



INFECTION CONTROL ASSOCIATION (SINGAPORE)

Sharing of knowledge and ideas from our members:

3rd International Congress of the Asia Pacific Society of Infection Control (APSIC) 2007
Kuala Lumpur Convention Centre (KLCC), Malaysia
8 July - 11 July 2007

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Learning objectives:

- a) To gain new updates & further improve knowledge on infection control; infection control programmes in other countries.
- b) To update and improve knowledge through education/sharing sessions and posters and network with experts/infection control professionals.
- c) To increase awareness of the global perspectives and evidence based practices in the field of infection prevention.

1. Introduction

The 3rd International Congress of the Asia Pacific Society of Infection Control (APSIC), organized by Ministry of Health (Malaysia), Malaysian Society of Infectious Disease and Chemotherapy, and Infection Control Association of Malaysia, was held between 8 July and 11 July 2007, in Kuala Lumpur Convention Centre (KLCC), Malaysia.

The Congress is also supported by the Association for Professionals in Infection Control (APIC), the International Federation in Infection Control (IFIC), the Society for Healthcare Epidemiology of America (SHEA), the Gulf States Cooperation Council (GCC) Centre in Infection Control and the Philippines Hospital Infection Control Society (PHICS).

The theme for this year APSIC congress was "Infection Control in a Global Village". The congress mainly focused on health care associated infections and protocols and experiences have been discussed. Some of the key topics on new ideas applied in enhancing patients' safety were:

- Infection Control: A Global Patient Safety Challenge, Didier Pittet (Switzerland).

- Hand Hygiene.
- Preventing Surgical Site infections (SSI).
- Device Associated Infection (Catheter-related bloodstream infections, Ventilator Associated Pneumonia, Central vascular catheter (CVC) infections).
- Update on Influenza: A Global Threat.
- Pandemic Preparedness, Hasan Abdul Rahman (Malaysia).
- Zero Tolerance of Healthcare associated Infections.
- The Pitfalls of Isolation Precautions, Geeta Metha (India).
- Isolation for Infectious diseases: Current Concept and practices.
- Ventilation Isolation: The Right Way at the Right Times, Patricia Ching (Hong Kong).
- MRSA-A Global Perspective, Didier Pittet (Switzerland).
- MRSA- New Insight in Management and Prevention, Seto Wing Hong (Hong Kong).
- MRSA- A problem in the Community? Paul A Tambyah (Singapore).
- The Economics of Infection Prevention, Kathleen M Arias.
- Blood borne Viral Infection in Healthcare Settings, C. Murphy.
- HIV infection: Prevention and Infection Control Strategies, Christopher Lee (Malaysia, ID unit, Sungei Buloh Hospital)

2. Infection Control: A Global Patient Safety Challenge, Didier Pittet (Switzerland)

Improving the safety of patient care is an issue that affects health systems in both developed and developing countries. To co-ordinate and accelerate improvements in patient safety, the World Health Organization (WHO) has supported the creation of the World Alliance for Patient Safety, which was launched in October 2004.

The first Challenge for 2005–2006 was launched in October 2005 under the banner 'Clean Care is Safer Care'. The Challenge addresses health care-associated infection, a major, patient safety problem affecting hundreds of millions of people worldwide. Three key elements of the implementation of the Global Patient Safety Challenge were highlighted:

- i. Invitation to ministers of health from all WHO Member States to make a formal statement pledging to tackle health care-associated infection within their countries.
- ii. Second, pilot testing of the new hand hygiene guidelines will occur at sites within each of the six WHO regions.
- iii. Specific expert task forces are addressing critical implementation topics, particularly in relation to hand hygiene. These include issues such as strategies to promote greater patient involvement, global implementation of a WHO hand hygiene formulation, indications for glove use and re-use, and religious, cultural, and behavioural aspects of hand hygiene.

The combined efforts expected under the Global Patient safety Challenge have the potential to save millions of lives and engender major cost savings by improving of basic infection control measures.

