

A Quick Guide for Cellulitis Treatment

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ABSTRACT

Cellulitis, a common bacterial skin infection, poses a clinical challenge in its management due to its varied etiology, ranging from streptococcal to staphylococcal species. This review delves into the intricate landscape of cellulitis treatment, exploring the nuances of antibiotic selection based on infection type, severity, and local epidemiology. The empirical use of antibiotics, guided by an understanding of likely pathogens, is crucial in balancing efficacy and preventing resistance. Special attention is given to the inclusion of MRSA coverage in high-risk scenarios. Tailoring antibiotic regimens to specific clinical situations, such as surgical site infections or diabetic foot complications, underscores the importance of flexibility in cellulitis management. Periodic reassessment, guided by culture results and clinical response, ensures a dynamic and effective treatment course. The review also emphasizes the critical role of antibiotic stewardship in combating resistance and sustaining effective cellulitis management.

KEYWORDS: Cellulitis, bacterial skin infection, antibiotic therapy, empirical treatment, MRSA coverage, surgical site infections, diabetic foot complications, antibiotic stewardship, resistance, clinical management.

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INTRODUCTION

Cellulitis, characterized as an acute bacterial skin infection affecting the dermal and subcutaneous tissues, presents a clinical profile marked by erythema, calor, induration, and tenderness. This condition arises under various risk factors, including disruptions in skin integrity like toe web intertrigo, dry skin with fissuring, wounds, bites, and previous radiation therapy. Chronic skin conditions such as eczema and underlying health issues like venous stasis, obesity, edema, and prior saphenous venectomy also contribute to susceptibility.

The causative agents for nonpurulent cellulitis are predominantly *Streptococcus pyogenes* (group A streptococci) and methicillin-sensitive *Staphylococcus aureus*. In cases of purulent cellulitis associated with furuncles, carbuncles, or abscess formation, *Staphylococcus aureus*, particularly methicillin-resistant strains, is a common culprit in the United States.

Diagnosis of typical, uncomplicated nonpurulent cellulitis relies on the combination of a thorough history and physical examination. Unlike more complicated cases, routine cultures for pathogens from cutaneous needle aspirates, biopsy specimens, or swabs are not typically recommended. Instead, the emphasis is on spontaneous drainage of purulent fluid for

culture and sensitivity testing, especially to exclude methicillin-resistant *Staphylococcus aureus* (MRSA).

First-line therapy for common, mild, nonpurulent cellulitis involves antibiotics such as penicillin V potassium, cephalexin, dicloxacillin, or clindamycin. Monitoring is crucial, with outpatient reevaluation after 48 to 72 hours to assess treatment efficacy. Hospitalization becomes necessary in specific situations, including neonates, periorbital cellulitis, complicated cellulitis with a significant systemic inflammatory response, suspicion of necrotizing infection, or patients with high-risk comorbidities like diabetes, cirrhosis, or immunosuppression.

It is pivotal to adhere to guidelines suggesting empiric antibiotic therapy directed at β -hemolytic streptococci with or without coverage for methicillin-sensitive *Staphylococcus aureus*. However, the dynamic nature of cellulitis necessitates outpatient reassessment to detect any signs of infection worsening and the potential evolution into an abscess. For patients with a history of penetrating trauma, the assessment should carefully include consideration of a retained foreign body. Moreover, vigilance is essential for bite wounds to the hands, as they can swiftly progress, invading tendon sheaths and resulting in closed space infections, potentially causing significant long-term impairment.

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TREATMENT

Goals:

Eradicating infection and preventing recurrences, controlling symptoms, and promoting antibiotic stewardship are the primary goals of managing cellulitis. This involves targeting the most likely organisms and minimizing the spectrum and duration of therapy.

Disposition:

Admission Criteria:

General Admission Criteria:

Admission is warranted for neonates with cellulitis, severely ill children, or those with diabetes. Relative admission indications for children include fever, younger age, larger size of lesion, significant lymphangitis, rapidly spreading lesions, involvement of sensitive structures, and signs of systemic illness. Adult patients with severe cellulitis or prominent systemic signs, periorbital cellulitis cases, significant comorbidity, rapidly spreading infection, concern for deeper or necrotizing infection, failed outpatient treatment, and poor adherence to therapy also require hospitalization.

ICU Admission Criteria:

ICU admission is recommended for patients with clinical indicators of sepsis syndrome, altered mental status, and hemodynamic instability.

