CliniLever® Health Care Tapware

Commercial Tapware and Valves

Innovation to Support Evidence-Based Healthcare Design

Certified System Quality ISO 9001 SAI GLOBAL

AUSTRALIAN OWNED

GalvinEngineering
the mark of reliability

Customised commercial water control products

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, from patients to staff and from staff to patients, or among-staff).

Definitions

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

- **Staphylococcus aureus:**
  1 in 3 people carry the Staphylococcus aureus bacterium in their nose or on their skin. In most cases the bacteria does not in cause problems. Occasionally it can cause serious health problems such as skin or wound infections, pneumonia or infections in the blood or bone. The concern is for the hard to treat variants that are resistant to antibiotic - Methicillin Resistant Staphylococcus Aureus (MRSA) and (commonly known as "Golden Staph") and Methicillin Sensitive Staphylococcus Aureus (MSSA). Staphylococcus 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 like door handles, taps and benches. There are various strains of MRSA.

- **Clostridium difficile:**
  Is an anaerobic toxin-producing bacterium 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 Clostridium difficile on the health-care system is considerable, with patients requiring additional infection-control precautions and specific treatment, and can spend an extra 1 to 3 weeks in hospital (McGregor, Riley and Van Gessel 2008).

- **Vancomycin**
  Is an antibiotic used to treat infections caused by enterococci, which bacteria are normally residing in the bowel without causing any illness. 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, or 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 as it is voluntary reporting in most states except WA. His 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. Average stay in hospital for a patient with S.aureus 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!**

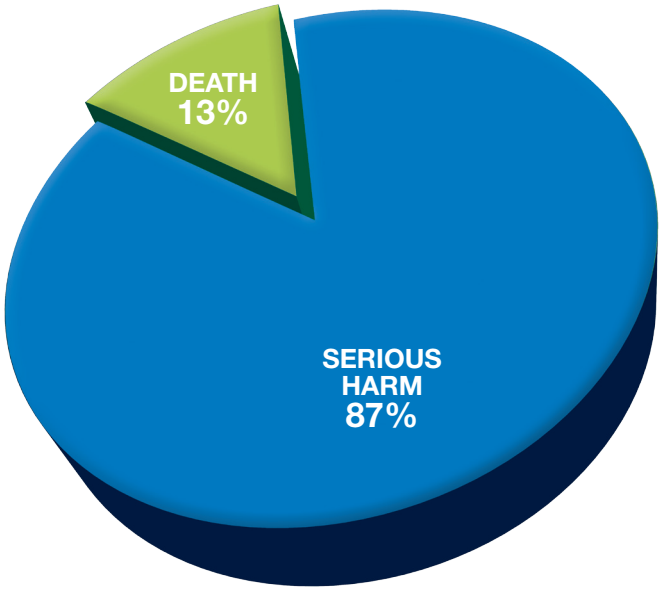
According to the Australian Council for Safety and Quality in Health Care, **approximately 1 in 5 suffer serious harm and approximately 1 in 30 die**.

Prof. Peter Collignon, an infectious disease expert from Canberra Clinical School of the Australian National University, has estimated in his research that 1700 deaths a year could be attributable to Staphylococcus aureus[2].

- **180,000 HAI per year in Australia**
- **1700 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 where 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. NSW this is a cost of $11 Million[2].

For Australia with an estimated 7,700 episodes a year - the estimated cost is $169 million annually.

