

CliniLever® Health Care Tapware

Commercial Tapware and Valves



**Innovation to Support
Evidence-Based
Healthcare Design**



A family
owned
Australian
business



What is Infection Control?

Infection control is focussed on preventing and reducing the impact of nosocomial or Healthcare-Associated Infection (HAIs). It addresses factors related to the spread of infections within the health-care setting (whether patient to patient, patient to staff, staff to patient, or staff to staff).

Definitions

HAI's or superbugs are difficult to treat because they do not respond to antibiotic treatment. The main bacteria that are of concern are:

- Staphylococcus aureus:**
 1 in 3 people carry the *S.aureus* bacteria in their nose or on their skin. In most cases the bacteria do not cause problems. Occasionally they cause serious health problems such as skin and wound infections, pneumonia and infections in the blood or bone. The concern is for the hard to treat variants that are resistant to antibiotics - Methicillin Resistant *S.aureus* (MRSA) (commonly known as "Golden Staph") and Methicillin Sensitive *S. aureus* (MSSA). *S.aureus* is responsible for the largest proportion of healthcare-associated bacterial infections (Cruikshank and Ferguson 2008) and is usually spread by direct skin contact (typically via hands) with a person who is infected or colonised, or through contact with shared items such as towels and shared surfaces such as door handles, taps and benches.
- Clostridium difficile:**
C. difficile is an anaerobic toxin-producing bacterium that usually causes diarrhoea and is the most common cause of healthcare-associated gastrointestinal infection. Transmission usually occurs through shared equipment, a contaminated environment or the hands of healthcare workers. The organism can be readily cultured from inanimate environmental sources such as beds, cupboards, floors and walls, as well as from the hands of healthcare workers. The impact of *C. difficile* on the health-care system is considerable with patients requiring additional infection-control precautions, specific treatment and an extra 1 to 3 weeks in hospital (McGregor, Riley and Van Gessel 2008).
- Vancomycin**
 Vancomycin is an antibiotic used to treat infections caused by enterococci, which normally reside in the bowel without causing any illness. Vancomycin Resistant Enterococci (VRE) infections are dangerous for people with a weakened immune system but most recover with appropriate antibiotic treatment. VRE infections are typically spread by physical contact with faeces, skin or objects that have been contaminated with VRE. This includes contact with contaminated hands, hospital equipment, bathroom taps and door handles.

Risk/Incident Rate

The benchmark incident rate for infection of MRSA is 2 cases for every 10,000 occupied bed days. The incident rate in Australia varies by state with those with mandatory incident reporting (WA) having the lower incident rate (1.1 per 100,000 population). Ferguson (2007)⁽¹⁾ indicated in his research that the average for Australia was 4.5-5.7 per 100,000 population. Prof. Collignon estimated that these figures are under reported due to voluntary reporting in all states except WA. The figure from his study is 35/100,000 population or today 7,700 episodes a year in Australia⁽²⁾.

Relative burden of health care-associated MRSA morbidity across Australia

Area	Health care-associated MRSA bacteremua events	Year(s) of Data	Rate per 100,000 population
Darwin	16	2006	13.3
New South Wales/Act**	437-602	2033-2005	6.2-8.5
Queensland*	133	2005	3.4
South Australia*	37	2006	2.4
Tasmania*	3	2006	0.6
Victoria**	270-330	2000-2006	5.4-6.6
Western Australia*	22	2006	1.1
Total	918-1143		4.5-5.7

MRSA = methicillin-resistant *Staphylococcus aureus*. ACT = Australian Capital Territory.

* Figures from these jurisdictions include private hospital event estimates.

** Figures from NSW and Victoria minimum estimates, because of incompleteness of current reporting in these states.

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Death rate

Consequence of *S.aureus* bacteremia (SAB) includes serious infection of endocarditis (heart infection), osteomyelitis (chronic bone infection) and septic arthritis (joint infection) leading to prolonged hospital stays and costs. The average stay in hospital for a patient with SAB is 26.5 days.

