Why Implement Antimicrobial Stewardship In Your Hospitals? (Part 2)

EIGHT KEY STEPS
(for implementing an Antimicrobial Stewardship Program - “ASP”)

1. Assess the motivations
2. Ensure accountability and leadership
3. Set up structure and organization
4. Define priorities and how to measure progress and success
5. Identify effective interventions for your setting
6. Identify key measurements for improvement
7. Educate and Train
8. Communicate

1. ASSESS THE MOTIVATIONS
• Analyze your situation and what problems you want to address.
• Define where you are and where you want to go, with quantitative figures. One of the ways of obtaining these data is to measure the quantity and quality of antibiotic use.
• What can be implemented will depend on local needs/issues, geography, available skills/expertise and other resources.

For example, easier or less costly approaches can include:
• Simple clinical algorithms
• Prescribing guidance for treatment surgical prophylaxis
• Intravenous (IV) to oral conversion
• Provision of microbiological support
• Restricting availability of certain antibiotics (formulary restriction)
• Automatic therapeutic substitution
• IV antimicrobial batching
• Promoting education.

2. ENSURE ACCOUNTABILITY AND LEADERSHIP
To ensure a successful Antimicrobial Stewardship Program:
• The program should be supported by the senior hospital management, who are accountable for the outcomes.
• A team of people and resources should be allocated by the head of the organization to implement and evaluate the program.
• The ASP team members must possess power, expertise, credibility and leadership. These individuals need to convince managers and healthcare staff of the added value of the program.
A key component of a stewardship program is leadership and culture of antibiotic use. This can be set out as a driver diagram.

3. SET UP STRUCTURE AND ORGANIZATION
The key components of the structure and governance of the ASP are:
• Dedicated resources, including dedicated personnel time for stewardship activities, education, and measuring/monitoring antimicrobial use.
• A multidisciplinary AS team [AST] with core membership of: - an infectious diseases physician (or lead doctor or physician champion) - a clinical microbiologist - a clinical pharmacist with expertise in infection. Other members could be specialist nurses, for example infection prevention or stewardship nurses, quality improvement/risk management/patient safety managers and clinicians with an interest in infection.
• Governance within the hospital’s quality improvement and patient safety governance structure.
• Clear lines of accountability between the chief executive, clinical governance, drug and therapeutics committee, infection prevention and control commit-
4. DEFINE PRIORITIES AND HOW TO MEASURE PROGRESS AND SUCCESS

The objectives of the ASP and how they are going to be achieved and measured need to be agreed by all the key stakeholders and communicated clearly. One way of doing this is to produce a Driver Diagram. A Driver Diagram is a logic chart with three or more levels, including:

- A goal or vision
- The high-level factors needed to achieve this goal. (called ‘primary drivers’)
- Specific projects and activities that would act upon these factors.

For more complex goals, each primary driver could have its own set of ‘secondary drivers’ (or lower level drivers). Driver diagrams can help an ASP team to:

- Explore the factors that need to be addressed to achieve a specific overall goal.
- Show how the factors are connected.
- Act as a communication tool for explaining a change strategy.
- Provide the basis for a measurement framework

5. IDENTIFY EFFECTIVE INTERVENTIONS FOR YOUR STAFF

A range of stewardship interventions has been reviewed in the IDSA guidelines. When establishing a new stewardship program, it is best to start with the core strategies and focus on achieving and maintaining them before adding some of the supplemental strategies.

6. IDENTIFY KEY MEASUREMENTS FOR IMPROVEMENT

Measurement of prescribing performance is essential to evaluate the impact of stewardship interventions on clinical practice and demonstrate benefits for patients.

Establishing what to measure, the frequency of measurement and how the data will be communicated and acted upon are also key.

In addition to the audit and feedback three other types of measurement are commonly used within stewardship programs:

- Surveillance of antimicrobial use and resistance.
- Data collection for quality improvement.
- Analysis of hospital datasets to evaluate positive and negative consequences of interventions.