2.1 Hand Hygiene

Health care-associated infections affect hundreds of millions of people worldwide and are major, global issues for patient safety. Hand Hygiene is the primary measure to reduce health care-associated infections, however, adherence with the recommendations for hand hygiene practices remains extremely low in most health care settings.

Professor Didier Pittet, leader for Global Patient Safety Challenge, WHO World Alliance for Patient Safety, indicated that time constraint was the leading factor for non compliance. A bedside hand-rub with an alcohol-based agent requires only 20 seconds, so the use of alcohol-based hand-rub should be the new standard of care in health care settings. Strategies to improve hand hygiene compliance must be multi-modal and include staff education and motivation, the use of performance indicators, and hospital management support. Educational programs must be extensive and complete.

Several issues such as availability of guidelines, awareness of potential risks of cross-transmission, and indications for hand hygiene should also be addressed.

Strategies to control infection in the ICU, Dr Nordiah Awang Jalil

- Introduction of the handwashing posters along the walls to the ICU and personally stood there to watch her doctors wash hands and encourage them. This strategy had the Hawthorne effect and did not last long.
- Introduction of the voice message to advise handwashing before entering the ICU.
- Handwashing practices improved but more needs to be done.
- Engaging champions for handwashing and also had an ultra violet ray box to check whether handwashing was done properly. This had an amazing effect and even visitors were convinced to comply with the handwashing practices.

3. Preventing Surgical Site infections (SSI)

Surgical Site Infections are a serious and relatively common serious complication of surgery. Despite the impact sterile technique and prophylactic antibiotics have had on infection rates, the incidence remains high.

Causes of infections are multi-factorial and include factors such as co morbidities, poor surgical technique, and failure to maintain sterility and skin contamination within the patient. Although wounds get contaminated, the host defense mechanism is what prevents most wounds from getting infected. Ms Charlotte from Kimberly Clark Corporation, USA, shared her knowledge on non-pharmacologic methods in SSI prevention and control:

- Aseptic techniques.
- Reduce skin contamination (Pre-surgery shower with antiseptic soap).
- Prevent cross contamination (Thoroughly wash and clean incision site to remove gross contamination before antiseptic skin preparation).
- Use clippers for hair removal (When possible, do not remove hair, if hair needs to be removed, remove immediately before surgery with clippers).
- Prevent hypothermia in preoperative and postoperative phase. (Monitor body temperature).
- Antibiotic prophylaxis.
- Glucose control (Control serum blood glucose levels in all diabetic patients, to avoid hyperglycemia).

The most important SSI prevention intervention is the appropriate selection, administration and discontinuation of antibiotic prophylaxis, removal of invasive devices as soon as possible.

4. Device Associated Infection (Catheter-related bloodstream infections, Ventilator Associated Pneumonia, Central vascular catheter (CVC) infections)

4.1 Preventing Catheter-Related Bloodstream Infections

Catheter-related bloodstream infections (CR-BSIs) are one of the most common and costly health care-associated infections. Dr William Jarvis from USA presented the evidence-based Central Line Bundle in preventing CR-BSIs:

- Hand hygiene before patient and catheter contact.
- Maximal barrier precautions during Central Venous Catheter insertion.
- Chlorhexidine skin antisepsis before and during catheter insertion.
- Use of chlorhexidine patch at the insertion site to prevent local infection.
- Use of Intravenous Team on education and training of staff.

A study by Huang et al (2006) on the control of MRSA, showed a 75% reduction in MRSA colonization/infections using:

- Maximal barrier.
- Contact isolation.
- Alcohol handrub.
- Hand hygiene campaign.
- Routine screening.

Ref: Huang SS/et al; CID 2006:43: 971-978

Other articles on MRSA: Chaix, et al JAMA 1999 (18) 282:1746

Use of antiseptic impregnated catheter for prolonged catheterization.

