Guidelines for Treatment of Skin and Soft Tissue Infections

These guidelines are not intended to replace clinical judgment. The antimicrobials are not listed in order of preference, and therapeutic decisions should be based on a number of factors including patient history, comorbidities, suspected etiology, antimicrobial susceptibility patterns, and cost. In certain populations (e.g., intravenous drug abusers, immunosuppressed, travelers), the suspected organisms may include a broader range of organisms. The Infectious Diseases consult services are available for complex patient consultations and should be strongly considered in patients with any severe infections. Cultures should usually be obtained if incision and drainage (I & D) is performed and/or if there is a discrete collection of pus or drainage that would allow an appropriate culture specimen to be obtained.
Note: Refer to table on page 4 for pediatric dosing.

Type of Infection	Suspected Organisms	Recommended Treatment
Non-culturable cellulitis (no purulent material or wound present)	*ß-hemolytic Streptococcus* (*Strep pyogenes* (group A strep)*, Strep agalactiae* (group B strep or GBS)*, Strep dysgalactiae* (group C strep)*, G streptococcus* (group G strep), Rarely *Staphyloccus aureus*	- Mild Cephalexin 500-1000mg PO q6h **OR** Dicloxacillin 500mg PO q6h **PCN allergy**: Clindamycin 300 mg PO q8h - Moderate-severe Cefazolin 2g IV q8h **OR** Oxacillin 2g IV q4h **PCN allergy:** Clindamycin 600 mg IV q8h -Severe systemic illness or no response/worsening at 48 hours consider vancomycin 10-15 mg/kg IV q12h[§] - If culture documented streptococcal infection: PCN VK 500 mg PO q6h OR Procaine PCN G 600,000 U IM bid OR Aqueous PCN G 2 MU IV q4h
Abscess, furuncles, carbuncles	*S. aureus*, including CA-MRSA and *ß-hemolytic Streptococcus* (less common)	**- I & D alone is likely adequate** Utility of antibiotics is unclear but are recommended in the following situations (see purulent cellulitis for treatment options): • Severe or extensive disease (multiple sites) • Rapid progression of cellulitis • Signs/symptoms of systemic illness • Associated immunosuppression or comorbidities (diabetes, HIV, active neoplasm) • Extremes of age • Associated septic phlebitis • Sensitive area (face, hand, genitals) • Lack of response to I & D
Purulent cellulitis or abscesses meeting criteria for treatment	*S. aureus*, including CA-MRSA and *ß-hemolytic Streptococcus*	- I & D - Mild Cephalexin 500-1000mg PO q6h **PLUS** TMP/SMX DS 1 tab PO q12h* OR Minocycline 100 mg PO q12h** OR Doxycycline 100 mg PO q12h** OR Clindamycin 300 mg PO q8h - Moderate-severe Vancomycin 10-15 mg/kg IV q12h[§] Consult pharmacy for patient-specific dosing. *- If gangrene, immunocompromised and/or severe systemic symptoms treat as per necrotizing fasciitis guidance below*

Folliculitis	*S. aureus*, *P. aeruginosa* (hot tub)	- Warm compress - No antibiotics
Impetigo	*S. aureus*, including CA-MRSA, *S. pyogenes*	- Warm water soak - Limited disease: Mupirocin ointment TID x 7d OR Retapamulin BID x 5d - Extensive disease: Cephalexin 250-500 mg PO q6h **PLUS** TMP/SMX DS 1 tab PO q12h* OR Minocycline 100 mg PO q12h** OR Doxycyline 100 mg PO q12h** OR Clindamycin 300 mg PO q8h OR
Erysipelas	*S. pyogenes*, rarely *S. aureus*, including CA-MRSA, or *S. agalactiae* Facial erysipelas should generally be treated with IV therapy including MRSA coverage	- PCN VK 500 mg PO q6h OR Procaine PCN G 600,000 U IM q12h OR Aqueous PCN G 2 MU IV q6h OR Clindamycin 300 mg PO/600 mg IV q8h - If concern for MRSA consider adding: TMP/SMX DS 1 tab* PO q12h
Diabetic foot ulcers	Diabetics: mixed aerobic and anaerobic flora. *S. aureus*.	**Assess for deep tissue infection/osteomyelitis** - Mild TMP/SMX DS 1 tab PO q12h* **PLUS** Amoxicillin/clavulanate 875/125 mg PO q12h OR Moxifloxacin 400 mg PO qday OR Levofloxacin 750 mg PO qday*** **PLUS** Clindamycin 300 mg PO q8h* - Moderate-severe[Ŧ] Vancomycin 10-15 mg/kg IV q12h[§] (Consult pharmacy for patient-specific dosing) **PLUS** Ertapenem 1g IV QDAY OR Piperacillin/tazobactam 4.5g IV q8h, over 4 hours OR Meropenem 500 mg IV q6h **PCN allergy**: Consider levofloxacin/clindamycin or aztreonam/clindamycin.
Necrotizing fasciitis	 Type I – mixed aerobic and anaerobic flora[Ŧ] Type II – *S. pyogenes*	- **Immediate surgical debridement** - Consider Infectious Disease consult - Piperacillin/tazobactam 4.5g IV q8h, infused over 4 hours OR Meropenem 500 mg IV q6h **PCN allergy:** Consider levofloxacin/clindamycin or aztreonam/clindamycin. - MRSA concern consider vancomycin 10-15 mg/kg IV q12h[§] Consult pharmacy for patient-specific dosing - Aqueous PCN G 2-4 MU IV q4h PLUS clindamycin 900 mg IV q8h

