

Sepsis Alliance and HROC Team to Shine Spotlight on National Security Threats Posed by "Superbugs"

The High Reliability Organization Council (HROC) and Sepsis Alliance will work together to raise awareness of the dangers presented by antibiotic resistant bacteria. These efforts aim to show the value of Military-related, and other government, initiatives toward antibiotic stewardship programs to help defend against so-called "superbugs."

SAN DIEGO, CALIFORNIA – January 26, 2017 – Sepsis Alliance and HROC are joining forces to raise awareness of "superbugs," or bacteria that are immune to drugs such as antibiotics. This partnership comes on the heels of a recent report by the Centers for Disease Control and Prevention (CDC) of a Nevada patient who recently died from a bacteria that could not be stopped by any antibiotic available in the U.S.¹

The case in Nevada was not the first detection in the past year. In April, 2016, the Military identified a patient in Pennsylvania with a germ impervious to the antibiotic of last resort.² Today, now there is new evidence that these bacteria are probably circulating more widely than reported, and even among people with no signs of infection.³

The potential risks to patients and their loved ones cannot be overstated, and historic outbreaks have demonstrated the incredible toll such superbugs can take. For example, in the nation's first large scale pandemic, the 1918 Spanish flu outbreak, the toll taken globally was severe -- it was estimated to have killed up to 5% of the world's population.⁴ In today's terms, a mortality rate of 5% would equate to 350 million people globally. In the U.S., a 5% mortality rate would equal more than *six times* the number of people that died from *all* causes last year.⁵

Currently, the CDC notes drug-resistant bacteria cause 2 million illnesses and 23,000 deaths annually.⁶ Given the increase in sepsis the past decade, more antibiotic use was expected. But antimicrobial overuse is leading to even more drug-resistant microbes.

Given these grave risks to our national security, the U.S. Army commissioned a new research arm in 2009 to address the global threat of antibiotic overuse and preventable drug-resistant infections. The Multidrug-Resistant Organism Repository and Surveillance Network (MRSN) was designed to improve biosurveillance, and tied to about 100 military facilities around the world.⁷

Pandemic-level diseases such as the flu, Ebola, and other pathogens that can spawn epidemics can, in turn, result in the most dangerous of all infection complications⁸, including sepsis. Sepsis is the body's overwhelming and life-threatening response to infection, and which can lead to tissue damage, organ failure, and death.

In short, the sepsis patient safety issue is contributing to a superbug public safety crisis, potentially leading to a vicious cycle of more infection and higher use of antibiotics.

Consequently, HROC and Sepsis Alliance have teamed to raise public awareness of the risks and the measures we can all take to reduce the many threats posed by superbugs to the nation and the world.

Antibiotic-resistant bacteria are considered by experts to be the result of the overuse of antibiotics⁹. To prevent possible infections from worsening, some people are using antibiotics more frequently and in stronger doses, given the threat to the elderly and the worries of severe infections and sepsis (currently a major focus nationwide). The paradox is that more resistant bacteria can emerge that won't be stopped by these antibiotics.

To battle this crisis, one measure currently advocated by the CDC is "antimicrobial stewardship" (AMS). Studies have shown stewardship programs, involving increased monitoring, education within clinical settings, and improvements to antibiotic use, may lower the use of antibiotics by almost 20 percent¹⁰. Such programs have also been linked to declining infection rates, especially from resistant microbes in a hospital.

Given the "limiting" that is assumed to happen in any stewardship, a misconception exists that antimicrobial stewardship could make it even harder to fight sepsis, such as by delaying needed antibiotics. Research into another Military-led contribution against the pandemic threat, called the Military Acuity Model (MAM), suggests otherwise.

Balancing the "not too little, not too much" antibiotic use was key to the research conducted for MAM being applied to the issue of patient safety. "We have been doing research into how MAM can help reduce the threat to patients, and the ways reducing task saturation can help with this looming healthcare crisis," said Lieutenant Colonel Jared Mort, an expert on MAM and its implementation. "This strategy relies on people reacting precisely the right way at the right time. This was the reason for HROC's research into ensuring reliability in the proper timing and execution of care tasks."

A study showing how MAM tackles threats to patients head-on is expected to be published shortly. However, it is not the only research that seems to suggest more attention be focused on improving the means by which healthcare is delivered.

Atul Gawande published a New Yorker article in 2007 quoting patient safety expert Peter Pronovost, M.D., who suggested the fundamental problem with the quality of American medicine is the failure to also view the *delivery* of health care as a science. Dr. Pronovost noted that the tasks of medical science fall into three buckets: 1. Understanding disease biology; 2. Finding effective therapies; 3. Ensuring those therapies are delivered effectively. Dr. Pronovost goes on to say, "That third bucket has been almost totally ignored by research funders, government, and academia. It's viewed as the art of medicine. That's a mistake, a huge mistake. And from a taxpayer's perspective it's outrageous."

This "Delivery Science" is where HROC and Sepsis Alliance are focusing their joint efforts and research.

In fact, the Bill & Melinda Gates Foundation estimated that \$4.5 billion per year¹¹ is required to protect against pandemic threats -- a key reason HROC and Sepsis Alliance joined the research to halt the rise of these pandemic risks, which often lead to sepsis.

The financial impact that individual health systems may suffer within pandemics is also a significant concern. The hospital that had the nation's first Ebola incident in 2014 was criticized for poor adherence to safety protocols¹², and suffered negative media attention after its mishandling of the Ebola patient. The financial impact of this superbug protocol failure was dramatic. The hospital's revenue dropped 25.6% the following month following the negative press, and continued to be reduced even months later. There are other expenses to consider, including losses from liability to patients and care workers, and costs from extra efforts to prevent the next disaster. Such expenses are so significant that they may force smaller, community-based hospitals to close, which will only exacerbate the issue of preventable fatalities in the event of an epidemic.

"Hospitals that get overwhelmed by patients during a pandemic or superbug outbreak will have too much to do in too little time," notes Terry Rajasenan, HROC's chief scientist for MAM projects. "If teams become more reliable, they don't wait for high acuity patients to reach riskier late stages of infection that consume more staff time and costlier care, such as intensive care units. An example of too urgent is septic shock -- often too late to save patients. Earlier treatment means fewer fatalities, but it also means more patients to review to properly catch actual infections sooner -- or else it would lead to giving patients antibiotics that weren't needed. Staff with enough 'time to think' can choose this ideal time to treat. In short, timing is critical, and it's adversely impacted by task saturation."

“Combating task saturation brings increased reliability and preparedness to our battle against pandemic risks, which in turn can help stop sepsis in its tracks,” said Tom Heymann, Executive Director of Sepsis Alliance. "All of us stand to benefit in improving antimicrobial stewardship. Every one of us.”

For those interested in learning more about improving antimicrobial stewardship and preventing infections from reaching sepsis in any setting, HROC encourages people to view its free online webinar on HROs, which is free for those qualifying as serving the public interest, such as those helping the Military and VA. More details are online at:

www.thinkhro.org

For more information on identifying sepsis, or coping with its aftermath, visit the Sepsis Alliance website at:

www.sepsis.org

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