CARILION CLINIC
Antimicrobial Stewardship

Pediatric Skin and Soft Tissue Infection Treatment Guideline

Disclaimer: this guideline should not replace clinical judgement.

Degree of Severity Definition		
Severity	**Purulent**	**Non-Purulent**
Mild	Incision and drainage (I&D) only	Cellulitis/erysipelas with no focus of purulence
Moderate	Systemic signs of infection	
Severe	Failed I&D Sepsis Severely Immunocompromised	Sepsis Severely Immunocompromised Presence of bullae or sloughing

Management of non-purulent SSTI

Type of Infection	Organisms	Preferred Treatment	Alternative Treatment (PCN allergy)	Duration
Cellulitis and Erysipelas *Erysipelas has defined borders *Blood cultures, tissue aspirates, and skin biopsies are **NOT** routinely recommended due to low yield	**Beta-hemolytic Streptococci:** Group A – *S. pyogenes* (most common), Group B – *S. agalactiae*, Groups C, G, F ***Staphylococcus aureus* only if:** large open wound, IV drug user, penetrating trauma, active *S. aureus* infection at another site	**Mild Treatment Options (oral):** Penicillin VK 20 mg/kg/dose PO q8h (max 500 mg/dose) Amoxicillin 12.5 mg/kg/dose PO q8h (max 500 mg/dose)	Cephalexin 12.5 mg/kg/dose PO q6h (max 500 mg/dose) Clindamycin 5-10 mg/kg/dose PO q8h (max 450 mg/dose)	5 days Duration is not contingent on erythema resolution alone, may extend to 7-10 days if slow clinical improvement
		Moderate Treatment Options (intravenous): Penicillin G 60,000 to 100,000 units/kg/dose IV q6h (max 4 million units/dose) Ampicillin 25 mg/kg IV q6h (max 2000 mg/dose)	Cefazolin 33 mg/kg IV q8h (max 1000 mg/dose) Clindamycin 10 mg/kg/dose IV q8h (max 600 mg/dose)	
		Severe Treatment Options (intravenous antibiotics): See Necrotizing Fasciitis recommendations below Consider ID consult		

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Impetigo * Oral antimicrobials recommended for numerous lesions or outbreaks affecting several people to decrease transmission	*S. aureus* *S. pyogenes*	**Mild:** Mupirocin (topical) twice daily **Moderate-Severe:** <u>Empiric/MSSA</u> Cephalexin 12.5 mg/kg PO q6h (max 500 mg/dose) <u>MRSA suspected/confirmed.</u> Clindamycin 5-10 mg/kg PO q8h (max 450 mg/dose)	**Moderate-Severe:** <u>Empiric/MSSA</u> Clindamycin 10 mg/kg PO q6h (max 600 mg/dose) <u>MRSA</u> SMX/TMP 5 mg TMP/kg PO q12h (max 160 mg TMP/dose) Doxycycline* 2 mg/kg PO q12h (max 100 mg/dose)	Mupirocin: 5 days All others: 7 days
Folliculitis	*S. aureus* *Pseudomonas aeruginosa* (hot tubs)	**No antimicrobials** Warm compresses Gentle cleanser		
Necrotizing Fasciitis	**Empirically:** Broad spectrum gram positive, gram negative and anaerobic coverage **Most common organisms:** Group A Streptococci (GAS) Gas Gangrene: *Clostridium perfringens, Clostridium septicum*	**Emergent surgical consultation**		
		Empiric: Vancomycin 15 mg/kg IV q6h (max 2000 mg/dose)** **PLUS** Piperacillin/tazobactam 75 mg pip/kg/dose IV q6h (max 3.375 g/dose) **Identified GAS or *Clostridium:*** Penicillin 60,000 to 100,000 units/kg/dose IV q6h (max 4 million units/dose) **PLUS** Clindamycin 10 mg/kg IV q6h (max 900 mg/dose)	**Empiric:** Linezolid <u><12 years</u>: 10 mg/kg IV/PO q8h (max 600 mg/dose) <u>≥12 years</u>: 600 mg IV/PO q12h **PLUS** Cefepime 50 mg/kg IV q8h (max 2000 mg/dose) **PLUS** Metronidazole 10 mg/kg IV/PO q6h (max 500 mg/dose) Meropenem 20 mg/kg IV q8h (max 1000 mg/dose)	Dependent upon surgical debridement/source control *Clindamycin used in combination for toxin binding should be **discontinued after 48-72 hours**

