

A newsletter from Kimberly-Clark

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# Meeting the Challenge of Healthcare-Associated Infections

Despite all our advances, we haven't made any gains in terms of reducing Healthcare-Associated Infections (HAIs) in two decades. Today, up to 10% (or 150,000) Australians treated in hospital will develop an infection and this contributes to 7,000 deaths.<sup>1</sup>

However, what is more damning is the fact that a third of HAIs can be prevented.<sup>1</sup>

HAIs cause longer stays in hospital and more surgery. Patients are off work longer and the cost to the healthcare system and hospitals, in terms of staffing and other resources, is considerable. In Australia, if a patient develops an infection during coronary artery bypass graft (CABG) surgery \$12,419 is added to the medical bill. In the case of a deep sternal wound infection, it's another \$31,597.<sup>1</sup>

The major contributors to the morbidity and mortality toll are respiratory and urinary tract infections, surgical wound infections and infections associated with intravascular cannulas.

Dr Wava Truscott, Director of Scientific Affairs and Clinical Education for Kimberly-Clark Health Care, suggested that the next phase on from micro-organisms building resistance to antibiotics and other drugs is the jump of micro-organisms from species to species.

"This is already happening with avian influenza and Creutzfeldt-Jacob disease," she said. "We're now dealing with organisms that are finding new routes into the body and developing new mechanisms for causing illness. They travel faster, migrate easily from person to person and can spread through

hospitals quickly when financial pressures, staff shortages and hospital upgrades and rebuilding disrupts the surveillance and infection control protocol."

The US has adopted a series of targeted approaches designed to specifically reduce mortality. One that is having a major impact is the 100,000 Lives Campaign. It uses the slogan: 'Some is not a number, soon is not a time'. "This campaign came about because healthcare professionals began to question the significance of the problems patients face when they are admitted to a hospital. It's only been going for six months but

already over 63,000 Americans have been saved. Infection control has played a major role. A host of strategies have been put in place to up the ante



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Dr Truscott



# Meeting the Challenge of Healthcare-Associated Infections

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when it comes to preventing infections in central lines, ventilator-assisted pneumonia and surgical sites. In fact, the number of people who have been saved from having an infection and possible death is a testament to how effective pro-active infection control can be".

"Despite all the best intentions of healthcare workers and hospitals to maintain a clean and safe environment, harmful micro-organism transfer through contact appears to be inevitable. Just think of all the portable equipment we use," Dr Truscott said. "The stethoscopes, blood pressure cuffs, pens and pagers.<sup>6</sup> They all carry harmful micro-organisms, which can be transferred to the patient. Then there are the hospital surfaces. Nurses gloves become contaminated 42% of the time they touch these surfaces.<sup>7</sup> In the rooms of patients with an infection, studies show 70% of the surfaces were contaminated<sup>7</sup> and in the case of nurses attending patients with MRSA in a wound or their urine, 65% of their gowns were contaminated with MRSA."<sup>6</sup>

**"Prudent antimicrobial use, timely hand washing, aseptic technique and minimal use and early removal of invasive devices, not to mention adequate infection control staffing to maintain an active program are essential,"**

To properly address this, Dr Truscott believes we have to start with patient education. "We need to educate patients that when they're coming in for surgery or some hospital procedure that they need to tell us if they have a cold, sore throat or some other remote infection so we can either delay the surgery or take the appropriate action. Pre-surgery showers with antiseptic soap and chlorhexidine gluconate make a big difference, as do multiple showers, which have a cumulative effect. Thoroughly washing around surgical sites to remove dirt and organic debris before the application of the antiseptic is also important. There is no doubt using the correct techniques prevents infection".

"Self protection for healthcare workers is also important. Double gloving makes a huge difference in the number of organisms that get through to the skin or wounds. Gowns need to be impermeable to prevent strikethrough as well as being low linting and abrasion-resistant. Mask use is important, as are goggles to protect the eyes. Glove use is very important and scrub and circulating nurses need to be aware that a vinyl glove will quickly fill with water the moment the hands start manipulating the instruments. Hand washing can't be emphasised enough," Dr Truscott says.



