Good morning Chairman Harkin, Ranking Member Alexander, and Members of the Committee. Thank you for the opportunity to present this testimony—it is a privilege to be here. I am Dr. Jonathan Perlin, President, Clinical and Physician Services and Chief Medical Officer of Hospital Corporation of America (HCA).

First, I would like to take a moment to recognize the family of Rory Staunton, to whom I offer my deepest sympathy and whose commitment to elevating attention to sepsis and its prevention inspires the work we do.

Today, I will speak to how a learning health system can help address some of our nation's most pressing challenges in infection prevention and patient safety. Specifically, I would like to discuss how lessons from the REDUCE MRSA study provide a model for rapidly and efficiently accelerating the prevention of healthcare-associated infections and could be applied to improving the early recognition and treatment of sepsis.

BACKGROUND

Healthcare-associated infections (HAIs), or infections acquired through medical care, afflict almost two million patients annually. About 80,000 of those patients die. Most HAIs are preventable. Beyond the catastrophic human toll, avoidable infections also represent the unnecessary use of healthcare resources.

A major concern with HAIs is antibiotic resistance. Used unnecessarily or inappropriately, antibiotics kill the most susceptible organisms and, in their void, create a favorable environment for the selection of more resistant bacteria. This has resulted in a scary alphabet soup of superbugs, including *Clostridium difficile* (*C. diff*), Carbapenem-resistant Enterobactriaceae (CRE), Methicillin-resistant *Staphylococcus aureus* (MRSA), multidrug-resistant tuberculosis (MDR TB), and Vancomycin-resistant Enterococcus (VRE) that is threatening even the healthiest patients.

In a recent report *Antibiotic Resistance Threats in the United States*, *2013,* The Centers for Disease Control and Prevention recommends a four-pronged strategy to address resistance: 1) prevention of infections; 2) tracking resistant bacteria; 3) improved use of antibiotics; and 4) development of new antibiotics and diagnostic tests for resistant bacteria. This is complemented by increased attention to reducing the overuse of antibiotics, selecting the most appropriate and organism-specific antibiotic for each clinical situation, and prescribing and complying with courses of therapy for the recommended duration of time. Good stewardship, or the careful use of antibiotics in both humans and animals, improves patient outcomes and enhances the prevention and treatment of HAIs and sepsis.

REDUCE MRSA AND THE LEARNING HEALTH SYSTEM

I would like to talk about our work to combat one of these superbugs, MRSA. HCA, in partnership with CDC, Harvard Pilgrim Health Care, University of California Irvine School of Medicine, Rush Medical College, and Washington University St Louis, recently concluded the REDUCE MRSA trial.

Methicillin-resistant *Staphylococcus aureus*, more commonly known by its abbreviation, MRSA, was identified in the recent CDC report as a serious threat to human health. MRSA, along with *Staphylococcus aureus* generally, account for approximately one quarter of all deaths from hospital-acquired infections. With the goal of preventing all potentially avoidable harm, prevention of MRSA infections is a national priority.

The REDUCE MRSA trial, conducted across 74 intensive care units (ICUs) at 43 HCA-affiliated hospitals, involving 74,000 patients, answered the question of which of three alternative approaches to prevent MRSA infection in ICU patients is truly best. The answer sets a new standard for infection prevention. This trial showed that universal decolonization—using antimicrobial soap and nasal ointment at the time of admission for all ICU patients—reduced *all* bloodstream infections, including those caused by MRSA, by 44 percent.

This study demonstrates the power and efficiency of a learning health system, defined by the Institute of Medicine (IOM) as one committed to both the generation and use of scientific evidence. REDUCE MRSA is notable not only for its outcomes, but for its methods. It didn't take a single hospital 43 years to amass the power of this study—it took 18 months. It didn't take a single-purpose research team, but was implemented by nurses and infection prevention professionals during the course of their routine patient care. The study also didn't occur in a laboratory, but within community hospitals across the country.This type of pragmatic research answers real-world questions in real-world environments that generalize to real-world situations, and it provides a powerful model for accelerating science. For more detail of this trial, please refer to the article published in the June 2013 edition of the New England Journal of Medicine, *Targeted versus Universal Decolonization to Prevent ICU Infection*. Additional information about the learning health system may be accessed through the commentary published by the IOM, *A win for the learning health system*. Both full-text articles are included as attachments.

SEPSIS AND AN OPPORTUNITY TO APPLY THE LEARNING HEALTH SYSTEM

The learning health system, as employed in the REDUCE MRSA trial, is critical to accelerating our understanding, prevention, and treatment of sepsis. Sepsis is a final common pathway for a number of diseases, including community and hospital-acquired infections. Not everyone who has an infection will develop sepsis, yet everyone with sepsis has an infection. The learning health system platform can help us discover which clinical and biochemical indicators suggest risk for sepsis, become sharper in recognizing sepsis and intervening earlier, and build the evidence defining best treatment.

The current state-of-science provides insight into markers of severe sepsis, and the state-of-the-art is to put this science into use though a campaign to recognize sepsis as early as possible. But turning the clock back further is required. Metaphorically, we can identify the building that's on fire. We need to be able to recognize risk for sepsis, and that means we need to see the earliest signs of smoke, and even prevent fires. Methods used in the REDUCE MRSA study can help us identify early signals, test competing care strategies, and determine the best practices in fighting sepsis and reducing its catastrophic toll.

CONCLUSION

In closing, I would like to commend CDC, and this committee, for support of a learning health system. The REDUCE MRSA study was not only one of the largest trials ever done; it was one of the most efficient. Its results save lives, save resources, and suggest scientifically-informed policy. Thus, I encourage your continuing support of the work CDC, AHRQ, NIH and other Federal agencies do to foster pragmatic research to combat the threat of antibiotic resistance, HAIs, and sepsis. I would like to acknowledge all of our collaborators, in particular Richard Platt, Susan Huang, and John Jernigan, the CDC Prevention Epicenters Program, Harvard Pilgrim Health Care Institute, and the Agency for Healthcare Research & Quality.

On World Sepsis Day, and in the presence of the family of Rory Staunton, it seems a fitting time to commit to a learning health system. Thank you, Chairman Harkin, Senator Alexander, and members of the Committee for your leadership.

REFERENCES

1. Platt R, Huang SS, Perlin JB. A win for the learning health system. Commentary. 2013. Institute of Medicine, Washington, DC. http://www.iom.edu/WinforLHS. [Full text included as Attachment 1]
2. Huang SS, Septimus E, Kleinman K, et al; CDC Prevention Epicenters Program and AHRQ DECIDE Network and Healthcare-Associated Infections Program. Targeted versus universal decolonization to prevent ICU infection. *N Engl J Med*. 2013; 368:2255-65. [Full text included as Attachment 2]
3. Platt R, Takvorian SU, Septimus E, et al. Cluster randomized trials in comparative effectiveness research: randomizing hospitals to test methods for prevention of healthcare-associated infections. *Med Care*. 2010;48:Suppl: S52-S57. [Full text included as Attachment 3]