

The Broad Street Pump

Health-associated Infection Prevention and Control (HAIPC); *new approaches to old problems: Short Course*

Professor Lyn Gilbert

Clinical Professor & Director, Centre for Infectious Diseases & Microbiology-Public Health, Westmead Hospital & Sydney Emerging Infections & Biosecurity Institute, University of Sydney

The fairly mundane title for this CIDM-Public Health/SEIB short course, belied what turned out to be a stimulating meeting/workshop, which attracted over 100 registrants and provoked lively discussions. The full program and PowerPoint presentations are available at www.cidmpublichealth.org.au and selected abstracts are reproduced below.

The program was designed to showcase novel approaches to HAIPC, involving epidemiology, ethics, economics and surveillance, which are often neglected in conventional approaches to infection control, which emphasise (appropriately) hand hygiene and patient isolation, but often fail to address poor compliance with these crucial components of HAIPC. Some approaches discussed by presenters included:

- more critical analysis of HAI epidemiological data;
- use of sensitive clinical and microbiological surveillance data to model transmission of multi-resistant organisms in real-time;
- the use of video reflexive technology to provide healthcare workers (HCA) with insight into their work practices and encourage new approaches to problem solving;
- an ethical approach to HAIs and the implications for improving compliance with evidence-based policy, including individual and organizational responsibilities;
- the role and importance of the environment in transmission of micro-organisms.

Among the highlights were presentations by registrants who responded to calls for abstracts. All of those received were excellent and much appreciated by the audience. Most were accounts of HAI outbreaks, some in special "high risk" settings, which nicely complemented a series of invited presentations on these topics.

The prevention of avoidable harm to patients and minimization of unnecessary excess healthcare costs are critically important - ethically, economically and medically – to our healthcare system. This has been, belatedly, recognized by State and Federal Governments, which are now expecting greater accountability from healthcare organisations. Healthcare settings are often a major source of transmission of emerging pathogens and their spread into the wider community and a major breeding ground for antimicrobial resistance. This makes HAIPC a crucial public health issue also.

Australia's healthcare system still lags behind those of some other countries, particularly in Europe, in achieving best practice standards in HAIPC and minimising HAI rates, but there have been major improvements over the past 5 years. CIDM-Public Health and SEIB will continue to contribute to research, training and practice improvement towards this goal.



Inside this issue

Epidemiology of HAIs: uses, pitfalls and the future
Mary-Louise McLaws [p2]

Seeing ourselves as others see us – videoreflexive ethnography in infection prevention and control
Suyin Hor [p2]

My Sister's Keeper? HCW accountability and the ethics of compulsion in IPC
Ian Kerridge [p2]

What would I want if I were the patient? IPC ethics & the golden rule
Lyn Gilbert [p3]

Risky rules – the pitfalls of rules and checklists in IPC
Christine Jorm [p3]

Why do we do surveillance? What to measure and how to do it
Kathy Dempsey [p4]

Personal protective equipment - does it work; who does it protect?
Jan Gralton [p4]

Keeping Hospitals Clean - novel systems and practical issues
Jo Tallon [p4]

Are surfaces and fomites a source of HAI?
Jen Kok [p5]

Microbial strain typing in surveillance and outbreak investigation
Matthew O'Sullivan [p5]

Translating surveillance data into early warning and rapid response
Vitali Sintchenko [p5]

IPC in haematology and haematopoietic stem cell transplant (HSCT) patients – how to protect the most vulnerable patients
Patricia Ferguson [p6]

**Staff Profiles [p6]
Upcoming Symposia [p7]**

Epidemiology of HAIs: uses, pitfalls and the future

Mary-Louise McLaws

Professor of Epidemiology in Healthcare Infection and Infectious Diseases Control, School of Public Health & Community Medicine, The University of New South Wales

Over the past two decades treatments of acutely ill patients include antibiotic therapy and invasive complex life-saving procedures that increase the risk of acquiring a healthcare associated infection (HAI). Over this period infection prevention guidelines have improved changing the epidemiology of HAI. Yet, our approach to surveillance and analysis of the data has not kept pace with these changes. With our need to provide quarterly HAI reports with the community now demanding to know their current risk of HAI while being zero tolerant of HAIs. Our datasets are often too small to provide reliable estimates of risk or risk reduction. We have not adapted with these competing demands and provide clinicians and patients with poor quality evidence on our infection prevention programs. HAIs are becoming statistically rare events in absolute number and our approach to analysis needs to adapt. We spend precious clinical hours auditing basic patient safety practice – hand hygiene – but provide unreliable data to the community via *MyHospitals* website while hand hygiene rates are to be judged “*the most effective ways to minimise the risk of healthcare associated infections, such as Staphylococcus aureus bacteraemia (SAB).*” These common errors and others made during data collection and analysis will be discussed with suggestions for future trends.