**Doxycycline is NOT recommended for children < 8 years old but may be used in life-threatening situations*

*** Vancomycin may be adjusted per protocol based on age and renal function*

*** Addition of clindamycin has been shown to reduce the in vitro release of streptococcal pyrogenic exotoxins, however there is still a lack of clinical prospective trials strongly recommending its use in this setting. **Addition is not needed if linezolid is part of the empiric regimen as linezolid has been shown to reduce toxin production**. Surgical intervention remains the most important treatments to manage necrotic spread.

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Management of purulent SSTI				
Type of Infection	**Organisms**	**Preferred Treatment**	**Alternative Treatment (IV, PCN allergy)**	**Duration**
Abscesses (Furuncles, Carbuncles) ***For moderate/ severe, send purulent material for culture and sensitivity**	*S. aureus*	**Mild** I&D only		
		Moderate/Severe I&D plus systemic antibiotics **Empiric/MRSA:** Clindamycin 10 mg/kg IV/PO q8h (max 600 mg/dose) **MSSA:** Cephalexin 12.5 mg/kg PO q6h (max 500 mg/dose) Cefazolin 33 mg/kg IV q8h (max 1000 mg/dose)	**Empiric/MRSA:** Vancomycin 15 mg/kg IV q6h (max 2000 mg/dose)** SMX/TMP 5 mg TMP/kg IV/PO q12h (max 160 mg TMP/dose) Linezolid <12 years: 10 mg/kg IV/PO q8h (max 600 mg/dose) ≥12 years: 600 mg IV/PO q12h **MSSA:** Nafcillin 25 mg/kg IV q6h (max 2000 mg/dose)	5 days May extend to 7-10 days if slow clinical improvement
Preseptal (Periorbital) Cellulitis	*S. aureus* *S. epidermidis* *S. pyogenes* *H. influenzae* (unimmunized)	Clindamycin 10 mg/kg IV/PO q6h (max 600 mg/dose) **Rhinosinusitis/ unimmunized**: Amoxicillin/clavulanate (Formulation 7:1) 22.5 mg/kg PO q12h (max 875 mg amox/dose)	**Rhinosinusitis/unimmunized**: Cefdinir 7 mg/kg PO BID (max 300 mg/dose) OR Ceftriaxone 50-75 mg/kg IV q24h (max 2000 mg/dose)	5 days May extend to 7-10 days if slow clinical improvement

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Orbital Cellulitis	*S. aureus* *S. epidermidis* *S. pyogenes* **Other organisms:** *S. anginosus* Neisseria spp *M. catarrhalis* Oral anaerobes *H. influenzae* (unimmunized)	Clindamycin 10 mg/kg IV q6h (max 600 mg/dose) **PLUS** Ceftriaxone 50-75 mg/kg IV q24h (max 2000 mg/dose) **Suspected intracranial extension:** Vancomycin 20 mg/kg IV q6h (max 2000 mg/dose)** **PLUS** Ceftriaxone 50-75 mg/kg IV q24h (max 2000 mg/dose) **PLUS** Metronidazole 10 mg/kg IV/PO q8h (max 500 mg/dose)	**Suspected intracranial extension:** Vancomycin 20 mg/kg IV q6h (max 2000 mg/dose)** **PLUS** Meropenem 20 mg/kg IV q8h (max 1000 mg/dose) **OR** Levofloxacin 6 months-5 years: 10 mg/kg IV q12h (max 375 mg/dose) ≥5 years: 10 mg/kg IV q24h (max 750 mg/dose)	Minimum 10-14 days, dependent on symptom resolution

