full-strength povidone-iodine or hydrogen peroxide
- 67% scrubbed entire wound surface before suturing
Laufman, 1977: gut vs. synthetic

- Gut suture...
  - caused more tissue reaction
  - had a higher wound infection rate
  - had less tensile strength
  - had knots which held less well
  - degraded more quickly in infection
What Suture Material Should I Use?

Rodeheaver, 1981: Dexon® vs. Vicryl®

- Dexon® thinner, weaker
- Dexon® with less breaking strength at 10 days
- Both absorbed at 90 - 120 days
- Vicryl® was the preferred material
# Absorbable Sutures

<table>
<thead>
<tr>
<th>Type</th>
<th>Knot security</th>
<th>Tensile strength</th>
<th>Wound security</th>
<th>Tissue reaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gut</td>
<td>*</td>
<td>**</td>
<td>5-7 days</td>
<td>***</td>
</tr>
<tr>
<td>Chromic</td>
<td>**</td>
<td>**</td>
<td>10-14 days</td>
<td>***</td>
</tr>
<tr>
<td>Dexon®</td>
<td>****</td>
<td>****</td>
<td>25 days</td>
<td>*</td>
</tr>
<tr>
<td>Vicryl®</td>
<td>***</td>
<td>****</td>
<td>30 days</td>
<td>*</td>
</tr>
</tbody>
</table>
## Non-Absorbable Sutures

<table>
<thead>
<tr>
<th>Type</th>
<th>Knot security</th>
<th>Tensile strength</th>
<th>Wound security</th>
<th>Tissue reaction</th>
<th>Ease of working</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silk</td>
<td>****</td>
<td>*</td>
<td>*</td>
<td>****</td>
<td>****</td>
</tr>
<tr>
<td>Mersilene</td>
<td>****</td>
<td>**</td>
<td>***</td>
<td>***</td>
<td>****</td>
</tr>
<tr>
<td>Nurolon</td>
<td>***</td>
<td>**</td>
<td>**</td>
<td>***</td>
<td>***</td>
</tr>
<tr>
<td>Nylon</td>
<td>**</td>
<td>***</td>
<td>***</td>
<td>**</td>
<td>**</td>
</tr>
<tr>
<td>Prolene®</td>
<td>*</td>
<td>*****</td>
<td>*****</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Ethibond®</td>
<td>***</td>
<td>*****</td>
<td>*****</td>
<td>**(*)</td>
<td>***</td>
</tr>
</tbody>
</table>
I’ve Heard ‘Running’ Stitches Are No Good.

McLean, 1980

- 51 patients with continuous, running (‘baseball’) stitch
- 54 patients with interrupted stitch
- Two infections in each group
Elek, 1956: “When bacterial contamination of simple wounds is moderate, suture foreign bodies are the sine qua non for development of wound infection.”
How Do I Close the “Dead Space?”

- Condie, 1961
- de Holl, 1971
  - Leaving the dead space resulted in lower infection rates than obliterating it with sutures
What Can I Use Other Than Sutures?

Brickman, 1989: 87 ER patients, 2/3 with scalp lacerations

- 65% closed in 30 seconds using staples
- No infections
What Can I Use Other Than Sutures?

- MacGregor, 1989: 100 ER patients, 2/3 with scalp lacerations (no anesthetic!)
  - Staples took 18.8 seconds each
  - Sutures took 124 seconds each
  - Patients preferred staples
What Can I Use Other Than Sutures?

Koehn, 1981
- Steri-Strips® stay on for ~8 days
- Skin prep: no difference
- Benzoin®: no difference

Rodeheaver, 1983: Shur-Strips® better than Steri-Strips®
What Can I Use Other Than Sutures?

Sutton, 1985: Strips vs. sutures for pretibial flap lacerations

- 53 days for sutured flaps to heal
- 38 days for taped flaps to heal
What Can I Use Other Than Sutures?

Dermabond® approved in US
- Bruns, 1996
- Simon, 1997
- Quinn, 1997
- Singer, 1998
- Quinn, 1998
- Osmond, 1999
What Can I Use Other Than Sutures?

Davies, 1988: Scalp lacerations in children with long hair

- 3 to 4 mm of hair twisted into ‘rope’
- Tie across wound with 3 or 4 throws
- Knots grow away from wound
- Snip away in 3-4 weeks
# Do Topical Antibiotic Creams Do Anything?

<table>
<thead>
<tr>
<th>Topical Agent</th>
<th>Days of Healing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polysporin®</td>
<td>8.8</td>
</tr>
<tr>
<td>Neosporin®</td>
<td>9.2</td>
</tr>
<tr>
<td>Johnson &amp; Johnson</td>
<td>9.8</td>
</tr>
<tr>
<td>No treatment</td>
<td>14.2</td>
</tr>
<tr>
<td>Iodine</td>
<td>16.0</td>
</tr>
</tbody>
</table>
Do Topical Antibiotic Creams Do Anything?

Dire, 1995: prospective randomized, double-blind, placebo-controlled

<table>
<thead>
<tr>
<th>Topical Agent</th>
<th>Infection Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bacitracin®</td>
<td>5.5% (6/109)</td>
</tr>
<tr>
<td>Neosporin®</td>
<td>4.5% (5/110)</td>
</tr>
<tr>
<td>Silvadene®</td>
<td>12.1% (12/99)</td>
</tr>
<tr>
<td>Placebo</td>
<td>4.9% (5/101)</td>
</tr>
</tbody>
</table>
How Long Should the Dressing Stay On?

Chrintz, 1989: 1202 clean wounds

- Dressing off at 24 hours → 4.7% infection
- Dressing off at suture removal → 4.9%

Lotti, 1997: many theoretical advantages to leaving occlusive dressing until suture removal
Can I Get the Stitches Wet, Doctor?

