

Skin and soft tissue infection

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IDAT Short course 2016

Non purulent SSTI

- Impetigo, ecthyma
- Cellulitis, Erysipelas
- Erysipeloid
- Necrotizing infection
- Etc eg Glanders, bubonic plaque

Purulent SSTI

- Furuncle
- Carbuncle
- Abscess
- Etc eg Tularemia

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SSTI severity

- Purulent SSTI
 - Mild infection: I&D is indicated
 - Moderate: + systemic signs
 - Severe: failed I&D + ABT, systemic signs
- Non purulent SSTI
 - Mild infection: no focus of purulence
 - Moderate: + systemic signs
 - Severe: failed oral ABTs, systemic signs, compromised, signs of deeper infection

Impetigo, Ecthyma

- *S. aureus* or Beta hemolytic streptococci
- Difference
 - Depth
 - Scar
- ABT should be active against both *S. aureus* and streptococci
- Systemic therapy preferred
 - Pts with numerous lesions
 - Outbreaks

Treatment

Antibiotic	Dosage	Comment
Dicloxacillin	250 mg po qid	
Cephalexin	250 mg po qid	
Erythromycin	250 mg po qid	Some strains of <i>Staphylococcus aureus</i> and <i>Streptococcus pyogenes</i> may be resistant
Clindamycin	300-400 mg po qid	
Amoxicillin-clavulanate	875/125 mg po bid	
Retapamulin ointment	Apply lesions bid	For patients with limited number of lesions
Mupirocin ointment	Apply lesions bid	For patients with limited number of lesions

Cellulitis, Erysipelas

- Erysipelas
 - Upper dermis
 - Delineated border
 - May be refer to cellulitis of face
- Cellulitis
 - Deeper dermis, subcutaneous fat
 - No clear border
- Areas of erythema, swelling, tenderness, and warmth, sometimes accompanied by lymphangitis and inflammation of the regional lymph nodes. The skin surface may resemble an orange peel (peau d'orange)

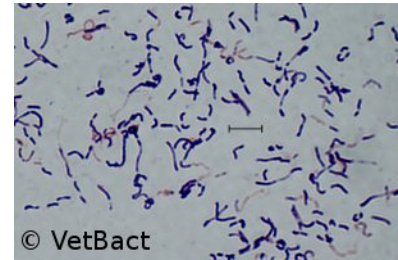
Cellulitis, Erysipelas

- Streptococci, often group A, but also from other groups, such as B, C, F, or G
- MSSA: less frequent, MRSA: unusual
 - Often related to penetrating trauma, IVDU
- NSAIDS or steroid can hasten clinical improvement in nondiabetic patients (but weak evidence)

Treatment

Antibiotics	Dosage
Penicillin G	2–4 million units every 4–6 h IV
Clindamycin	600–900 mg every 8 h IV
Nafcillin	1–2 g every 4–6 h IV
Cefazolin	1 g every 8 h IV
Penicillin V	250–500 mg every 6 h po
Cephalexin	500 mg every 6 h po

Erysipeloid



- *Erysipelothrix rhusiopathiae*
 - a thin, pleomorphic, non-spore-forming gram-positive rod
- fish, marine animals, swine, or poultry
- Target appearance, lymphangitis, lymphadenopathy
- Treatment
 - Penicillin (500 mg qid) or amoxicillin (500 mg 3 times daily [tid]) for 7–10 days
 - Resistant to vancomycin, teicoplanin, and daptomycin

Necrotizing fasciitis

- Type I – polymicrobial
 - Spread from GI/GU tract
 - decubitus ulcers
 - IVDU
- Type II – monomicrobial
 - *S. pyogenes*, *S. aureus*, *V. vulnificus*, *A. hydrophila*, and anaerobic streptococci (*Peptostreptococcus*)

Diagnosis score?

