

VASP Skin and Soft Tissue Infection – Inpatient Management

This guidance document is meant to provide general recommendations and does not supersede clinical decision making.

Purulent Cellulitis	Non-purulent Cellulitis	Cat/Human/Dog Bites
Pyomyositis	Impetigo or Ecthyma	Necrotizing Fasciitis/ Fournier’s Gangrene
Furuncles and Carbuncles	Cutaneous Abscess	Surgical Site Infections

Purulent Skin and Soft Tissue Infections			
	Disease Characteristics	Treatment	Duration
Purulent Cellulitis	Purulent drainage without a drainable abscess Pathogen of concern: <i>S. aureus</i>	Antibiotic Selection: ≤ 1 SIRS Criteria*: <ul style="list-style-type: none"> • Empiric antibiotics options <ul style="list-style-type: none"> ○ TMP-SMX 5-8 mg/kg/day TMP PO ○ Cephalexin + Doxycycline 100mg BID PO ○ Cefadroxil 1000 mg BID + Doxycycline 100mg BID PO ○ Linezolid 600mg BID PO • Targeted MRSA options <ul style="list-style-type: none"> ○ TMP-SMX 5-8 mg/kg/day TMP PO ○ Doxycycline 100mg BID PO ○ Linezolid 600mg BID PO • Targeted MSSA options <ul style="list-style-type: none"> ○ Cephalexin 500mg Q6h or 1000mg Q8h PO ○ Cefadroxil 1000 mg BID ≥ 2 SIRS Criteria: <ul style="list-style-type: none"> • Obtain blood cultures • Empirically initiate IV vancomycin + ceftriaxone 2g IV daily or Ampicillin/Sulbactam 2gQ6h • Stepdown to above PO options once: <ul style="list-style-type: none"> ○ MRSA Bacteremia is ruled out ○ Clinical stability obtained ≥ 24 hours ○ Patient is tolerating oral therapy 	5 Days ‡

*SIRS Criteria: Body Temperature $>38^{\circ}\text{C}$ or $<36^{\circ}\text{C}$; Pulse > 90 beats/minute; Respiratory rate > 20 breaths/minute; WBC $> 12\text{K}$ or $<4\text{K}$

‡: Consider prolonging for infections without resolution at end of therapy

Purulent Skin and Soft Tissue Infections			
	Disease Characteristics	<u>Treatment</u>	Duration
Cutaneous Abscess	Collection of pus in the dermis circled by erythematous swelling Pathogen of concern: <i>S. aureus</i>	I&D <u>without</u> antibiotics unless patient has: <ul style="list-style-type: none"> • > 1 <u>SIRS Criteria</u>* • >2 cm surrounding erythema • Multiple abscesses • Lack of response to I&D or incomplete I&D • Severely immunocompromising status 	5 Days
Furuncles and Carbuncles	Infection of the hair follicle(s) extending from dermis where abscess forms in subcutaneous tissue Pathogen of concern: <i>S. aureus</i>	If <u>antibiotics are indicated</u> based on above criteria, obtain abscess cultures with I&D and tailor therapy based on species and susceptibilities. <u>Antibiotic Selection:</u> Follow criteria seen for Purulent Cellulitis above	

*SIRS Criteria: Body Temperature >38C or <36C; Pulse > 90 beats/minute; Respiratory rate > 20 breaths/minute; WBC > 12K or <4 K

Purulent Skin and Soft Tissue Infections			
	Disease Characteristics	<u>Treatment</u>	Duration
Pyomyositis	Collection of pus within individual muscle groups Pathogen of concern: <i>S. aureus (90%)</i>	Obtain blood <u>and</u> abscess cultures. Initiate empiric antimicrobial therapy with focus on gram-positive coverage. <u>Antibiotic Selection:</u> <ul style="list-style-type: none"> • Empirically initiate IV vancomycin + ceftriaxone • Step-down to PO options once: <ul style="list-style-type: none"> ○ MRSA Bacteremia is ruled out ○ Clinical stability obtained ○ Patient is tolerating oral therapy • Step-down options: <ul style="list-style-type: none"> ○ Empiric step down options: <ul style="list-style-type: none"> ▪ TMP-SMX 5-8 mg/kg/day TMP PO ▪ Doxycycline 100mg BID PO ▪ Linezolid 600mg BID PO ○ Targeted MRSA options <ul style="list-style-type: none"> ▪ Same as above ○ Targeted MSSA options <ul style="list-style-type: none"> ▪ Cefadroxil 1000 mg BID 	14 – 21 Days

