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# Hand hygiene compliance: is there a theory-practice-ethics gap?

Manfred Mortell

**T**he origins of hand hygiene and the empirical use of disinfectants date back to as early as 800 BC, when Homer reported the use of sulphur as a disinfectant in *The Odyssey*. The evolution continued with the discovery of chlorine in 1774 by Scheele, a Swedish chemist. In 1825, Labarraque, a French pharmacist, advocated the use of calcium hypochlorite for general sanitation, which included hand hygiene, in hospital wards. The late 19th century ushered in the acceptance of Louis Pasteur's germ theory of infection, which started infection control practices that were the genesis of evidencebased practice (Block, 1991).

## Abstract

Practice is usually based on tradition, rituals and outdated information; there is often an additional gap between theoretical knowledge and its application in practice. This theory-practice gap has long existed (Allmark, 1995; Hewison et al, 1996). It often arises when theory is ignored because it is seen as idealistic and impractical, even if it is practical and beneficial. Most research relating to the lack of integration between theory and practice has concluded that environmental factors are responsible and will affect learning and practice outcomes. The author believes an additional dimension of ethics is required to bridge the gap between theory and practice. This would be a moral obligation to ensure theory and practice are integrated. To implement new practices effectively, healthcare practitioners must deem these practices worthwhile and relevant to their role. This introduces a new concept that the author calls the theory-practice-ethics gap. This theory-practice-ethics gap must be considered when examining some of the unacceptable outcomes in healthcare practice (Mortell, 2009). The literature suggests that there is a crisis of ethics where theory and practice integrate, and practitioners are failing to fulfil their duty as providers of healthcare and as patient advocates. This article examines the theory-practice-ethics gap when applied to hand hygiene. Non-compliance exists in hand hygiene among practitioners, which may increase patient mortality and morbidity rates, and raise healthcare costs. Infection prevention and control programmes to improve hand hygiene among staff include: ongoing education and training; easy access to facilities such as wash basins; antiseptic/alcohol handgels that are convenient, effective, and skin- and userfriendly; and organisational recognition and support for clinicians in hand washing and handgel practices. Yet these all appear to have failed to achieve the required and desired compliance in hand hygiene.

**Key words:** Hand hygiene ■ Theory ■ Practice ■ Ethics ■ Compliance ■ Healthcare associated infection (HCAI) ■ Evidence-based practice





Dr Oliver Wendell Holmes in Boston in 1843 and Dr Ignaz Semmelweis in Vienna in 1861 advocated hand washing to prevent the transmission of infectious disease, specifically the bacterium *Streptococcus pyogenes*, which was implicated in puerperal sepsis. This is a serious form of septicaemia that results in unacceptably high mortality during or shortly after giving birth. Both physicians independently concluded that disease was transmitted from patient to patient by physicians' and nurses' hands and clothing (Block, 1991; Heseltine, 2001). Semmelweis instituted a strict hand washing policy with antiseptic in his practice; within three months, mortality rates decreased from 5–30% to 1–2% (Risse, 1980).

Scientific application of infection control practices started more than 180 years ago, with publications by Dr Ignaz Semmelweis in prominent British and Austrian medical journals endorsing hand hygiene (Hebra, 1847; 1848; Routh, 1849).

Hand hygiene transcends every culture. Biblically, the first mention of washing of the

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hands is in Exodus 30: 18–21: 'So they shall

wash their hands and feet, so they die not.'

In Islam, the Qur'an (5.6) says that washing and cleanliness are paramount without exception. 'Wudhu' (ablution) is a mandatory act. The Qur'an says: 'For Allah loves those who turn to him constantly and He loves those who keep themselves pure and clean'; the prophet Muhammad said: 'Cleanliness is half the faith.'

Hand hygiene has become an integral part of our culture. Hand washing is taught at every

infections (HCAIs) which, in turn, should reduce patient morbidity and mortality.

According to the NHS and the Centers for Disease Control and Prevention (CDC) in the US, hand hygiene is simple, cost effective and an important strategy in preventing the spread of infection. It is recognised as the single most important factor in reducing and preventing HCAIs (CDC, 2002; Health Protection Scotland, NHS National Services

pathogens from practitioners to patients and subsequently from patients to staff.

However, many practitioners fail to apply hand hygiene in their day-to-day practice. This ethical and practice failure has serious consequences. Healthcare literature confirms that practitioners often fail to comply with hand hygiene practices, which leads to increased mortality and morbidity rates and greater financial costs (Pittet et al, 1999; 2000; 2004; Askarian, 2006).

### Theory-practice-ethics gap

The author believes a 'Homer Simpson' mentality persists, one of ongoing noncompliance. Therefore, an ethical problem exists on the non-adherence of healthcare providers to hand hygiene recommendations.