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

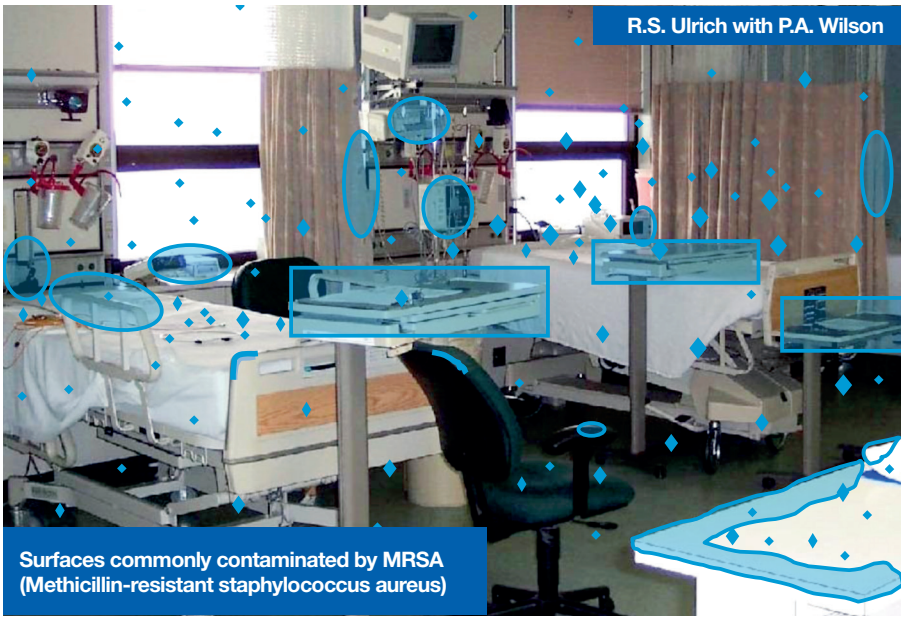
State	Incident rate per 100,00 population	Population	Incidents	Cost annually
NSW	8.5	6,000,000	510	$11,220,000
QLD	3.4	5,000,000	170	$3,740,00
SA	2.4	2,000,000	48	$1,056,000
VIC	6.6	6,000,000	396	$8,712,000
WA	1.1	2,000,000	22	$484,000
AUSTRALIA	**35**	**22,0000**	**7,700**	**$169,400,000**

Collignon P., Nimmo G., Gottieb T., Gosbells 1., “Staphylococcus aureus Bacteremua, Australia”, CDC 1010-6059, Vol11 , No.4 April 2005.

How is this caught?

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

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



Surfaces commonly contaminated by MRSA (Methicillin-resistant staphylococcus aureus)

Who is at risk?

Those at risk are people with compromised immune systems such as

- 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 for reducing the risk of S.aureus and seen as 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; and
7. Better hospital design to include more single rooms for patients.

Design of our healthcare and correctional facilities; this is seen as a critical for the best way to stop HAI is to eliminate the infectious agent or deny it a reservoir in which to grow.

Single room design - In the UK, the NHS Confederation has gone even further; it suggests single rooms with en-suite facilities as a way of optimising infection control. Studies including Mulin's[8] suggest single room with convenient sink access improves 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 for the Prevention and Control of HAI's hydraulic and architectural design must ensure adequate access of 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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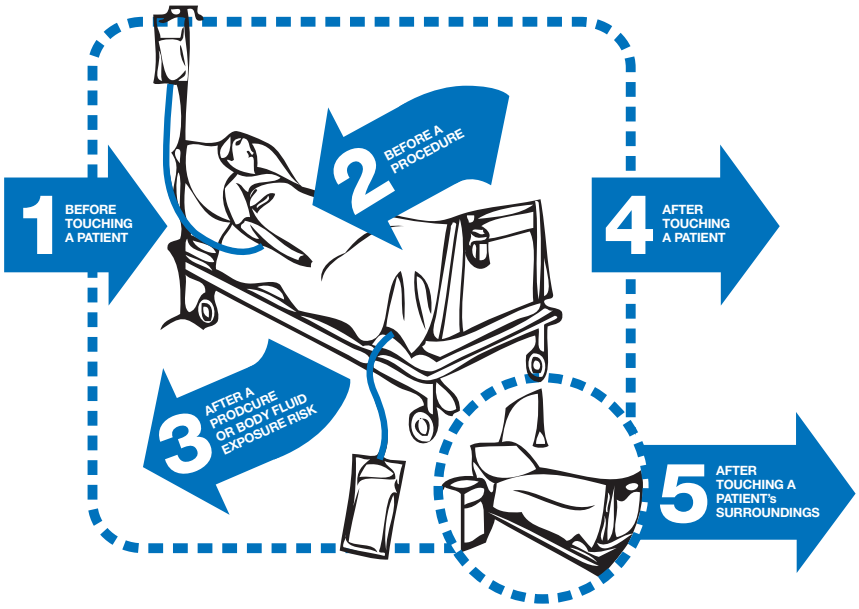
The Five Critical Moments