Non-Purulent Skin and Soft Tissue Infections			
	Disease Characteristics	Treatment	Duration
Erysipelas or Cellulitis	<p>Acutely spreading, erythematous, painful, edematous infection of the epidermis, dermis, and subcutaneous tissue <u>without</u> abscess or purulent drainage</p> <p>Pathogen of concern: <i>S. pyogenes</i> <i>S. aureus</i> is rare</p> <p>MRSA Risk Factors:</p> <ul style="list-style-type: none"> Recent or ongoing MRSA infection at alternate site IVDU Penetrating trauma 	<p><u>Antibiotic Selection:</u> ≤ 1 SIRS Criteria*:</p> <ul style="list-style-type: none"> Cephalexin 500mg Q6h PO Cefadroxil 1000 mg BID PO <p>Not a PO candidate:</p> <ul style="list-style-type: none"> Cefazolin 2g Q8h <u>until</u> patient can tolerate PO <p>MRSA risk factors OR severe Cephalosporin Allergy:</p> <ul style="list-style-type: none"> TMP-SMX 1-2 DS BID PO Linezolid 600mg BID PO 	5 Days ‡
		<p>>1 SIRS Criteria:</p> <ul style="list-style-type: none"> Obtain blood cultures Empirically initiate Ceftriaxone 2g daily <p>Severe <u>Cephalosporin</u> allergy:</p> <ul style="list-style-type: none"> Levofloxacin 750mg Daily <p>MRSA Risk Factors Present:</p> <ul style="list-style-type: none"> Add IV vancomycin to options above Discontinue once blood cultures are negative for MRSA 	
Impetigo or Ecthyma	<p>Erythematous papules evolve into pustules that rupture forming honey-colored crust</p> <p>Pathogens of concern: <i>S. aureus</i> <i>S. pyogenes</i></p>	<p>Impetigo single lesion: Mupirocin 2% Ointment 2 to 3 times daily</p>	5 Days ‡
		<p>Ecthyma or Impetigo with numerous lesions:</p> <ul style="list-style-type: none"> Amox/Clav 875/125mg BID PO Cephalexin 500mg Q6h or 1000mg Q8h PO Cefadroxil 1000 mg BID PO <p>Severe <u>Cephalosporin</u> allergy:</p> <ul style="list-style-type: none"> TMP-SMX 1-2 DS BID PO 	

*SIRS Criteria: Body Temperature >38C or <36C; Pulse > 90 beats/minute; Respiratory rate > 20 breaths/minute; WBC > 12K or <4 K

‡: Consider prolonging to 7-14 days for infections without resolution at end of therapy

Necrotizing Skin and Soft Tissue Infections

	Disease Characteristics	<u>Treatment</u>	Duration
<p>Necrotizing Fasciitis Or Fournier's Gangrene</p>	<p>Aggressive subcutaneous infection that tracks along superficial fascia compromising all tissue between skin and muscles.</p> <p>Pathogens of concern: <i>S. aureus</i> <i>S. pyogenes</i> <i>V. vulnificus</i> <i>A. hydrophila</i> <i>Peptostreptococcus</i> <i>P. aeruginosa</i> <i>C. perfringens</i></p>	<p><u>Surgical intervention</u> is the mainstay of therapy. In addition to aggressive I&D, intravenous antimicrobials should be started targeting pathogens of concern. Blood cultures and surgical cultures should be obtained with antibiotics tailored accordingly.</p> <p><u>Antibiotic Selection:</u> Empiric Preferred regimens: <ul style="list-style-type: none"> • Linezolid 600mg BID IV + piperacillin/tazobactam Empiric regimens when severe penicillin allergy: <ul style="list-style-type: none"> • Linezolid 600mg BID IV + cefepime 2g IV Q8h + metronidazole 500mg BID IV Empiric regimens when severe penicillin <u>and</u> cephalosporin allergy: <ul style="list-style-type: none"> • Linezolid 600mg BID IV + levofloxacin 750mg Q24h IV + metronidazole 500mg BID IV Transition linezolid (1:1), levofloxacin (1:1), and metronidazole (1:1) to oral therapy once: <ul style="list-style-type: none"> • Clinical stability is obtained • Patient is tolerating oral therapy </p> <hr/> <p>If a patient cannot receive Linezolid due to allergies, or <u>multiple</u> serotonergic drug interactions: <ul style="list-style-type: none"> • Vancomycin IV + piperacillin/tazobactam + clindamycin 900mg Q8h IV Severe Penicillin allergy: <ul style="list-style-type: none"> • Vancomycin IV + cefepime 2g Q8h IV + clindamycin 900mg Q8h IV Severe Penicillin <u>and</u> Cephalosporin allergy: <ul style="list-style-type: none"> • Vancomycin IV + levofloxacin 750mg Q24h IV + clindamycin 900mg Q8h IV Transition levofloxacin (1:1) and metronidazole (1:1) to oral therapy once: <ul style="list-style-type: none"> • Clinical stability is obtained • Patient is tolerating oral therapy </p>	<p>Antibiotics should be discontinued 48 hours after definitive source control</p> <p>Anti-toxin coverage can be discontinued once clinical stability is obtained (MRSA/anaerobic coverage needed until cultures indicate otherwise)</p>