As reported by the Australian Productivity Commission (2009) a study estimated that **Australian hospitals have a minimum of 180,000 Hospital Acquired Infections annually!**

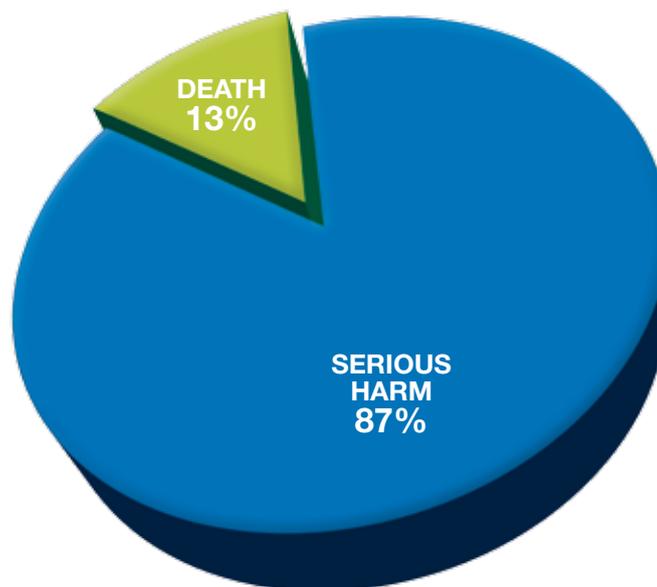
According to the Australian Council for Safety and Quality in Health Care **approximately 1 in 5 suffer serious harm and approximately 1 in 30 die.**

Prof. Peter Collignon, an infectious disease expert from Canberra Clinical School of the Australian National University, has estimated in his research that 1,700 deaths a year could be attributable to *S.aureus*².

- **180,000 HAI per year in Australia**
- **1,700 deaths per year in Australia for SAB**

UK studies⁽³⁾ show the death rate from MRSA infection at 34% and MSSA at 25%. In NSW recently over 500 cases of MRSA were identified across 46 hospitals. The death rate was estimated at 20% by Prof. Collignon.

Estimated Hospital Acquired Infections 2009



Australian Productivity Commission (2009)

Cost

Each case of MRSA translates to a cost of \$22,000 per case. In NSW this is a cost of \$11 Million⁽²⁾.

Australia wide, with an estimated 7,700 episodes a year, the cost is estimated at \$169 million annually.

- **7,700 MRSA case per year in Australia**
- **\$169 Million per year cost of MRSA**

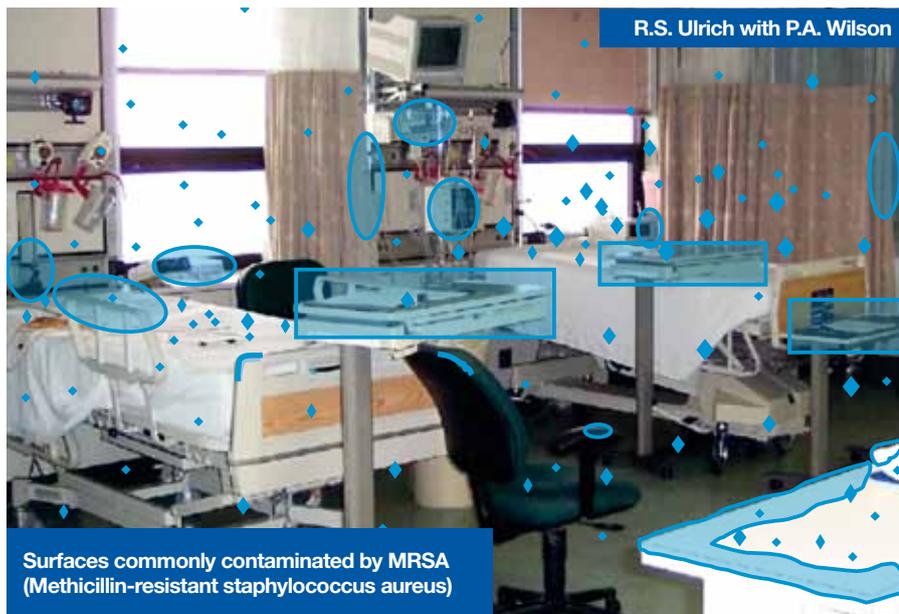
State	Incident rate per 100,00 population	Population	Incidents	Cost annually
NSW	8.5	6,000,000	510	\$11,220,000
QLD	3.4	5,000,000	170	\$3,740,000
SA	2.4	2,000,000	48	\$1,056,000
VIC	6.6	6,000,000	396	\$8,712,000
WA	1.1	2,000,000	22	\$484,000
AUSTRALIA	35	22,000,000	7,700	\$169,400,000

Collignon P., Nimmo G., Gottlieb T., Gosbells L., "Staphylococcus aureus Bacteremia, Australia", CDC 1010-6059, Vol11, No.4 April 2005.