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As far as the bigger picture is concerned, infection control requires a breadth of expertise that only a multidisciplinary team made up of infection control practitioners, a hospital epidemiologist, biostatistician, an infectious diseases physician and microbiologists as well as molecular biology laboratory

facilities can give.<sup>1</sup> This necessitates the move to developing academic infection control departments specifically charged with studying and preventing HAIs in our major teaching hospitals. It also means implementing a national validated surveillance system to keep HAIs under control.<sup>1</sup> Lastly, the implementation of a comprehensive protocol of behavioural changes and new product development, at the level of patient care, will also be critical if we are going to achieve the goal of reducing HAIs by as much as the evidence suggests we can".

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# Hand hygiene in the spotlight

Hand hygiene is the most important method for preventing the spread of HAIs in hospitals, yet consistently, studies show hand hygiene practices among hospital staff are haphazard.

Associate Professor Paul Johnson, Deputy Director, Infectious Diseases Department of Austin Health, Melbourne, Victoria, led a multidisciplinary team that was responsible for the highly successful "Operation Clean Start" program, which had a marked effect on reducing MRSA infections in the hospital.<sup>1</sup>

**"It's critical that hand hygiene compliance and infections are continually measured and the results fed back to hospital staff. If you stop thinking of new ways to promote hand hygiene, compliance will fall and you'll end up back at baseline pretty quickly,"**

Associate Professor Paul Johnson

One tactic is the use of a 'control tower'. An 'infection control tower' keeps track of where all the infected patients are. At Austin Health they use a map of the hospital divided into specific areas, each under the surveillance and control of an infection control nurse. Post-it notes are placed on the map to show the location of all colonised or infected patients. Each morning, the nurses update the map using computer-generated alerts from the microbiology laboratory and then go out into the wards to provide tailored feedback and support. Their aim is to assist the ward staff manage their patient's beds in the most appropriate way and the practice ensures the optimal use of isolation rooms, gowns, gloves and hand hygiene procedures.

"Personalising feedback is another successful strategy. During "Operation Clean Start" we fed back results to wards as named patients who suffered an infection rather than as numbers on a spreadsheet. This approach draws on human empathy and results in everyone 'owning' the problem.

"Once we explained the strategy to hospital staff, the take up was instantaneous, and it spread through the hospital like wildfire because staff were sick of seeing patients with infections. For me, this has been the most pleasing aspect of it all."

"We're on the cusp of being overwhelmed by bacterial evolution," Associate Professor Johnson says. "There is already a new strain of community MRSA sweeping through the US. It not only renders standard antibiotics useless but means

MRSA is no longer the province of hospitals alone.

"This development is particularly alarming. It raises the urgency of adopting much higher standards of infection control here so we can be ready for the arrival of this new strain of MRSA and other emerging pathogens," Associate Professor Johnson says.

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## Getting patients in on the act

Why since Dr Ignaz Semmelweiss is hand hygiene compliance so low?

The solution may be patient education.

The World Health Organisation is looking at patient empowerment as a way to combat HAIs. Why? Because patients are a stable variant. Further, patients have a vested interest in getting better.

A US National Telephone Survey conducted last year and presented at the Society for Healthcare Epidemiology of America (SHEA) revealed that 85% of people questioned chose a hospital because it had low infection rates and 94% because it was clean. 80% said they would ask a healthcare worker to wash or sanitise their hands if its importance was explained to them by their healthcare worker<sup>1</sup>.

**Why not get patients on board as an active part of your "infection control" team?**

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# Tackling Ventilator-Associated Pneumonia

**Ventilator-Associated Pneumonia (VAP) is caused by bacterial colonisation of the throat and contamination of the person's lower airway<sup>1</sup> and is the second most common HAI.**

VAP affects 8-28% of patients receiving mechanical ventilation<sup>2</sup> and in contrast to other HAIs, such as urinary tract or skin infections where mortality is low, the death rate from VAP is approximately 30%.<sup>1</sup>

The longer a patient is on ventilation the greater the risk. Pneumonia increases from 6.5% (in patients ventilated for 10 days) to 28% (in patients on ventilation for 30 days).<sup>3</sup> In some cases, when the lung infection is caused by high-risk pathogens, the mortality rate from VAP can be as high as 76%.<sup>2</sup>