“If you cannot measure it, you cannot improve it”

Lord Kelvin 1824-1907

7. EDUCATE AND TRAIN

Education is a key component of any Antimicrobial Stewardship Program. It should include healthcare professionals from all care settings, as well as patients and the public. By increasing people’s knowledge and understanding of how antimicrobials should be used to treat common infections and why inappropriate use may lead to resistance and loss of effective treatments, this valuable resource can be protected for future generations.

Who should receive education in hospitals?

- Undergraduate curriculum Internship
- Professional training for new staff
- Continuing professional development for all prescribers
- Postgraduate education

8. COMMUNICATE

Communication is a key component of the success of an ASP. Clear, simple communication should show the vision and the benefits of the program, with core clinical messages. Identify and communicate to prescribers specific situations where antibiotics should be withheld and guidance in relation to the duration of antibiotic use, which is often an area of misuse. The importance of communicating, sharing and learning from data is also important. Face-to-face meetings with prescribers, where there is an opportunity for reflection about their prescribing practices, or attending multidisciplinary teams, web-ex conferences, etc. are all important in promoting learning about prudent prescribing.


Part one of this article is available at: http://www.kdheks.gov/epi/hai.htm
We’re Using The Strongest Antibiotics More than Ever Before And It’s Terrifying

Pretend you found a mosquito in your bedroom. Would your first move be to kill the mosquito or to call in the exterminator to fumigate your whole house? Probably you’d start by killing the mosquito and, maybe, if his friends kept showing up, you’d try a few other things. If none of that worked, you’d eventually call in the big guns.

Doctors use the same approach when they treat infections with antibiotics: In general, they try to use the weakest possible drug that they know will be effective for a specific kind of infection. If that doesn't work, they move on to the big guns—broad-spectrum antibiotics that can kill a wide range of bacteria.

But now, doctors are prescribing more broad-spectrum antibiotics than they ever have before—which leads researchers to speculate that first-line antibiotics aren't working as well as they used to.

A new report from the Centers for Disease Control and Resistance tracked antibiotic prescriptions at 300 US hospitals. Between 2006 and 2012, overall antibiotic prescription rates remained the same. But prescriptions for carbapenems—a class of antibiotics used to treat infections that don't respond to the usual drugs—jumped by an alarming 37 percent. Prescriptions of the extremely powerful antibiotic vancomycin—one of the only drugs effective against the scary skin infection, methicillin-resistant Staphylococcus aureus (MRSA)—increased by 27 percent.

Meanwhile, the use of fluoroquinolones, a very commonly prescribed class of antibiotics that isn't nearly as strong as carbapenems or vancomycin—dropped by 20 percent. The researchers think they can explain the rise in prescriptions of super-powerful antibiotic and the decline in use of less potent drugs: As bacteria develop resistance to the most commonly prescribed drugs, doctors have to call in the big guns more often. And if bacteria start developing resistance to the most powerful antibiotics, we’re really in trouble.

One way to avoid that dire outcome is to make sure that doctors save the last-resort drugs for bacteria that other drugs can't kill. The researchers note that "inappropriate antibiotic use increases the risk of antibiotic resistance and other adverse patient outcomes."

But hospitals are not the only source of superbugs. An astonishing 80 percent of all US antibiotics go to the livestock industry, where meat producers regularly dose even healthy animals with them. The good news is the FDA appears to be noticing the mounting evidence that our antibiotics are losing strength. The FDA signaled that it may soon limit how long farmers can use the drugs.

Source: Kiera Butler; senior editor at Mother Jones

Dual Antimicrobial Silicone Adhesive Securement Dressings

Central line associated blood stream infections (CLABSIs) represent the most costly of all hospital acquired infections (HAIs). Healthcare innovations, including antimicrobial vascular access dressings have contributed to the fight against these costly events. Skin can, however, be vulnerable to components of these dressings, including, but not limited to the amount of antimicrobial used, and the nature of the adhesive. A new dual antimicrobial silicone adhesive film dressing is available. This innovative technology protects over 7 days, achieving 99.99% bactericidal activity without the potential down-sides of higher levels of antimicrobial or acrylic adhesives on the skin.

