



Infection Control: A Potent Antimicrobial Resistance Containment Strategy

“Transmission of highly resistant bacteria from patient to patient within the hospital environment (nosocomial transmission) amplifies the problem of antimicrobial resistance and may result in the infection of patients who are not receiving antimicrobials.”

— WHO Global Strategy to Contain Antibiotic Resistance (2001)

Despite its proven efficacy in containing and preventing additional infections and curbing the associated antibiotic use, infection control is among the slowest disciplines to gain widespread implementation. Failure to carry out simple infection control practices, such as changing gloves and washing hands, is both dangerous and all too common. In resource-poor regions, this may be due to lack of adequate facilities (e.g., wash basins and clean towels), but more often it stems from failure to recognize its importance, understaffing, and/or forgetfulness. Controlling the spread and emergence of drug resistance in the hospital is best administered by an

active, coordinated infection control program, which may include targeted cohorting of infected patients, enhanced surveillance, isolation or rigorous barrier precautions, early discharge, and alterations in antimicrobial usage.

This issue of the APUA Newsletter focuses on issues of infection control and highlights standardized guidelines for infection control in the Netherlands and the U.S.; control of the spores of a deadly hospital pathogen—*Clostridium difficile*; a practical *Hospital Infection Control Assessment Tool (ICAT)* for developing countries, and a new APUA report on household hygiene.

Infection Control and Antibiotic Stewardship Models in The Netherlands

John E. Degener, chairman of SWAB
Peterhans J. van den Broek, chairman of WIP

The Dutch Working Party on Antibiotic Policy (SWAB) and the Working Party for Infection Prevention (WIP) operate a dual program for improving antibiotic use and for aggressive infection control of hospital-acquired infections, particularly those caused by multidrug-resistant microorganisms. These two groups are strong advocacy leaders for preserving the power of antibiotics in the Netherlands. The Dutch Government recognizes the importance of WIP and SWAB and funds these organizations annually.

SWAB, founded in 1996, is an independent working group aimed at the containment of antimicrobial resistance by optimizing the use of antibiotics. Its goals are achieved through guidelines development, educational programs, surveillance of antibiotic use/resistance and

WIP and SWAB *continued on page 4*

Environmental infection control of *Clostridium difficile*

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Clostridium difficile, a gram-positive anaerobic spore-forming bacterium, is the most common cause of infectious gastroenteritis in hospitalized patients in the U.S.¹⁹ *C. difficile* infection can cause anything from an asymptomatic carrier state to potentially fatal pseudomembranous colitis.¹⁹ The incidence of *C. difficile*-associated diarrhea (CDAD) has been on the rise in the U.S., Canada and Europe since 2000. In the U.S., *C. difficile* infection rates tripled between 2000 and 2005.¹² The yearly costs for U.S. hospital-associated *C. difficile* infections, projected from Massachusetts study data from 1999-

2003, were an estimated \$3.2 billion.¹⁷ The Association for Professionals in Infection Control and Epidemiology recently calculated that, on any single day, there are greater than 7,000 CDAD inpatients in U.S. medical institutions, with costs totaling \$17.6 to \$51.5 million. This is 6.5 to 20 times greater than previous incidence estimates.¹ This increase has been associated with a rise in virulence and severity of disease and higher relapse rates, particularly in the elderly.⁶ A new, highly virulent strain identified in many epidemics (known as North American pulsed-field 1 or NAP-1 in the U.S. and PCR ribotype 027 in Europe)^{7,19} is highly resistant to fluoroquinolone antibiotics and produces more toxins (A and B) in vitro.⁵ The prevalence of CDAD outside of

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C. difficile *continued from page 1*

hospitals has also increased in recent years; however, most of these patients have been released from a hospital between four weeks and six months prior.⁶

Risk factors for CDAD include antibiotic therapy (particularly fluoroquinolones), use of gastric acid-reducing drugs, elevated age, gastrointestinal surgery, and irritable bowel syndrome.^{2,4,6} Host genetic factors may also play a role.⁶ Fluoroquinolone therapy is associated with great reductions in colonic bacteria.⁶ Although vancomycin is the only FDA-approved treatment, metronidazole is recommended for less serious cases to prevent development of vancomycin resistance in other hospital-associated bacteria;⁶ however, metronidazole appears to have decreasing efficacy against *C. difficile*.¹⁶ Infected patients exposed to antimicrobials are more likely to experience CDAD relapses.² Antibiotic restriction is effective at reducing CDAD.¹⁹ This focus on minimizing antimicrobial exposure is known as "good antimicrobial stewardship."¹²

Additionally, efforts have focused on "environmental stewardship" since the primary reservoirs of *C. difficile* in hospital settings are colonized patients, contaminated equipment, and environmental surfaces.¹⁵ Therefore, control of *C. difficile* in the hospital environment includes: isolation of CDAD patients or placing CDAD patients in rooms together when individual rooms are not available;¹¹ the use of barriers including gloves and gowns by healthcare workers;¹⁵ proper hand hygiene including washing of hands with soap and water after contact with the patient or bodily fluids (by

APUA seeks 2009 Leadership Award nominees

Each year, APUA presents its Leadership Award to an individual or organization that demonstrates extraordinary leadership in promoting the prudent use of antibiotics. To make a nomination for consideration, please visit www.apua.org to read about past winners and obtain a nomination form.

