Rochester Patient Safety *C. difficile* Prevention Collaborative:
Long Term Care Antimicrobial Stewardship (funded by NYSDOH)

Clinical Practice Guideline* for the Diagnosis and Management of
Acute Bacterial Skin and Soft Tissue Infection (SSTI) in Nursing Home Residents

Context

- On average, about 1 in 10 nursing home residents is receiving antibiotics on any given day [1]
- Antibiotic use is highly variable across nursing homes, and antibiotic related adverse events are significantly more common in highest use nursing homes [2]
- Presumed SSTI is the 3rd most common reason for antibiotic prescriptions in nursing home patients, after presumed urinary tract infections and presumed respiratory infections [3]
- As many as 30% of all "cellulitis" cases are misdiagnosed and are treated with unnecessary antibiotics [4]
- Antibiotic stewardship initiatives have been shown to be effective in impacting antimicrobial use and prescribing in nursing home settings [5]

Objective

- Support providers in clinical decision making for appropriate initiation and use of antibiotics in nursing home residents with presumed SSTI through the development of an evidence based clinical guideline

Goals

- Encourage practice patterns focusing on appropriate spectrum and appropriate treatment duration as recommended by the latest evidence based professional society guidelines for treatment of uncomplicated SSTI [6]
- Reduce inappropriate wound culturing practices in settings of uncomplicated SSTI
- Reduce nursing home-acquired *C. difficile* infection [7,8]

* This guideline is intended to serve as a reference tool during the care of a nursing home patient with suspicion of uncomplicated bacterial SSTI. This guideline is not intended to address issues related to complex wound care, complex diabetic foot infections, or other specialized clinical circumstances. It is not intended to be a set of rigid criteria to replace clinical judgment regarding each patient's particular circumstances, clinical presentation, and other factors.

Cellulitis: Cellulitis of the legs involves only one of the extremities

Non-Purulent Cellulitis (treatment Fig 1)	Purulent Cellulitis (Treatment Fig 2)
• A common bacterial infection of the deeper dermis and subcutaneous tissue with erythema, warmth, pain, and swelling, typically with ill-defined borders, most commonly affecting the extremities in adults, frequently associated with symptoms and signs of systemic illness (e.g. fever, chills, malaise, tachycardia, hypotension in more severe cases). • **More likely associated with β hemolytic *Streptococcus*** (group A, B, C, G), *Staphylococcus aureus* rare • Routine cultures not recommended	• Cellulitis associated with focus of evolving purulence, such as a cutaneous phlegmon, abscess, furuncle, carbuncle, infected epidermoid cyst. • **Strong association with *Staphylococcus aureus*** • Deep cultures of purulence (collected during I & D, avoid superficial cultures) may be helpful with determining susceptibility pattern

Two Common conditions causing "red leg" often mistaken for Cellulitis: Commonly bilateral

Stasis Dermatitis	Lipodermatosclerois
• Skin erythema due to chronic venous stasis and edema • Skin redness **often associated with scale** • Unilateral or **Bilateral** • Usually chronic or recurring • Pruritic lesions, weeping lesions • Relapsing and Remitting Course	• Associated with chronic venous hypertension and stasis • Inflammation of the subcutaneous fat • Present as **fibrosed, rigid** red or brown skin

Chronic decubitus ulcers: When to culture and Treat?

- **Culture:** Do not use a superficial swab culture to diagnose infection because pressure ulcers are colonized by bacteria, deep cultures are needed if infection suspected
- **Infection suspected if:**
  1. Edema, erythema, increased purulence and drainage, necrosis, new or increasing pain **and**
  2. Presence of systemic infection: fever, leukocytosis, hypotension

