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**Clinical
Review**



ACUTE BACTERIAL SKIN AND SKIN STRUCTURE INFECTIONS (ABSSSI): PRACTICE GUIDELINES FOR MANAGEMENT AND CARE TRANSITIONS IN THE EMERGENCY DEPARTMENT AND HOSPITAL

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□ **Abstract—Background:** Acute bacterial skin and skin structure infections (ABSSSI), formally referred to as complicated skin and soft tissue infections, include infections with resistance to previously effective antimicrobials. Increasing dramatically in incidence, they have become a challenging medical problem associated with high direct and indirect costs to both the medical system and society. **Objectives:** To describe the burden of ABSSSI and to explore multidisciplinary approaches to its management and new treatments that can be initiated in the emergency department. **Discussion:** We offer a best practice model aimed at providing risk-stratified and convenient care for ABSSSI at the lowest possible cost, while minimizing complications, readmissions, and inappropriate antibiotic use. **In doing so, we focus on the care provided by emergency physicians and hospitalists and the transition of management between them for inpatient care, as well as the facilitation of observation or direct-to-outpatient care for suitable patients. Conclusions:** A standard, consistent, and multidisciplinary approach to ABSSSI can streamline care, reduce admissions, support antimicrobial steward-

ship, and improve clinical and resource consumption outcomes. © 2015 Elsevier Inc.

□ **Keywords—**skin infections; ABSSSI; processes of care; best practice; antibiotics

INTRODUCTION

Acute bacterial skin and skin structure infections (ABSSSI) have become a challenging medical problem associated with high direct and indirect costs to both the medical system and society. Infections due to bacteria with resistance to previously effective antimicrobials such as methicillin-resistant *Staphylococcus aureus* (MRSA) are increasing in incidence and have led to higher rates of complications and hospitalization. MRSA has emerged as the most common cause of purulent infections in the United States and many other areas. Meeting the challenge to deliver efficient health care not

only demands that we recognize and treat individual patients; we must also define strategies to optimize patient flow and resource utilization. An important goal is to limit inpatient stays and reduce hospital readmissions through seamless transitions of care from the emergency department (ED) into the hospital medicine service, and then out to the community. The purpose of this report is to describe a best practice model for patient care and resource management in ABSSSI.

Why ABSSSI and not cSSTI?

The terms “skin and skin structure infection” and “skin and soft tissue infection” (SSTI) were coined to describe infectious processes such as cellulitis, erysipelas, cutaneous abscesses, and infected wounds, ulcers, or burns. The designation of more severe SSTI included a lowercase “c” (cSSTI) for “complicated” skin and soft tissue infection and typically implied a need for inpatient management, surgical procedures, or a significant underlying comorbidity such as diabetes or systemic immunosuppression that complicates response to therapy.

In 2013, to identify more clearly a severe subset of SSTI that would typically be treated with parenteral antibiotic therapy, the United States (US) Food and Drug Administration (FDA) issued guidance that standardized the nomenclature to be used in the evaluation of new antimicrobial treatments for cSSTI, which are now referred to as acute bacterial skin and skin structure infections, or ABSSSIs. The rationale for developing this terminology was to provide a consistent means of identifying infections for which a reliable drug treatment effect can be estimated. The agents to be studied under the new definition are most often administered parenterally, and patient level of illness is reflected in parameters such as lesion size, leukocytosis, fever, and systemic inflammatory response syndrome (1).

The specific verbiage from the FDA is as follows:

ABSSSIs include cellulitis/erysipelas, wound infection, and major cutaneous abscess with a minimum lesion surface area of 75 cm². Diabetic foot ulcers and burn wound infections are excluded. Bacterial pathogens that commonly cause ABSSSI include *Streptococcus pyogenes* and *Staphylococcus aureus*, including MRSA strains. Less commonly identified bacteria include other *Streptococcus* species, *Enterococcus faecalis*, and Gram-negative bacteria (1).

Although various terms appear in the literature and some of the studies discussed in this review used the terms cSSSI or cSSTI, we will use ABSSSI consistently to describe these complicated infections, to avoid confusion. The primary etiologic organism of concern in ABSSSI is MRSA, and most novel antimicrobials studied to date under the new FDA guidance target MRSA specifically.

DISCUSSION

Management of ABSSSI: Time for a New Focus

Skin and skin structure infections are common causes for presentation to the ED. The majority of these patients can be treated effectively as outpatients with oral antimicrobial agents, with or without minor surgical intervention. For patients with the more serious ABSSSI, who are deemed to require parenteral therapy, effective communication and care transition between the ED and the hospital medicine service are particularly important. A clearly defined methodology for evaluating the need for inpatient care and subsequent outpatient and inpatient management is currently absent. The objective of such a methodology should be to provide highest quality care. Secondly, the goal is to give appropriate and convenient care at the lowest possible cost, while minimizing complications, readmissions, and inappropriate antibiotic use. We will first discuss why ABSSSIs are a high-priority infection that deserve immediate attention, and then describe why a consistent, quality-driven program to manage these patients is necessary.

Why ABSSSI and MRSA are High-priority Infections

- MRSA is prevalent in ABSSSI.
- Rates of MRSA infection and hospitalizations are dramatically increasing.
- MRSA and ASSSI have high rates of morbidity and other associated medical conditions.
- MRSA infection is a risk factor for subsequent hospitalization and death.
- Inadequate treatment of MRSA ABSSSI due to antibiotic resistance is likely a factor in relapse.
- Urgent need exists to reduce hospitalization through the use of more effective outpatient treatment strategies.
- Effective outpatient management can reduce cost and improve patient outcomes and satisfaction.

Profile of ABSSSI Today: The Importance of MRSA

Patients with ABSSSI present to EDs with a broad range of disease severity, ranging from cellulitis to serious, life-threatening, necrotizing infections. These infections may arise as the result of minor injuries that break the skin, from animal bites, to gunshot and knife wounds; or with no clear precipitating event.

As suggested by the FDA guidance above, staphylococci, predominantly MRSA, and to a lesser extent, methicillin-susceptible *S. aureus*, cause most skin infections. Some infections, such as those associated with a diabetic foot ulcer, are additionally caused by aerobic

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