2008 APUA Leadership Awardees

Dutch Working
Party on Antibiotic
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Party on Infection
Prevention



In recognition of their exemplary leadership in control of hospital infections and antibiotic resistance

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Dr. Inge C. Gyssens, Professor Jos W.M. van der Meer, Professor Henri S. Verbrugh
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Professor Peter J.M. van den Broek

Previous APUA Leadership Awardees

2007: Dr. Wasif Ali Khan and Sabeena Ahmed (International Centre for Diarrheal Disease Research, Bangladesh). 2006: Dr. Anna Lönnroth (European Research Commission Program); Dr. Herman Goossens (University Hospital, Antwerp). 2005: Dr. Richard Besser (U.S. Centers for Disease Control & Prevention). 2004: Dr. Gabriel Schmunis (The Pan American Health Organization). 2003: Drs. Frank M. Aarestrup and Henrik C. Wegener (Danish Veterinary Institute) and Robert L. Langer (McDonald's Corporation). 2002: Dr. David Bell (U.S. Centers for Disease Control & Prevention); Dr. Marissa Miller (National Institute of Allergy & Infectious Diseases); Dr. Murray Lumpkin (U.S. Food & Drug Administration). 2001: Dr. Rosamund Williams (World Health Organization)

workers and visitors);^{3,5} the use of dedicated equipment;^{1,3,5} disinfection of reusable devices with sporicidal agents (e.g., alkaline glutaraldehyde, ethylene oxide);⁹ and the appropriate disinfection of rooms using sporicidal agents, both daily and following patient discharge.⁹

Fecal contamination is predominated by *C. difficile* spores rather than vegetative cells, particularly following exposure to air and desiccation. Spores are highly resistant to environmental stresses and remain viable for weeks to months. The most contaminated hospital surfaces are floors and bed-rails. Window-sills, toilets, bed sheets, call buttons, electronic thermometers, and feeding tube equipment are also frequently contaminated.¹² The presence of *C. difficile* in the environment has been correlated with the prevalence of *C. difficile* on the hands of healthcare workers²⁰ and to the incidence of *C. difficile* infections.^{8,22} This is troubling because spores are resistant to commonly used alcohol hand sanitizers. In one study, 30% of *C. difficile* spores remaining on hands following the use of alcohol hand sanitizer were transmitted to a second person via handshaking.¹⁵

Spores are also resistant to many hospital disinfectants^{7,18} such as detergents and quaternary ammonium compounds. Many of these cleaners actually stimulate sporulation.^{21,23} Importantly, epidemic strains produce significantly more spores than non-epidemic strains in response to cleaning agents as well.⁷ Routine cleaning does not effectively remove *C. difficile* from the hospital environment. In contrast, sodium hypochlorite (common household bleach) solution is effective in the disinfection of environmental surfaces¹⁸ and the reduction of transmission during an outbreak.^{5,14} In a study by McMullen et. al.,¹⁵ CDAD rates decreased in two hospital units; one unit performed environmental cleaning with a 10% household bleach solution (5000 ppm chlorine) or disinfecting wipes (10% bleach) in all rooms; the second unit fol-

lowed the same cleaning routine, but only in rooms of CDAD patients. A subsequent hospital-wide education program emphasizing hand hygiene had no significant effect on CDAD rates in either unit. In another study, switching from a quaternary ammonium disinfectant to sodium hypochlorite reduced *C. difficile* transmission in a high-incident ward. Reverting to a quaternary ammonium disinfectant resulted in a return to previous CDAD levels.¹⁴ Wilcox et. al.²³ also observed a significant reduction in

“Spores are resistant to many hospital disinfectants such as detergents and quaternary ammonium compounds. Many of these cleaners actually stimulate sporulation.”

CDAD rates with a hypochlorite-based disinfectant in comparison to the use of a detergent-based disinfectant. Recently, Figueroa et. al.¹⁰ reported a dramatic reduction in CDAD after implementing a hospital-wide bleach-based cleaning protocol that included contact isolation for all patients with *C. difficile* diarrhea. After six months, the rate of CDAD decreased by 68%, from 10 cases per 1000 patient days to 3.4 cases per 1000 patient days.

In summary, improved cleanliness in hospital settings is an effective and economically feasible approach to reduce the spread of *C. difficile*. The use of a common household bleach cleaning solution is the most effective means to eliminate *C. difficile* spores. Hospitals that have implemented thorough cleaning and disinfecting programs in their wards have effectively controlled the spread of *C. difficile*. Also, hospitals that restrict the use of antibiotics via implementing “antibiotic stewardship” programs have more success in protecting their patients.

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APUA Recommended Reading

Antibiotic Policies: Fighting Resistance

By: Jos W.M. van der Meer

Ian M. Gould, Editor

Foreword by John McGowan

Published by Springer, 2007

Written by internationally acclaimed experts in the field of antibiotic resistance, *Antibiotic Policies: Fighting Resistance* addresses many of the key issues burdening our societies and hospitals during this era of antibiotic resistance and growing shortage of new antibiotics. The book provides practical advice and control strategies for the critical problems related to current and future antibiotic resistance problems.

WIP and SWAB *continued from page 1*

stimulation of research. SWAB is a collaboration between The Infectious Diseases Society of The Netherlands, The Dutch Society of Medical Microbiology, and The Dutch Association of Hospital Pharmacists.

