15-18 Healthcare Preparedness and Public Policy/Non-Quantitative Research

43 Uniforms and Their Role in Nosocomial Infection: An Evidence Review

Heather P. Loveday, MA RN RNT PGCEA PGCARM Dip.N[1], Jennie Wilson, BSc(Hons) MSc RGN[1], Peter Hoffman, MSc. BSc.[2], Robert J. Pratt, CBE FRCN[1].
[1]Thames Valley University, London, United Kingdom, [2]Health Protection Agency, London, United Kingdom.

Background: There is significant public concern in England about healthcarers wearing uniform in public places and that contaminated uniforms contribute to the spread of nosocomial infections (NI). Evidence of a link between contaminated uniforms and NI, or that uniforms worn in public places contributes to the spread of infection from healthcare environments to the community has not been systematically assessed.

Objective: To inform the development of a national uniform policy.

Methods: A Systematic review was conducted focusing on advances in laundry processes, microbiological and clinical evidence of infection risks to patients from contaminated uniforms and patient perceptions of the significance and infection risks of uniforms.

Results: Uniforms play an important role in the public's perception of healthcare professionals. This is derived from social and cultural images leading patients to judge the professionalism and trustworthiness of practitioners based on the clothes they wear. The colour and design of uniforms may reinforce socially constructed concepts of cleanliness that result in unachievable expectations. Evidence directly related to this area is limited. Small scale studies show that uniforms and white coats become progressively contaminated during clinical care and most microbial contamination originates from the wearer of the uniform. Although some studies theorise that uniforms transmit HAI, no studies demonstrated this in practice. A small number of studies evaluated the phases of the wash cycle in hospital laundries for patient linen but not uniforms. They indicate that microorganisms are removed and killed during laundering, and dilution during washing and rinsing is important. Significant reductions in microorganisms occur at lower temperatures more commonly used in home laundering. A small number of studies show that home laundering provides effective decontamination. We found no recent studies that accounted for advances in domestic washing machine and detergent technology or that addressed the theoretical infection risk linked with wearing uniforms in public places.

Conclusions: Despite the limited amount and quality of the evidence, the general public's perception is that uniforms pose an infection risk when worn in and outside clinical settings. Reinforced by media comment and a lack of clear, accessible information it has a damaging effect on the relationship between professionals and patients and the public image of healthcare workers. There is no good evidence to suggest uniforms are a significant risk; that home laundering is inferior to commercial processing of uniforms, or that it presents a hazard in terms of cross-contamination of other items in the wash-load with hospital pathogens. It is essential that the evidence is considered in a balanced way and not over emphasised in the development of uniform policy and that the general principles of infection control are stressed.

44 Extending the Cure: An evaluation of policy responses to the growing threat of antimicrobial resistance

Ramanan Laxminarayan, PhD MPH, Extending the Cure Project team.
Resources for the Future, Washington, DC, USA.

Background: Increasing bacterial resistance to antibiotics is a leading problem facing the public health community both in the United States and abroad. Its root causes lie in insufficient incentives for patients, physicians, hospitals and pharmaceutical companies to act in ways that would conserve antibiotic effectiveness.

Objective: To examine the problem of antibiotic resistance as a natural resources problem, and propose solutions from an incentive-based perspective. To evaluate policy options that will enable society to make the best use of existing antibiotics, sensibly encourage the discovery of new antibiotics, and give drug companies a greater incentive to sell these new drugs responsibly.

Methods: The report is the result of a two-year study by researchers at Resources for the Future, the University of Chicago, the National Institutes of Health (NIH) and Emory University to objectively evaluate a range of policy options for dealing with antibiotic resistance. The policy options presented were debated at four consultations with medical and scientific experts who provided invaluable insights into the incentives behind choices concerning antibiotic use and development.

Results: The full range of policy actions considered in the study, their pros and cons, and the actors involved, are summarized in the attached table. An important finding of this work is that relatively little of the information necessary exists to properly evaluate these policy options, prioritize them, or combine them in ways that will be effective and efficient. It is important to distinguish the *policy* context, which is the subject of this report, from the *technical* context_that is, the actual practices, such as multi-drug treatment and infection control measures in hospitals_about which some more is known. The policy options involve how to ensure that those practices are followed.