Seeing ourselves as others see us – videoreflexive ethnography in infection prevention and control

Suyin Hor

Senior Health Researcher, Centre for Health Communication, University of Technology

To date, hospital-acquired infections have primarily been dealt with through the design and implementation of behavioral guidelines that healthcare practitioners are tasked to comply with, such as hand hygiene protocols. Despite the best intentions of all involved, compliance with these guidelines has been variable, a finding in tune with much of the health services and safety literatures on guidelines in general. A different and increasingly popular approach focuses on the ‘microsystems’ of care, and on the work that frontline practitioners accomplish, collaboratively, in order to integrate guidelines meaningfully into their practices. Videoreflexive ethnography is a research method that takes this approach, but gives it a pedagogical twist. The aims of this method are to draw on and develop frontline practitioners’ own capacities to identify infection risks, to reflect on these risks collaboratively, and to change their practices adaptively with changing circumstances. Rather than prioritising guidelines for practice, this method prioritises the relationships and networks between health care practitioners that allow guidelines or protocols to become useful amidst the complexity and unpredictability of frontline care.

My Sister’s Keeper? HCW accountability and the ethics of compulsion in IPC

Ian Kerridge

Director & Associate Professor, Centre for Values, Ethics and the Law in Medicine, University of Sydney

Everything that we do in healthcare and biomedicine is ultimately about ethics. Research, practice and policy have, at their end, the goal of providing security and maximising welfare. This is why HAI are so disturbing and why they represent not simply an organisational or clinical concern – but a moral one. And so we should do what we can to prevent them. But it does not follow that we should do everything that we can to prevent HAI. Indeed, there are actions and policies that we *can not* demand of our healthcare systems and health practitioners nor *should not* demand of them. This is particularly the case with regard to immunisation of healthcare workers. The principal task, therefore, is to think where our duties and obligations lie and where they finish, and what the ‘costs’ are both of inaction and action.

What would I want if I were the patient? IPC ethics & the golden rule

Lyn Gilbert

Clinical Professor & Director, Centre for Infectious Diseases & Microbiology-Public Health, Westmead Hospital & Sydney Emerging Infections & Biosecurity Institute, University of Sydney

Doctors and nurses can generally recognise bad infection control practice (especially when they, themselves, or their relatives, are patients) but often fail to use best practice themselves so the fact that serious, but preventable, healthcare-associated infections continue to occur is perplexing. Can an ethical analysis provide a new approach to prevention?

Infection control ethics must balance the rights and responsibilities of patients (individually and collectively), communities (within and outside hospitals) and healthcare workers (HCWs). An ethical theory that prioritises outcomes (by emphasising surveillance and preventive strategies), may overlook potential adverse effects on individuals (e.g. isolation, intrusive screening; resistance from HCWs); an approach that emphasises individual rights and autonomy (of patients and/or HCW) may fail to enforce safe practice and/or be confused by conflicting rights.

Hospital patients' have rights that include: appropriate care, access to relevant information and protection from avoidable harm. Most HCWs take their responsibilities towards their patients seriously, so why are patients' rights to protection from preventable infection so often breached? HCWs are asked to observe policies and procedures that are (ideally and usually) evidence based, but often unnecessarily detailed, poorly explained, inconsistent with workflow, may be intrusive or uncomfortable for patients and numerous. Breaking the rules (not performing hand hygiene, for example) will not lead to an immediate adverse outcome – most HAIs are the result of multiple breaches of different rules by several people. So we blame "the system" and fail to hold individuals accountable. An ethical approach to IPC requires a new approach involving all levels of the health system.

Risky rules – the pitfalls of rules and checklists in IPC

Christine Jorm

Associate Professor, Department of Public Health & Community Medicine, University of Sydney

This paper uses human factors theory and clinical insights from focus group discussions to argue that the current patient safety interest in more rules and regulation (and punishment for violators) is naïve. Such thinking ignores the complexity of clinical work and its highly social nature. The recent checklist mania is used as an example. The work of safety giant Rene Almberti is discussed. The ways in which rules and regulation can decrease safety are explained (and tips given for successful design and implementation).