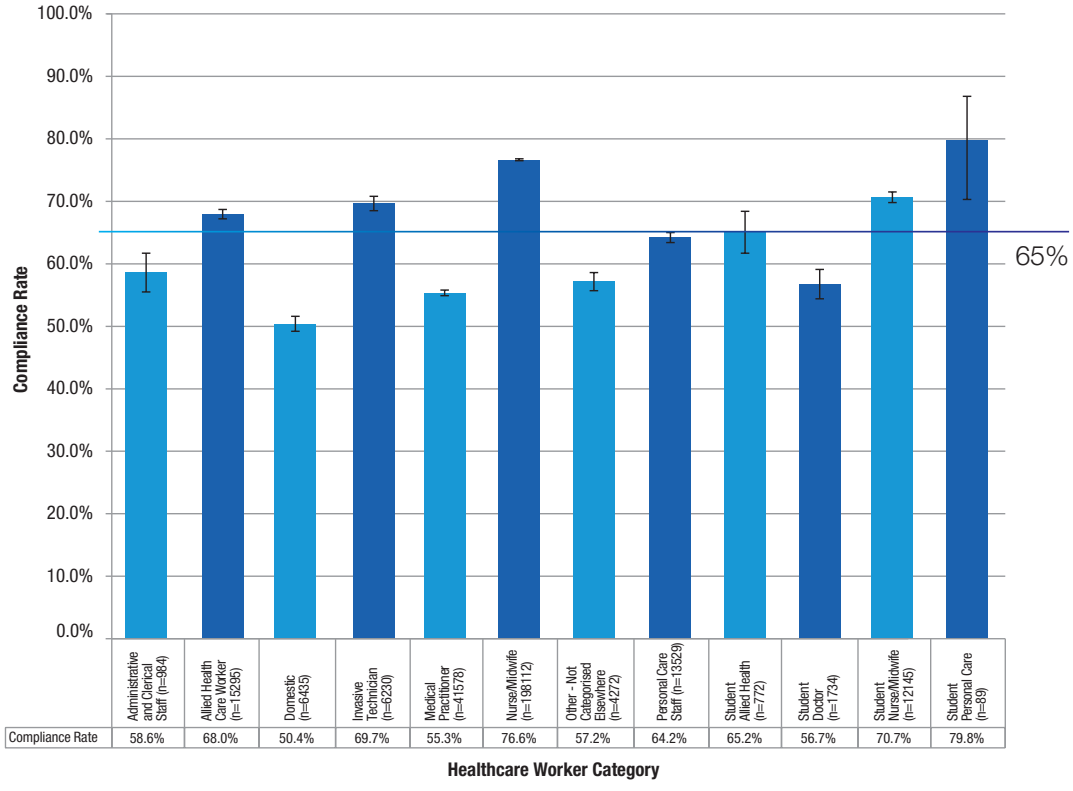
Hand Hygiene Compliance

Compliance within the healthcare environment to hand hygiene is the focus of the Five Moment of Hand Hygiene program. With WHO setting a minimum benchmark of 55% compliance and with 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:

Moment	Compliance Rate
1 Before Touching a Patient	50.4%
2 Before Precedure	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]One of the key barriers given in the Hand Hygiene Project development work was "lack of access to sinks" and "concerns with water saving".

