Northwestern Medicine Antimicrobial & Diagnostic Stewardship Clinical Guidance: SSTI

Skin and soft tissue infection (SSTI) Clinical Pathway

Rule out other diagnosis that may mimic SSTI
- Allergic contact dermatitis
- Stasis dermatitis
- Erythema nodosum
- Gout
- Insect bites/sting
- Drug rash
- Urticaria
- Tinea or Herpes

Infection Type

Non-Purulent
Absence of pus or abscess
Cellulitis with new/rapid spread of pain tenderness, erythema, edema, warmth

Necrotizing SSTI
Rapidly progressing: Necrotizing fasciitis, Fournier's gangrene, Ludwig's angina, Gas Gangrene

Purulent
Focal region of pus or abscess noted (Furuncle, carbuncle, abscess) with or without surrounding erythema

Pathogens

Streptococci (Common):
Strep pyogenes (GAS)
Group B & C Strep
MSSA (Rare)

Type 1: Mixed pathogens
Aerobic + anaerobes
Type 2: Monomicrobial
Strep pyogenes (GAS) or Staph aureus
Type 3: Clostridial
Clostridium perfringens

Staph aureus (Common):
MSSA & MRSA
Streptococci

Severity

Mild
No or minimal surrounding erythema

Moderate to Severe or High-risk Patient
>2cm abscess
Erythema present
Extensive disease (multiple sites)
Systemic signs of infection
Sensitive area (face, hand, genitals)
Immunocompromised or uncontrolled diabetes

Procedures & Diagnostic Testing

Prompt surgical consultation with debridement as indicated

Incision & Drainage (I&D) alone

Incision & Drainage (I&D)

Obtain blood cultures
Send wound culture & Purulent wound (MRSA/MSSA) PCR if purulence noted
Send OR tissue culture when available
ID consultation recommended

Send wound culture & Purulent Wound (MRSA/MSSA) PCR

Antibiotic Decision

Abx Recommended

Supportive Care Only
Abx NOT recommended

Abx Recommended

Abx Recommended

Mild:
Cephalexin
Severe PCN allergy:
Clindamycin

Moderate-Severe:
Cefazolin
Severe PCN allergy:
Clindamycin

Empiric:
Pip/tazo +
either Linezolid OR
(Vancomycin + Clindamycin)

Empiric:
Vancomycin or Linezolid

Moderate:
If MRSA present:
TMP/SMX OR
Doxycycline
If MSSA present:
Cephalexin

Severe:
Definitive:
If MRSA present:
Vancomycin OR Linezolid
If MSSA present:
Cefazolin

Definitive or Step-down Abx therapy should be guided by micro results if available

Step-down Abx therapy should be guided by micro results if available

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ADSP SKIN AND SOFT TISSUE INFECTIONS (SSTI)

Antimicrobial guidelines are based on the most likely organisms responsible for infection, local susceptibilities, and prevalence of resistant organisms. Therapy may need to be adjusted once identification and susceptibility are determined. Recent culture data should be evaluated to inform empiric therapy selection.