Goldberg, 1981: 100 patients with sutured scalp lacerations allowed to wash hair → no infection or wound disruption

Noe, 1988: 100 patients with surgical excision of skin lesions allowed to bathe next day → no infection or wound disruption
Who With a Cut Should Get Antibiotics?

Burke, 1961

“Systemic antibiotics have no effect on primary staphylococcal infections if the bacteria creating the infection have been in the tissue longer than three hours before the antibiotics are given.”
Who With a Cut Should Get Antibiotics?

Edlich, 1971, 1973

Gentle scrubbing of wound prolonged effective period of antibiotics, probably by breaking up fibrin in which bacteria had taken hold.
**Who With a Cut Should Get Antibiotics?**

Edlich, 1986: Recommends antibiotics if ‘chance of infection >10%’

- Delay in cleansing of >6 hours
- Stellate cut with abraded skin edges
- Soiled by saliva, feces, vaginal secretions
  - “Dirty” or “contaminated”
- Feet
Who With a Cut Should Get Antibiotics?

Edlich, 1986

- Use a broad-spectrum antibiotic
- Give the first dose intravenously
- Treatment for more than 3 days unwarranted
Who With a Cut Should Get Antibiotics?

...artificial heart valves?

- Kaplan, 1977: no recommendation for patients with valves and simple cuts

BUT

- Clooey, 1985: reported 4 cases of endocarditis from skin infections
...artificial joints?

- Ahlberg, 1978
  - 27 cases of hematogenous infection to joint arthroplasties requiring removal of hardware
  - At least 5 due to infection from skin
Who With a Cut Should Get Antibiotics?

…lymphedema?

van Scoy, 1983

- Patients with lymphedema and history of recurrent cellulitis require prophylactic penicillin when skin integrity disrupted
Who With a Cut Should Get Antibiotics?

...hand laceration?
- Roberts, 1977
- Worlock, 1980
- Grossman, 1981
- Haughey, 1981

Oral antibiotic administration has no effect on clinical course of simple hand wounds.
Who With a Cut Should Get Antibiotics?

...other body site?

- Hutton, 1978
- Thirlby, 1983
- Samson, 1977
- Day, 1975

Oral antibiotic administration has no effect on the clinical course of most simple wounds.
Aren’t Human Bites Pretty Nasty?

Lindsey, 1987: Institutionalized, retarded patients

- Bites: 17.7% infected (77/434)
- Cuts: 13.4% infected (108/803)
  - No one needed hospital admission
  - No one needed intravenous antibiotic
  - No serious infections or complications
Schweich, 1985

- 33 children bitten by other children
- 4 were infected on presentation
- 16 got antibiotic – one got infected
- 13 got no antibiotic – none got infected

- 75% were superficial abrasions
  - 0% infection rate
- 13% were puncture wounds
  - 38% infection
- 11% were frank lacerations
  - 37% got infected
He Bit Your WHAT??

Tomasetti, 1979: 25 bites of face
Spinelli, 1986: 5 eyelids chewed off
Brandt, 1969: 5 ears chewed off
Laskin, 1958: 5 lips chewed off

Sometimes in anger, sometimes in passion – all sewn back and did well
Bite U, 1984

“Patients seen soon after injury without evidence of joint penetration should be managed by irrigation and open management of the wound, immobilization in a hand dressing, tetanus prophylaxis, oral administration of a cephalosporin, and reexamination within 24 hours.”
Dog Bites Man (and Woman)

 Dire, 1994: 769 dog bite victims

- Prospective survey to define risk factors
  - Wound depth
  - Need for debridement
  - Female sex (??)
Dog Bites Man (and Woman)

Cummings, 1994: meta-analysis

- Relative risk for infection: 0.56
- Number needed to treat: 14
Callaham, 1994: looked at Cummings’ meta-analysis, dropped 60% infection rate study

- NNT now 26
- If you treat 100 dog-bite victims at $20 per prescription you will prevent 3.8 infections at a cost of $526 each
Elenbass, 1984: eleven patients with cat bite

- Placebo – 5/6 infected
- Oxacillin – 0/4 infected
- Sanford’s Guide to Antibiotic states ‘80% of cat bites get infected’ based on this one study!!
I Still Wanna Treat.
What Should I Use?

Callaham, 1988

If already infected or high risk
• Dog: dicloxacillin or cephalexin QID
• Cat: dicloxacillin or penicillin QID
• Man: dicloxacillin PLUS penicillin

If for prophylaxis, maximum treatment 5 days
I Stepped on a Rusty Nail!! – Foot Puncture

Chisholm, 1989: treatment based on...

- Type and condition of penetrating object
- Footwear at time of injury
- Estimated depth of puncture
- Possibility of retained foreign body
- Elapsed time since injury
- Indoor vs. outdoor injury
- Infection risks: diabetes, vasculopathy
I Stepped on a Rusty Nail!! – Foot Puncture

Chisholm, 1989

- Presentation <24 hours – careful exam for retained material, trim epidermal flap – NO indication for prophylactic antibiotic
- Presentation >24 hours usually with established infection – treat with oral antistaphylococcal antibiotic
How About Those Nasty Intra-Oral Cuts?

Altieri, 1987

- Suturing increased infection rate from 4% to 21%
- 14 patients received sutures
  - No antibiotic given: 2 infections
  - Penicillin given: 1 infection
How About Those Nasty Intra-Oral Cuts?

Steele, 1989: 62 patients with full-thickness through-and-through oral mucosa-to-skin wounds

- Prospective, double-blinded, placebo-controlled
- *Trend* toward penicillin-treated group having fewer infections