4.2 Prevention of Ventilator Associated Pneumonia (VAP)

Ventilator-associated pneumonia (VAP) is the most common hospital-acquired infection among patients requiring mechanical ventilation. VAP is defined as pneumonia that arises after 48-72 hours of intubation. VAP can result in prolonged hospitalization, increased medical cost and excess mortality. Hand hygiene, oral care and Head of Bed elevation have been reported to have a significant relationship with reduction of VAP.

Strategies and practices aimed at preventing bacterial colonization and subsequent aspiration leading to infections were discussed:

- Frequent oral care
- Head of bed at 30-45 degrees unless contraindicated
- Hand hygiene
- Use of closed suction system

Oropharyngeal colonization with pathogenic bacteria and subsequent aspiration of contaminated secretions into the lower airways appear to be one of the most important mechanisms for the development of VAP. Thus, VAP might be avoided by proper and frequent oral care. Oral care protocol should be available for healthcare staff. Head of Bed should be

elevated to 30° to 45° in patients receiving mechanical ventilation unless doing so is medically contraindicated.

Evidence-Based Medicine in the Management of Ventilator-Associated Pneumonia, Charlotte D Owens (USA):

- Current definition hospital-acquired pneumonia (HAP), ventilator-associated pneumonia (VAP) and health care-associated pneumonia (HCAP).
- Impact of nosocomial infections.
- Current clinical practice and device prevention strategies and their rationale. Interventions to reduce the incidence of ventilator-associated pneumonia like semi-recumbent positioning in all eligible patients, daily “sedation vacation” appropriate sedation, deep venous thrombosis prophylaxis, stress ulcer prophylaxis, oral care, scheduled daily readiness to wean assessment.
- Most common pathogens in VAP.
- Issues and controversies in the diagnosis.

4.3 Central vascular catheter (CVC) infections

The majority of healthcare-associated infections are associated with invasive devices or procedures. It has been estimated that CVC-BSIs in ICU patients cost \$296 million to \$2.3 billion annually.

Bundles (evidence based prevention) are now commonly used. Example of a bundle for CVC infection prevention:

- Education.
- Hand hygiene.
- Maximal sterile barrier precautions.
- CHG skin antisepsis.
- Optimal site care.
- Monitoring.
- Leadership.
- Checklists are used to check on compliance.

For prolonged catheterization, antiseptic/antimicrobial impregnated catheters may offer benefit.

5. Update on Influenza: A Global Threat

Pandemic influenza originated in East Asia has caused millions of deaths in 1957 and 1968. Influenza vaccines and antivirals have been developed against influenza, however there are limitations on the availability of vaccines in terms of global production. This antiviral is also limited in their efficacy and overuse is predicted to result in resistance. Therefore, Infection Control professionals have pivotal role in preventing and controlling pandemic and seasonal influenza by enhancing the use of personal protective equipment, hand hygiene, vaccination and education of patients, staff and families.

With the mutations of the influenza virus, the vaccines may not be effective at all. Moreover, the development of vaccine takes time, by with the influenza virus may have mutated again or become resistant.. Getting people to wear masks and practice of hand hygiene is the best strategy. Thus prevention is better than cure and education is the way to go.

5.1 Pandemic Preparedness, Hasan Abdul Rahman (Malaysia)

Dato Dr Hasan Addul Rahman, Director of Disease Control Division said Malaysia had begun preparing for the bird flu and pandemic influenza since 2003. The National Influenza Pandemic Preparedness Plan was launched last year to provide a response framework for the health sector and to build capacities to cope with the pandemic. The Plan is in the Internet and communicated to various levels in Malaysia. The government had also allocated a special funding of RM60.4 million, with a yearly allocation of RM47 million for continuous preparation for the outbreaks including antiviral stockpiles, vaccination, training and surveillance.

The Response Plan consists of:

- Political Commitment.
- Intersectoral & multilevel collaborations.
- System of surveillance in human influenza & interaction with animal networks.
- Risk communication in pandemic situation.
- Use of PPE & environmental decontamination.
- Maintenance of essential services.
- Vaccines & antivirals.
- 21 designated hospitals in Malaysia prepared to handle any outbreak.