Recommendations for Specialist Referral:

Specialist referrals are essential for cases requiring expertise. Surgeons should be consulted for underlying necrotizing processes, postoperative wound infections, perianal abscess, and complex wounds. Plastic or hand surgery is relevant for face or hand bite wounds, podiatrists for chronic foot infections, ophthalmologists for periorbital cellulitis, and oral surgeons or otolaryngologists for significant facial cellulitis. Infectious disease specialists should be consulted for immunocompromised patients, unusual exposures, and infections unresponsive to empiric therapy.

Antibiotic Management in Cellulitis: Delving into Treatment Options

Cellulitis, a common bacterial skin infection, requires a meticulous approach to antibiotic management to achieve optimal outcomes. The overarching goals of treatment encompass eradicating infection, preventing recurrences, controlling symptoms, and promoting antibiotic stewardship. The choice of antibiotics is guided by factors such as the type of infection, likely pathogens, severity, and disease progression.

1. Erysipelas:

Erysipelas, often attributed to *Streptococcus pyogenes*, is typically treated with oral penicillin as the preferred option. Alternatives include amoxicillin, cephalexin, and clindamycin. In cases of systemic inflammation, parenteral antibiotics may be initiated, with a usual treatment duration of 5 days, extendable to 10 if necessary.

2. Nonpurulent Mild to Moderate Cellulitis:

Caused by streptococcal species and *Staphylococcus aureus*, this form of cellulitis requires empiric antibiotics targeting β -

hemolytic streptococci. The treatment duration ranges from 5 to 7 days, with extension based on clinical necessity. Outpatient options include oral penicillin, amoxicillin, cephalexin, dicloxacillin, and clindamycin. Coverage for Methicillin-resistant *Staphylococcus aureus* (MRSA) is considered depending on local prevalence.

3. Purulent, Severe, or High-risk Cellulitis:

Empiric antibiotic therapy with MRSA coverage is initiated and may be adjusted based on culture results. Purulent cellulitis necessitates incision and drainage, followed by oral antibiotics with consideration for MRSA coverage. Severe cases may require parenteral antibiotics, with potential broadening of coverage for complicated severe cellulitis.

4. Complicated Severe Cellulitis:

Broad-spectrum coverage is recommended for cases involving necrotizing infections, deep tissue involvement, and major abscesses. Surgical intervention is considered if there is inadequate response to empiric therapy. The role of nonsteroidal anti-inflammatory drugs (NSAIDs) or systemic corticosteroids is limited.

5. Other Clinical Situations:

Specific clinical scenarios, such as surgical site infections, chronic diabetic foot infections, and exposures to unusual pathogens, demand tailored approaches. The choice of antibiotics should be guided by the unique characteristics of each situation.

CONCLUSION

In navigating the complex terrain of cellulitis management, a meticulous and nuanced approach to antibiotic therapy emerges as paramount. The selection of antibiotics is intricately woven into the fabric of infection type, severity, and local microbial epidemiology. The overarching goals of eradicating infection, preventing recurrence, controlling symptoms, and fostering antibiotic stewardship guide the clinician through a dynamic decision-making process.

The spectrum of cellulitis, from erysipelas to severe, complicated cases, necessitates tailored antibiotic strategies. Empiric therapy, driven by a judicious understanding of likely pathogens, seeks to strike a balance between efficacy and minimizing the emergence of resistance. The inclusion of MRSA coverage, particularly in purulent or high-risk scenarios, reflects the evolving landscape of bacterial resistance patterns.

Integral to successful cellulitis management is the recognition of nuanced clinical situations, each demanding a bespoke therapeutic approach. From surgical site infections to chronic diabetic foot complications, the diversity of scenarios underscores the need for flexibility in antibiotic choices. Periodic reassessment, coupled with a readiness to adapt antibiotic regimens based on culture results and clinical response, ensures a dynamic and effective treatment course.

As we navigate the ever-changing landscape of infectious diseases, the judicious use of antibiotics remains a linchpin in achieving positive outcomes. Antibiotic stewardship, rooted

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in evidence-based practices, not only combats resistance but also paves the way for a sustainable and effective cellulitis management paradigm. The clinician's role in this intricate dance is one of continuous assessment, adaptability, and commitment to optimizing patient care in the face of evolving microbial challenges.

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