The SWAB guidelines, which are evidence-based and produced by multidisciplinary expert committees, are presented for comment to the members of relevant medical specialist societies before publication. The guidelines deal with the major infections and provide a mutual framework for local antibiotic guidelines in hospitals throughout the country. SWAB guidelines, which are found at its web site (www.swab.nl) have set the standard of antibiotic prescribing within the Netherlands.

SWAB plays a major role in increasing awareness of trends in use and resistance. As a national focal point for Anti-microbial Resistance for the European CDC, SWAB coordinated the first Public Awareness Campaign in the Netherlands that was launched on the first European Antibiotic Awareness Day on November 18, 2008.

Since 2003, SWAB has annually issued NethMap, a comprehensive report of the frequencies of hospital and community antibiotic resistance and antibiotic usage in the Netherlands. Although antibiotic use and resistance rates are relatively low compared to almost any other country, the NethMap surveillance reveals that rates are rising slowly. Increases have been observed in species relevant to public health, such as gonococci and pneumococci, as well as in typical hospital-associated bacteria such as multiple drug-resistant *Escherichia coli* and *Klebsiella* sp. The rise in quinolone-resistant bacteria is a point of major concern, both inside and outside hospitals. NethMap demonstrates that the "search and destroy policy" for MRSA, recommended by WIP and implemented in the majority of Dutch healthcare institutions, is successful in controlling hospital-related MRSA. Since awareness has been focused on the animal-related MLST type 398 strain, a rise is seen in the detection of

this strain in patients derived from a farm environment. Over the past five years, nitrofurantoin has replaced trimethoprim for the treatment of uncomplicated urinary tract infection in primary care. This is totally in accord with SWAB recommendations following the emergence of trimethoprim resistance. However, the observed replacement of amoxicillin with the combination drug amoxicillin-clavulanic acid in general practice has occurred outside of current therapy guidelines and indicates the need for urgent action to either restore the former antibiotic, or adjust the current guidelines if necessary. In addition, a rise in quinolone resistance has been observed concurrent with a rise in quinolone use. SWAB will continue to make efforts to alert doctors to use these valuable drugs appropriately and in a restrictive manner. All NethMap data can be retrieved from the SWAB website (www.swab.nl)

WIP (www.wip.nl/UK/; founded in 1980), predated SWAB, and is also an independent working group comprised of professionals from three Dutch societies (The Infectious Diseases Society of the Netherlands, The Dutch Society of Medical Microbiology, and The Society for Hygiene and Infection Prevention in Health Care). The aim of WIP is to develop and publish up-to-date, scientifically based guidelines for prevention of healthcare-associated infections in settings ranging from hospitals, nursing homes, practices of dentists and family doctors to homecare and ambulance transport. WIP successfully pioneered the formulation of national guidelines to prevent the spread of MRSA in The Netherlands, and published these for the first time in the late 1980's. Guidelines for the prevention of spread of other multi-resistant microorganisms, such as VRE and multidrug-resistant gram-negative rods, followed later.

The guidelines, prepared by expert committees, are available for four months to the health care community for commentary and suggestions, before publication. The guidelines are very strict, but through the authority of the WIP, they are nationally accepted. They are updated on a regular basis, and freely available at

(www.wip.nl/UK/document.htm). WIP encourages use of the guidelines through advice, teaching and organization of seminars. They are endorsed by the Health Inspectorate, which uses them as professional standards. As such, the WIP has a substantial impact on the prevention of the spread of multi-resistant microorganisms in Dutch health care.

Other Infection Control Resources: APIC, CDC, AHA

The Association for Professionals in Infection Control and Epidemiology (APIC) has as its sole mission to improve health and patient safety by reducing risks of infection and other adverse outcomes. The Association's more than 12,000 members have primary responsibility for infection prevention/control and hospital epidemiology in healthcare settings around the globe. APIC advances its mission through education, research, consultation, collaboration, public policy, practice guidance and credentialing. The APIC web site (www.apic.org) is a rich source of educational materials and tools for infection control.

The U.S. Centers for Disease Control and Prevention (CDC) also publish guidelines and recommendations for the prevention of healthcare-associated infections. Topics include: Guidelines for disinfection and sterilization in healthcare facilities, environmental infection control in healthcare facilities, and other important infection control topics. For more information see: <http://www.cdc.gov/ncidod/dhqp/guidelines.html>.

For new resources from the American Hospital Association, see pp.5 and 7.

The Evolving *Staph aureus* Epidemic Global Focus on MRSA March 11-14, 2009 Honolulu, Hawaii

For information, visit:
www.staph2009.com

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New AHA guidelines issued for infection control in U.S. hospitals

In a major collaborative effort to consolidate and standardize the diverse and overwhelming quantities of information for the prevention of nosocomial infection, the nation's top epidemiological societies have partnered with the American Hospital Association (AHA) and the Joint Commission to produce *a Compendium of Strategies to Prevent Healthcare-Associated Infections in Acute Care Hospitals* (see excerpt, p.7). Written in language that is clear to all health care professionals, the guidelines synthesize the most effective and cutting-edge information available for six major healthcare-associated infections (HAIs): MRSA, *Clostridium difficile*, surgical site infections, ventilator-associated pneumonia, central line-associated blood stream infections, and catheter-associated urinary tract infections. The guidelines, which represent the first "professional consensus" on best practices and performance measures, were developed in partnership with the IDSA, APIC and SHEA, and are intended to be shared with senior hospital staff, quality improvement and IC teams. The compendium and related patient information can be accessed at <http://www.preventinghais.com>.