6. Zero Tolerance of Healthcare associated Infections

Zero tolerance is defined as reducing selected healthcare associated infection rates to zero or to an irreducible minimum. The types of healthcare associated infections that may be reduced to zero are:

- Central line associated blood stream infections.
- Ventilator associated pneumonias.
- Healthcare associated MRSA.

Zero Tolerance of Healthcare-Associated Infections, Denise Murphy (USA)

Denise Murphy, one of the plenary speaker from USA, shared her stories that she collected as she traveled in the hospitals in USA in search of clinical excellence among Institutions who have successfully controlled healthcare associated infections to zero or near zero rates. The speaker used these role models as business cases to demonstrate the value of infection control to administrators or audiences. Purpose is to campaign for support/resources to improve infection control programmes worldwide. Ms Murphy concluded that the reasons for the success are:

- Organizations/Institutions target zero as a goal, being not easily satisfy with a comparable international benchmarking rate.
- Cultural change with commitment from hospital leaderships, physician champions & multi-disciplinary teams.
- Use the IHI bundles approached of evidence based medicine as intervention tools. Transparency of data, data feedback routinely to physician & nurses of the teams.

- Real time analysis.
- Personalize infection i.e. talk about the patient who developed an infection & not a number or a rate to create reality impact.
- Communicate often with the teams.
- Celebrate success and market the value of infection prevention to hospital administrators.

Other measures that add values are:

- Critical event analysis.
- Daily assessment of device use and reminder to remove catheter.
- Involvement of ICU link nurses.
- Weekly executive report.
- Education.
- Empowering staff to stop the line insertion.
- Engineering infection prevention factors into the system of the hospitals/healthcare.

7. The Pitfalls of Isolation Precautions, Geeta Metha (India)

CDC has reviewed and published the Guideline for Isolation Precautions in 2007.

Reasons for the new guidelines are:

- The transition of healthcare delivery from primarily acute care hospitals to other healthcare settings.
- The emergence of new pathogens e.g. SARS, CoV Avian Influenza in humans.
- Renewed concern for evolving known pathogens e.g. *C. difficile*, noroviruses, community-associated MRSA.
- Development of new therapies e.g. gene therapy.
- Threat of bio-weapon attacks.

New additions to the isolation guidelines include:

- Respiratory Hygiene/Cough Etiquette.
- Safe injection practices.
- Use of a mask when performing certain high-risk, prolonged procedures involving spinal canal punctures.
- Protective environment (PE) recommendations for the protection of the immuno-compromised.
- Emphasize administrative involvement for improved adherence.
- Specific infection control considerations for high priority (CDC Cat A) diseases that may result from bioterrorist attacks.

Pitfalls of hand hygiene, gloves, aprons, mask, goggles, sub optimal compliance to isolation & cohorting were discussed.

In a study by Askarian et al in an Iranian Teaching Hospital (2007), education is needed as 90.9% HCW reported that they need additional education on standard precautions and infection control practices. There is a linear positive correlation between the KAP scores.

Ref: Askarian M et al Infection Control Epidemiology, 2007,28(2) 241

8. Isolation for Infectious diseases: Current Concept and practices

Transmission-Based Precautions are based on the modes of transmission of epidemiological important pathogens. These precautions are used when caring for patients who are infected or colonized with such pathogens and are designed to interrupt the transmission of infection that can be spread by:

- Airborne
- Droplet
- Contact

Transmission-Based Precautions may be used in addition to Standard Precautions that should be applied to all patients to minimize the risks of transmitting pathogens from known or unknown sources of infection. All healthcare workers would require training to understand and comply with the current concept and practice. Infection Control professional may need to modify these precautions according to their institution setting, e.g. cohort patients with the same pathogen when single or private room is not available.