Specific Indication	Empiric Therapy	Severe β-lactam allergy Allergy Guidance	Pathogen	Targeted Treatment	Oral (PO) Option Allergy Guidance	Duration	Comments See ADSP for Antimicrobial Dosing
Non-Purulent Cellulitis	**Mild:** Cephalexin **Moderate to Severe:** Cefazolin	Ceph Allergy: Clindamycin	*Streptococcus* spp.	Cefazolin	Cephalexin	5 days	*S. aureus* is uncommon in the absence of abscess, necrosis, or purulent drainage. Consider obtaining blood cultures for patients with malignancy, severe systemic infection or unusual predisposing factors.
Purulent SSTIs	**Mild:** Incision & drainage (I&D) alone **Moderate:** I&D PLUS TMP-SMX OR Doxycycline (PO) **Severe:** I&D PLUS Vancomycin	--	MSSA or *Streptococcus* spp.	Cefazolin	Cephalexin	Outpatient: 5 days Up to 10 if clinically indicated Inpatient: 7 days Up to 14 days if clinically indicated	Note for NMH ED Only: Consider use of Dalbavancin if patient eligible Follow up wound culture & PCR Antibiotics are recommended with I&D for the following patients: - Incomplete or no response to I&D alone - Difficult to completely drain - Systemic illness - Several infection sites - Rapid progression with cellulitis - Immunocompromised - Extremes of age
			MRSA	Vancomycin OR Linezolid	TMP-SMX OR Doxycycline		
Bite Wound Prophylaxis	Amoxicillin-clavulanate	Doxycycline + Metronidazole	*Pasteurella multocida* *Staphylococcus* spp. *Streptococcus* spp. Anaerobes	Amoxicillin-clavulanate	Amoxicillin-clavulanate	3 days Up to 5 days as clinically indicated	Recommended for the following patients with: - Immunocompromise - Asplenia - Advanced liver disease - Edema of area - Moderate to severe injury (especially hand or face) - Deep penetrating wound to periosteum or joint capsule Consider rabies post- exposure prophylaxis
Bite Wound Treatment	Amoxicillin-clavulanate (PO) OR Ampicillin-sulbactam (IV)	Doxycycline + Metronidazole	*Pasteurella multocida* *S. aureus,* Strep spp. Anaerobes	Amoxicillin-clavulanate	Amoxicillin-clavulanate	7 days Up to 14 days as clinically indicated	Consider rabies post-exposure prophylaxis

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Decubitus Ulcer See osteo guidance for decubitus ulcer with osteomyelitis	**Not infected**: Wound care						Consider wound care alone (no antibiotic therapy) if no signs of systemic illness, soft tissue abscess, or local cellulitis. ID Consult for management of concern for infected ulcer ^Undrained abscess or concern for septic joint may warrant up to 4 weeks of antibiotic therapy with monitoring ¥ MRSA detected via culture or PCR
	Cellulitis surrounding non-infected ulcer: Cephalexin (PO) OR Cefazolin (IV)	Ceph Allergy: Clindamycin OR TMP-SMX (PO)	MSSA, *Streptococcus*	Cefazolin	Cephalexin	5 days. Up to 10 if clinically indicated	
	Infected ulcer without risk for stool contamination: Cefazolin OR Vancomycin* *if severe, prior treatment, frequent hospitalizations	Ceph Allergy: Vancomycin	Often polymicrobial: Strep spp., *S. aureus*	Based on culture & susceptibilities	If susceptible: Cephalexin If MRSA¥: TMP-SMX OR Doxycycline	2 weeks Up to 4 weeks as clinically indicated^	
	Infected ulcer WITH risk for stool contamination: **(**Ceftriaxone + Metronidazole) OR Piperacillin-tazobactam ADD Vancomycin* *if severe, prior treatment, frequent hospitalizations	Ceph Allergy: Vancomycin + Aztreonam + Metronidazole	Often polymicrobial: Strep spp. *Enterococcus* spp. Enterobacterales, *Pseudomonas, S. aureus,* Anaerobes	Based on culture & susceptibilities	If susceptible: (Cephalexin OR Ciprofloxacin) + Metronidazole If MRSA¥: TMP-SMX + Metronidazole	2 weeks Up to 4 weeks as clinically indicated^	