Skin and Soft Tissue Infections Secondary to Bites			
	Disease Characteristics	Treatment	Duration
Cat Bite	Pathogens of concern: <i>S. aureus</i> (MSSA) <i>Streptococcus sp.</i> <i>Pasteruella multicide</i>	3-5 days of preemptive antibiotics only indicated if patient has: <ul style="list-style-type: none"> • Immunocompromising status/Asplenia • Advanced liver disease • Injuries that have penetrated the periosteum or joint capsule • Severe injuries particularly to the hands or face Otherwise, antibiotics should be withheld unless there are signs/symptoms of skin and soft tissue infection. Preferred therapy: <ul style="list-style-type: none"> • Amoxicillin-clavulanate 875/125mg BID PO Penicillin allergic options: <ul style="list-style-type: none"> • Cefuroxime 500mg BID PO + Metronidazole 500mg BID PO Penicillin and Cephalosporin allergic options: <ul style="list-style-type: none"> • Doxycycline 100mg BID PO + Metronidazole 500mg BID PO • Levofloxacin 750mg Daily PO + Metronidazole 500mg BID PO <u>Animal Bites Tetanus Vaccination:</u> Tetanus Vaccination Considerations: <ul style="list-style-type: none"> • Adults who have not received DTap, Tdap, or TD in previous 5 years should receive either Td or Tdap • Adults who have never received Tdap or whole Tdap history is unknown should receive Tdap 	5 Days
Dog Bite	Pathogens of concern: <i>S. aureus</i> (MSSA) <i>Streptococcus sp.</i> <i>Pasteruella canis</i> <i>Capnocytophaga</i> <i>Fusobacterium</i>	Tetanus Immune Globulin (HyperTET S/D) <ul style="list-style-type: none"> • Wounds that are not clean or minor in patients with < 2 prior Tetanus vaccines • Inject 250 Units IM x 1 dose <u>Rabies:</u> Not Previously Vaccinated: <ul style="list-style-type: none"> • Inject RabAvert (PCECV) 1ml IM on day 0, 3, 7, and 14 <ul style="list-style-type: none"> ○ For persons with immunosuppression, PCECV should be administered using a 5-dose vaccine regimen (i.e., 1 dose of vaccine on days 0, 3, 7, 14, and 28), ○ Schedule follow up vaccines after discharge with the Belcourt Clinic 615-875-1000 • Inject 20 U/kg body weight of Human Rabies Immune Globulin (HRIG) around and into previously cleansed wounds. Any remaining volume should be administered at a site distant from vaccine administration site. Previously Vaccinated: <ul style="list-style-type: none"> • Inject RabAvert (PCECV) 1ml IM on day 0, 3 <ul style="list-style-type: none"> ○ Schedule follow up vaccines after discharge with the Belcourt Clinic 615-875-1000 • HRIG should not be administered 	
Human Bite	Pathogens of concern: <i>S. aureus</i> (MSSA) Streptococcus Viridans <i>Eikenella corrodens</i> <i>Peptostreptococcus</i> <i>Fusobacterium</i> <i>Prevotella</i> <i>Corynebacterium</i>		