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



Sustainability or whole of life costs are now recognised as important to the decision 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.

If something does break down, are replacement parts available? 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.

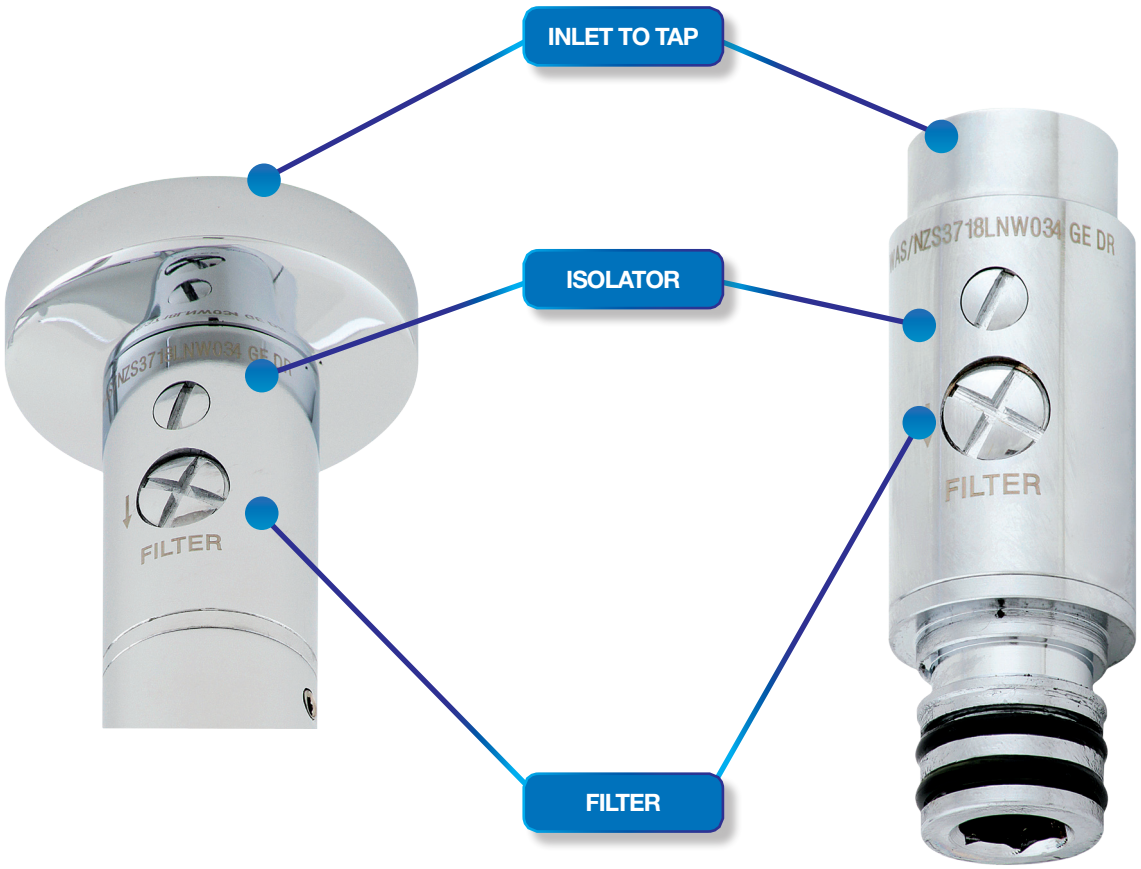
Hospital engineers and maintenance staff understand the true cost of maintenance is based:

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

Where there are always maintenance jobs to do criteria for escalating work to outside contractor. Hollywood Hospital has a 20 minute limit on a job before call out and 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 operating areas or wards the ease to 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 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 by 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 a 100 times a day for 20 seconds each time will use close to 400 litres of water each day. By specifying CliniLever® a tap with the required WELS rating may provide savings of up to an 13%.