The new dressing has the unique advantage of two antimicrobial agents, chlorhexidine and silver. Chlorhexidine has broad-spectrum activity against a wide range of both Gram-positive and Gram-negative organisms as well as yeast and fungi with a low mammalian toxicity profile. Although chlorhexidine has been found to be effective against a wide range of bacteria, some hospital-acquired Gram-negative bacteria, including Pseudomonas and Klebsiella, are resistant to chlorhexidine. Therefore, silver was added in combination with chlorhexidine to enhance the antimicrobial performance. Silver has been used for many years in clinical settings. It is an antimicrobial agent with broad-spectrum antimicrobial activity and low toxicity to the human body. It is reported to have activities against Gram-negative and Gram-positive bacteria and there is also a minimal development of bacterial resistance. Of the commonly used forms of topical silver application, silver dressings are used extensively for wound management.

Furthermore, it has been shown that there is actually a ‘synergistic’ effect of having both chlorhexidine and silver within the silicone medium. The combination of chlorhexidine diacetate and silver sulfate has synergistic, enhanced antibacterial activity against several strains of P. aeruginosa and MRSA. These results suggest improved skin sepsis when these antimicrobial agents are used in combination in a cover dressing.

Source: ICT Infection Control Today; Blom, K., Werthen, M.; Val DiTizio, Ph.D, Chief Scientific Officer, Covalon Technologies LTD
Health care personnel (HCP) in Kansas acute care hospitals continue to step up to help protect themselves from seasonal influenza, as well as their patients, co-workers and families. A statewide hospital survey conducted annually by KHC confirmed that the influenza immunization rate among HCP has steadily risen over the past eight years.

According to KHC’s survey of 141 Kansas hospitals this summer, the statewide immunization rate of 92.3 percent during the 2015-16 flu season is the highest yet, and compares favorably with the national rate of 91.2 percent.

In contrast, the first statewide survey KHC conducted for the 2008-09 flu season found that only 64 percent of health care workers and medical staff were immunized against the flu.

Source: Kansas Healthcare Collaborative
Influenza Vaccination Recommendations Released

Routine annual influenza vaccination of all persons aged ≥6 months without contraindications continues to be recommended. No preferential recommendation is made for one influenza vaccine product over another for persons for whom more than one licensed, recommended product is otherwise appropriate. Updated information and guidance in this document includes the following:

- In light of low effectiveness against influenza A(H1N1)pdm09 in the United States during the 2013–14 and 2015–16 seasons, for the 2016–17 season, ACIP makes the interim recommendation that LAIV4 should not be used. Because LAIV4 is still a licensed vaccine that might be available and that some providers might elect to use, for informational purposes, reference is made to previous recommendations for its use.

- 2016–17 U.S. trivalent influenza vaccines will contain an A/California/7/2009 (H1N1)–like virus, an A/Hong Kong/4801/2014 (H3N2)–like virus and a B/Brisbane/60/2008–like virus (Victoria lineage). Quadrivalent vaccines will include an additional vaccine virus strain, a B/Phuket/3073/2013–like virus (Yamagata lineage).

Recent new vaccine licensures are discussed:

- An MF59-adjuvanted trivalent inactivated influenza vaccine (aIIV3), Fluad (Seqirus, Holly Springs, North Carolina), was licensed by FDA in November 2015 for persons aged ≥65 years. Regulatory information is available at http://www.fda.gov/BiologicsBloodVaccines/SafetyAvailability/VaccineSafety/ucm473989.htm. aIIV3 is an acceptable alternative to other vaccines licensed for persons in this age group. ACIP and CDC do not express a preference for any particular vaccine product.

- A quadrivalent formulation of Flucelvax (cell culture-based inactivated influenza vaccine [ccIIV4], Seqirus, Holly Springs, North Carolina) was licensed by FDA in May 2016, for persons aged ≥4 years. Regulatory information is available at: http://www.fda.gov/BiologicsBloodVaccines/Vaccines/ApprovedProducts/ucm502844.htm. ccIIV4 is an acceptable alternative to other vaccines licensed for persons in this age group. No preference is expressed for any particular vaccine product.