Surgical Site Infections (SSI)			
	Disease Characteristics	Treatment	Duration
Superficial SSI	<p>Only involves the subcutaneous space between the skin and underlying muscular fascia and usually occurs within 30 days</p> <p>Pathogens of concern: <i>S. aureus</i> <i>S. pyogenes</i> <i>Clostridium</i> species Coagulase negative-Staphylococcus</p>	<p><u>Surgical intervention</u> is the mainstay of therapy to ensure infected material is evacuated. I&D alone without antibiotics is sufficient if:</p> <ul style="list-style-type: none"> • <5cm of erythema and induration • ≤ 1 SIRS criteria noted* <ul style="list-style-type: none"> ○ A fever alone up to four days after procedure is likely postoperative inflammation rather than infection. <p><u>If antibiotics are indicated</u> based on above criteria, obtain abscess cultures with I&D and tailor therapy based on culture and susceptibilities.</p> <p>Antibiotic Selection:</p> <ul style="list-style-type: none"> • Empirically initiate IV vancomycin <ul style="list-style-type: none"> ○ In cases of intraabdominal/perineal/axilla/female reproductive procedures the addition of ceftriaxone 2g IV daily + metronidazole 500 mg BID PO is reasonable • Stepdown to PO options once: <ul style="list-style-type: none"> ○ MRSA bacteremia is ruled out ○ Clinical stability obtained ○ Patient is tolerating oral therapy • Stepdown PO options: <ul style="list-style-type: none"> ○ PO TMP-SMX 5-8 mg/kg/day of TMP ○ Doxycycline 100 mg BID ○ Linezolid 600 mg BID • In cases of intraabdominal/perineal/axilla/female reproductive procedures: <ul style="list-style-type: none"> ○ Addition Levofloxacin 750mg + metronidazole 500mg BID PO OR Amox/Clav 875mg/125mg BID PO is reasonable • Targeted MRSA Options: <ul style="list-style-type: none"> ○ PO TMP-SMX 5-8 mg/kg/day of TMP ○ Doxycycline 100 mg BID ○ Linezolid 600 mg BID • Targeted MSSA Options: <ul style="list-style-type: none"> ○ Cephalexin 500 mg Q6h PO ○ Cefadroxil 1000 mg BID PO 	5 Days †

<p style="text-align: center;">Deep SSI</p>	<p>Involves the fascia and muscle and occurs within 30 days of procedure or within 1 year if prosthesis was inserted</p> <p>Pathogens of concern: <i>S. aureus</i> <i>S. pyogenes</i> Coagulase negative-Staphylococcus</p>	<p><u>Surgical intervention is the mainstay of therapy to ensure infected material is evacuated.</u></p> <p>Obtain abscess cultures with I&D and blood cultures if systemic signs of infection are noted. Tailor therapy based on species and susceptibilities.</p> <p>Antibiotic Selection:</p> <ul style="list-style-type: none"> • Empirically initiate vancomycin IV + ceftriaxone 2g IV daily <ul style="list-style-type: none"> ○ In cases of intraabdominal/perineal/axilla/female reproductive procedures the addition of metronidazole 500mg BID PO is reasonable • Stepdown to PO options once: <ul style="list-style-type: none"> ○ MRSA bacteremia is ruled out ○ Clinical stability obtained ○ Patient is tolerating oral therapy • Stepdown PO options: <ul style="list-style-type: none"> ○ TMP-SMX 5-8 mg/kg/day TMP PO ○ Linezolid 600mg BID PO ○ Doxycycline 100mg BID PO + Cephalexin 500 mg PO Q6h ○ Doxycycline 100mg BID PO + Cefadroxil 1000 mg BID • In cases of intraabdominal/perineal/axilla/female reproductive procedures: <ul style="list-style-type: none"> ○ Addition Levofloxacin 750mg + metronidazole 500mg BID PO OR ○ Amox/Clav 875mg/125mg BID PO is reasonable 	<p style="text-align: center;">7 Days (Dependent on source control)</p>
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*SIRS Criteria: Body Temperature >38C or 90 beats/minute; Respiratory rate > 20 breaths/minute; WBC > 12K or <4K

‡: Consider prolonging to 7-14 days for infections without resolution at end of therapy

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