*** Vancomycin may be adjusted per protocol based on age and renal function*

Surgical Site Infections

Type of Infection	Suspected Organisms	Recommended Treatment Options
Surgical Site Infections *Culture and sensitivity for any purulent material *Short course (24-48 hours) recommended **ONLY** for patients with significant systemic response	**<48 hours:** *S. pyogenes*, Clostridium spp **>48 hours:** *S. aureus*	**Suture removal plus I&D** **MRSA** Clindamycin 10 mg/kg IV/PO q6h (max 600 mg/dose) Vancomycin 15 mg/kg IV q6h (max 2000 mg/dose)** Linezolid <12 years: 10 mg/kg IV/PO q8h (max 600 mg/dose) ≥12 years: 600 mg IV/PO q12h **MSSA** Cefazolin 33 mg/kg IV q8h (max 2000 mg/dose) Nafcillin 25 mg/kg IV q6h (max 2000 mg/dose)
	Consider adding coverage for gram negatives and anaerobes for surgeries involving: • GI tract • Perineum • Female genital tract	Ceftriaxone 50-75 mg/kg IV q24h (max 2000 mg/dose) **PLUS** Metronidazole 10 mg/kg IV/PO q8h (max 500 mg/dose) **PCN allergy:** Levofloxacin 6 months-5 years: 10 mg/kg IV q12h (max 375 mg/dose) ≥5 years: 10 mg/kg IV q24h (max 750 mg/dose) **PLUS** Metronidazole 10 mg/kg IV/PO q8h (max 500 mg/dose)

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Bite Wounds

Tetanus and Rabies vaccines as appropriate

For patients with wounds that do not appear infected, consider 3-5 days of pre-emptive antimicrobial therapy for:

IDSA Prophylaxis Recommendations

- **Immunocompromised or asplenic**
- **Advanced liver disease**
- **Preexisting or resultant edema of the affected area**
- **Moderate to severe injuries (especially hands or face)**
- **Injuries involving periosteum or joint capsule**

Red Book Prophylaxis Recommendations

- Moderate or severe bite wounds, especially if edema or crush injury is present
- Puncture wounds, especially if penetration of bone, tendon sheath, or joint has occurred
- Deep or surgically closed facial bite wounds
- Hand and foot bite wounds
- Genital area bite wounds
- Wounds in immunocompromised and asplenic children
- Wounds exhibiting signs of infection
- Cat bite wounds

Source of bite	Common Organisms	Antimicrobial Agents			
		Oral	Oral, PCN allergy	IV	IV, PCN allergy
Dog, cat, other mammal	Pasteurella spp *S. aureus* Streptococci Capnocytophaga spp Moraxella spp Neisseria spp Corynebacterium spp Anaerobes	Amoxicillin/ clavulanate (formulation 7:1) 12.5 mg/kg PO q12h (max 875 mg amox/ dose)	Clindamycin 10 mg/kg IV/PO q6h (max 600 mg/dose) **PLUS** Cefuroxime 15 mg/kg BID (max 500 mg/dose) **OR** Cefdinir 7 mg/kg PO BID (max 300 mg/dose) **OR** TMP/SMX 5 mg TMP/kg IV/PO q12h (max 160 mg TMP/dose)	Ampicillin-sulbactam 25 mg ampicillin/kg IV q6h (max 2000 mg ampicillin/ dose [3000 mg ampicillin-sulbactam])	Ceftriaxone 50-75 mg/kg IV q24h (max 2000 mg/dose) **OR** TMP/SMX 5 mg TMP/kg q12h (max 160 mg TMP/dose)
Human	Streptococci *S. aureus* *Eikenella corrodens* Haemophilus spp Anaerobes				
Reptile	Enteric gram-negatives Anaerobes			Ampicillin-sulbactam 25 mg ampicillin/kg IV q6h (max 2000 mg ampicillin/ D Dose [3000 mg ampicillin-sulbactam]) **PLUS** Gentamicin * 5 mg/kg IV q24h	

**Gentamicin: pharmacy consult is recommended*

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References

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