How is this caught?

Hospital Acquired Infection (HAI) is nothing new. Acquiring infection is a simple process. Firstly there must be a place for the bacteria to reproduce then a method of transmission and lastly a vulnerable host. **Breaking the chain of infection at any point will stop it.**

Ulrich and Wilson⁽⁶⁾ state from their research that under favourable conditions microorganisms will proliferate and remain in an infectious form (as shown in the example pictured).



Who is at risk?

- People with weak immune systems (people living with HIV/AIDS, cancer patients, transplant recipients, severe asthmatics, etc.)
- Diabetics
- Intravenous drug users
- Use of quinolone antibiotics
- Young children
- The elderly

Solutions for impacting HAI's

The following are the recognised means of reducing the risk of *S.aureus* and are part of any infection control program:

1. Hand hygiene — the five critical moments
2. Decontamination of the environment and shared equipment
3. Contact precautions for infected and colonised patients
4. Active surveillance and screening
5. Effective programs that prevent common infections (eg, intravascular catheter sepsis, surgical site infections)
6. Good antibiotic stewardship
7. Better hospital design to include more single rooms for patients

Design of our healthcare and correctional facilities

This is critical because the best way to stop HAI is to eliminate the infectious agent or deny it a reservoir in which to grow.

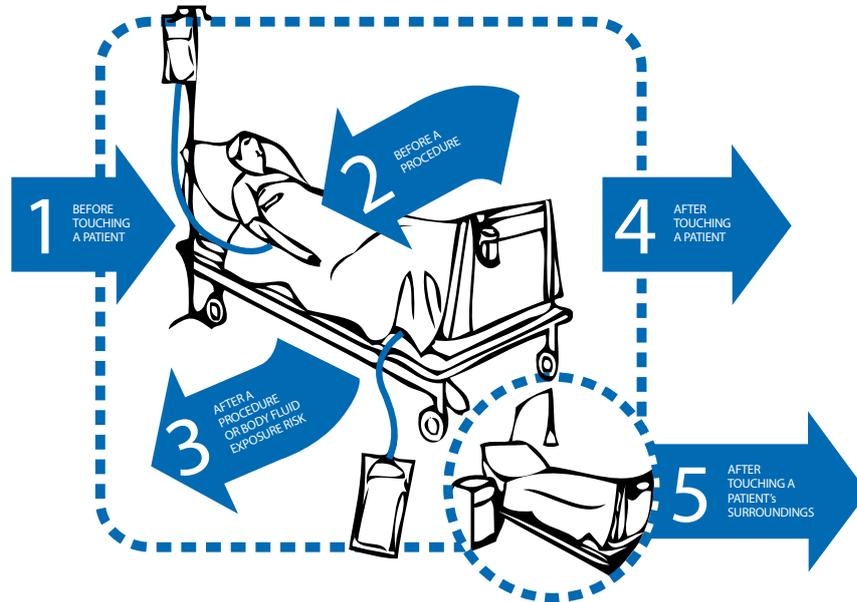
Single room design - The NHS Confederation (UK) suggests single rooms with en-suite facilities as a way of optimising infection control. Studies including Mulin's⁽⁶⁾ suggest single rooms with convenient sink access improve hand hygiene compliance. The cost of such a design should be viewed in the long term. The financial savings from efficient control are, according to a Philadelphia study, three times the cost of control measures.

Studies have shown that for the prevention and control of HAI's hydraulic and architectural design must ensure adequate access to suitable hand wash facilities. Basins should be sited, in addition to washroom applications, in all patient areas, treatment rooms, sluices and kitchens. In clinical areas they should be fitted with wrist or elbow operated mixer taps or ideally a mixer with automatic 'no touch' operation.

Beyond building design and hand washing facilities specifying products designed to break the infection chain will produce a safer environment.