APUA releases report on hygiene for healthy homes

A new APUA report provides guidance to consumers on creating a healthy household environment and keeping families and homes safe from infection. The report, prepared in conjunction with an expert panel of clinicians, provides consumers with information and answers to commonly asked questions on the contraction of MRSA and other skin infections. It also stresses hand washing as the single most important activity individuals can do to prevent the acquisition and spread of disease. The report gives guidelines to help individuals become informed consumers, providing guidance on reading cleaning product labels. Special attention is given to babies and persons with compromised immunity. For a sample excerpt, see p.6. The full report will be available in March 2009 at www.apua.org.



APUA acknowledges The Clorox Company for its unrestricted support of APUA's educational efforts to control AMR.

APUA Consumer Fact Sheet on MRSA*

Q. My doctor says I have a staph infection. Does that actually mean that I have MRSA?

A. No. "Staph" is short for *Staphylococcus aureus*, which is a type of bacteria that lives on the skin of 25-30% of the population at any given time. Most of the time, it does not cause problems, but if it enters your body through a break in the skin, it can cause a "staph infection." MRSA stands for methicillin-resistant *Staphylococcus aureus*. It is simply one type of staph infection, and the symptoms it causes are the same as the symptoms seen in other staph infections of the skin. The difference between MRSA and other forms of staph is that MRSA has become resistant to many types of antibiotics. This can make it more difficult to treat; however there *are* antibiotics available that can treat most MRSA infections. For more information on antibiotic resistance see www.apua.org.

Q. I keep reading that MRSA is associated with poor hygiene. I wash my hands all the time, and keep my house clean, but I have MRSA. What am I doing wrong?

A. You are not doing anything wrong. Washing your hands is the best thing you can do to protect yourself from many infectious diseases, including MRSA. However, even people who clean their hands and homes often and well sometimes still carry MRSA. Having MRSA does NOT mean you have poor hygiene.

Q. How can I avoid getting an MRSA infection?

- A. • The most important thing you can do to protect yourself from MRSA and other infectious diseases is to wash your hands often. When soap and water are not available, alcohol-based hand sanitizer is a good substitute.
- MRSA can enter the body through small cuts and cracks in the skin's surface, so take steps to keep your hands from getting dry and cracked.
 - Keep cuts and scrapes clean and covered until they are healed.
 - Do not share personal items like towels and washcloths.
 - Disinfect frequently touched surfaces

Q. If someone in my family has MRSA, does that mean that I need to disinfect everything in my house every day? What areas in the home should I clean more carefully?

A. You do not need to disinfect every area in your home every day, but targeted cleaning of surfaces in the kitchen, bathroom and nursery is appropriate. You will also want to take the additional steps of carrying out targeted disinfection of surfaces that have come in contact with MRSA infections and surfaces that people frequently touch. Here are some things to keep in mind:

- Choose a cleaning product with a label that says it is also a disinfectant, and make sure to read the label carefully before using any product. Many disinfectants need to stay in contact with the surface you are cleaning for several minutes; if you just spray the cleaner and then wipe it off with a paper towel right away, it may not work.
- Cleaning can be hard on your hands, causing your skin to become dry or cracked. Wear gloves while doing extensive cleaning, in order to protect your skin. Remember, MRSA usually enters the body through a break in the skin, so extensive cleaning could do more harm than good if you don't take steps to protect your hands.
- Special attention should be paid to areas that have come into direct or indirect contact with an MRSA infection. For example, if you set a bandage that had been covering an infection on the bathroom counter before throwing it away, you should clean and disinfect that surface. You may also want to clean areas that people touch often, such as faucet handles and doorknobs.

Q. I am concerned about getting MRSA at my gym or during sports practice. What can I do to prevent this?

A. • If you are worried about MRSA at your gym, you can use paper towels and disinfecting wipes to wipe down the surfaces of workout equipment before and after using it. You can also rinse your hands with alcohol-based sanitizers after workout. Many gyms already provide these materials in

workout areas. If yours does not, you can ask gym management staff to start supplying them.

- You may also place a towel between yourself and exercise equipment seats.
- Make sure cuts and scrapes are covered before working out or practicing a sport.
- If you get a cut or scrape while practicing, take a break to clean it and cover it up.
- Avoid sharing towels and other personal care items with other people.
- Take a shower after working out, especially if you are participating in a sport that involves physical contact with other people.

Q. I will be going into the hospital for surgery soon. Is there anything I can do to reduce the risk of getting MRSA while I am there?

A. The best step you can take is to bring your own alcohol-based hand sanitizer and/or politely ask people who come into your room to wash their hands or clean them with an alcohol-based hand sanitizer. Don't be shy about asking doctors and nurses to do this. You can also ask your doctor what steps will be taken to reduce the risk of infection, and ask if there are other things you can do yourself to reduce the risk.

Q. Since surface disinfectants kill MRSA effectively, can I help keep myself and my family healthy by using those disinfectants on my own skin? Can I spray family members or pets with these disinfectants?

A. No. This may seem like a logical step to try, but it will actually do much more harm than good. These products are not formulated to be used on humans or animals. They are composed of strong chemicals, and some of them can be absorbed into your body through your skin. They can also irritate your skin or cause it to develop tiny, sometimes invisible cracks. MRSA and other bacteria can enter through these small breaks in the skin. Always remember to follow cleaning product label instructions.

