# Infection control, ethics and accountability

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## ABSTRACT

- Health care-associated infections (HAIs) are a major clinical and economic problem in Australian hospitals, and a significant proportion are preventable.
- HAIs are the result of complex environmental, microbiological, pathological, behavioural and organisational factors, and prevention requires a multifaceted ("bundled") approach, including appropriate policies, educational programs for health care workers, and adequate resources to implement them effectively.
- Failure to protect patients from avoidable harm, including HAIs, has significant ethical implications; it often reflects both organisational systems failure and non-compliance of health care workers with evidence-based policies, including hand hygiene.
- If implemented with appropriate safeguards, infection control "bundles" that include sanctions for poor compliance with hand hygiene and other infection control policies, will achieve sustained improvements where previous approaches have failed.


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Health care-associated infections (HAIs) are generally regarded either as unavoidable complications of life-saving interventions or as system failures resulting from inadequate resourcing. Unlike pandemic influenza or severe acute respiratory syndrome (SARS), they do not generally cause widespread public alarm or social disruption, and usually attract little public attention. We argue that HAIs should be viewed not only as clinical and systems issues, but also as ethical problems encompassing patients' rights and the obligations of health care institutions and individual health care workers (HCWs).

HAIs are, broadly, infections that result directly from contact with the health care system. They are often caused by antibiotic-resistant bacteria or by viruses transmitted, directly or indirectly, from other patients on the hands of HCWs. In 2002, an estimated 1.7 million HAIs occurred in the United States, causing 99 000 deaths.[1] There are limited data for Australia but, proportionately, the burden of HAIs is probably similar. In 2005, the estimated annual cost of HAIs in Australia was at least $1 billion.[2] Potentially untreatable infections with multiresistant organisms are increasing,[3] and respiratory viral infections are a recurring threat to highly immunocompromised patients.[4] The fact that a significant proportion of HAIs are preventable[5] has serious ethical, as well as medical and economic, implications.

## Preventing health care-associated infections: hand hygiene and beyond

It was shown over 150 years ago that the hands of HCWs are the main vector for transmission of nosocomial pathogens,[6] and that hand disinfection can reduce HAI rates.[7,8] Nevertheless, acceptable levels of compliance with recommended hand hygiene practice are difficult to achieve and sustain. Provision of alcohol-based handrub at patients' bedsides,[9] education, and leadership from senior clinicians[10] can improve baseline compliance rates,[11] but significant improvement is rarely sustained. Recent campaigns in New South Wales and Victorian public hospitals have led to modest improvements in compliance, from 47% to 62% (30% to 46% among doctors),[12] and from 21% to 48%,[8] respectively. While these results are encouraging, they also indicate room for significant improvement.

It is theorised that hand hygiene behaviour comprises an "inherent" component, ingrained from childhood and primarily for self-protection, and an "elective" component, primarily to protect others.[13] Deficiencies in the latter are demonstrated by better compliance after, than before, patient contact.[12] Measures designed to influence elective behaviour, such as audits of compliance and feedback to HCWs, can enhance compliance,[14] at least temporarily.

There are many other evidence-based strategies which, combined (in "bundles"), can reduce multidrug resistance and HAIs within health care facilities, if properly implemented.[15] In addition to hand hygiene, these include screening patients for carriage of multiresistant organisms, isolation and contact precautions, improved environmental cleaning, antibiotic stewardship and optimal management of vascular access devices. Their effective implementation depends on organisational systems — protocols, procedures, facilities, equipment, education, training and communication, as well as adequate staff, leadership and culture change.

Recently, governments and health care organisations in several countries with relatively high rates of HAI have accepted the need to improve HAI control programs.[16,17] In Australia, HAI rates vary widely between comparable hospitals in different jurisdictions, but they are considerably lower in Western Australia than in the eastern states.[18] This is probably due to major differences in infection control policies between jurisdictions;[19] it suggests that the "search and destroy" policy used for control of methicillin-resistant *Staphylococcus aureus* in WA[20] is effective, although evaluation is difficult without consistent national surveillance data.

## Is culture change possible in Australia?

Health care is undergoing major changes in Australia. There is an increasing focus on patient safety; health care institutions are expected to account for outcomes as well as activity; reporting of adverse events and public disclosure of error rates is encouraged; and system failures are increasingly recognised as causes of adverse outcomes. HAIs have not been included among reportable medical errors or key performance indicators, partly because they are complex: HAIs can rarely be attributed to single events or decisions. This is changing, because of greater awareness of the burden of HAIs and the cost-effectiveness of prevention,[21] and the increasing incidence and range of antibiotic resistance. The Australian Commission on Safety and Quality in Health Care has proposed "a national and systematic approach to . . . surveillance, hand hygiene, infection control guidelines and building clinician capacity".[22]

**Case report of a patient with health care-associated infection**

Following an infection-control workshop at which a speaker suggested that compliance with hand hygiene would improve if patients were "empowered" to insist that health care workers (HCWs) disinfect their hands before touching them, a participant recounted a telling (but not unique) personal anecdote.

The participant, herself a HCW, had recently been treated for a rare type of cancer. Her condition created such clinical interest that, during her first assessment at a cancer clinic, she was examined by 15 HCWs — doctors, medical students and nurses. Only the nurses used the alcohol-based hand disinfectant, which was available from any of three dispensers in the consulting room, before examining her. She was warned that her treatment, which would include chemotherapy, surgery and radiotherapy, would entail a high risk of infection. When she expressed concern about acquiring methicillin-resistant *Staphylococcus aureus* (MRSA), her doctor suggested she consider transferring to a private hospital, which she refused.