Recommendations for influenza vaccination of persons with egg allergy have been modified, including:

- Removal of the recommendation that egg-allergic recipients should be observed for 30 minutes post-vaccination for signs and symptoms of an allergic reaction. Providers should consider observing all patients for 15 minutes after vaccination to decrease the risk for injury should they experience syncope, per the ACIP General Recommendations on Immunization.

- A recommendation that persons with a history of severe allergic reaction to egg (i.e., any symptom other than hives) should be vaccinated in an inpatient or outpatient medical setting (including but not necessarily limited to hospitals, clinics, health departments, and physician offices), under the supervision of a health care provider who is able to recognize and manage severe allergic conditions.

Sources: CDC; ICT Infection Control Today

Do Weekend Admissions Impact Risk of Hospital-Acquired Conditions?

A large study published in the British Medical Journal found that patients admitted to the hospital on a weekend had an increased risk of developing a hospital-acquired condition (HAC). The data found that falls/trauma were the most common event accounting for 85% of all HAC. To a lesser extent, pressure ulcers and catheter-associated urinary tract infections were the next HAC found. HACs occurred more by patients admitted on weekends by 5.7% than those admitted on weekdays 3.7%. Some of the potential factors affecting HAC rates are staff volume and level of expertise are often lower during weekends. Reduced staffing may result in limited attention to patients, being less familiar with acute and chronic conditions of patients if you are covering for a staff member, reduced resources allocated towards diagnostic testing and operative intervention on weekends.

Addressing concerns of medical staff and patients admitted to a hospital on weekends my be:

- Added resources and efforts of healthcare administrators and providers are needed to tackle the potential shortcomings in quality of patient care during susceptible periods.

- Staffing problems are universal concern. Further training and implementation of prescribed protocols my help.

- Improved implementation of protocols for patient care may prevent HACs, especially during times of decreased staffing.

- Initiation of programs to provide a standard of common practice treatment, whether on weekends or weekdays.

Ask yourself these questions. Do you look at day of admission when investigating HAIs? Is your hospital staffed the same on weekends as it is during the week?

Source: Sentri 7
Honey ‘Could Reduce Catheter Infections’

Manuka honey could hold the key to keeping flexible tubes used in hospitals bug-free, says a UK study. The findings published in the Journal of Clinical Pathology suggest that even low dilutions of this honey can curb the activity and growth that can build up on any surface, including plastic.

Breeding ground for infections

These biofilms have been shown to establish themselves on medical devices where they cause infections and act as reservoirs for pathogens. They pose a particular risk to patients fitted with urinary catheters, used to drain the bladder of urine, because they are often in place for long periods of time. As a result, their use – which can be as high as 1 in 4 hospital patients – is associated with frequent complications, such as inflammation and infection.

Antibacterial

The use of honey as a health remedy dates back centuries. Recent research suggests it may have antibacterial and anti-inflammatory properties. Manuka honey is produced in Australia and New Zealand by bees that pollinate the native Manuka tree. It is highly viscous, and there is evidence it has been used in the past to treat wound infections. Several studies suggest Manuka honey is effective when used on top of wounds and leg ulcers. It has also been shown as effective in fighting infection and promoting healing. The researchers from the universities of Southampton and Portsmouth investigated whether Manuka honey could prevent biofilms establishing themselves and growing.

E. coli and Proteus

To do so, they cultured strains of E. coli and Proteus mirabilis bacteria on plastic plates in the laboratory. These 2 bacteria were chosen because together they cause most of the urinary tract infections associated with long term catheter use. The honey was diluted with distilled water and applied to the plastic in 5 different strengths ranging from 16.7% honey down to just 3.3%. The results showed that Manuka honey considerably reduced the stickiness of the bacteria, and therefore the development of a biofilm. This was true, even at the lowest dilution of 3.3%, where it curbed stickiness by 35% after 48 hours compared with a medium that did not contain Manuka honey. However, the greatest effect was seen after 3 days and at the higher dilution of 16.7%, when stickiness had been reduced by 77%.