If VAP develops within 48 to 72 hours of the patient starting ventilation, it is called early-onset pneumonia. This form of VAP is most often due to antibiotic-sensitive bacteria.<sup>1</sup> If the pneumonia develops after three days, it is considered late-onset pneumonia and is often caused by antibiotic-resistant pathogens.<sup>1</sup>

These pathogens can come from the patient themselves, the hospital environment or through contact with other patients, staff and invasive devices.<sup>3</sup>

When it comes to the role of devices and VAP, endotracheal intubation, mechanical ventilation, nasogastric tube placement and enteral feedings are all contributory factors.<sup>3</sup>

At an institutional level, when healthcare workers take part in VAP preventative education programs, specifically tailored to issues in that particular hospital, prevalence rates have been shown to drop.<sup>1</sup> These types of programs not only improve clinical outcomes but also reduce the costs associated with VAP. In order to be effective, they rely on a person or group to take charge of the whole program and they require the presence of a

HAI surveillance system for tracking infections.<sup>1</sup>

At an individual level, there are many precautions that can be taken to reduce colonisation and prevent VAP.

Initiatives include:<sup>4</sup>

## Hand washing and using gloves

Hand washing is crucial and is the basic first step. Wearing gloves, especially when patients are being suctioned is most important, even if close-suction devices are being used. Gloves are very easily contaminated and must be changed before treating other patients or after performing other tasks.

## Routine oral hygiene

Effective oral care involving brushing the patient's teeth, using mouthwashes and thorough suctioning of oral secretions is also important. Routine oral hygiene programs reduce VAP by 57.6%.

## Suction

Endotracheal suction protocols reduce VAP. Closed Suction Systems also reduce patient exposure to environmental pathogens and reduces respiratory stress.

## Nasal hygiene

Regular nasal care is as important as oral care, especially if the patient has had a nasogastric or nasoenteric tube in place. Nasotracheal intubation should be avoided wherever possible in favour of the oropharyngeal route.

## Patient Turning and Positioning

Routine turning helps move mucous accumulating in the lower patient airway, which can be a



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breeding ground for VAP. Elevating the patient's head 30 to 45 degrees reduces the accumulation of secretions in the sub glottic area.

### **Prevent patient contamination by circuit condensation**

Warm expired air has a tendency to condense in ventilator tubing promoting microbial growth in the pooled condensate. Condensation traps can be used to allow drainage without opening the circuit, which can cause a microbial dump into the lungs or contamination from the external environment.

### **Endotracheal cuff pressure**

The maintenance of optimal pressure in the endotracheal cuff while the patient is intubated is important, if it is under-inflated it can form creases where secretions collect. Avoid any unnecessary manipulation of the endotracheal tube, which can cause gaps in the cuff allowing secretions access to the patient's lungs. Early tube removal also reduces VAP.

### **Use single-use devices**

This prevents cross-contamination from reusable devices. All other reusable devices, such as resuscitation bags, temperature probes should be subject to sterilisation.

### **Digestive tract decontamination**

Still a subject of much debate even though antibiotic paste is used in the mouths and stomachs of ventilated European patients to prevent VAP.

### **Influenza vaccinations**

All staff should receive seasonal influenza vaccinations.

### **Avoid antacids and histamine type-2 antagonists**

Ventilated patients are at risk of stress ulcers and when antacids and histamine type-2 antagonists are used they create an acidic environment promoting bacterial colonisation and increase in gastric volume and distension.

### **Use post-pyloric feeding**

Post-pyloric feeding as opposed to gastric feeding is associated with an overall reduction in pneumonia.

Healthcare professionals have an instrumental role to play in reducing VAP in hospitals. Nurses in particular can be instrumental by keeping vigilant for symptoms, assisting when a diagnosis is made and decreasing the risk factors.<sup>3</sup> Infection control has a major responsibility to coordinate the efforts of multidisciplinary caregivers so a full team approach is directed at overcoming what is a multifaceted problem.<sup>3</sup>

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