STANFORD EMERGENCY DEPARTMENT & CLINICAL DECISION UNIT
EMPIRIC ANTIBIOTIC GUIDELINES FOR ACUTE BACTERIAL SKIN AND SKIN-STRUCTURE INFECTIONS

PURULENT CELLULITIS (cutaneous abscess, carbuncle, furuncle)

Common pathogen: *Staphylococcus aureus*

Duration of Therapy: 5 days

Condition/Severity	Admit/CDU/Discharge	Cultures?	Antibiotic Recommendation
Mild Typical abscess +/- cellulitis with no systemic signs of infection	Discharge	Yes – wound I&D	I&D *plus* Antibiotics: TMP-SMX DS 1-2 PO BID Alternative: Doxycycline 100 mg PO BID
Moderate Purulent infection with *only one* systemic sign of infection: – temp>38°C – HR >90 bpm – RR>24 bpm – abnormal WBC >12K or <400 cells/mcg/L – Lymphangitis	Discharge	Yes – wound I&D	TMP-SMX DS 1-2 PO BID Alternative: Doxycycline 100 mg PO BID
	CDU if any factors below[1,2]: • Concern for poor adherence to therapy • Exacerbation of comorbidities • Significant clinical concern *Note: cutaneous inflammation and systemic features often worsen after initiating therapy and failure to improve at 24 hours NOT considered clinical failure*	Yes – wound I&D	**EMPIRIC ANTIBIOTICS**: TMP-SMX DS 1-2 PO BID Alternative: • Doxycycline 100 mg PO BID **DEFINITIVE ANTIBIOTICS**: MRSA: TMP-SMX DS 1-2 PO BID MSSA: cephalexin 500mg PO Q6h or cephalexin 1g PO Q8h
Severe • Hypotension • 2 or more systemic signs of infection – temp>38°C – HR >90 bpm – RR>24 bpm – abnormal WBC >12K or <400 cells/mcg/L – Lymphangitis • Immunocompromised**	Admission	Yes - blood	**EMPIRIC ANTIBIOTICS:** Vancomycin Per Pharmacy Alternatives: Consult pharmacy for restricted antibiotics **DEFINITIVE ANTIBIOTICS:** MRSA: Vancomycin MSSA: Cefazolin 2g IV Q8H

CELLULITIS (NON-PURULENT)

Common pathogens: *Streptococcus spp* (usually *S. pyogenes*). *Staphylococcus aureus* less frequently causes cellulitis, but cases due to this organism are typically associated with an open wound or previous penetrating trauma, including sites of illicit drug injection

Duration of therapy: 5-days for uncomplicated cellulitis (as effective as a 10-day course if clinical improvement has occurred by day 5)

Treatment response: Reduction in lesion size (by 20%) 48 to 72-hours

Condition/Severity	Admit/CDU/Discharge	Cultures?	Antibiotic Recommendation
Mild* Typical cellulitis/erysipelas with no focus of purulence and no systemic signs of infection	Discharge	No	Cephalexin 500 mg PO Q6h * or Cephalexin 1g PO Q8h Beta-lactam allergy: Clindamycin 300 mg PO Q6H (alt: clindamycin 450mg PO Q8H) Or TMP-SMX 1-2DS tab PO BID
Moderate* Typical cellulitis/erysipelas with *only one* systemic sign of infection: – temp>38°C – HR >90 bpm – RR>24 bpm – abnormal WBC >12K or <400 cells/mcg/L – Lymphangitis	Discharge	No	Cefazolin 1 gm IV ONCE, discharge home with cephalexin 500 mg PO Q6H* Alternative: Clindamycin 600 mg IV ONCE, home with clindamycin 300 mg PO Q6H (alt dose: 450mg PO Q8H)
	CDU if: [1,14] • Concern for poor adherence to therapy • Exacerbation of comorbidities • Significant clinical concern Note: cutaneous inflammation and systemic features often worsen after initiating therapy, failure to improve at 24 hours NOT considered clinical failure	No	Cefazolin 1 gm IV Q8H, rapid transition to cephalexin 500 mg PO Q6H Alternative: Clindamycin 600 mg IV Q8H, rapid transition to clindamycin 300 mg PO Q6H (alt dose: clindamycin 450mg PO Q8H)
Severe • Hypotension • *Two or more* systemic signs of infection: – temp>38°C – HR >90 bpm – RR>24 bpm – abnormal WBC >12K or <400 cells/mcg/L – Lymphangitis • Immunocompromised**	Admission	Yes: Blood***	Vancomycin per pharmacy ***PLUS*** cefazolin 2g IV Q8H Severe Beta-lactam allergy: Vancomycin per pharmacy

*Consider an alternative agent (e.g. TMP/SMX) in patients who do not respond to β-lactam therapy after 72-hours of treatment initiation, MRSA risk factors, or signs of systemic toxicity[3]

** Immunocompromise/Impaired host defense includes: organ transplant, active chemotherapy, neutropenia, chronic corticosteroid use (high-dose/long-term corticosteroid use [e.g. ≥2 weeks of ≥20 mg/day prednisone-equivalent]). Does NOT include diabetes, or dialysis-dependence. **Consider IV antibiotics +/- admission, reasonable to deviate from above recommendations at clinical discretion.**