Future treatment

The researchers say: “Our study demonstrates that diluted honey is potentially a useful agent for reducing biofilm formation on indwelling plastic devices such as urinary catheters, probably by using a periodic flushing agent. They add that patients might also benefit from honey’s anti-inflammatory properties, which are generally stronger in dark honeys, such as Manuka. Another important factor, they say, is that antibacterial resistance is unlikely to be a problem when honey is used. However, the research team say that their findings were made in laboratory conditions and that further research is necessary to see if it can be duplicated in a clinical setting.

Source: Medscape - S. Eminike et al, Journal of Clinical Pathology; WebMD medical reference

Point of Care Hand Hygiene - Where to Rub?

The POC is defined as the place where the following 3 elements come together: the patient, the health care worker, and the provision of care or treatment. Five opportunities have been identified by the World Health Organization (WHO) when hand hygiene is most to prevent infection and improve patient outcomes. The 5 moments include before patient contact, as you enter the patient zone, before performance of an aseptic task, after body fluid exposure risk, after patient contact and after contact with patient surroundings, when leaving the patient zone. In a survey with US and Canadian health care workers, the most frequent barriers of using alcohol-based hand rub (ABHR) were dispenser/sinks not in convenient locations (41%), being busy (36%), empty product dispensers (33%), and products drying out hands (32%). The survey also revealed the 2 most desired location for placement were wall-mounted dispenser within 3 ft. of the patient or at the foot of the bed. POC hand hygiene is an effective method of promoting hand hygiene at the critical moments when a patient is most vulnerable. The survey highlights the universal need for increased education and provision of accessible and acceptable hand hygiene products.

Source: American Journal of Infection Control (AJIC); Elsevier
HAI Forum Probes Role of Medical Devices and Equipment

To stop the spread of healthcare-associated infections (HAIs), more attention needs to be paid to the role of medical devices and equipment. This was the thought that sparked last week’s two-day forum on medical technology and HAIs hosted by AAMI in collaboration with the American Hospital Association, the Centers for Disease Control and Prevention (CDC), the Food and Drug Administration’s Center for Devices and Radiological Health (FDA/CDRH), and the Joint Commission in Herndon, Va.

During the invitation-only event, which served as a follow-up to the 2011 summit on medical device reprocessing convened by AAMI and the FDA, 100 experts were tasked with identifying a list of HAI hazards and articulating potential solutions and mitigation strategies. The HAI risk factors they identified included facility design, water quality, device reprocessing, and competency and training.

Based on CDC estimates, there were 722,000 HAIs in U.S. acute-care hospitals in 2011. About 20 percent of these infections are transmitted through the healthcare environment, which includes medical devices, said William A. Rutala, director of hospital epidemiology for the occupational health and safety program at the University of North Carolina.

One of the most recent high-profile cases of HAIs associated with medical devices occurred between 2012 and the spring of 2015 when at least 250 patients, based on a U.S. Senate committee report, were infected with antibiotic-resistant bacteria after undergoing endoscopic procedures with devices that had not been properly disinfected.

But the problem of HAIs is much larger than device reprocessing, a number of presenters were quick to point out. For example, the FDA sent out a safety communication after the heater-cooler units found in bypass machines used during open-heart surgery were linked to the transmission of nontuberculous mycobacterium. The agency said it had received 32 reports of patient infections associated with these devices between January 2010 and August 2015.

Still, the FDA said it is unsure exactly how many people may have been impacted by this HAI, as it can take years for symptoms to develop, making it “challenging for a healthcare facility, healthcare provider, manufacturer, or patient to recognize that infections…may be associated with the use of or exposure to a particular medical device.”

This type of indirect exposure to potentially harmful bacteria is something that hadn’t been on the radar for many healthcare professionals. “I don’t think we’ve paid enough attention…to the impact (of) water and air…with regard to healthcare-associated infections,” said Lisa Waldowski, an infection control specialist at the Joint Commission.