During the next 12 months, she and her husband repeatedly asked numerous HCWs who cared for her to clean their hands before touching her. With rare exceptions, the doctors either ignored her or asserted that hand hygiene was needed only *after* the examination — ignoring evidence that environmental surfaces, which are inevitably touched by HCWs as they move between patients, such as door handles, files and mobile phones, are often contaminated with MRSA. Despite her efforts, she developed an MRSA infection, which complicated and delayed, but fortunately did not ultimately prevent, her remission.

She was, understandably, unimpressed by the suggestion that "empowerment" of patients would improve hand hygiene compliance. If she had failed, it seems unlikely that a more typical patient, with little medical knowledge, often fearful and vulnerable because of illness, and possibly with poor English, would feel confident enough to question, let alone be heeded by, a busy doctor. ◆

## Beyond systems failures — a return to individual responsibility

There is good evidence that HAI rates can be reduced by a systemwide approach. However, success also depends on the extent to which clinicians embrace measures such as adequate hand hygiene as internalised norms.[23] Most HCWs acknowledge the importance of hand hygiene and often overestimate their compliance.[24] Nevertheless, many patients, relatives and infection control professionals can cite examples of HCWs who repeatedly fail to disinfect their hands and react negatively to reminders[25] (see Box). This may be due to ignorance of evidence that the hospital environment and fomites are often contaminated,[26-28] or due to cognitive dissonance that allows HCWs to believe, despite the evidence, that their hands are uniquely uncontaminated. Hand basins or hand-rub dispensers are not always easily accessible but, even when they are, compliance may not improve.[29] Whatever the reasons, persistent non-compliance of a few influential HCWs can seriously undermine an infection-control program through negative role-modelling.

Recent conference reports from two hospitals in the US suggest a potentially effective new approach (R Shadowen et al, Society for Healthcare Epidemiology Annual Scientific Meeting 2006, abstract 1915; and Murthy R, Infectious Diseases Society of America Annual Meeting, 2007, abstract 566). In both hospitals, low baseline rates of hand hygiene compliance initially improved after hospital-wide campaigns. However, targets were not achieved, nor improvements sustained, until disciplinary procedures were introduced for repeated breaches of hand hygiene protocols. In one hospital, these included counselling by the department chair, followed, if non-compliance continued, by referral to a credentials committee, mandatory continuing education and, ultimately, suspension of clinical privileges. In both hospitals, physicians' compliance improved within a few months, from 60%–70% to over 90%, and improvement was sustained for at least 12 months.

These results suggest that sanctions for non-compliance may be a key element of the "bundle" of measures needed to reduce HAI rates. The risk of penalties has "normalised" wearing of seat belts and motorcycle helmets in Australia; it is reasonable to expect penalties to have a similar effect on hand hygiene compliance. Sanctions would be controversial and are likely to be criticised on the grounds that an adversarial system would damage professional relationships and threaten clinical autonomy. We suggest that, if sanctions were implemented with appropriate safeguards and included in a multifaceted infection-prevention program that also included positive measures to encourage compliance, they would succeed where voluntary regulation has consistently failed.

This approach takes account of complex environmental, microbiological, pathological, behavioural and organisational determinants of HAIs, while also acknowledging the importance of individuals in protecting patients. It would require that safeguards to protect HCWs, based on agreed ethical principles, be negotiated between health administrators, clinical leaders, professional organisations and HCW representatives. Explicit procedures for auditing and recording compliance and for administering penalties and appeals would be included.

Sanctions for non-compliance with hand hygiene policies would be justified only if it could be shown that non-compliance can cause harm to patients. While direct evidence of harm is difficult to prove in individual instances of non-compliance, there is ample evidence that consistently applied hand hygiene practice can reduce HAI rates. Although non-compliance may be occasionally unavoidable in an emergency, it should generally be possible to maintain "normalised" hand hygiene behaviour even in stressful situations. Loss of privileges would arise only after repeated documented breaches and the failure of less coercive measures, such as appropriate education and counselling. Sanctions would be applied impartially to any HCW who breached hand hygiene policies consistently, regardless of seniority or professional standing of the HCW.

Before considering a program involving sanctions, health care organisations would need to take all reasonable steps to facilitate compliance, by developing unambiguous policies and effectively communicating them to all HCWs, providing easily accessible hand hygiene products and educational programs, and introducing fair, transparent audit procedures and feedback of results to individual units. Unit directors and clinical leaders would be responsible for reviewing audit results and promoting a unit-based culture of compliance and improvement, especially in units where patients are at particularly high risk of HAIs. In these circumstances, sanctions would rarely need to be imposed but the *possibility* would reinforce the principle that HCWs have a professional and moral responsibility to comply with evidence-based policies motivated by concern for patient safety.

Reducing harm from adverse events associated with health care, including HAIs, requires not only that imperfect systems be improved, but also that individuals be accountable for day-to-day practices that can undermine even the best systems.[24] If high levels of compliance are to be sustained beyond the latest campaign, good hand hygiene must become a habit. However, habits change only in response to strong incentives. The knowledge that breaches of hand hygiene policies will have significant consequences should be incentive enough to ensure that sanctions are rarely imposed.

We propose that compliance with infection-control policies should be a condition of medical, nursing and other HCW registration and employment, with explicit penalties for non-compliance. The renewed awareness of system failures as causes of medical error and adverse patient outcomes has provided the basis for improving quality and safety. However, it has also diverted attention from the critical role of individuals in complex health systems, and the moral obligations of health professionals to "do no harm". Workers in the food and microchip manufacturing industries are required to maintain high standards of cleanliness to protect their products, and face dismissal if they fail to comply. It is not unreasonable to expect similar standards from HCWs and health authorities to protect patients from preventable harm.

## Competing interests

None identified.

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