This becomes a patient advocacy issue that the author calls the hand hygiene 'theory-practice-ethics gap'. Evidence from both the IPC literature and the author's clinical

level of school, advocated in the workplace, and emphasised during nursing, medical and Hand hygiene has been recognised and paramedic training programmes. practised for more than a century and is

The primary objective of hand hygiene supported by evidence. Infection prevention recommendations has always been to reduce and control (IPC) programmes recommend pathogen transmission and healthcare acquired hand hygiene to prevent transmission of experience suggests indifference to recommendations based on evidence.

We have all seen educated and knowledgeable clinicians fail to practice their organisation's hand hygiene recommendations. One possible explanation for this is that there is an 'ethical gap' (Mortell, 2009).

### Incidence and costs of HCAIs

Hospitals are dangerous places; 4–10% of patients contract an HCAI while in hospital (Johnson et al, 2005; Hidron et al, 2008). It has been estimated that HCAIs are responsible for 90 000 deaths per year in the US and 5 000 deaths per year in the UK (Donaldson, 2007). They are a worldwide problem, with more than 1.4 million people acquiring infections in hospitals per year (Pittet and Donaldson, 2006). HCAIs are not related to their original admission complaint or diagnosis. One third of these HCAIs are preventable (Kerksiek, 2008). The CDC has

Scotland, 2007; Pratt et al 2007).

reported that two million Americans acquire an infection in hospital. Of those two million patients, 90 000 die of that HCAI. Those most at risk include neonates, infants, children, pregnant women, older people and immunocompromised people. The US healthcare sector spends \$28.4bn–\$33.8bn per year on treating these HCAIs (Scott, 2009). HCAIs cost the NHS more than £1bn per year (Inweregbu et al, 2005).

### Long-term non-compliance

Despite remarkable scientific, medical and healthcare advances over the past century, HCAIs persist, resulting in substantial mortality and morbidity (Jarvis, 1996).

### 1012

Unquestionably, the most important tool in the practitioner's arsenal for preventing infection is effective hand hygiene (CDC, 2002). The basic rule in hospital is that

clinicians should wash their hands between patients.

Semmelweis in 1861 proposed a theory on the importance of hand cleanliness as a preventive measure in pathogen transmission (Risse, 1980). This theory was not acknowledged or accepted by the medical profession until the early 1900s.

This lack of acceptance of new knowledge became known as the Semmelweis reflex. It describes a certain type of human behaviour, characterised by a rejection of new knowledge because it contradicts entrenched norms, beliefs or paradigms.

Nearly 180 years after Semmelweis proposed his theory, many HCAs continue to be caused by pathogens transmitted from one patient to another via healthcare staff who have not washed their hands between patients.

Hand hygiene compliance among staff remains alarmingly low (Creedon, 2008; Gilbert, 2010) and, with the current evidence base emphasising its importance, it is difficult to rationalise why clinicians continue to be resistant to hand-hygiene practices.

**Reasons for non-compliance, training and surveillance** Most research conclusions regarding HCAI suggest that clinicians are not aware of hand hygiene practices, citing a lack of education or orientation to a workplace (Chandra and Milind, 2001).

Ineffective hand hygiene is also blamed on a lack of priority, insufficient time, inconvenient facilities for hand washing, allergy to or intolerance of antiseptics, and lack of leadership, whether from role models or senior management (Boyce, 1999).

Specialty occupations and procedures with a high risk of transmission have both been

**Professional status**

The evidence shows that effective hand hygiene can reduce HCAs and inhibit the spread of MRSA (CDC, 2002; Watcher and Shojanian, 2004; Askerian et al, 2006).

Studies have demonstrated that hand hygiene compliance is inversely related to status; doctors and nurses do not practice hand hygiene as recommended by the WHO hand hygiene guidelines but compliance is better among nurses than among other clinicians; surgeons, anaesthesiologists and critical care physicians wash their hands the least (Suchitra and Lakshmi Devi, 2007; Creedon, 2008). On a paediatric intensive care unit, just

linked with higher levels of non-compliance (Heseltine, 2001; Pittet et al, 2004) (see below). Other researchers suggest that IPC training can help increase compliance with hand hygiene, targeting staff who continue to demonstrate non-compliance (Suchitra and Lakshmi Devi, 2007).

These findings were confirmed by research in the author's healthcare organisation (Figure 1). This organisation requires all staff to be vigilant regarding hand hygiene and mandates 100% compliance in line with World Health Organization recommendations (WHO, 2009).

The data collection method used to obtain hand hygiene compliance for 2010 and 2011 in the cardiac surgical ICU was observational surveillance, which was audited daily.

During 2010 in the cardiac surgical ICU, nurses provided doctors with unit-based, ongoing non-mandated collegial support and requests to perform and maintain hand hygiene, in line with WHO (2009) requirements. When the nurses provided the doctors and other paramedical staff with this continual education, training and observational surveillance feedback, hand hygiene compliance was maintained at greater than 70%.