The role of heating, ventilation, and air conditioning systems was just one factor identified during the forum as contributing to HAI risk. Other factors which were named by a diverse group of clinicians, sterilization and reprocessing professionals, microbiologists, regulators, healthcare technology management professionals, representatives from accreditation bodies, and other experts included:

- Inadequate facility design
- Inadequate surface/fixture disinfection
- Inadequate risk management practices
- Issues with steam/water quality
- Aged/outrated facilities
- The actions of healthcare providers, housekeeping and environmental services staff, as well as the C-suite
- Failure to consider reprocessing requirements when purchasing equipment
- Inadequate resources and training for sterilization and reprocessing staff
- The complexity of reusable devices and other design issues that make them difficult to clean
- Issues with instructions for use
- Inadequate point-of-use treatment, such as decontamination
- Insufficient maintenance and repair of equipment and devices

For many in attendance, implementing a quality management system seemed like the most effective way to structure solutions to many of these problems. In fact, a new standard - ST90 - that adapts the quality management system guidance found in ANSI/AAMI/ISO 13485 to device processing in healthcare facilities is expected to be published sometime next year. However, fixing the issue of device-related HAIs does not rest solely on the shoulders of standards developers or central sterile processing staff, everyone has a role to play, Suzanne Schwartz, associate director for science and strategic partnerships at CDRH, articulated during her keynote speech. “Solutions are needed at an ecosystem level,” she said. “Until we change our model to more of a systems approach, our siloed efforts will only get us so far.” This event was a first step in gaining the consensus needed to take such a systems approach.

A summary report of the proceedings will be available by the end of the year. AAMI is also planning to develop a guide to help healthcare delivery organizations conduct HAI risk assessments in 2017.

Source: Association For The Advancement of Medical Instrumentation (AAMI)
FDA Clearance of Sterile, Single-use Endoscope for Colonoscopies

The Food and Drug Administration (FDA) gave 510 (k) clearance for the invendoscopy E200 System, which includes the invendoscope SC200, the first and only sterile, single-use colonoscope has received 510(k) clearance.

The invendoscope SC200 is a simple, safe and effective solution to clinical and hygienic challenges, ensuring that a new colonoscope is always ready for physicians to use and that each patient receives his or her own device. The new advanced invendoscopy technology leads endoscopy ergonomics into the 21st century with robotic assistance for tip control and a new design to offer gastroenterologists (GIs) greater control and enhanced comfort while performing procedures.

The invendoscopy E200 System has been cleared by the FDA to provide visualization and diagnostic/therapeutic access to the adult lower gastrointestinal tract (including but not limited to, the anus, rectum, sigmoid colon, colon, cecum and ileocecal valve) for endoscopy and endoscopic surgery. The colonoscope component of the invendoscopy E200 System, the invendoscope SC200, is a sterile single-use disposable device.

The one-of-a-kind technology provides a platform specifically tailored to address the need for device sterility during endoscopies, the importance of which has been underscored by various recent ‘superbug’ outbreaks in multiple U.S. hospitals. The FDA clearance of the invendoscopy E200 System continues its pathway of validation. That provides endoscopists in the U.S. with a revolutionary technology that will allow doctors to perform colonoscopies with a system that significantly improves medical staff and patient safety while enhancing physician comfort during procedures.

A colonoscopy is widely regarded as the gold standard for colon cancer screening. Colon cancer is the second most common cause of cancer-related deaths in the U.S., but may be prevented through proper screening, such as colonoscopy. The sterile, single-use invendoscopy SC200 delivers a technology that improves the current colonoscopy experience by providing advanced ergonomics for the physician, enhancing safety through the elimination of risky manual cleaning processes, easing financial burden on institutions and ensuring that each patient receives a new, sterile colonoscope.

The invendoscope SC200 is a sterile and single-use colonoscope that eliminates the main challenge of gastrointestinal endoscopy: the complex reprocessing of endoscopes, which is costly, overly challenging, manual-labor intensive and increases patients’ risk for cross-contamination. The scope has low associated startup cost. The technology also improves practice efficiency by eliminating the need for scope cleaning, reprocessing and repairs; and simplified setup allows for ease of use and fast turnaround.

The CDC estimates that at least 1 in 276,000 GI procedures places a patient at risk of endoscopy-associated infection (EAI) a six-fold increase over the initial estimate. More than 55 million procedures were performed with GI endoscopic devices in 2009, nearly 50 percent of them colonoscopies, and the number is increasing annually.