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The Five Critical Moments

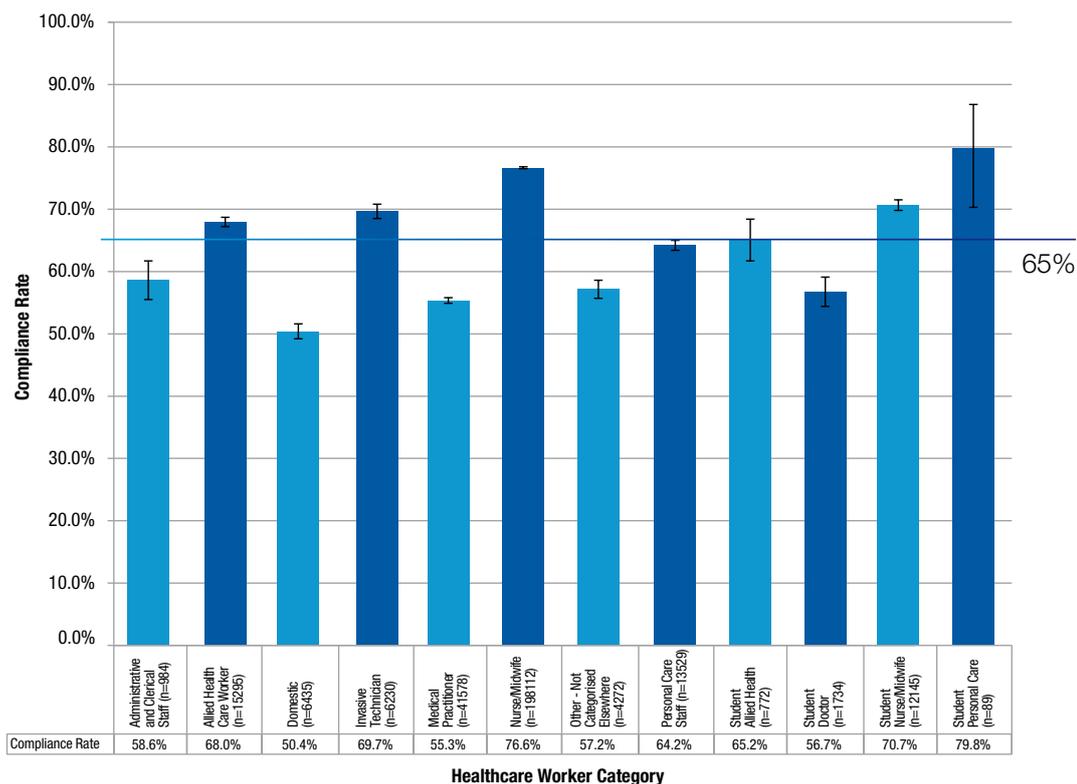


Hand Hygiene Compliance

Compliance within the healthcare environment to hand hygiene is the focus of the Five Moment of Hand Hygiene program. With the WHO setting a minimum benchmark of 55% compliance and other local bodies setting higher goals to reduce the risk (Department of Human Services Victoria has a 65% target) our healthcare professionals are falling well short.

National Hand Hygiene Compliance Rates by Healthcare Worker Type - All Facilities Period 2 (Mar-June) -2011

Moment	Compliance Rate
1 Before Touching a Patient	50.4%
2 Before Procedure	58.5%
3 After a Procedure or Fluid Exposure Risk	69.6%
4 After Touching a Patient	67.0%
5 After Touching a Patient's Surroundings	44.1%



⁽⁵⁾Two of the key barriers identified in the Hand Hygiene Project development work were “lack of access to sinks” and “concerns with water saving”.

Sustainability or whole of life costs are now recognised as important in the design and development of our healthcare facilities.

Maintenance

Often an overlooked factor in the purchase decision, maintenance costs can have a significant impact on the life costs of a facility.

Are replacement parts available, if something does breakdown? A comprehensive back-up service is key to a proficient maintenance programme, a reassurance the client may not need at handover but will value as they maintain their facility.