For a PDF format, see www.tufts.edu/med/apua/MRSA_fact_sheet.pdf

**Excerpted from the Hygiene for a Healthy Household® project, funded in part through an unrestricted grant from The Clorox Company (12/08).*

Leadership Responsibilities in HAI Prevention*

Tasks for hospital leaders to consider in preventing HAIs (from the American Hospital Association)

Infrastructure Requirements	Adequately staff the infection prevention and control program responsible for identifying patients with infections.
	When using information technology, ensure it collects data and calculates needed measurement information.
	Provide resources for appropriate staff education and training.
	Ensure adequate laboratory support for timely processing of specimens and reporting of results.
Practical Implementation	Provide resources to educate physicians, nurses and other health care personnel about guidelines to prevent central line-associated blood stream infections (e.g. with online and paper versions). These guidelines should be easily accessible.
	Encourage the use of checklists and other effective tools that promote adherence to the guidelines.
	Periodically assess health care personnel knowledge of, and adherence to, prevention measures.
INFECTION-SPECIFIC ACTIONS	
Central Line-associated Blood Stream Infections	Establish catheter insertion kits/carts containing all necessary items for insertion.
	Ensure that any health care personnel who inserts a central venous catheter undergoes a credentialing process.
Ventilator-associated Pneumonia	Provide easy access to noninvasive ventilation equipment and institute protocols to promote the use of noninvasive ventilation.
	Ensure that all ICU beds used for patients undergoing ventilation have a built-in tool to provide continuous monitoring of the angle of incline.
Catheter-associated Urinary Tract Infections	Ensure that only trained, dedicated personnel insert urinary catheters.
	Ensure that supplies necessary for aseptic-technique catheter insertion are available.
	Implement a system for documenting the following information in the patient record: indicators for catheter insertion, date and time of catheter insertion, individual who inserted catheter, and date and time of catheter removal. Include documentation in nursing flow sheet, nursing notes, or physician orders.
	Implement an organization-wide program to identify and remove catheters that are no longer necessary, using one or more methods documented to be effective.
	Develop and implement institutional policy requiring continual, usually daily, review of the necessity of continued catheterization.
	Implement daily ward rounds by nursing and physician staff to review all patients with urinary catheters and to ascertain continuing necessity.
	Develop a protocol for management of postoperative urinary retention, including nurse-directed use of intermittent catheterization and use of bladder scanners.
Surgical Site Infection	Employ education of patients and patients' families as an effective method to reduce risk associated with intrinsic patient-related SSI risk factors.
MRSA	Implement a laboratory-based alert system that immediately notifies infection prevention and control personnel and clinical personnel of new MRSA-colonized or -infected patients.
	Implement an alert system that identifies readmitted or transferred MRSA-colonized or -infected patients.
	Convene a multidisciplinary team (including representatives from the microbiology laboratory, infection prevention and control personnel, nursing staff, medical staff, materials management, environmental services and hospital administration) that plans and oversees active surveillance testing.
<i>Clostridium difficile</i>	Implement a system to coordinate with housekeeping department when bleach is needed for environmental disinfection.

*Source: AHA Quality Advisory (Oct. 30, 2008) www.aha.org/aha/advisory/2008/081030-quality-adv.pdf

Hospital Infection Control Assessment Tool (ICAT) for Developing Countries*

Infection control within hospitals is a worldwide effort, especially in developing countries. Infections acquired during critical hospital stays constitute a large source of morbidity and mortality in the world today; however, such infections can be prevented through systematic infection prevention measures taken by hospital staff and patients. Financial constraints in developing countries make the implementation of such prevention measures difficult. In order to address hospital infection control practices in developing countries, **Management Sciences for Health (MSH)/Rational Pharmaceutical Management (RPM) Plus** has collaborated with **Harvard University** and the **U.S. Agency for International Development (USAID)** to develop a standardized assessment approach to provide guidance for countries wishing to establish or improve hospital infection control practices.

The Infection Control Assessment Tool (ICAT) was developed to help hospital staff locate problems in, and standardize, their infection control practices throughout various areas of their hospital. The ICAT provides a practical approach for assessing the quality of existing infection control practices and in addition, provides specific recommendations for improving practices and monitoring the effectiveness of improvements. It consists of 21 modules for self-assessing infection control throughout different areas of the hospital. The ICAT, being modular, allows it to be adapted to all hospital settings regardless of the size of the hospital or the abundance of hospital resources. Prior to the initiation of the ICAT, it is important that the planning and executing team have thoughtful, clear objectives that have been decided upon in collaboration with hospital leadership. The first step is identifying certain problem areas in the hospital where infection control is lacking and intervention is needed. A united effort between hospital staff and administration is important.

The ICAT itself, is extremely user-

friendly, with each module consisting of questions answered either yes/no, multiple choice, or as checklist responses. The questions can be answered to address infection control practices for specific departments or for the hospital as a whole. A general module is divided into subsections which address specific aspects of the general topic. For example, if the department being assessed is labor and delivery, then a subsection would be glove use during C-section deliveries. These subsections are scored via a point system and overall using three broad categories: (1) Excellent practice; (2) Good practice; (3) Poor practice. The scores of the subsections are totaled and used to provide an overall score for that particular module (See Fig.). The modules vary in relevance to particular areas of the hospital including questions on hand hygiene, general ward, injections, and air suctioning techniques.