Current infection control guidelines require that GI flexible endoscopes, such as colonoscopes, only be high-level disinfected, as these devices are unable to withstand the heat of high-temperature sterilization. More healthcare-associated infection outbreaks have been linked to contaminated endoscopes than to any other medical device. The alternative available option of prolonged gas sterilization creates a financial burden on GI practices, necessitating the purchase of additional units to ensure device availability at all times.

Source: ICT Infection Control Today

UV Light Disinfection Reduces C. diff in Patient Rooms

Research was conducted by scientists from the Society for Healthcare Epidemiology of America, and published in Infection Control & Hospital Epidemiology. According to the study's authors, UV-C light disinfection not only reduces the risk of patients developing C. difficile infections, but also saves between $350,000 to $1.5 million each year in healthcare costs. "UV light disinfection is a fast, safe, and effective technology to reduce the risk of C. difficile infection associated with the hospital environment," lead author David Pegues states. "The success of this technology is dependent on Environmental Services employees as a critical partner in our ongoing efforts to eliminate hospital-acquired infections such as C. difficile and to improve patient safety." In the study, scientists observed three hematology-oncology units at the Hospital of the University of Pennsylvania during a one-year period. They found using UV disinfection protocols, reduced the incidence of C. difficile by 25 percent among new patients compared to the year before. By contrast, units in the non-study group saw a 16 percent increase of infection rates over the same time period. The protocols not only reduced infection rates, but did so without negatively affecting turnaround time for patient rooms. Cleaning only took five minutes longer compared to non-study units. "These findings have real implications for both health systems and patients. The effectiveness and efficiency of UV-C robots make it a practical and cost effective technology that will benefit hospitals around the country and save people's lives," Pegues added.

Source: United Press International
CDC Funds 34 Innovative Projects to Combat Antibiotic Resistance

The Centers for Disease Control and Prevention (CDC) has awarded more than $14 million to fund new approaches to combat antibiotic resistance, including research on how microorganisms naturally present in the human body (referred to as a person’s microbiome) can be used to predict and prevent infections caused by drug-resistant organisms. The awards, made through CDC’s Broad Agency Announcement (BAA), support activities in the CDC Antibiotic Resistance Solutions Initiative. The initiative, which also provides funding for state health departments and other partners, implements the tracking, prevention, and antibiotic stewardship activities outlined in the National Action Plan for Combating Antibiotic-Resistant Bacteria.

“Understanding the role the microbiome plays in antibiotic-resistant infections is necessary to protect the public’s health,” said CDC director Tom Frieden, MD, MPH. “We think it is key to innovative approaches to combat antibiotic resistance, protect patients, and improve antibiotic use.”

The majority of the projects are being conducted through universities across the country and one by a commercial company and two by a nonprofit. Awardees include: Brown University, Columbia University, Cornell University, Emory University, Georgia Institute of Technology, The Joint Commission, Ohio State University, OpenBiome, Pennsylvania State University, Rutgers University, Synthetic Biologics, Inc., University of Georgia, University of California Berkley, University of California Davis, University of Cincinnati, University of Colorado, University of Maryland, University of Michigan, University of Pennsylvania, University of Virginia, University of Oregon, University of Utah, Virginia Commonwealth University, Washington University and Yale University. Some awardees are conducting multiple projects.

The role of the microbiome
The body’s microbiome is a community of naturally occurring microbes in and on our bodies. Bacteria and other microbes live on our skin and in our gut, mouth, and respiratory and urinary tract. Antibiotics are life-saving medicines, but they also can disrupt the microbiome by changing the balance of good and bad bacteria. With a disrupted microbiome, resistant bacteria can take over (or colonize) and the body is less able to defend against infection, putting people at risk for potentially untreatable illnesses. Patients with microbiomes disrupted by antibiotics are vulnerable to infections by tough-to-kill germs such as Methicillin-resistant Staphylococcus aureus (MRSA), Carbapenem-resistant Enterobacteriaceae (CRE) and Clostridium difficile (C. difficile). These patients can then carry drug-resistant bacteria, which can easily spread to other people, especially those who also have a disrupted microbiome.