Making it easier

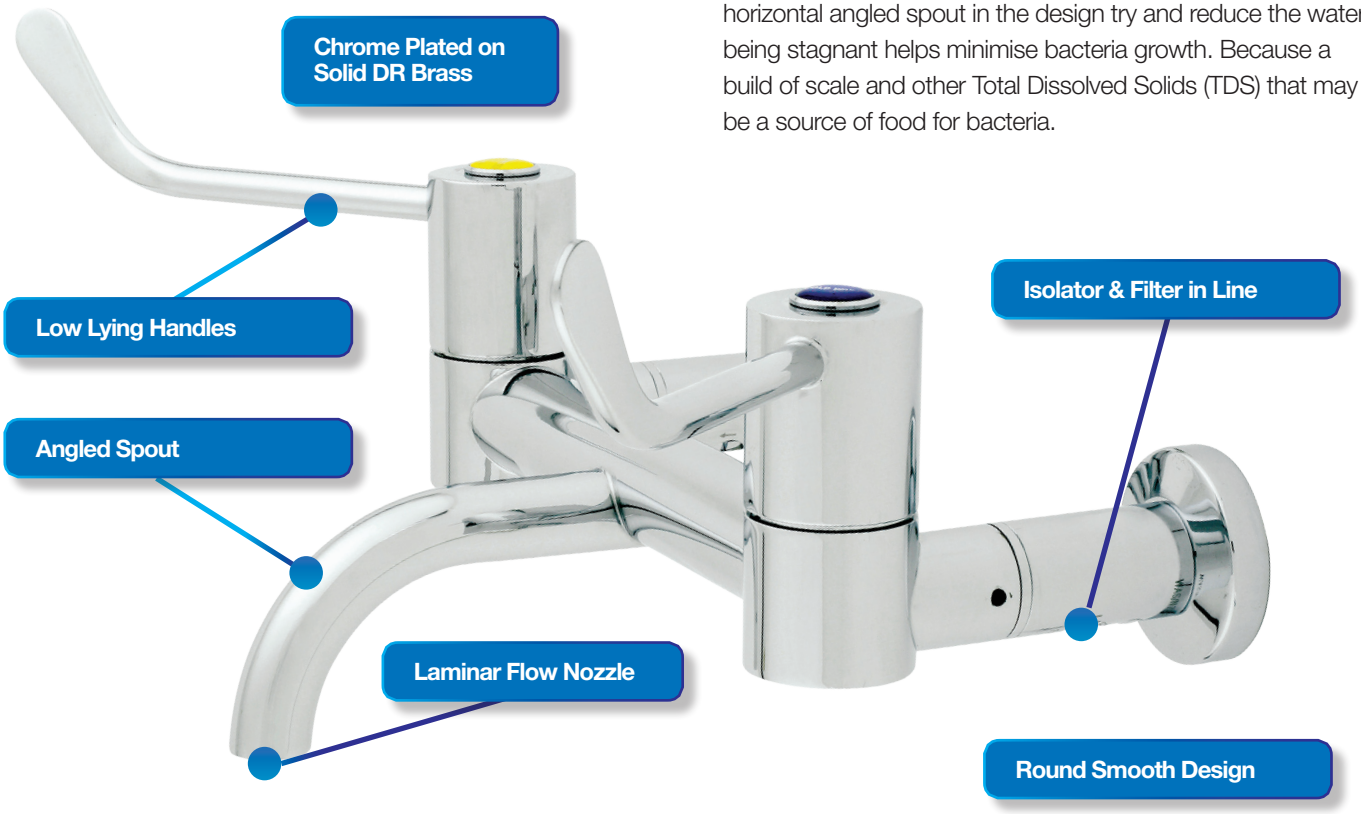
It is recognised as best practice that hobs and benchtops should be free of equipment to reduce the risk of scum or bacteria build up and to ease cleaning. Hence the move to wall-mounted taps is now leading the design drive. Additionally the contemporary design of smooth lines and curves is driven by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

CliniLever® - Reducing the risk of contamination; and hand hygiene compliance is key to winning the fight against MRSA. Helping this by providing ease to use, clean and maintain range of taps for all situation has been 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 of lever handles 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 simplify and facilitate faster and easy cleaning and promote a clean room environment

Smart Design - New design features which includes a horizontal angled spout in the design try and reduce the water being stagnant helps minimise bacteria growth. Because a build 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 range of CliniLever®. This combined with continued review of Healthcare guidelines we believe that we are able to provide a an innovative design 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 and the design is developed with this factor in mind.

