

Symposium

Introduction

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Introduction to Infectious Disease Symposium

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Infectious disease crises are becoming more prominent in the news. The Ebola outbreak in West Africa mesmerized the world as efforts expanded in an attempt to contain this highly infectious disease. The spread of this virus to the United States and other countries provoked fear, which led to better techniques for treatment, isolation, and screening. Transmission of infectious diseases is now becoming a major concern of the public. Although less publicized, another important milestone regarding infection is evolving. The White House released a document, *National Strategy for Combating Antibiotic Resistant Bacteria*, in September 2014.¹ This national strategy was developed to respond to the serious or urgent threat that resistant bacteria pose to public health.¹ Why is this document so important? It represents the recognition by politicians that resistant bacteria are a major concern of our health care system.

Headlines have heightened the awareness of the American public about the magnitude of the bacterial resistance problem that health care providers have recognized for some time. To launch an effective campaign against resistance, all parties involved in this issue must recognize and participate in the steps needed to combat resistance. The public needs to understand that viral infections should not be treated with antibiotic drugs. Politicians need to support the development of new antibiotic drugs. The agricultural industry needs to closely examine their use of antibiotic drugs that may be contributing to resistance. For health care providers, an increased understanding of resistance, how it developed, and best steps to deal with the problem will assist in improving care of their patients.

When I was thinking about what topics would be appropriate for this symposium, I wanted to deal with various perspectives of infectious disease issues and resistance. In my practice as an acute care nurse practitioner, I continue to learn about bacterial resistance and how it has developed. If we understand the process of resistance in more depth, we will be better equipped to deal with the phenomenon. The first article in this series explores a number of mechanisms that bacteria have developed over thousands of years that have helped their survival. Bacteriophages, bacteriocins, and killing factors are a few of the natural bacterial defenses that are discussed. Scientists are studying these defenses to see if they can be used to destroy bacteria.

Another issue is the demand for new antibiotic drugs, which has become more important as resistance increases. The financial incentive for pharmaceutical

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companies to develop new drugs is not enticing, but more antibiotic drugs are being developed as our antimicrobial arsenal continues to shrink. As new drugs are developed, it is imperative that prescribers understand proper dosing of each drug and the correct clinical setting for each drug's use. Kris Scordo reviews the antibiotic drugs that are used to treat methicillin-resistant *Staphylococcus aureus* (MRSA). She discusses older drugs, including vancomycin, as well as new drugs such as tedizolid, which was approved for use in 2014.

Many patients in the acute and critical care setting develop renal failure and require continuous renal replacement therapy. Antibiotic dosing for patients who are on continuous renal replacement therapy can be challenging and usually requires the expertise of a clinical pharmacist. Greg Susla addresses renal replacement techniques and analyzes the drug factors affecting removal by renal replacement therapy. An important concept in his article is the fact that some patient populations such as immunocompromised patients may need more aggressive dosing of antibiotic drugs to maximize blood drug levels. When changes are made in renal replacement therapy, drug dosing adjustments should be considered.

Many guidelines and protocols have been promoted by regulatory bodies to help deal with transmission of hospital-acquired infections. The clinical nurse specialist is the role

that frequently directs the implementation of protocols within a continuous quality improvement program. However, that task is "easier said than done." As a clinical nurse specialist, Kathleen Stacey critically analyzes the many factors that affect the successful implementation of these types of quality improvement programs and provides perspectives that may improve successful implementation.

The final topic addressed in this symposium is the care of patients with Ebola virus. The National Institutes of Health is one of the designated centers that have cared for these patients. A multidisciplinary team volunteered to care for these patients and was trained to properly and safely care for them. Sue Johnson, Neil Barranta, and Dan Chertow share their perspectives about that process, which may be helpful for institutions that are considering initiating this type of program. Important topics such as required staffing and social ostracism that these individuals experienced are discussed.

I hope these articles will be helpful in expanding the knowledge base of the advanced practice clinician and provide useful clinical information in dealing with the increasing threat of bacterial resistance and challenging infections.

REFERENCE

1. Centers for Disease Control and Prevention. http://www.cdc.gov/drugresistance/pdf/carb_national_strategy.pdf. Published 2014. Accessed March 14, 2015.