8.1 Ventilation Isolation: The Right Way at the Right Times, Patricia Ching (Hong Kong)

The speaker used simple terms and diagrams to break through the engineering jargon to explain how the mechanical systems works, the isolation requirement, effective dilution for negative and positive pressure isolation rooms, select/design the right isolation room to achieve desired results to minimize the risk of transmission of airborne pathogens. The following points were highlighted in the design for an isolation room:

- Air Flow direction.
- Position of supply and exhaust grills-filtered air should enter from one side of the room, flows across the patient's bed and exits on the opposite side of the room.
- Position of bed, size of the room and number of furniture in the room.
- Air exchange and dilution.
- Pressure different of room to anteroom & corridor

Reducing TB Transmission and Natural Ventilation in resource limited settings

A recent evaluation of natural ventilation was effective in reducing nosocomial transmission of tuberculosis (Escombe et al; 2005). Natural ventilation by opening windows & proper use of prevailing winds has the potential of providing high air change rates around 30-50 ACH. In theory, if a room is diluted sufficiently, the risk of cross infection is greatly reduced.

Air changes per hour (ACH) in a naturally – ventilated room observed in an experiment in Hong Kong:

Room Conditions	ACH
Completely open window + open door	29.3–93.2
Completely open window + closed door	15.1–31.4
Half-open window + closed door	10.5–24
Closed window + open door	8.8

The study concluded that; ventilation isolation needs to rely on EMB through literature research. Collaboration with hospital engineer shows that “under ventilation = risk” and “over ventilation = waste”

9. MRSA

9.1 MRSA-A Global Perspective, Didier Pittet (Switzerland)

Prof Didier Pittet presented a summary of recent advances and studies that addresses the control of endemic and community-acquired MRSA.

MRSA are associated with significant adverse outcomes and increased healthcare costs. Patients colonized with MRSA serve as a reservoir for spread within the healthcare environment. The most efficient approach to control of endemic MRSA remains controversial. Several reports have suggested the followings:

- Active surveillance cultures to identify and subsequently manage high-risk patients with MRSA colonization/infection.
- Isolation or cohorting of patients with MRSA colonization/infection.
- The short –term use of topical decolonization strategies in eradicating MRSA in specific patient groups.
- Environmental cleanings.
- Combination of measures like restriction of certain antibiotic classes, education, hand hygiene compliance.

9.2 MRSA- New Insight in Management and Prevention, Seto Wing Hong (Hong Kong)

Prof Seto shared his observation on the pattern of endemic pathogenic organisms during the pre-SARS and post-SARS periods. The rates of acquisition of methicillin-resistant *Staphylococcus aureus* (MRSA), and the rates of ventilator-associated pneumonia (VAP) were compared.

During SARS period, there was a upgrading of infection control precautions, which included the wearing of gloves and gowns all the time, an extensive use of steroids, and a change in antibiotic prescribing practices. The question asked was “does the change in infection control practices help to reduce MRSA rates?” Findings suggested that there was an increase in the rate of MRSA but a decrease in rate of gram-negative organisms. The conclusion was that the MRSA reservoir remains in patients during SARS as suspected SARS patients took up all the isolation rooms. Gloves and gowns were worn all the time therefore cross-transmission remained.

The Society for Healthcare Epidemiology of America (SHEA) guidelines in 2003 designed to control hospital-acquired MRSA and VRE as (1) identification and contact isolation of carriers of MRSA and VRE; (2) strict adherence to hand washing and hygiene guidelines; and (3) prudent use of antimicrobial agents remained as important measures of control.

9.3 MRSA- A problem in the Community? Paul A Tambyah (Singapore)

Methicillin-Resistant *Staphylococcus aureus* is a worldwide hospital acquired problem as a result of antibiotic selection pressure, but reports of emerging infection in individuals in remote rural areas with no exposure to modern facilities. This community acquired MRSA was not related to hospital MRSA strains and were susceptible to a wide range of antibiotics except beta-lactams. Some possess the PVL virulence element associated with severe soft tissue infections. Different strains have different epidemiologic trajectories in different continents, although it was not reported to have occurred in Asia.