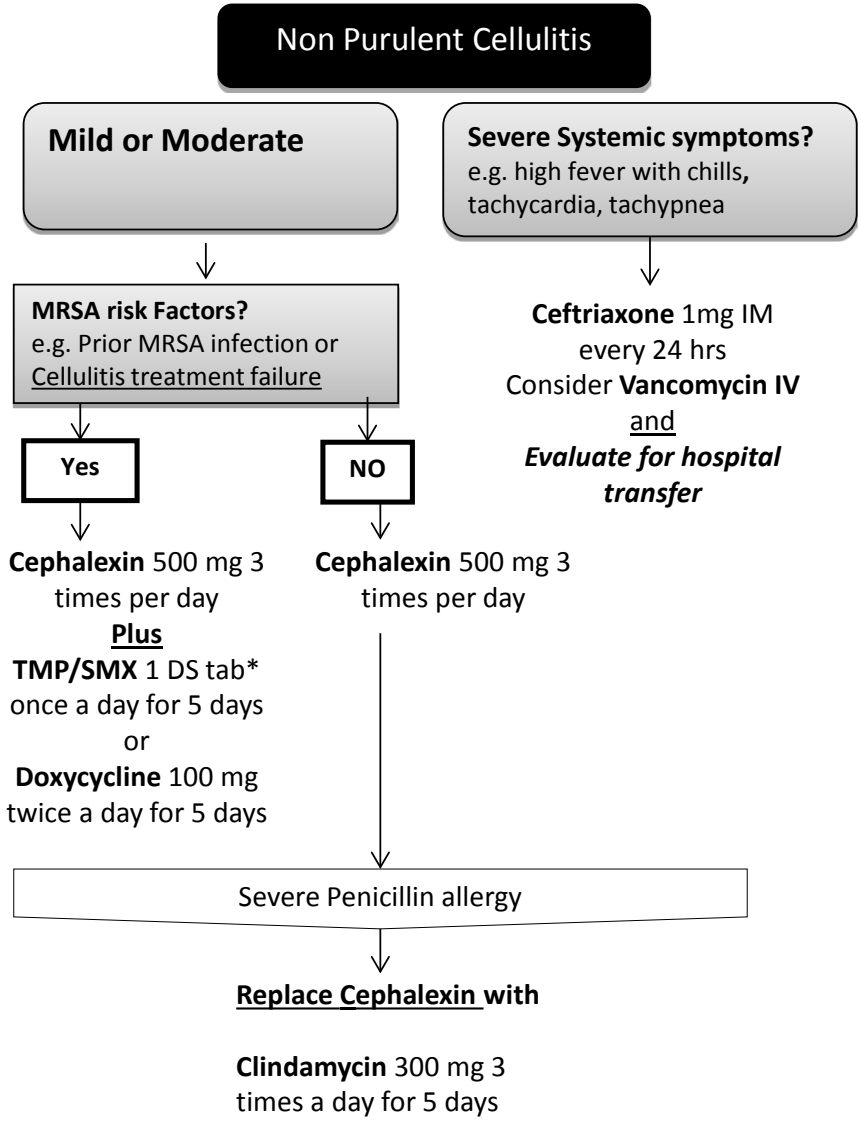
When to initiate antibiotics for skin and soft tissue infection:

New or increasing purulent drainage at a wound, skin, or soft-tissue site
Or
At least **two** of the following: • Fever (temperature > 100°F [37.9°C] or two repeated temperatures of 99°F [37°C]), 2°F (1°C) above the baseline or • Redness, or • Tenderness, or • Warmth, or • Swelling that is new or increasing at the affected site

Updated Mc Geer Surveillance criteria for skin and soft tissue infection:

Purulence at SSTI site
Or
New or increasing presence of at least **4** of the following sign or symptom subcriteria: • Heat at the affected site • Redness at the affected site • Swelling at the affected site • Tenderness or pain at the affected site • Serous drainage at the affected site • One constitutional criterion o fever o leukocytosis (WBC 114,000 leukocytes/mm3, left shift (16% bands or ≥1,500 bands/mm3) o Acute mental status changes o Acute functional decline