In addition to the 21 modules for self-assessment, ICAT also includes five observation checklists. These can be used for some aspects of the assessment which are better dealt with through direct observation over time. For example, hand-washing practices during the process of patient care tend to be better observed than recalled. During the planning stages of the assessment, the assessment team should make a list of behaviors which are best observed and develop a checklist on a given topic to

make sure that it encompasses the intended information.

A final feature of the ICAT which makes it so useful to hospitals is that it includes a step-by-step manual for using the assessment, which according to workshop participants, is simple and user-friendly. The ICAT was first developed and field-tested in hospitals throughout the Philippines and later adapted for lower income and lower resource hospitals. After this adaptation, it was successful when field-tested again in Uganda. In early 2007, ICAT implementation workshops were held in Pretoria and Mbabane in collaboration with RPM Plus. The South African National Department of Health and the Swaziland Ministry of Health and Social Welfare consider these workshops a first step in combating hospital infection and the growing problem of antibiotic resistance.

Sample Module Scoring Sheet Adapted from Infection Control Assessment Tool (ICAT)

Name of Module: <u>Labor and Delivery</u>						
Date Completed: <u>12 December 2005</u>						
Module Section	Possible Total	Point Range			Your Total	Your Rating
		Excellent >75%	Good 50-75%	Poor <50%		
General issues, hygiene glove use	4	4	2-3	0-1	3	E
Cleaning and general Hygiene	4	4	2-3	0-1	3	G
Glove use for vaginal deliveries	4	4	2-3	0-1	3	G
Glove use for C-sections	2	2	1	0	3	E
Scrub for vaginal delivery	6	5-6	3-4	0-2	5	E
Barriers worn for vaginal delivery	8	6-8	4-5	0-3	2	P
Invasive devices	5	4-5	3	0-2	4	E
Labor & delivery procedures	11	8-11	6-7	0-5	8	E
Prophylactic antibiotics use	4	3-4	2	0-1	4	E
Postpartum care	5	4-5	3	0-2	2	P
Total for module	47	35-47	23-34	0-23	33	G

*see http://pdf.usaid.gov/pdf_docs/PNADK023.pdf

APUA NEWS

Gates Foundation awards APUA new Grant: Preventing Deaths in Africa by Improving Antibiotic Access and Effectiveness

Washington D.C. (October 26, 2008). The Alliance for the Prudent Use of Antibiotics (APUA) announced a \$1.37 million grant from the Bill & Melinda Gates Foundation to explore ways of reducing millions of preventable deaths from severe respiratory and diarrheal infections in Africa. This project was announced in conjunction with a colloquium at the annual ICAAC/IDSA meeting warning of increasing antibiotic resistance.

The project will investigate ways to fast-track antibiotics to sick children in the village before they succumb to severe diarrhea or acute respiratory illnesses. APUA will work with local field staff in Zambia and Uganda to map antibiotic supply and distribution channels, detect counterfeit drugs and measure laboratory capacity to monitor antibiotic resistance. It will also document the prevalence and costs of drug resistance.

In the developing world, antibiotics are often out of reach for patients and dispensed by health workers and street vendors without adequate training or laboratory guidance. "Because of rapidly increasing antibiotic resistance, no currently available antibiotic can be assumed to be active against a particular pathogen. Continual monitoring is needed to determine the right drug choice," said Stuart B. Levy, MD, President of APUA and Professor of Medicine and Microbiology at Tufts University School of Medicine. The project builds on 27 years of APUA's global research and advocacy work to improve antibiotic access and effectiveness worldwide.

Pneumonia and severe diarrhea are leading causes of death in Sub Saharan Africa. Each year, more than three million children in developing countries die from acute respiratory infections, and

approximately 1.9 million children die from diarrheal diseases. Penicillin resistance for *Streptococcus pneumoniae* is as high as 50 percent in some parts of Africa. Douglas Holtzman, PhD, MPH of the Gates Foundation notes: "This project will provide essential field data needed to improve antibiotic access and use in developing countries. The ultimate goal is to reduce the public health threat of drug resistance while saving more lives."

Established in 1981, the Boston-based APUA has affiliates in more than 60 countries, including 11 in Sub-Saharan Africa. APUA's mission is promoting appropriate antimicrobial access and "Preserving the Power of Antibiotics."[®] (see www.APUA.org)

Public Policy Testimony and EPA Response

APUA opposes use of gentamicin spray on apple orchards

In September 2008, APUA sent a letter to the United States Environmental Protection Agency (EPA) expressing strong opposition toward, and suggesting reconsideration of, EPA's recent decision to approve the use of gentamicin as a spray treatment for fireblight, a plant disease found in apples. APUA's major concern was the potential transfer of antibiotic resistant genes in the environment from plants to animals by fruit consumption. Gentamicin is a critically important medicine for humans and APUA warns that the use of this antibiotic as a plant treatment will foster the spread of resistant bacteria to applicators and consumers. The drug is a vital life-saving antibiotic in humans and subsequent resistance could be a disastrous threat to the US medical system and the country's health security.