The following overall recommendations are made for those engaged in improvement of IPC:

- Find ways of increasing staff expertise around IPC – change viewpoint from that of: correct/incorrect, right/wrong, compliance/violation to thinking about ways of practicing more or less safely.
- Avoid proliferation and creation of rules that are hard to follow thereby preventing the normalisation of deviance. This normalisation increases the rate of drift into failure (patient harm).
- Always test and monitor new rules/procedures/protocols/checklists (including with outcome measures)
 - Be careful to avoid introducing brittleness, allow for the unpredictability of healthcare
 - Consider opportunity costs as well as benefits, clinical time is finite
 - Consider new risks introduced
- Preserve team work and co-operative behaviours

Remember that the workplace is a social space – staff have relationships, perform their identity, are sensitive to criticism and highly aware of power differentials.

Why do we do surveillance? What to measure and how to do it

Kathy Dempsey

Clinical Nurse Consultant, Co-Manager, Infection Prevention & Control Unit, Westmead Hospital

Surveillance is an essential component of an effective infection prevention and control program. To be effective, surveillance requires thoughtful planning that is based on a clear understanding of its purpose. Surveillance programs should be based on sound epidemiological and statistical principles. "Surveillance is a systematic method of collecting, consolidating, and analysing data concerning the distribution and determinates of a given disease or event, followed by the dissemination of that information to those who can improve the outcomes." If surveillance data are properly collected and analysed, they can provide information that can be used to improve the quality and outcomes of healthcare and to promote public health. There are a number of different surveillance methodologies that can be utilised such as Total House (Hospital wide) surveillance, targeted surveillance and a combination surveillance strategy. Surveillance assists the Healthcare provider to identify and measure maximum benefits. It is important that surveillance is also appropriate for your facility/ area. The results of these activities need to be reliable and useful as they are measures of key performance risk areas within your organisation. One of the key surveillance activities for Infection prevention and control is the monitoring of healthcare-associated infections or HAIs. The surveillance of HAIs assists in identifying whether there is an infection problem, the magnitude and the factors that contribute to the infections. It is crucial for Infection Prevention and Control that surveillance continues to be utilised.

Personal protective equipment - does it work; who does it protect?

Jan Galton

Research Officer, HammondCare Clinical Training Centre, Hammondville, NSW

Healthcare workers (HCWs) are invariably exposed to communicable pathogens frequently throughout the course of delivering clinical care. The prevention of transmission and infection potentially can be achieved through the use of robust infection control precautions, including the use of appropriate personal protective equipment (PPE). In the past, the use and effectiveness of masks, gloves, gowns and other types of PPE was established through clinical experience and based on the assumed transmission routes of communicable pathogens. With an increased ability to detect pathogens, especially viral pathogens, our understanding of the transmission routes of common pathogens has clarified. Yet, certain current infection control precautions still remain based on historical empiricism. Given such advances in the current knowledge regarding the transmission routes of pathogens, it is integral for HCWs to understand the interplay between transmission, infection control and PPE choice. Using the transmission of respiratory viruses as a case example, this presentation will examine:

- The transmission routes of common respiratory viruses;
- The infection control precautions recommended to counter common respiratory viruses and how PPE integrates into a broader infection control approach;
- How the transmission route affects the PPE choice;
- How PPE works and who is protected by using it; and
- The efficacy and limitations of PPE for countering secondary transmission and infection.

Keeping Hospitals Clean - novel systems and practical issues

Jo Tallon

Clinical Nurse Consultant, Co-Manager, Infection Prevention & Control Unit, Westmead Hospital

Cleanliness of the healthcare environment is one of the key ways to prevent patients, staff and visitors acquiring a healthcare associated infection. Cleanliness is intrinsically linked to infection prevention and control. A clean well ordered environment provides the foundation for excellent infection control practice to flourish. A clean healthcare environment is essential to the dignity and comfort of patients. All staff are responsible for the cleanliness of healthcare facilities. A clean facility reflects a culture of concern for patients and respect for those working in and visiting the facility.

New technologies have enabled the development of efficient cleaning equipment and products such as dual purpose cleaner/disinfectants, Vaporised Hydrogen Peroxide, steam, Adenosine Triphosphate(ATP) cleaning monitors and microfibre cleaning products. In spite of these technological developments, adherence to good, basic environmental practices remains one of our biggest challenges.

Cleaning standards should reflect the outcomes of a cleaning service and remain focused on the need to have a clean, safe environment therefore standards should be designed to focus users' attention on the outcome or input sought rather than the method by which it is achieved.

Are surfaces and fomites a source of HAI?