Conclusions: There is an urgent need to expand the policy research and dialogue process over the next few years. Filling in the knowledge gaps should allow us to develop a comprehensive “playbook” of incentive-based policy options that government and other policymakers could use to make a real difference in the fight against antibiotic resistance.

45 The SHEA/APIC Communication Network- Taking the Pulse on Infection Prevention and Control and Hospital Epidemiology Issues

Belinda Ostrowsky, MD, MPH[1], Loretta Fauerbach, MS, CIC[2], Neil Fishman, MD[3], Louise-Marie Dembry, MD[4], Kathleen Arias, MS, MT, SM, CIC[5], Leonard Mermel, DO, ScM[6], Trish Perl, MD, MSc[7], The SHEA/APIC Communication Network Team.
[1]SHEA/APIC Communication Network, New Rochelle, NY, USA, [2]Shands Hospital at the University of Florida, Gainesville, FL, USA, [3]University of Pennsylvania School of Medicine, Philadelphia, PA, USA, [4]Yale University School of Medicine, Hamden, CT, USA, [5]Arias Infection Control Consulting, LLC, Crownsville, MD, USA, [6]Rhode Island Hospital & Brown Medical School, Providence, RI, USA, [7]Johns Hopkins Medical Institutions, Baltimore, MD, USA.

Background/Objective: The SHEA/APIC Communication Network, is funded via a cooperative agreement with DHQP, CDC. Its goal is to provide real-time, two-way communication between infection prevention and control/healthcare epidemiology professionals (IPC/HE), and CDC/public health (PH) systems in emergent and non-emergent times on IPC/HE issues.

Methods: Surveys were e-mailed to SHEA and APIC members who joined the Network. Priorities for 2006 included: recruiting/educating members (via discussion groups, informational sessions and presentations at meetings, calls and society newsletters), strengthening liaisons with other organizations and PH system (via calls/correspondence) and building the technical infrastructure for real time, two way communication (via the membership database, designated Network web pages on APIC and SHEA websites and electronic survey entry).

Results: Since 9/05, 1401 SHEA and APIC members joined the Network (from > 1150 facilities, 50 states and 5 foreign countries). Contact information was obtained (98% e-mail, 94% fax numbers). Since 9/05, 2337 SHEA and APIC members have responded to Network activities at least once.
Outreach at annual meetings of SHEA and APIC and 2 state programs reached > 350 participants via presentations/discussions and > 2000 via handouts/informal discussions. Conference calls were held with > 40 APIC chapter presidents.
Due to mumps outbreaks in the US, DHQP, CDC asked the Network to assess healthcare facility experience and capacity for mumps care. A survey was developed, responses collected from 339

Network members (50 states), data aggregated and disseminated within 1 month, 4/06-5/06 (illustrates Network's ability to quickly take a pulse on an issue).
The Network initiated dialogue with: National Healthcare Safety Network, Council of State and Territorial Epidemiologists, state/local health departments, Emerging Infections Network, and Infectious Diseases Society of America.
Almost 200 network members in 39 states piloted an electronic Influenza survey. About 38-40% (almost 500) US network members visited the new web pages in the 5 business days between 12/21/06 -1/1/07. The pilot successfully illustrated the network's new technical advances and ability to share information and receive feedback during holidays.

Conclusions: The Network provides the infrastructure to take the pulse on current IPC/HE topics and quickly disseminate information and resources.

46 Improving Health Care Worker Staffing During an Influenza Pandemic:
Insights from a Hospital-Based On-Line Survey

Adi V. Gundlapalli, MD, PhD, Gerard Doyle, MD, Jeffrey Sanchez, Colleen Connelly, RN, Barbara Mooney, Louise Eutropius, JeanMarie Mayer, MD, Michael Rubin, MD, Marc Babitz, MD, Lynda Faldmo, Boaz Markewitz, MD, John Michael, MD, Thomas Miller, MD, Stephen Morris, MD, Andrew Pavia, MD, Margaret Pearce, PhD, Kristin Ries, MD, Matthew Samore, MD, Susan Terry, MD, Richard Sperry, MD, University of Utah Pandemic Influenza Policy Group.
University of Utah School of Medicine, Salt Lake City, UT, USA.