Summary of EPA's Response:

In early November 2008, APUA received a very thoughtful and encouraging response from Dr. Debra Edwards, the Director of the Office of Pesticide Programs at EPA regarding APUA's opposition to the use of gentamicin in

apple fireblight. The letter shared APUA's concerns and provided justification for EPA's decision to allow the Michigan Department of Agriculture to use gentamicin to fight fireblight within the state's apple industry. The typical procedure regarding the use of pesticides involves a carefully regulated process requiring the registration and approval of proposed pesticides before use in the environment. States may request a temporary exemption to this process under certain circumstances. An exemption was granted by EPA to the Michigan Department of Agriculture under a strict time limit which has now expired. EPA confirmed its commitment to the importance of antibiotic regulation and management. EPA continues to monitor developments in the gentamicin situation and thanked APUA for its interest and concern.

APUA highlights AMR at Global Ministerial Forum

Dr. Susan Foster, APUA's Director of Public Policy and Education, attended the Global Ministerial Forum on Research for Health held in Bamako, Mali from November 17-19. The meeting was attended by over 800 participants, including a number of Ministers of Health and health service workers from around the world. Dr. Foster, along with Dr. Rachel Nugent, Deputy Director, Global Health, Center for Global Development, Washington, DC, and Martha Gyansa-Lutterodt, Programme Manager, National Drugs Programme, Ghana, led a session entitled "Drug resistance as a global health policy priority." The session presented the work of the Center for Global Development's Working Group on Antibiotic Resistance. Presenters stressed that antimicrobial drug resistance should be recognized as a global health and policy priority. Antibiotics are uniquely societal drugs through which each patient use has an impact on the greater community. Without coordination and

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action to control it, the world's people will become increasingly vulnerable to disease and infections of all types. The consequences are mortality and morbidity that undermine renewed global health efforts. Resistance to the most common antibiotics is increasing rapidly, affects treatment of most major infectious diseases and extends beyond any geographic borders. The drug resistance problem often poses a conflict between private and public interests: people want medicine that they believe will bring response quickly, even if it is not the appropriate one or the correct dosage.

The worst scenario is to have only partial access to antimicrobials, or for patients to use only part of a prescription—leading to more rapidly evolving resistance. One should think about drug efficacy as a diminishing resource and use less, not more. The causes of resistance include drug misuse, illiteracy/poor education or simply failure to understand that resistance will develop and increase patient vulnerability.



Honored representatives of SWAB and WIP enjoy the APUA Members' Reception and Leadership Award event at the 2008 ICAAC in Washington, D.C. From left: Dr. Jos W. M. van der Meer (SWAB), Dr. B. J. Kulberg (SWAB), Dr. Inge C. Gyssens (SWAB), Dr. Hans Wagenvoort (WIP), Dr. Christina M. Vandenbroucke-Grauls (WIP)

Drug sellers in Africa and other developing countries are ubiquitous. One strategy for improving drug use is to approach them as a resource that could be educated about the causes and effects of drug resistance. The true magnitude of counterfeit drugs is not known, but is estimated at 30% or more across Africa.

Conclusions of the session included:

- Antimicrobial resistance will limit the lifespan of drugs, making industry less interested in research and development.
- Countries will spend more on antimicrobials to achieve the same impact as rates of drug resistance increases.
- Dire consequences and millions of deaths may result if the major antimalarial component (artemisinin) is lost to drug resistance.
- We should focus on developing guidelines and educating the public about the use of antibiotics for a specific set of complaints, including pneumonia and other pediatric infections, post-natal infections in women, opportunistic infections in both children and adults with HIV/AIDS, and for some well-targeted infections of adults, such as sexually transmitted infections, urinary tract infections, and pneumonia. By focusing efforts on when and where antibiotics should be used, we can channel antibiotic use more appropriately.
- Policy recommendations included the following: Antimicrobial resistance must be incorporated into public health studies; Public health laboratories should establish monitoring systems; Cross-country regulatory networks should monitor use of antibiotics; and a conference on antibiotic resistance across regions and disease should be held.

In addition to the session on the 18th, a separate session was held on the 20th at which further details and discussion were held on the work of the Center for Global Development's antibiotic resistance working group.



Members and friends of APUA attending the ICAAC Members' Reception. From left: Dr. Anthony Boni, (USAID), Dr. David Sack (Johns Hopkins University and Cera Products), Doug Holtzman (Bill and Melinda Gates Foundation), Dr. Anibal Sosa (APUA International Chapter Director), Dr. Marilyn Roberts (University of Washington), Dr. Stuart B. Levy (President, APUA)

APUA continues focus on "reservoirs of antimicrobial resistance"

The AMROAR initiative, supported by the National Biodefense Analysis and Countermeasures Center (NBACC) is a continuation of APUA's NIAID-sponsored ROAR (Reservoirs of Antibiotic Resistance) project effort. The aim is to gain a fuller understanding of the role of commensals as reservoirs of antimicrobial resistance that contribute to the current antibiotic resistance problem in infectious agents. The ROAR project has produced two open-source informational databases (see www.roarproject.org): an isolate databank of phenotypic and genetic resistance data to promote trend analysis; and a searchable library of annotated, peer-reviewed publications focused solely on the examination of antibiotic resistance and its transfer among the normal flora of humans and animals and their associated environments (air, water, soil and waste). AMROAR is designed to "mine" this literature database for historical and current trends and relationships that will inform the body of knowledge on antibiotic resistance in the commensal flora. Working in collaboration with key experts in the area of commensal resistance, the AMROAR project is evaluating the accumulated knowledge base on this subject in order to identify key knowledge gaps and suggest a research agenda for advancing our understanding of the role of commensal bacteria in the problem of

antibiotic resistance. In June, 2008, the AMROAR project convened an expert group and produced a provocative report and set of recommendations designed to move this science forward. (see: www.APUA.org).