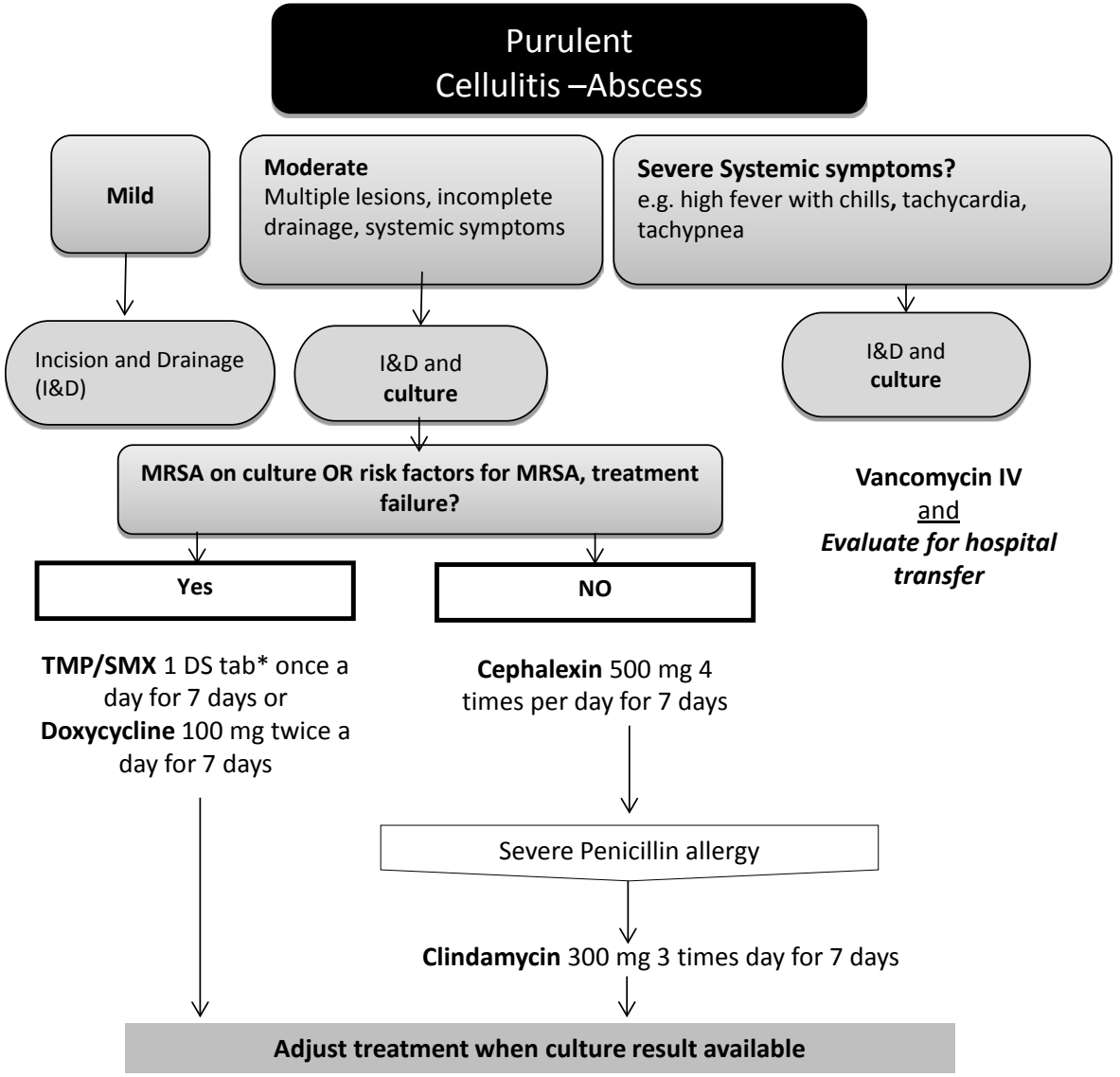
Figure 1. Treatment of non-purulent cellulitis



The recommended duration is 5 days. Treatment should be extended if the infection has not improved within this time period

* Increase TMP/SMX dose to 1 DS twice a day for residents with creatinine clearance > 30ml/min

Figure 2. Treatment of purulent cellulitis



The recommended duration is 7 days. Treatment should be extended if the infection has not improved within this time period

* Increase TMP/SMX dose to 1 DS twice a day for residents with creatinine clearance > 30ml/min

REFERENCES:

1. Pakyz AL, Dwyer LL. Prevalence of antimicrobial use among United States Nursing Home Residents: Results from a National Survey. Infect Control Hosp Epidemiol. 2010; 31:661-2

2. Daneman, N, Bronskill SE, et al. Variability in antibiotic use across nursing homes and the risk of antibiotic-related adverse outcomes for individual residents. JAMA 2015; 175 (8):1331-1339

3. Katz PR, Beam TR Jr et al Antibiotic use in the nursing home. Physician practice patterns. Arch Intern Med 1990, Jul; 150(7):1465-8
4. Weng QY, Raff AB, et al Costs and Consequences Associated with Misdiagnosed Lower Extremity Cellulitis, JAMA Dermatol, published online November 2, 2016

5. Fleet E, Rao GG et al. Impact of Implementation of a novel antimicrobial stewardship tool on antibiotic use in nursing homes: a prospective cluster randomized control pilot study. J Antimicrob Chemother 2014; 69:2265-2273

6. Practice Guidelines for the Diagnosis and Management of Skin and Soft Tissue Infections: 2014 Update by the Infectious Diseases Society of America, accessed at http://cid.oxfordjournals.org/content/early/2014/06/14/cid.ciu296.full

7. Clinical practice guideline for the evaluation of fever and infection in older adult residents of long-term care facilities: 2008 update by the Infectious Diseases Society of America. J Am Geriatr Soc. 2009;57(3):375-94.

8. Loeb M, et al. Development of minimum criteria for the initiation of antibiotics in residents of long-term-care facilities: results of a consensus conference. Infect Control Hosp Epidemiol. 2001;22(2):120-4.

9. Stone ND, et a. Surveillance definitions of infections in long-term care facilities: revisiting the McGeer criteria. Infect Control Hosp Epidemiol. 2012;33(10):965-77

10. Stevens V, Dumyati G et al. Cumulative antibiotic exposures over and the risk of *Clostridium difficile* infection. Clin Infect Dis. 2011 1;53(1):42-8.

11. Mandell GL, Bennett JE, Dolin R. Principles and Practice of Infectious Diseases, 8th Ed. Saunders, 2015