Background: It is widely accepted that healthcare resources will be strained in the event of an influenza pandemic. A major issue is likely to be health care worker (HCW) absence from work due to illness or concern for safety.

Objective: To understand HCW-perceived barriers to reporting to duty during an influenza pandemic.

Methods: An anonymous on-line survey was made available on the intranet to all employees, house-staff and faculty of a large urban healthcare system that includes a tertiary care teaching hospital. During a 60 day period from July - September 2006, a campaign was launched to encourage participation that included email reminders from senior and middle management, postings in newsletters and reminders at staff meetings. Questions focused on 1. Comfort level regarding their knowledge of seasonal and avian influenza; 2. Perceived barriers to and factors that would facilitate their reporting to work in the event of a pandemic. All questions were scored on a scale of 1 (least likely) to 5 (most likely), with 3 indicating neutrality.

Results: A total of 1450 responses were received (32% of all active employees). Nursing and physician/non-physician providers accounted for 52%. Consistently, a third of respondents were neutral in their knowledge of seasonal and avian influenza. They were least comfortable in their knowledge of treatment options and 67% were in favor of an educational session on avian influenza. An overwhelming 94% indicated that they would report to work as usual during a pandemic, with a majority (62%) indicating that they would do so even with a sick family member in their household. The main reasons cited for this were an obligation to their co-workers and community, ethical obligation to their job and the need for a paycheck. Barriers to reporting to work included a concern for their family, concern for occupationally acquiring influenza and subsequent complications, including death. Factors that would contribute to their reporting to work included (of nearly equal importance): provision of prophylactic medications to the HCW and family members, education to improve their knowledge of seasonal and avian influenza with emphasis on prevention in self and family, assurance that their institution was planning for a pandemic and had adequate supplies of personal protective equipment and when available, the assurance that they and their family members would be placed on a priority list for receipt of pandemic influenza vaccine. Nearly all (92%) declared that would elect to receive the pandemic vaccine.

Conclusions: To our knowledge, this is the first large hospital-based survey to show that assurances to HCW that they and their family members will be protected to the extent possible are likely to improve

HCW staffing during a pandemic. This should be combined with education, salary considerations and detailed preparedness planning in the inter-pandemic stage.

47 A Survey of Infection Control Programs in a National Healthcare System

Thomas R. Talbot, MD, MPH[1], Sheri Tejedor, M.D.[2], Robert A. Greevy, Ph.D.[1], Hayley Burgess, Pharm. D.[3], Mark V. Williams, M.D.[2], Jayant K. Deshpande, M.D. M.P.H.[1], Patsy McFadden, R.N.[4], Matthew B. Weinger, MD[1], Robert S. Dittus, M.D. M.P.H.[1], Theodore Speroff, Ph.D.[1].
[1]Vanderbilt University School of Medicine, Nashville, TN, USA, [2]Emory University School of Medicine, Atlanta, GA, USA, [3]Hospital Corporation of America Corporate, Nashville, TN, USA, [4]Centennial Medical Center, Nashville, TN, USA.

Background: With the increasing focus upon infection prevention among consumers and legislators and the anticipated introduction of mandatory national reporting metrics, it is important to assess current infection control (IC) practices and resources

Objective: As a part of a larger project to evaluate different strategies for reducing blood stream infections (BSI) and ventilator-associated pneumonias (VAP) in intensive care units, we sought to assess the baseline IC practices in a large cohort of hospitals owned and operated by the Hospital Corporation of America (HCA).

Methods: The Infection Control Surveillance Survey (ICSS), an electronic 98-item instrument, was created and administered in September 2005. The ICSS included queries on hospital demographics, IC program tools and resources, details on infection surveillance with a focus upon IC practices for BSI and VAP surveillance, and IC participation in institutional quality improvement (QI) efforts.