The awards will fund research exploring the link between antibiotics, the microbiome and the downstream consequences of widespread antibiotic use. Research projects will study:

How antibiotics disrupt a healthy microbiome
- Determine how exposure to antibiotics early in life affects microbiome development.
- Determine novel strategies that protect and restore the microbiome.

How a disrupted microbiome puts people at risk
- Develop indices to predict risks for patients who take specific antibiotics. Determine if these indices predict risk for spreading an infection or becoming infected with drug-resistant bacteria.
- Develop and test microbiome measurements to monitor a patient’s risk, and assess enhanced infection control effectiveness in protecting a person’s microbiome.

How antibiotic stewardship can be improved to better protect the microbiome
- Tailor antibiotic stewardship strategies to a patient’s individual microbiome.
- Tailor antibiotic stewardship to address needs in different healthcare settings (e.g., hospital unit, nursing home, doctor’s office).

The BAA also funds research in the areas of advanced molecular detection, medication safety and infection prevention in healthcare. For more information on the BAA and the list of antibiotic resistance funded projects, visit the Antibiotic Resistance Solutions Initiative webpage.
**C. difficile Risk Raised By Using Same Hospital Bed As Antibiotic Treated Patient**

Antibiotic use is associated with greater risk of *Clostridium difficile* infection, but according to a new study, you do not necessarily need to take antibiotics for them to pose such a risk. Researchers suggest just using the same hospital bed as a prior patient who received antibiotics may increase the likelihood of *C. difficile* infection.

For their study, Dr. Freedberg and colleagues set out to investigate whether receipt of antibiotics in hospital stays may raise the risk of CDI for subsequent patients who use the same bed. The researchers included patients in their final analysis if they had spent a minimum of 48 hours in the first hospital bed they were allocated. Prior patients had to have used the same bed for at least 24 hours, and they had to have left this bed at least 1 week before the subsequent patient used it. A computerized clinician order entry system was used to determine the antibiotic receipt of prior patients. Subsequent patients with a history of CDI were eliminated from the analysis, as were those who tested positive for CDI within 48 hours of hospital admission. This was to get a more accurate view of how a prior patient's antibiotic use affected the CDI incidence of subsequent patients. The team pinpointed 100,615 pairs who sequentially used the same hospital bed. Of these, there were 576 pairs in which the subsequent patient developed CDI within 2-14 days of initial arrival at their hospital bed.

Overall, the researchers found that subsequent patients were **22 percent more likely to develop CDI if the patient who previously occupied their bed had received antibiotics.** Subsequent patients had a 0.72 percent cumulative risk of CDI if the prior occupant of their bed used antibiotics, compared with a 0.43 percent risk for subsequent patients whose prior occupant of their bed did not use antibiotics. While the heightened risk of CDI reduced slightly when accounting for a number of possible confounding factors - including patient comorbidities and ward type - the researchers say their findings still showed a "statistically significant" association between antibiotic use by a prior patient and increased risk of CDI in a subsequent patient.

Dr. Daniel Freedberg, of the Columbia University Medical Center (CUMC) in New York states, "The increase in risk was small but is of potential importance given the frequency of use of antibiotics in the hospital. These data imply that patient-to-patient transmission of *C. difficile* or other bacteria that mediate susceptibility to CDI takes place in the non-outbreak setting and in the face of a multifaceted effort seeking to prevent healthcare-associated CDI. More generally, these data support the hypothesis that antibiotics given to one patient may alter the local microenvironment to influence a different patient's risk for CDI."

The team explains that in patients colonized with *C. difficile*, antibiotic use may increase proliferation of the bacterium, increasing the number of *C. difficile* spores that make into the environment.

Source: Medical News Today, Honor Whiteman

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**PUBLIC SERVICE EXECUTIVE Department of Health & Environment**

Operational management of the statewide Healthcare Associated Infection prevention program. Interested applicants can find full details of the job description and apply at [http://jobs.ks.gov](http://jobs.ks.gov)

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**Wishing You and Yours a Happy and Healthy Holiday Season and New Year.**

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**Kansas Department of Health and Environment**

Past issues of Semmelweis Times available at: [http://www.kdheks.gov/epi/hai.htm](http://www.kdheks.gov/epi/hai.htm)