Jen Kok

Infectious Diseases Physician, Clinical Microbiologist, Research Fellow, Centre for Infectious Diseases & Microbiology, University of Sydney

There is on-going controversy as to whether surfaces and fomites contribute to the transmission of multi-resistant organisms (MROs). The degree of environmental contamination depends on the surface examined, and the infected body site. Bedside rails and tables, remote controls, toilet seats and rails, dressers, door handles and intravenous pumps; medical equipment including stethoscopes and blood pressure cuffs; computer keyboards and mice at staff workstations are frequently contaminated. Assessing the quality of evidence for MRO transmission is difficult as studies generally report contamination, rather than transfer, rates. Temporospatial relationships and confounders including disinfection procedures and other interventions further affect reported rates. Nevertheless, reducing environmental contamination has been shown to be effective in controlling nosocomial outbreaks of MROs.

Microbial strain typing in surveillance and outbreak investigation

Matthew O'Sullivan

Staff Specialist, Centre for Infectious Diseases & Microbiology, Westmead Hospital; Senior Lecturer, Sydney Emerging Infections & Biosecurity Institute, University of Sydney

Microbial strain typing is utilised to classify isolates of an organism into groups below a species level. This may be done to study evolutionary relationships, to monitor for strains that have increased virulence potential or to detect person to person transmission.

Strain typing in infection control has traditionally been used retrospectively to confirm or refute a nosocomial outbreak that has been suspected clinically. Increasingly, strain typing is being used prospectively as part of laboratory surveillance to identify clusters of related strains that may subsequently trigger infection control investigations. This latter approach has been facilitated in recent years by the development of high-throughput, inexpensive and discriminatory PCR-based typing methods.

Not all surveillance requires microbial strain typing. The utility of strain typing in infection control surveillance will depend on the background incidence of the organism in question and the discriminatory power, stability, reproducibility, ease of interpretation, portability of results, turnaround time and cost of the method used for typing.

Translating surveillance data into early warning and rapid response

Vitali Sintchenko

Associate Professor, Centre for Infectious Diseases & Microbiology-Public Health, Westmead Hospital & Sydney Emerging Infections & Biosecurity Institute, University of Sydney

The recent developments of microbial genome sequencing and advances in information technology enable more efficient and effective reporting of hospital-acquired infections (HAI), suspected transmission events and outbreaks of antibiotic resistant infections. The whole genome sequencing of isolates involved in HAI outbreaks further enhances infection control surveillance and allows fine epidemiological discrimination not achievable by standard molecular typing methods. Furthermore, such approach potentially enables the study of evolutionary dynamics within the host, the progression from carriage to disease and the processes responsible for changes in antibiotic susceptibility profiles. Emerging evidence suggests the clones of HAI pathogens occur predominantly in geographical clusters. These pathogens diffuses through regional health care networks, rather than spreading freely in the community encouraging control efforts aimed at interrupting the spread within and between health care institutions. International surveillance networks sharing decentralised typing results on a Web-based platform can provide crucial information for clinicians, diagnostic microbiologists, and infection control teams on the dynamics of HAI spread, and especially the spread of MRSA, to provide early warning of emerging strains, cross-border spread, and importation by travel.

IPC in haematology and haematopoietic stem cell transplant (HSCT) patients – how to protect the most vulnerable patients

Patricia Ferguson

Staff Specialist, Infectious Diseases & Infection Prevention & Control, Blacktown Hospital

This high-risk group shares many infection risks, including profound immunosuppression, invasive procedures and long hospitalisations.

Bacterial infections during neutropenia complicate mucositis and line infections. Hand hygiene remains the most effective prevention method (AI), with CVC bundles beneficial in other patient groups (AII). Patients with MROs, diarrhoea and respiratory illness should use pathogen-specific precautions, with universal contact precautions recommended for all HSCT recipients (AIII), but not other haematology patients.

Fungal infections are known to be associated with environmental fungi and renovations. Ward design remains important (separate bedrooms and bathrooms, positive pressure rooms, HEPA, laminar air flow, cleaning). Negative pressure rooms are required for airborne pathogens.

Respiratory virus infections are common, potentially serious and highly transmissible. Contact and droplet precautions and health care worker influenza vaccination (BI) are accepted recommendations. A new simple clinical screening tool stratifies patients without respiratory virus infection (high negative predictive value) and those with possible infection requiring viral testing (low positive predictive value) (BI). Multi-modal methods (screening, excluding visitors and staff with respiratory symptoms, increasing vaccination of staff and family contacts) have been shown to reduce all-cause nosocomial pneumonia in allogeneic HSCT recipients during their transplant admission (BI). Outpatient areas remain important sites of outbreaks, and require separation of symptomatic patients and droplet/contact precautions.

Mandatory influenza vaccination for health care workers in this high risk area (BI) is an unresolved issue. Future IPC challenges include screening and surveillance of respiratory viruses, all-cause pneumonia, MRO acquisition and CLABSIs, and reporting of these key clinical indicators.