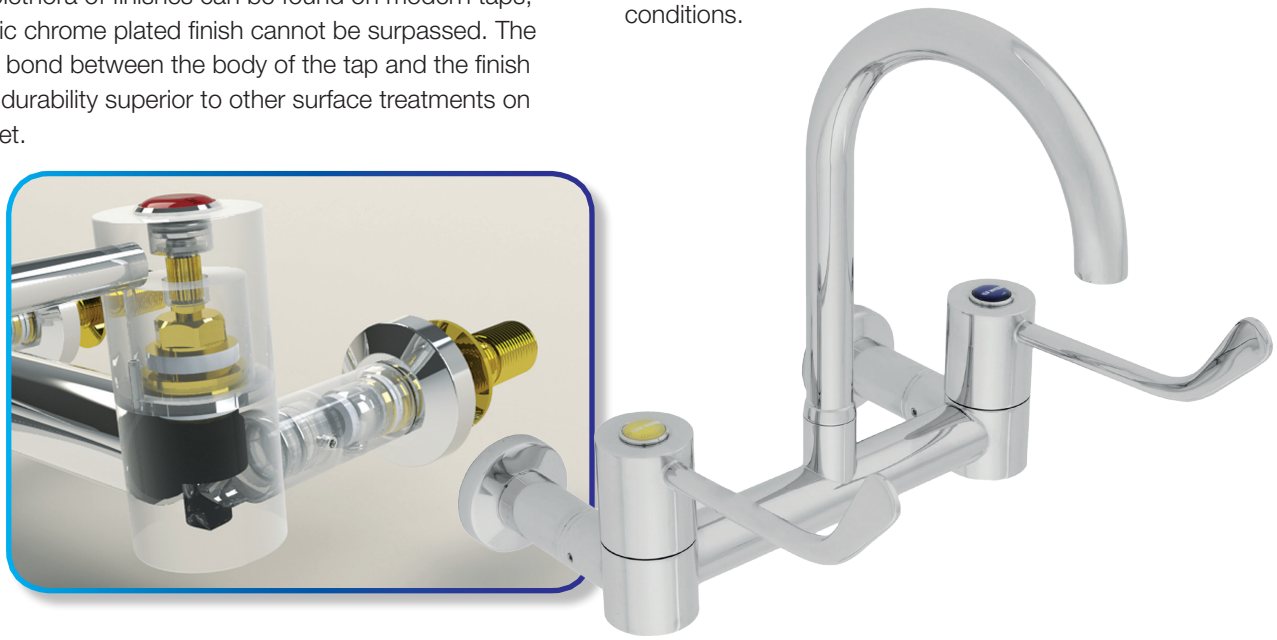
Resilience

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 facilities reliability is guaranteed. 5 year warranty provided across 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 Bacteremua, 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., Evidience based design for reducing infections, Public Review. Health. 8, 24-25 (2006)
(7) Westmead project on watersaving (2004/05) accessible at http://www.sydneywater.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 baumanii 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.uchealth.com.au/sawmh/index.php?option=com_content&task=view&id=53, accessed 21 June 2009.

PO Box 2063, Malaga, WA 6944
Within Australia: 1300 514 074 Outside Australia: +61 (0)8 9249 5900
Fax: +61 (0)8 9249 5916 Email: galvin@galvinengineering.com.au
www.galvinengineering.com.au
ABN 78 008 719 382

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