- The Laboratory Risk Indicator for Necrotizing Fasciitis (LRINEC) score
 - Score ≥ 6 should be considered as NF
 - 10% of NF have score < 6
- 6 serologic markers
 - CRP, WBC count, hemoglobin, sodium, creatinine and glucose

LRINEC Score

- CRP (mg/L) ≥ 150 : 4 points
- WBC count ($\times 10^3/\text{mm}^3$)
 - < 15 : 0 points
 - 15–25: 1 point
 - > 25 : 2 points
- Hemoglobin (g/dL)
 - > 13.5 : 0 points
 - 11–13.5: 1 point
 - < 11 : 2 points
- Sodium (mmol/L) < 135 : 2 points
- Creatinine (umol/L) > 141 : 2 points
- Glucose (mmol/L) > 10 : 1 point

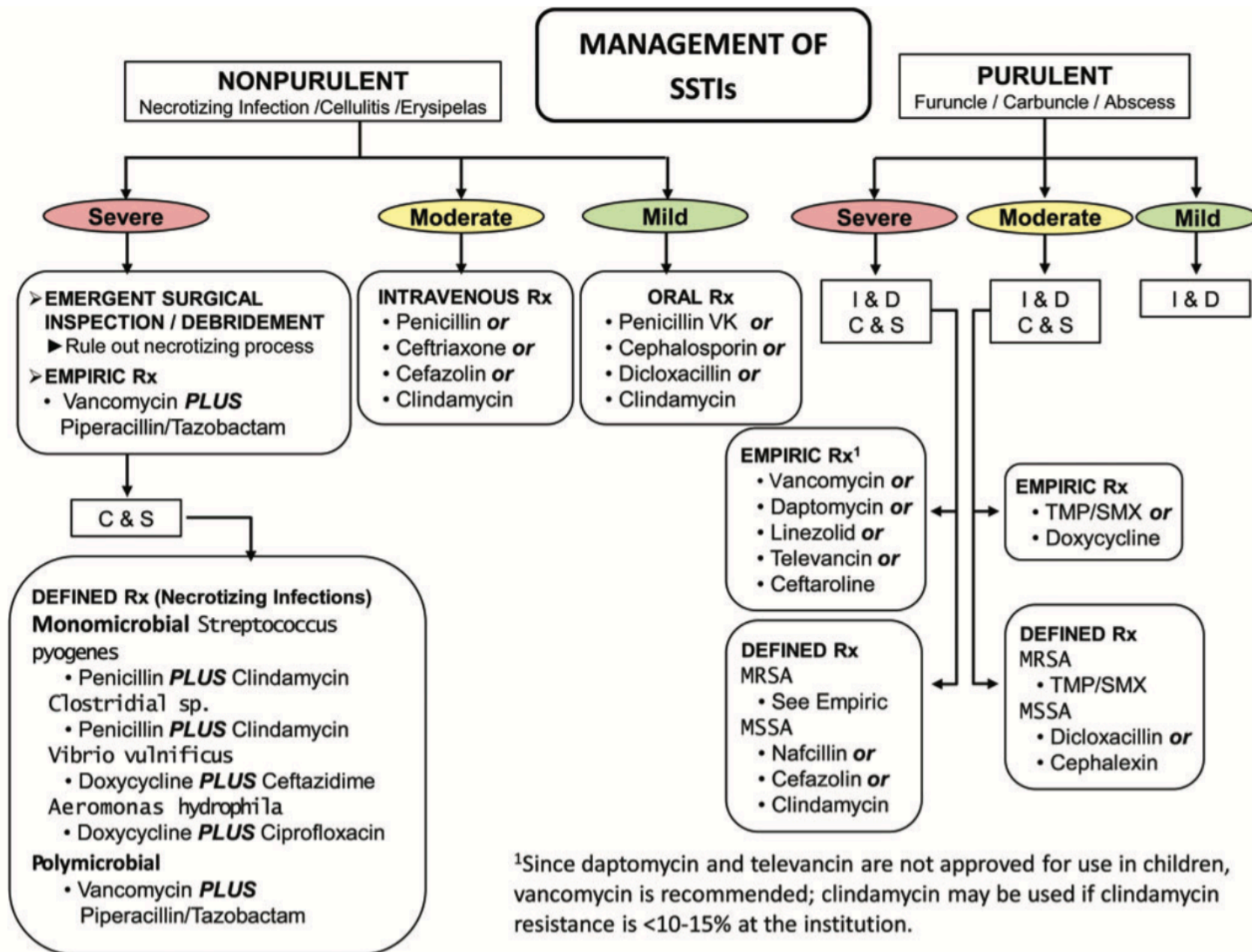
Gas gangrene, Myonecrosis

- *Clostridium perfringens*, *Clostridium novyi*, *Clostridium histolyticum*, *Clostridium septicum*
- Trauma associated: severe pain within 24h, skin discoloration, bullae, gas
- Spontaneous gangrene: neutropenic pt, GI cancer, *C.septicum*
- Require emergent debridement and appropriate ABTs