With the widespread use of Day surgery, long-term rehabilitative care and ambulatory care in many settings, the so-called community acquired MRSA is often health care associated rather than hospital acquired.

This has implications for Infection Control Practitioners to extend the reach to ambulatory settings to ensure that MRSA control is effective.

There is a concern with community acquired MRSA in US and Europe. Is this a problem in Singapore? The speaker reviewed the situation and mentioned that in Singapore, MRSA is not the most common cause of community-acquired infection. For Singapore at least, most of the so-called community-acquired MRSA is actually healthcare-acquired; people somehow related to healthcare facilities and bring these resistant bacteria out of the hospital and into the community.

10. The Economics of Infection Prevention, Kathleen M Arias

The speaker analyzes the issues surrounding the economics of infection prevention. A growing body of evidence proves that reduction of healthcare-associated infections saves lives and money. It is the goal of infection control professionals to build the economic case for infection prevention and communicate it broadly to relevant parties in order to improve quality.

11. Blood borne Viral Infection in Healthcare Settings, C. Murphy

Global overview of Occupational Exposure

- 40% – 80% of occupational exposures are under-reported by nurses & doctors.
- (AJIC – 2005 June).
- The main reason of the high sharp injuries rates example in Germany was due to the lack of implementation of safety devices.

Ref: ICHE 2007:28:473-8.

EPINET software

The main advantage of the EPINET software in which some hospitals have been using this program, is that it can help analyse data better, so users can prioritize their prevention effect.

Some causes of Needle Stick Injuries

- Carelessness.
- Distraction.
- Altered behavior & circumstance.
- Fatigue (esp. medical trainees).

Prevention measures

- Avoiding unnecessary injections.
- Safe management of sharps.
- Immunization.
- Engineering control – e.g. sharp box placement
- Personal ownership for disposal by user.
- Education.
- Anticipate & prevent sudden patient movement.
- Avoid recapping & manipulation.
- Point of use collecting of used sharps.

Ref: AJIC 1986, 14(1): p1-10

Ref: WHO 2003,81:491- 500

Impact of Safety Devices in US show 35.9% reduction in NSI; phlebotomy NSI decreased by 60%; IV catheter injury reduced by >50%.

Ref: ICHE 2007,28:1-4

Based on the NSI data - What to prioritize:

- Frequency
- Type of device
- Risk of blood pathogen
- Multicenter studies on device efficacy / engineering control
- Vaccination
- Investigate & root cause analyses of exposure/& potential exposure
- Commitment & improved clinical governance & adoption of safety culture by organization and individual.

11.1 HIV infection: Prevention and Infection Control Strategies, Christopher Lee (Malaysia, ID unit, Sungei Buloh Hospital)

Standard precautions are currently used at the hospital. Standard Precautions encompasses precautions in the handling of blood, all body fluids, secretion/excretion & avoidance of contamination of non-intact skin and mucous membrane. However, usually most staff does different things for different patient according to patients' profile.

- Components of Standard Precautions – same as local hospitals
- US data – as at July 2000 – total 56 workers were infected through exposure.
- HIV transmission risk – 3 in 1000 (0.3%), thus 997 times – nothing happened.

Preventing NSI in all settings:

- The best person to consult on preventive measures – is the person working in the unit.
- Location of sharps boxes – look at work processes & decide

- Work practices – actual implementation from the wards e.g. use of neutral zone (kidney dish in OT when passing sharps)
- Safety devices – choose something that don't have to be taught (one that can activate by itself at end of procedure)

Evidence of AZT as PEP: current evidence based on animal models.

Ref:

Card.DM.NEJM 1997,337:1485-90

J Virol. 1998,72:426-73

Arch Int Med 1999,159:2361-3

MMWR June 29, 2001 50(RR11),1-42.