APUA 2008 Membership Reception and Leadership Award

APUA would like to thank all APUA Scientific Advisory Board, Members, and Chapter Leaders who joined us for the APUA annual Member Reception and Leadership Award Presentation at the 48th Annual Interscience Conference on Antimicrobial Agents and Chemotherapy in Washington, D.C. on October 27th. This year APUA gave special recognition to the Netherlands organizations WIP and SWAB for its dual programs of antibiotic use improvement and aggressive infection control. Leaders from these programs received the APUA 2008 Leadership Award for their model research and advocacy work to promote appropriate antimicrobial prescribing and control of hospital-acquired infections, in particular of infections caused by multi-drug resistant microorganisms in the Netherlands. APUA would also like to acknowledge corporate sponsors and project partners for their generous unrestricted support and partnership in "Preserving the Power of Antibiotics."® Special thanks go to Wyeth Pharmaceuticals for its support of this year's membership reception. Lists of past awardees and nomination forms for APUA's 2009 Leadership Award can be



APUA Chapter Leaders visit with APUA staff at the Annual Members' Reception in Washington, D.C. From left: APUA Executive Director, Kathleen Young, APUA International Chapter Director, Anibal Sosa, M.D. Chapter Leaders Dr. Beatriz Perez-Gorricho (APUA-Spain) and Dr. Roman Kozlov (APUA-Russia)

found at www.APUA.org. For more information on the awardees programs visit <http://www.swab.nl>, and <http://www.wip.nl/UK/Default.htm>.

APUA Country Chapter Activities

APUA-United Kingdom Reported by Dr. Clodna McNulty, Chapter Coordinator

The Department of Health (DH) in England has established an advisory group focusing on surveillance and control practices of Antibiotic Resistance and Healthcare Associated Infections (ARHAI). The group meets to discuss ways to combat ARHAI concerns and includes participants from a wide range of health professions. In early 2008, the DH launched a new Public Education Campaign targeted to young adults with children explaining the growing problem of antibiotic resistance and myths associated with antibiotic use. In addition, England is leading a European project called "e-Bug" which is set to launch in 2009. It will feature web-based games for teenagers to learn about hygiene and antibiotic resistance. For more information on the "e-Bug" project visit: <http://www.e-bug.eu/> and for more information on the APUA UK Chapter visit: <http://www.tufts.edu/med/apua/Chapters/unitedkingdom.html>

APUA-Spain Reported by Dr. Beatriz Perez Gorricho, Chapter Coordinator

The APUA Spain chapter continues to work on increasing the surveillance and control of antimicrobial resistance and the overall prudent use of antibiotics. Currently, there are educational projects focusing on improving antibiotic guidelines especially for antibiotic use in children and adults. In addition, these projects urge the use of law enforcement to ensure that antibiotics are prescribed only by trained professionals and to cut back on antibiotic self medication. For more information visit: <http://www.tufts.edu/med/apua/Chapters/Spain.html>

APUA-Ethiopia Reported by Tenaw Andualem, Chapter Coordinator

The APUA Ethiopia chapter is one of the most recent members to the APUA organization with official chapter recognition in March 2007. It is working to assess the current needs and status of antibiotic resistance in Ethiopia. For more information visit: www.apua.org

APUA Russian Federation Reported by Roman Kozlov, Chapter Coordinator

The APUA Russia Chapter continues to be a strong force drawing attention to antibiotic resistance throughout Russia and especially throughout Eastern Europe. Their "Map of Resistance" (<http://www.antibiotic.ru/map/eng/>) summarizes published data on antimicrobial resistance. The project provides free access to information regarding antimicrobial resistance to every region of Russia for use by specialists. The data provided on the "Map of Resistance" site are regularly updated as new results are obtained. For more information visit: <http://www.tufts.edu/med/apua/Chapters/Russia.html>

Obituaries

It is with great sadness that we inform you of the passing of two of APUA's most esteemed colleagues:

Jean Claude Pechère, MD was an Emeritus Professor in the School of Medicine, University of Geneva and Immediate Past President of the International Society of Chemotherapy.

Trained in microbiology and infectious disease in Paris and Seattle, WA, Pechère had the rare ability to convey the complexity of life and biodiversity to diverse audiences.

Thomas S. Whittam, 54, who received his PhD from the University of Arizona, was a Hannah Professor of Michigan State University, a mentor to countless undergraduate and graduate students, and above all, a life-long teacher.

APUA will miss the camaraderie and expert guidance these colleagues so generously provided over the years.

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"Preserving the Power of Antibiotics"®

Founded in 1981 as a nonprofit organization, APUA is the only organization in the world solely dedicated to strengthening society's defenses against infectious diseases through research and education on antibiotic use and antibiotic resistance. APUA's mission is to improve infectious disease treatment and control worldwide through promoting appropriate antibiotic access and use and reducing antibiotic resistance. With members in over 100 countries and 60 affiliated country chapters, APUA provides a unique network to support country-based activities and facilitate international planning and communication. APUA's resources include an international scientific advisory board with members of national academies of medicine and science and a professional staff with specialized expertise. APUA's global network of affiliated chapters serves to tailor interventions to local customs and practices.

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