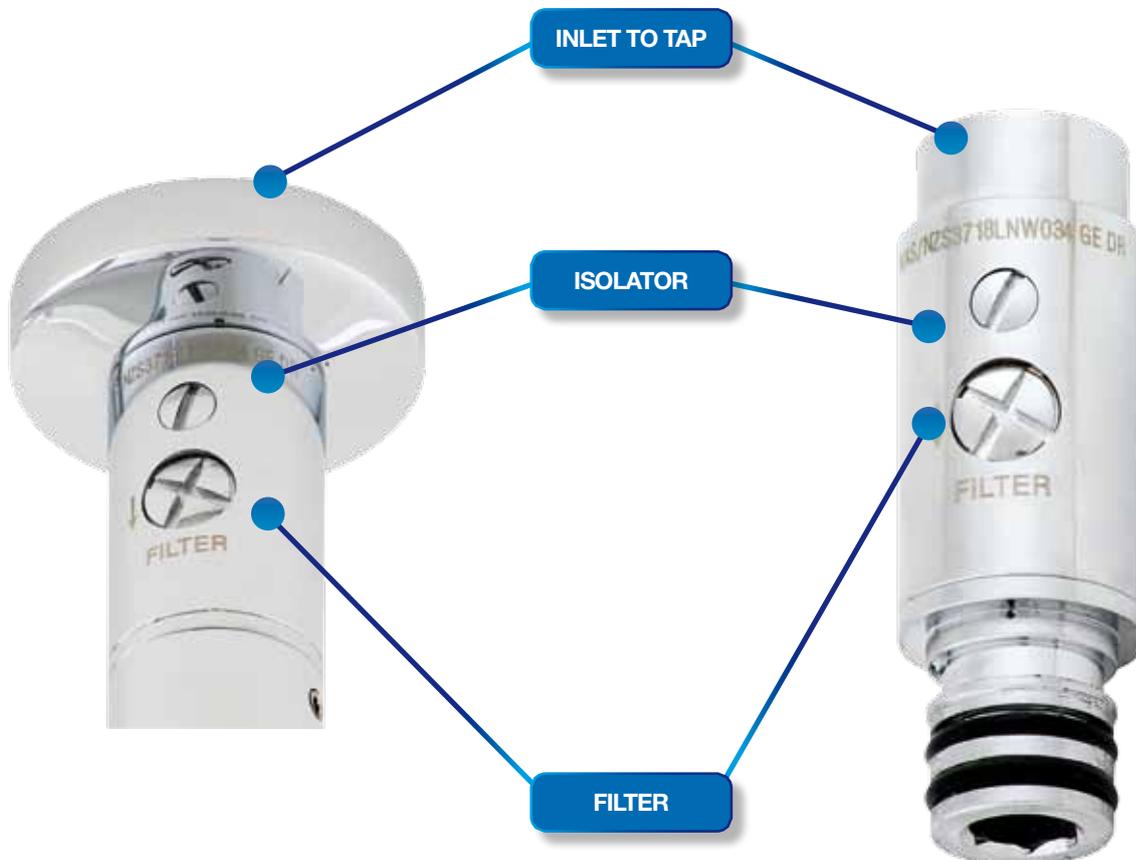
Hospital engineers and maintenance staff understand the true cost of maintenance.

True cost of maintenance = Planning time for all staff involved + maintenance time for all staff involved + escalation cost for call out.

For example, Hollywood Hospital has a 20 minute limit on a maintenance job before a call out to an outside contractor is required hence their true cost is:

Changing washer/repair = 2 days planning + maintenance time to find and isolate tap + escalation cost for call out of \$300 = \$1500-\$2000 per repair.

Why so high for planning? Because being able to close down a tap often requires isolating a whole room, area or ward. Where these services are in operating areas or wards the close down requires substantial consultation.



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Water Saving of over 100,000⁽⁷⁾

A typical hospital will use 1,460 litres of water each year for every square meter of floor space. For Gold Coast Hospital that's 250 million litres a year! (170,000 sqm).

Almost 55% of water used within a hospital will be used in sanitary facilities. Saving water therefore makes good sense for both environmental and financial reasons. All hospital sanitary facilities, whether clinical or public, have the potential to save money and natural resources through sound product specification and building management.

It is understood that all facilities can reduce water consumption and their water bills. There are a number of Australian case studies that show water savings of up to 68%⁽⁹⁾. For a hospital this is obviously a massive benefit and one that can be realised without compromising hygiene, infection control or patient care.

Almost 25% of all the water used in a typical hospital washroom comes out of taps. A tap with a flow of 12 litres per minute which is used 100 times a day for 20 seconds each time will use 400 litres of water per day. By specifying CliniLever® a tap with the required WELS rating may provide savings of up to an 13%.

Making it easier

It is best practice that benches be free of equipment to reduce the risk of scum or bacteria build up and to ease cleaning. Hence the move to wall-mounted taps is now leading the design drive. The contemporary design of smooth lines and curves is driven by the need to reduce surface droplets and ease cleaning. Any hard edges or ridges increase the time (and cost) spent cleaning as well as provide a zone for dirt to accumulate.

CliniLever® - Reducing the risk of contamination: Hand hygiene compliance is key to winning the fight against MRSA. Providing easy use, clean and maintain taps for all situations is the goal of Galvin Engineering. CliniLever® is the answer for users, hospital engineers and infection control practitioners in today's modern healthcare environments.