However, during 2011, doctors were not receptive to nursing requests to comply with WHO requirements and, as a consequence, nurses did not provide ongoing support to doctors as they had in 2010. The outcome observed was that physician compliance fell to 60% or less (Figure 2). Only nurses and paramedics maintained compliance greater than 80% because of ongoing education, observation, feedback and a genuine belief in the benefits of hand hygiene to patient safety.

**Evidence and advice disregarded**

As mentioned above, there is no lack of research data that advocates hand hygiene as a practice that can reduce HCAI. The CDC reminds healthcare professionals that cleaning our hands is the most important thing to promote good health and prevent transmission of pathogens (Chandra and Milind, 2001; CDC, 2002).

Fundamental problems with hand hygiene compliance still exist, despite ongoing IPC education and monitored observation. Hand hygiene compliance has been measured as low as 26% (Mathai et al, 2011).

Even the spread of multidrug-resistant pathogens, such as MRSA, has not compelled staff to adopt recommended practices (Meengs et al, 1994). IPC programmes are in place in many healthcare organisations, but failure to comply with them remains high (Lynch and White, 1993; Heseltine, 2001).

Other researchers recommend more research to support evidence demonstrating a direct relationship between good hand hygiene practices and a lower incidence of HCAI.

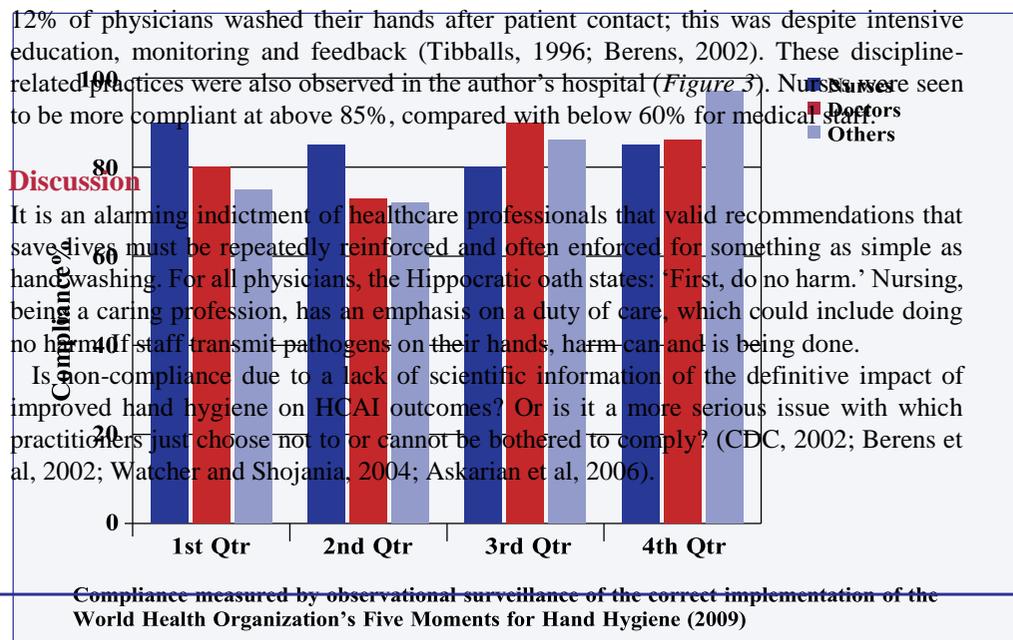
Some observational researchers have reported a blatant disregard for evidence-based practice by healthcare professionals (Watcher and Shojanian, 2004).

Of particular concern is that the author has observed some staff ignoring evidence from authorities such as the WHO (2009), the CDC (2002) and accreditation organisations such as the Joint Commission (2010).