Results: The HCA network currently includes 167 facilities in 21 states. Surveys were completed for 134 facilities. The median total number of beds for the study population was 219 (range 12-836) with a median of 22 ICU beds (range 0-159). ICU surveillance was conducted at most facilities, with a median of 2 (range 0-10) ICUs under surveillance per facility. Only 8/134 (6%) facilities were members of the Centers for Disease Control & Prevention's National Nosocomial Surveillance (NNIS) program. 78% (104/134) of facilities had one infection control professional (ICP), of whom 73/104 (70%) spent >75% of their time on IC duties. 59/134 (44%) facilities did not have an ICP certified in infection control and epidemiology. IC software was used for surveillance by only 39/128 (31%). All IC programs reported involvement in institutional infection prevention and QI initiatives. Most IC programs conducted surveillance using the NNIS definitions for BSI (130/133, 98%) and VAP (129/132, 96%), respectively. Difficulty obtaining denominator data to determine BSI rates was reported by 60/126 (48%) facilities, which resulted in months where BSI rates could not be reported in 29/126 (23%) hospitals. Less than 30% (37/128) of programs reported having difficulty obtaining denominator data to determine VAP rates. 17/130 (13%) hospitals reported having months where VAP rates could not be reported due to incomplete denominator reporting. A comprehensive program to prevent BSI or VAP had been implemented at 58/134 (43%) and 79/134 (59%) of facilities, respectively. Surveillance for surgical site infection and catheter-associated urinary tract infections were performed by 70/134 (52%) and 75/134 (56%) of the facilities, respectively.

Conclusions: IC practices and resources varied substantially across a large healthcare system, thus illustrating some of the challenges in standardizing practices in anticipation of mandatory reporting of nosocomial infection data.

48 Mandatory Reporting of Hospital Acquired Infections in Tennessee (TN): Legislation & Proposed Rule Changes

Marion A. Kainer.
Tennessee Department of Health, Nashville, TN, USA.

Background: About 2 million Americans acquire healthcare associated infections annually; at least one

third are considered preventable. Consumers' groups are urging legislators to pass legislation mandating public reporting of hospital-acquired infections (MPRHAI). Multiple states have enacted legislation that requires health care organizations (HCO) to publicly disclose healthcare associated infection rates.

Objective: Describe the proposed new rules as well as the legislation that was passed on MPRHAI.

Methods: We describe the process resulting in the new legislation and rules and describe implementation plans.

Results: In TN, legislation was enacted requiring use of NHSN definitions, methodology and software (NHSNDMS) as recommended by a study group that included TN Department of Health (TDH) staff, regulators, infection control professionals, healthcare epidemiologists, hospital administrators, and the TN Hospital Association. The study group reviewed impacts of MPRHAI legislation in other states, quality improvement initiatives (QII) from multiple organizations, and HICPAC guidelines. Emphasis was placed on collection of actionable, verifiable data. Legislation included language from the APIC/IDSA/SHEA model legislation. Central line associated blood stream infections (CLABSI) in intensive care unit (ICU) patients will be reported publicly by identified HCO and ICU type. Surgical site infection (SSI) post coronary artery bypass graft (CABG) surgery will be reported to the TDH; aggregate data will be reported to the public. In addition, the TDH has proposed rule changes on: hand-hygiene, influenza vaccination (including requirement for declination statements) and central line insertion practices; a rule-making hearing will be held in January 2007.
Training in NHSNDMS is underway. CDC and other states using NHSN are sharing training materials and lessons learned. Tennessee hospitals will join a "group", allowing the TDH to view data on CLABSI and SSI post CABG. Data-collection will commence in July 2007.

Conclusions: NHSN uses standardized definitions and methodology and provides a useful platform to implement MPRHAI legislation. No costs are incurred for software development and maintenance. Infection control professionals can also use data for QII.

49 The Value of a Certified Infection Control Professional to a State Health Department

Brenda J. Roup, PhD, RN, CIC.
Maryland Department of Health and Mental Hygiene, Baltimore, MD, USA.

Background: The Maryland Department of Health and Mental Hygiene (DHMH), Office of Epidemiology and Disease Control Programs (EDCP) provides expert consultation on the prevention and control of infections to health care providers, other State agencies, and the general public in Maryland. Except for a hiatus of 18 months, DHMH/EDCP has had a certified (CIC) infection control professional (ICP) on staff since the early 1980s. During that hiatus, calls concerning infection prevention and control issues were made to facility-based ICPs, rather than to DHMH. Facility based ICPs, however, may have lacked knowledge of infection control regulations, legislation, and DHMH policies that applied Statewide.