***Blood cultures should be obtained and cultures of skin biopsy or aspirate considered for patients with malignancy, severe systemic features (such as high fever and hypotension), and unusual predisposing factors, such as immersion injury, animal bites, neutropenia, and severe cell-mediated immunodeficiency

Condition	Admit/CDU/Discharge	Culture?	Antibiotic Recommendation
Necrotizing Fasciitis/ Fournier Gangrene	Admission Emergent surgical consultation recommended for suspicion of necrotizing fasciitis	Yes	Vancomycin per Pharmacy ***PLUS*** piperacillin/tazobactam 4.5g IV x 1 in the ED, then Q8H extended infusion ***PLUS*** clindamycin 600-900 mg IV Q8H <u>Documented group A streptococcal necrotizing fasciitis</u>: penicillin G 4 million units IV Q4H ***PLUS*** Clindamycin 600-900mg IV Q8H

CONSIDERATIONS FOR DEVIATION FROM ABOVE GUIDELINES

Condition	Details	Recommendations
Failure of Oral Antibiotics	<u>Definition of antibiotic failure</u>: Less than 20% reduction in erythema at 48-72 hours after appropriate oral antibiotics[4,5] Failure rate: 12% regardless of spectrum of antibiotics[1]	Consider change in antibiotic medications +/- IV antibiotics +/- admission Consider alternative diagnosis- mimics of cellulitis. May consider dermatology or Infectious Disease consult
Impaired host defense/ immunocompromised	Immune suppression defined as: • Active chemotherapy • Transplant patients • Neutropenic patients • Chronic corticosteroid users [prednisone equivalent ≥20mg/day x 2 weeks) Does **NOT** include: • Diabetes • Dialysis-dependence	Consider IV antibiotics +/- admission

Emergency Department Antibiogram for Staphylococcus Aureus from Wounds

		Clindamycin	Oxacillin	TMP-SMX	Tetracycline	Vancomycin
STAPH AUREUS (MRSA)	40	77.5% (40)	0% (40)	95% (40)	97.5% (40)	100% (40)
STAPH AUREUS (MSSA)	124	81.5% (124)	100% (123)	100% (123)	94.3% (123)	100% (123)

Note: Displays % Susceptible (Number Tested)

References:

1. Stevens DL, Bisno AL, Chambers HF, et al. Practice Guidelines for the Diagnosis and Management of Skin and Soft Tissue Infections: 2014 Update by the Infectious Diseases Society of America. *Clin Infect Dis*. 2014;59. doi:10.1093/cid/ciu296
2. Golan Y. Current Treatment Options for Acute Skin and Skin-structure Infections. *Clin Infect Dis Off Publ Infect Dis Soc Am*. 2019;68(Suppl 3):S206-S212. doi:10.1093/cid/ciz004
3. Moran GJ, Krishnadasan A, Mower WR, et al. Effect of Cephalexin Plus Trimethoprim-Sulfamethoxazole vs Cephalexin Alone on Clinical Cure of Uncomplicated Cellulitis: A Randomized Clinical Trial. *JAMA*. 2017;317(20):2088-2096. doi:10.1001/jama.2017.5653
4. Yadav K, Suh KN, Eagles D, et al. Predictors of Oral Antibiotic Treatment Failure for Nonpurulent Skin and Soft Tissue Infections in the Emergency Department. *Acad Emerg Med Off J Soc Acad Emerg Med*. 2019;26(1):51-59. doi:10.1111/acem.13492
5. Research C for DE and. Acute Bacterial Skin and Skin Structure Infections: Developing Drugs for Treatment. U.S. Food and Drug Administration. http://www.fda.gov/regulatoryinformation/search-fda-guidance-documents/acute-bacterial-skin-and-skin-structure-infections-developing-drugs-treatment. Published October 17, 2019. Accessed October 25, 2019.
6. Torres J, Avalos N, Echols L, Mongelluzzo J, Rodriguez RM. Low yield of blood and wound cultures in patients with skin and soft-tissue infections. *Am J Emerg Med*. 2017;35(8):1159-1161. doi:10.1016/j.ajem.2017.05.039

Document Information

I. Original Author/Date:

a. Owner: Brian Rice, MD

b. Author/date: Brian Rice, MD 10/2019
Christine Reynolds, PharmD 10/2019
Adrianne Remigio, PharmD 10/2019

II. Gatekeeper: Emergency Department; Antimicrobial Stewardship Program III. Review and Renewal Requirement

This document will be reviewed every three years and as required by change of law or practice

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Emily Mui, PharmD, BCIDP 10/2019
Marisa Holubar, MD 10/2019
Stan Deresinski, MD 10/2019
Lina Meng, PharmD, BCPS, BCCCP 10/2019
David Ha, PharmD, BCIDP 10/2019
William Alegria, PharmD, BCIDP 10/2019
Amy Chang, MD, PharmD 10/2019
Mary Smith, MD 03/2023

V. Approvals

a. Antimicrobial Subcommittee: 10/2019, 03/2023

b. Pharmacy & Therapeutics Committee: 11/2019