Antibiotics treatment

Type of Infection	First-line Antimicrobial Agent	Adult Dosage
Mixed infections	Piperacillin-tazobactam plus vancomycin	3.37 g every 6–8 h IV 30 mg/kg/d in 2 divided doses
	Imipenem-cilastatin	1 g every 6–8 h IV
	Meropenem	1 g every 8 h IV
	Ertapenem	1 g daily IV
	Cefotaxime plus metronidazole or clindamycin	2 g every 6 h IV 500 mg every 6 h IV 600–900 mg every 8 h IV
<i>Streptococcus</i>	Penicillin plus clindamycin	2–4 million units every 4–6 h IV (adult) 600–900 mg every 8 h IV

<i>Staphylococcus aureus</i>	Nafcillin	1–2 g every 4 h IV
	Oxacillin	1–2 g every 4 h IV
	Cefazolin	1 g every 8 h IV
	Vancomycin (for resistant strains)	30 mg/kg/d in 2 divided doses IV
	Clindamycin	600–900 mg every 8 h IV
<i>Clostridium</i> species	Clindamycin plus penicillin	600–900 mg every 8 h IV 2–4 million units every 4–6 h IV (adult)
<i>Aeromonas hydrophila</i>	Doxycycline plus ciprofloxacin or ceftriaxone	100 mg every 12 h IV 500 mg every 12 h IV 1 to 2 g every 24 h IV
<i>Vibrio vulnificus</i>	Doxycycline plus ceftriaxone or cefotaxime	100 mg every 12 h IV 1 g qid IV 2 g tid IV



Drainage alone or plus ABT

ORIGINAL ARTICLE

Trimethoprim–Sulfamethoxazole versus Placebo for Uncomplicated Skin Abscess

David A. Talan, M.D., William R. Mower, M.D., Ph.D., Anusha Krishnadasan, Ph.D., Fredrick M. Abrahamian, D.O., Frank Lovecchio, D.O., M.P.H., David J. Karras, M.D., Mark T. Steele, M.D., Richard E. Rothman, M.D., Ph.D., Rebecca Hoagland, M.S., and Gregory J. Moran, M.D.

N Engl J Med 2016; 374:823-832 | [March 3, 2016](#) | DOI: 10.1056/NEJMoa1507476

- Multicenter, double-blind, RCT
- TMP-SMX 7 days VS placebo in pts with skin abscess S/P I&D
- Abscess present less than a week, at least 2.0cm in diameter, fluctuant
- I&D : #11 scalpel, minimum incision not less than 1 cm
- **Note : MRSA prevalence

Table 3. Cure Rates among Patients with a Drained Cutaneous Abscess in Three Trial Populations.*

Trial Population	Cure of Abscess		Difference (95% CI)	P Value†
	Trimethoprim– Sulfamethoxazole	Placebo		
	no./total no. (%)			
Modified intention-to-treat 1	507/630 (80.5)	454/617 (73.6)	6.9 (2.1 to 11.7)	0.005
Per-protocol‡	487/524 (92.9)	457/533 (85.7)	7.2 (3.2 to 11.2)	<0.001
FDAGEEP	218/601 (36.3)	204/605 (33.7)	2.6 (–3.0 to 8.1)	0.38

* CI denotes confidence interval.

† P values were calculated with a Wald asymptotic test of equality with a continuity correction.

‡ The primary outcome was clinical cure at the test-of-cure visit (7 to 14 days after the end of the 7-day treatment period) in the per-protocol population.

Linezolid VS Vancomycin

Cochrane Database Syst Rev. 2016 Jan 7;1:CD008056. doi: 10.1002/14651858.CD008056.pub3.

Linezolid versus vancomycin for skin and soft tissue infections.