Easy to Use - Low lying style to assist with the activation of the tap unit. Easy to reach lever handles to promote the use of elbow or wrist and break the chain of contamination through touch.

Easy to Clean - Wall mounted tap designs to avoid clutter on the basin top in order to facilitate simple, fast and easy cleaning and promote a clean room environment.

Smart Design - New design features which include a horizontal angled spout reduce stagnant water and help minimise bacteria growth. By reducing build up of scale and other Total Dissolved Solids (TDS) that may be a source of food for bacteria.



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The Design

Galvin Engineering has worked closely with architects and hydraulic engineers to develop the functional requirements of the new CliniLever® range. This combined with continuous review of healthcare guidelines means that we are able to provide an innovative product to support evidence based healthcare design that will help beat HAIs.

Developing the style and operation of the CliniLever® healthcare range is integral as infection control is never far from the minds of the design and installation team.

Resilience

While a plethora of finishes can be found on modern taps, the classic chrome plated finish cannot be surpassed. The chemical bond between the body of the tap and the finish make its durability superior to other surface treatments on the market.

Smooth

The new range reduces contact transmission by eliminating the places where bacteria hide. Inevitably product selection will have an impact on cleaning regimes. Obviously a smoothly contoured assembly is much easier and faster to clean effectively. Fitting a wall mounted tap unit instead of the traditional hob mounted type will facilitate faster and more economic cleaning.

Products that have 'cleaning friendly' smooth outer skins are more complex to manufacture because of their internal structure. Manufactured at Galvin Engineering's ISO9001 quality endorsed Australian manufacturing facility guarantees reliability. A 5 year warranty is provided across the CliniLever® range which is subject to our warranty conditions.



Source:

- ⁽¹⁾ Ferguson JK. Healthcare-associated methicillin-resistant Staph. aureus (MRSA) control in Australia and New Zealand. *Aust Infect Control* 2007; 2: 60-66.
- ⁽²⁾ Collignon P., Nimmo G., Gottlieb T., Gosbells I., "Staphylococcus aureus Bacteremia, Australia", *CDC* 1010-6059, Vol11, No. 4 April 2005.
- ⁽³⁾ Second Year of the Department of Health's mandatory MRSA bacteraemia surveillance scheme in acute trusts in England: April 2002-March 2003
- ⁽⁴⁾ Collignon PJ, Grayson ML, Johnson PDR. Methicillin-resistant Staphylococcus aureus in hospitals: time for a culture change [editorial]. *Med J Aust* 2007; 187: 4-5. http://www.mja.com.au/public/issues/188_01_070108/letters_070108_fm-4.html
- ⁽⁵⁾ Hand Hygiene project (<http://wiki.qut.edu.au/display/hhe/hand+hygiene+evaluation+project>)
- ⁽⁶⁾ Ulrich R.S. & Wilson P., Evidence based design for reducing infections, *Public Review. Health.* 8, 24-25 (2006)
- ⁽⁷⁾ Westmead project on watersaving (2004/05) accessible at <http://www.sydneypwater.com.au/Publications/CaseStudies/HospitalsSavesLivesandWaterConserver6.pdf>
- ⁽⁸⁾ Mulin, B., Rouget, C., Clement, C., Bailly, P., Julliot, M. C., Viel, J. F. et al. (1997). Association of private isolation rooms with ventilator-associated Acinetobacter baumannii pneumonia in a surgical intensive-care unit. *Infection Control and Hospital Epidemiology*, 18(7), 499-503.
- ⁽⁹⁾ NSW: *Sydney West Area Health Service* - Hadfield, J. (2008) 'Reducing our Health Environmental Footprint', presentation, Sydney West Area Health Service, <http://www.physiciansweek.com/pdf/Presentations/hadfield.pdf>, accessed 4 March 2009. and QLD: *St Andrews's War Memorial Hospital, Queensland* - St Andrews's War Memorial Hospital (2008) 'St Andrew's Hospital Beats All Expectations in Reducing Water Usage', http://www.uhealth.com.au/sawmh/index.php?option=com_content&task=view&id=53, accessed 21 June 2009.

Whilst all reasonable care has been taken in compiling the information in this document, the designs, dimensions and products shown are indicative only and should not be relied upon without our prior approval. Due to our policy of continuous development, we reserve the right to alter any details of specifications or products without notice. All information, drawings, technical specifications and product designs remains the property of Galvin Engineering Pty Ltd.

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