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Diabetic Foot Infection: Mild to Moderate No signs of systemic infection See osteo guidance for DFI with osteomyelitis	Amoxicillin-clavulanate OR Cephalexin	Ceph Allergy: TMP-SMX OR Levofloxacin (PO)	Often polymicrobial: Strep spp., *S. aureus,* Enterobacterales **Note Recent Culture Data & Risk for Anaerobes, MRSA, or Pseudomonas**	Use empiric PO recommendations. Tailor therapy based on culture & susceptibilities when available		**Mild**: 1 week Up to 2 weeks as clinically indicated **Moderate**: 1 week Up to 2 weeks as clinically indicated	Do not treat clinically uninfected wounds. Recommend wound care & control of hyperglycemia. ID Consult for management of infected wounds [1] Risk factors for anaerobes: Wet, necrotic, ischemic limb, macerated wound [2] Risk factors for MRSA: positive wound MRSA PCR or culture, prior antibiotics or hospital inpatient stay within 90 days [3] Risk factors for *Pseudomonas*: prior Pseudomonas, prior antibiotics or hospital inpatient stay within 90 days, macerated/ water exposure
	Risk for anaerobes[1] Amox-Clav OR (Cephalexin + Metronidazole) Ceph Allergy: (TMP/SMX OR Levofloxacin) + Metronidazole						
	Risk or isolation of MRSA[2] TMP-SMX OR Doxycycline ADD Amoxicillin-clavulanate if risk for anaerobes[1]			Based on culture & susceptibilities or if no culture data available (TMP-SMX OR Doxycycline) ADD Amoxicillin-clavulanate if risk for anaerobes[1]			
	Risk or isolation of *Pseudomonas*[3] Cefepime ADD Metronidazole (or switch to pip-tazo alone) if risk for anaerobes[1]			Cefepime ADD Metronidazole if risk for anaerobes[1]	If susceptible: Ciprofloxacin ADD Metronidazole if risk for anaerobes[1]		
Diabetic Foot Infection: Severe[5] See osteo guidance for DFI with osteomyelitis	Vancomycin + (Piperacillin-tazobactam OR Ampicillin-sulbactam)^ ^Guided by previous cultures & local resistance rates	Vancomycin + Aztreonam + Metronidazole	Often polymicrobial: *Streptococcus* spp. *Enterococcus* spp. Enterobacterales spp. *Pseudomonas, S. aureus,* Anaerobes	See mild to moderate PO options for oral step-down therapy		**Severe**: 2 weeks Up to 4 weeks as clinically indicated	[5] Severe infection = signs of systemic infection, hemodynamic instability, leukocytosis, bacteremia Do not treat clinically uninfected wounds. Recommend wound care & control of hyperglycemia. ID Consult for management

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Surgical Site Infection	Vancomycin + Piperacillin-tazobactam	Ciprofloxacin (NMH & PH) OR Aztreonam (other NM sites)[6] + Vancomycin + Metronidazole	MSSA	Cefazolin	Cephalexin	24h after surgical debridement	Antibiotics unnecessary in most cases. Patients with high fevers, tachycardia, or erythema extending beyond wound margins may require a short course of antibiotics in addition to opening & debriding the incision. [6] Ciprofloxacin or aztreonam choice based on local *Pseudomonas* susceptibility [7] If confirmed or suspected *Enterococcus*, may consider Amox/clav (PO) if susceptible
			MRSA	Vancomycin	If susceptible: TMP-SMX, doxycycline, or linezolid		
			Streptococcus	Cefazolin	Cephalexin		
			Pseudomonas	Cefepime	Ciprofloxacin		
			Intra-abdominal source: mixed Gram-negative & Gram-positive[7]	Piperacillin-tazobactam	Ciprofloxacin + Metronidazole		
Necrotizing Fasciitis	Emergent surgical debridement PLUS Linezolid OR (Vancomycin AND Clindamycin) + Piperacillin-tazobactam	Emergent surgical debridement PLUS Linezolid OR (Vancomycin AND Clindamycin) + Aztreonam	Polymicrobial	Based on culture & susceptibility results	If susceptible, Ciprofloxacin + Metronidazole	7 days after last surgical debridement Up to 14 days as clinically indicated	Prompt surgical consult for immediate surgical debridement is indicated. If streptococcal infection, consider management for toxic shock syndrome. Recommend Infectious Diseases consult.
			Group A *Streptococcus*	Ampicillin	Amoxicillin		
			Clostridium perfringens	Penicillin G + Clindamycin	Penicillin G + Clindamycin		

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6. Schaper NC, van Netten JJ, Apelqvist J, et al. Practical guidelines on the prevention and management of diabetes-related foot disease (IWGDF 2023 update) [published online ahead of print, 2023 May 27]. *Diabetes Metab Res Rev*. 2023;e3657. doi:10.1002/dmrr.3657
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