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- 9 RCTs (3144pts)
- Linezolid Pros
 - Better clinical and microbiological cure rate (RR 1.09, 95% CI 1.03 to 1.16; RR 1.09, 95% CI 1.03 to 1.16)
 - More effective in MRSA (RR 1.09, 95% CI 1.03 to 1.17; RR 1.17, 95% CI 1.04 to 1.32)
 - Less side effects (red man syndrome, pruritus, rash)
- Linezolid Cons
 - More thrombocytopenia and nausea (RR 13.06, 95% CI 1.72 to 99.22; RR 2.45, 95% CI 1.52 to 3.94)
- Unanswered
 - No difference in all-cause mortality
 - Cost

Other form

- Animal/Human bite
- Compromised host
- Surgical site infection
- Special pathogens

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Animal bite

- Mono/polymicrobial
 - Streptococci/staphylococci
 - *Pasteurella multocida* and fusobacteria
- Human bite
 - Streptococci, *S. aureus*, and *Eikenella corrodens*
 - Anaerobic organisms
 - Fusobacterium, Peptostreptococcus, Prevotella, and Porphyromonas species
- Do not forget tetanus toxoid

Antimicrobial Agent by Type of Bite	Therapy Type		
	Oral	Intravenous	Comments
Animal bite			
Amoxicillin-clavulanate	875/125 mg bid	. . .	Some gram-negative rods are resistant; misses MRSA
Ampicillin-sulbactam	. . .	1.5–3.0 g every 6–8 h	Some gram-negative rods are resistant; misses MRSA
Piperacillin-tazobactam	. . .	3.37 g every 6–8 h	Misses MRSA
Carbapenems		See individual info.	Misses MRSA
Doxycycline	100 mg bid	100 mg every 12 h	Excellent activity against <i>Pasteurella multocida</i> ; some streptococci are resistant
Penicillin plus dicloxacillin	500 mg qid/500 mg qid	. . .	
SMX-TMP	160–800 mg bid	5–10 mg/kg/day of TMP component	Good activity against aerobes; poor activity against anaerobes
Metronidazole	250–500 mg tid	500 mg every 8 h	Good activity against anaerobes; no activity against aerobes
Clindamycin	300 mg tid	600 mg every 6–8 h	Good activity against staphylococci, streptococci, and anaerobes; misses <i>P. multocida</i>
Second-generation cephalosporin			Good activity against <i>P. multocida</i> ; misses anaerobes
Cefuroxime	500 mg bid	1 g every 12 h	
Cefoxitin	. . .	1 g every 6–8 h	
Third-generation cephalosporin			
Ceftriaxone	. . .	1 g every 12 h	
Cefotaxime	. . .	1–2 g every 6–8 h	
Fluoroquinolones			Good activity against <i>P. multocida</i> ; misses MRSA and some anaerobes
Ciprofloxacin	500–750 mg bid	400 mg every 12 h	
Levofloxacin	750 mg daily	750 mg daily	
Moxifloxacin	400 mg daily	400 mg daily	Monotherapy; good for anaerobes also
Human bite			
Amoxicillin-clavulanate	875/125 mg bid	. . .	Some gram-negative rods are resistant; misses MRSA
Ampicillin-sulbactam	. . .	1.5–3.0 g every 6 h	Some gram-negative rods are resistant; misses MRSA
Carbapenems			Misses MRSA
Doxycycline	100 mg bid	. . .	Good activity against <i>Eikenella</i> species, staphylococci, and anaerobes; some streptococci are resistant

Bacillary angiomatosis, cat scratch disease



- *Bartonella henselae*, *Bartonella quintana*
- Cat scratch disease: normal host, *B. henselae*
 - Papule or pustule with lymph node enlargement, 10% suppurate node
- Bacillary angiomatosis: HIV pt, *B. quinata*
 - red papules, vary in sizeber
 - subcutaneous, painful nodules

Dx and Rx

- Difficult diagnosis: c/s is rarely positive
 - Positive Warthin-Starry silver stain of infected lymph node tissue
- Treatment
 - Cat scratch disease:
Azithromycin 500mg on D1 then 250mgx4d
 - Bacillary angiomatosis:
Erythromycin 500 mg qid or doxycycline 100 mg bid for 2 weeks to 2 months

Cutaneous anthrax

- Eschar lesion
- Surrounding edema
- Regional lymphadenopathy
- C/S from lesion almost positive, but H/C is negative
- Treatment
 - Oral penicillin V 500 mg qid for 7–10 days
 - Quinolones for bioterrorism case

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