Staff Profiles



Kathy Dempsey

Position: Clinical Nurse Consultant in Infection Control

Phone: (+612) 9845 7501

Email: kathy.dempsey@wsahs.nsw.gov.au

Kathy is a qualified Infection Prevention and Control practitioner with extensive experience. She has been an Infection Control Consultant for the past 16 years & Department Manager for the Unit for 7 years and sharing the role for the last 9 years. Kathy holds a Certificate in Infection Control and Hospital Epidemiology (SHEA/CDC – America), Basic and Advanced Certificates in Infection Control, a Post Graduate Certificate in Medical Microbiology and a Masters of Nursing – Microbiology, Infection Control, Critical Care & Epidemiology.

Kathy has been a Consulting Infection Control expert on various state & national Committees, Involved in numerous expert advisory committees/taskforces to Ministry of Health and the CEC including previous MRO task force, Hand Hygiene steering committee, HAI expert advisory committee and steering committee & ICP expert consultant on Blood Borne Advisory Panel. Kathy has published a number of articles on Infection Control. Kathy is a credentialed ICP and is a member of the Australian College of Infection Prevention & Control (formerly AICA) credentialing committee.



Jo Tallon

Position: Clinical Nurse Consultant in Infection Control

Phone: (+612) 9845 9192

Email: jo.tallon@wsahs.nsw.gov.au

Jo is a qualified Infection Prevention and Control Practitioner with extensive experience. She has been an Infection Control Consultant for the past 11 years & Department Manager for the Unit, a role she has shared for the last 9 years. Jo holds a Certificate in Infection Control and Hospital Epidemiology (SHEA & ECCMID) Basic and Advanced Certificates in Infection Control, a Post Graduate Certificate in Renal, Nephrology, Transplant & Haemodialysis and Grad Cert in Public Health. Jo has also published a number of articles on infection control.

Jo has been a Consulting Infection Control expert on various state contract management committees, Involved in numerous expert advisory committees/taskforces and steering committees to Ministry of Health and is currently the Chair of Environmental Hygiene Working Party and ICP member of the CEC HAI Expert Advisory Committee.

Upcoming Symposia

**Viruses in May
to be held in August this year**

VIM AUGUST 2012

**August 16-18, 2012
The Carrington Hotel
Katoomba, NSW**

VIM August 2012 is an excellent value scientific conference. Registration fees include two and a half days of scientific program and three days of catering including dinner and drinks on two evenings. Discounted hotel rates are available at the Carrington Hotel.

This meeting, now in its ninth year, is Australia's only meeting focusing specifically on the clinical, diagnostic and management aspects of viral infections. It enjoys an outstanding reputation and attracts pathologists, microbiologists, infectious disease physicians, general practitioners, as well as registrars, scientists, from Australia and overseas.

This meeting is accredited for continuing education by the RCPA. In 2012, the meeting will highlight **Principles and Practice of Clinical Virology, Viral Hepatitis and Respiratory Infections and Emerging and Exotic Viral Infection Issues.**

For more information please go to: www.virusesinmay.com

SEIB COLLOQUIUM

**October 11-12, 2012
The University of Sydney
Main Campus**

This free colloquium is open to anyone with an interest in the areas of emerging/re-emerging infectious diseases and biosecurity, with a particular emphasis on the Asia-Pacific region.

Now in its third year, the SEIB annual colloquium will bring together members of the medical community for a special two-day event.

The first day will focus on microbial ecology and antimicrobial resistance and day 2 will discuss social networks and communications in addition to food security and safety.

Full programme and register online at:
www.sydney.edu.au/seib

The annual Beveridge Lecture will also be held on Day 2. The theme this year is *Rabies Control in Indonesia: what's the threat to Australia?* The lecture will be given by Dr. Helen Scott-Orr.

Register online at:
<http://whatson.sydney.edu.au/events/published/the-ian-beveridge-memorial-lecture>

Contact Us

For more information on any articles or CIDM-PH & SEIB events, or to join the e-lists and receive regular updates, please contact us.

CIDM-PH

Centre for Infectious Diseases and Microbiology - Public Health
Mailing Address: PO Box 533, Wentworthville NSW 2145
Phone: (612) 9845 6255
Email: lou.orszulak@wsahs.nsw.gov.au or
lyn.gilbert@sydney.edu.au

SEIB

Sydney Emerging Infections and Biosecurity Institute
Mailing Address: ICPMR Bldg Rm 3114, Westmead Hospital, Westmead, NSW 2145
Phone: (612) 9845 9864
Email: seib@sydney.edu.au
christine.aitken@sydney.edu.au