Clostridial myonecrosis (gas gangrene)	*C. perfringens*, rarely *C. septicum*	- **Immediate surgical debridement** - Aqueous PCN G 2-4 MU IV q4 PLUS clindamycin 900 mg IV q8h
Bite wounds	Human: *S. viridans, S. aureus, Haemophilus* spp., *Eikenella corrodens, Peptostreptococcus*, *Fusobacterium, Porphyromonas, Prevotella*	- Wound irrigation, evaluate for deep penetration - Prophylaxis for 3-5 days is recommended for non-infected wounds: Amoxicillin/clavulanate 875/125 mg PO q12h **PCN allergy**: Consider Clindamycin 300 mg PO q8h **PLUS** doxycycline 100 mg PO q12h** OR TMP/SMX 1 DS PO q12h OR levofloxacin 750 mg qday*** - Active Infection Ampicillin/sulbactam 3 g IV q6h OR Cefoxitin 2g IV q8h OR Clindamycin 900mg IV q8h **PLUS** [levofloxacin 750 mg PO qday **OR** TMP/SMX DS 1 tab PO q12h]
	Dog/cat: *Pasteurella multocida,* streptococci, staphylococci, *Fusobacterium, Bacteroides, Porphyromonas, Prevotella* Consider *Capnocytophaga canimorsus* in splenectomized dog bite patients.	- Consider tetanus booster and rabies vaccine. - Wound irrigation - Prophylaxis for non-infected bites wounds not recommended but should be considered in the following situations: • Deep puncture (especially cats) • Moderate or severe with crush injury • On hand or genitals • Near prosthetic material • Involves bone, joint, or poorly vascularized area • Patient is immunocompromised - Prophylaxis (3-5 days) and oral therapy: - Amoxicillin/clavulanate 875/125 mg PO q12h **OR** Clindamycin 300 mg PO q8h PLUS TMP/SMX 1 DS PO q12h* **OR** Cefuroxime 500 mg PO q12h PLUS Clindamycin 300 mg PO q8h - Severe infection requiring intravenous treatment: Ampicillin/sulbactam 3 g IV q6h **OR** Ceftriaxone 1g (2g if >80kg) IV qday PLUS metronidazole 500 mg IV q8h **OR** Levofloxacin 750 mg IV qday PLUS metronidazole 500 mg IV q8h

CA-MRSA – community-associated methicillin-resistant *S. aureus*; I & D – incision and drainage; TMP/SMX – trimethoprim/sulfamethoxazole; PCN – penicillin

*May consider using TMP/SMX DS 2 tabs PO bid for more severe infections. Monitor for increased adverse effects, such as hyperkalemia and GI upset.

**Should not be used in pregnant women or children under the age of 8 years.

***Ciprofloxacin 500mg PO q12h is an alternative for outpatients

[§]Alternatives to vancomycin include linezolid 600 mg PO/IV q12h OR daptomycin 4 mg/kg IV q24h.

[Ŧ]Tigecycline 100 mg IV load, then 50 mg IV q12h** may be considered as an alternative.

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Recommended Dosing for Pediatrics (excluding neonates)

Antimicrobial Agent	Recommended Dosing
Amoxicillin/clavulanate	Amoxicillin:clavulanate 14:1 – 45 mg/kg PO q12h 7:1 – 10-22.5 mg/kg PO q12h Range: 20-45 mg/kg/day 4:1 – 7-13.3 mg/kg PO q8h Range: 20-40 mg/kg/day divided q 8h Maximum daily dose: 2 g (amoxicillin component) - All doses represent the amoxicillin component
Ampicillin/sulbactam	25-100 mg/kg (ampicillin component) IV q6h Maximum daily dose: 8 g (ampicillin component)
Aqueous PCN G	25,000-100,000 U/kg IV q4-6h Range: 100,000-400,000 U/kg/day Maximum daily dose: 24 mU
Cefuroxime	10-15 mg/kg PO q8-12h Maximum daily dose: 1 g
Cephalexin	6.25-37.5 mg/kg PO q6h Maximum daily dose: 4 g
Clindamycin	2.5-10 mg/kg PO q6-8h Range: 10-30 mg/kg/day Maximum daily dose: 1.8 g 6.25-10 mg/kg IV q6-8h Range: 25-40 mg/kg/day Maximum daily dose: 4.8 g
Daptomycin	Safety not established in pediatrics.
Doxycycline	Not to be used in children under 8 years old. 1-4 mg/kg PO q12-24h Range: 2-4 mg/kg/day Maximum daily dose: 200 mg
Levofloxacin	< 6 months: use not recommended ≥ 6 months to <5 years: 10 mg/kg/dose PO/IV q12hrs ≥5 years: 10 mg/kg/dose PO/IV q24hrs Maximum daily dose: 750 mg
Linezolid	10 mg/kg PO/IV q8-12h Maximum daily dose: 1.2 g
Meropenem	20 mg/kg IV q8h Maximum daily dose: 1.5 g
Minocycline	Not to be used in children under 8 years old. 2 mg/kg PO bid or 4 mg/kg PO qhs Maximum daily dose: 200 mg
PCN VK	6.25-16.7 mg/kg PO q6-8h Range: 25-50 mg/kg/day Maximum daily dose: 3 g
Piperacillin/tazobactam	100 mg/kg (piperacillin component) IV q6-8h Range: 150-400 mg/kg/day (piperacillin component) Maximum daily dose: 16 g (piperacillin component) **NOTE:** all doses must be infused over 4 hours, except in NICU patients
Tigecycline	Safety not established in pediatrics.
TMP/SMX	4-6 mg/kg (trimethoprim component) PO bid Maximum daily dose: 160 mg (trimethoprim component)
Vancomycin	10 mg/kg IV q6h Maximum daily dose: 4 g