Objective: The objective of this review was to detemine the proportion of infection control consults to DHMH that were State-wide in nature, as opposed to those whose queries concerned a single healthcare facility.

Methods: To determine what percentage of consults to the current DHMH ICP were Statewide in nature, all consults during the years 1999 - 2005 were reviewed for types of calls and topics. A consult was defined as any telephone, electronic, or personal encounter between the DHMH ICP and anyone seeking guidance on an infection prevention or control issue.

Results: The numbers of consults directed to the current DHMH ICP steadily increased each year from 1999 - 2005. Long term care facility ICPs and local health department communicable disease nurses comprised 55% of callers, followed by acute care ICPs, staff of other State agencies, and private citizens. Greater than 75% of the consults related to issues that concerned Statewide infection prevention and control practices, such as regulations, legislation, and DHMH infection prevention and control policies.

Conclusions: Having a certified ICP on staff at a State health department provides callers with access to an individual who, by virtue of her/his status as Certified in Infection Control (CIC), has a broad range of knowledge related to infection prevention and control, as well as knowledge of Statewide regulations, legislation, and guidelines related to infection control. Without such an individual at a State health department level, callers may use ICPs at local hospitals who may lack knowledge of policies that apply across the State. State health departments may benefit from having a certified ICP on their communicable diseases staff.

50 Compliance with CDC Recommendations Among Interventional Radiologists: Results of a National Online Survey.

Pavani Reddy, David Liebovitz, Howard Chrisman, Al A. Nemcek Jr., Gary A. Noskin.
Northwestern Memorial Hospital, Chicago, IL, USA.

BACKGROUND: Despite the expanding role of interventional radiology, the rate of compliance with Centers for Disease Control (CDC) guidelines among interventional radiologists (IRs) in the United States (U.S.) is unknown. Knowledge of current practices among physicians is instrumental in identifying educational needs and in developing strategies to reduce infection risk.

OBJECTIVE: To assess current infection control (IC) practices among IRs in the context of recommendations by the CDC.

METHODS: From Nov-Dec 2006, all members of the Society of Interventional Radiology (SIR) were invited to participate in an anonymous, online IC questionnaire via e-mail.
RESULTS: Of 3347 U.S. members, 3019 were contacted via a valid e-mail address and 956 (31.7%) logged into the survey website; of these, 907 (94.9%) completed the 57-item questionnaire. Participating IRs were predominately male (89.3%), full-time attendings (84.2%) who perform over 20 procedures weekly (73.7%). 63.3% U.S. IRs practice in a community-based hospital and 31.3% in an academic center. 235 (24.6%) experienced a needlestick injury within the past year, most often due to operator error (75.9%). Only 71.3% reported the injury to employee health. Less than 65% IRs report compliance with annual ppd testing; notably, those who received a yearly ppd reminder were much more likely to receive annual testing than those who did not (OR 19.0, CI 12.6-28.7, $p < 0.05$). Despite CDC recommendations, IC precautions taken during central venous catheter placement were variable: 71% IRs used gowns, 68% used caps, 59% used large sterile drapes, and only 52% used face masks. Personal protective equipment use during the disposal of bodily fluids also varied; only 28.7% IRs report consistent use. While most IRs (95%) change gloves when torn, only 18% report washing hands regularly between glove applications. Over 40% IRs noted a change in IC practices within the last 5 years, citing changes in hospital guidelines (68.9%), recommendations by a professional organization (42.3%), and concerns about exposure to bloodborne pathogens such as HIV (38.0%) as the most common reasons. Interestingly, only 41.7% had IC training at the onset of their practice; less than 15% recall an assessment of IC knowledge within the past year.

CONCLUSIONS: IRs demonstrate a wide variety of IC practices, though often not in accordance with CDC guidelines. IRs were most likely to change IC practice if required to do so by their own hospitals; therefore, IC professionals can play an important role in nosocomial infection prevention if they are actively involved in the implementation and routine assessment of institutional IR IC compliance.