British Journal of Nursing, 2012, Vol 21, No 17



**infection control**



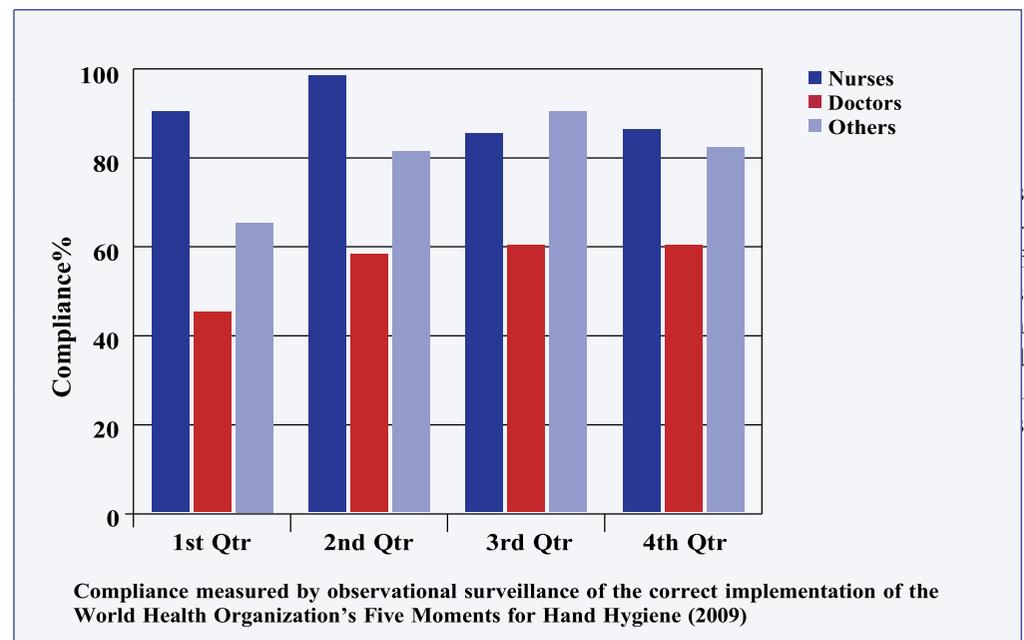
If non-compliance with hand hygiene were the result of a theory-practice gap, then Argyris and Schon's (1974) model of doubleloop learning that subjects all variables to critical scrutiny could modify and explain current hand hygiene outcomes.

Even institutions with ongoing guidelinebased IPC programmes found that their efforts were only slightly effective in changing behaviour (Boyce, 1999).

Several studies that surveyed staff understanding of hand washing found that most of them understood the role of hand washing in the prevention of HCAs (Jarvis, 1994; Pittet et al, 2000; 2004). These studies also found that the majority of these staff did

**Figure 1. Compliance with hand hygiene at a cardiac ICU in 2010. In 2010, doctors were receptive to nurses' hand hygiene messages and compliance was above 70%**

**Figure 2. Compliance with hand hygiene at the same cardiac ICU in 2011. In 2011, doctors were no longer receptive to nurses' hand hygiene messages and their compliance fell below 60%. High-status professionals**



were less likely than other healthcare staff to follow good hand hygiene practice

British Journal of Nursing, 2012, Vol 21, No 17

When nursing-initiated and directed education and feedback was not provided to all staff being observed, only nurses maintained compliance at greater than 85% (Figure 3). The author's organisational goal was 100%. This pattern of non-compliant behaviour has been observed in numerous studies (Pittet, 2000; Heseltine, 2001; Pittet et al, 2004; Askarian et al, 2006).

### Conclusion and recommendations

History has shown us that HCAs are problematic to healthcare organisations around the world because of the risks they pose to patients and staff, and the financial pressures they induce.

There is no doubt that effective ICP programmes are essential to reduce HCAs, and observational surveillance is a critical component of any successful ICP programme.

Hand hygiene should be as simple as ABC: Always Be Careful—Consistent—Compliant.

The author believes that hand hygiene compliance is likely to continue to be problematic and remain low, regardless of the evidence-based practice recommendations and ICP programmes.

The author is unable to explain why education and training do not change behaviour, and the scientific arguments in the literature are not sufficient to explain the poor compliance among healthcare professionals.

The author recommends that an emphasis should be placed on clinicians' moral and ethical obligations with respect to hand

hygiene compliance as part of training and orientation. In addition, performance at global, organisational, unit/ward/department and individual levels should be provided to all healthcare workers, ensuring there is a feedback system that informs and validates practitioner compliance or non-compliance.

If high compliance with hand hygiene by clinicians is an organisational goal, then compliance strategies employed by the organisation must include a message of a duty of care towards patients.

In addition, mandatory IPC hand hygiene surveillance involving all staff, regardless of status and position, is essential to achieve and maintain higher compliance.

The recognition and importance of hand hygiene must be recognised, adopted and endorsed by the very same staff who currently do not comply.

All staff are patient advocates and therefore have a moral obligation to be caring, compliant and, most importantly, effective when performing the global standard precaution called hand hygiene.

*Conflict of interest: none*

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## KEY PoInTs

- Although hand hygiene has long been advocated as the best method of preventing health-care acquired infections, many healthcare professionals fail to comply with good hand hygiene practice
- Given that most clinicians understand the theory behind hand hygiene, it is an ethical and patient advocacy issue ■ The higher the professional status of staff, the less likely they are to wash their hands between patients ■ As patient advocates, nurses need to reinforce the concept of a moral obligation to follow hand hygiene practice ■ Training and orientation to a new workplace should include ethical responsibilities to practise good hand hygiene
- Mandatory surveillance of all staff as well as performance monitoring at individual, ward/department/unit, organisational and global levels are needed to ensure good hand hygiene