

Physician 'defiance' towards hand hygiene compliance: Is there a theory–practice–ethics gap?



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Background: The theory–practice gap has always existed [1,2]. This gap is often cited as a culmination of theory being idealistic and impractical, even if practical and beneficial, is often ignored. Most of the evidence relating to the non-integration of theory and practice assumes that environmental factors are responsible and will affect learning and practice outcomes, hence the gap. Therefore, the author believes that to 'bridge the gap' between theory and practice, an additional dimension is required: *ethics*. A moral duty and obligation ensuring theory and practice integrate. In order to effectively implement new practices, one must deem these practices as worthy and relevant to their role as healthcare providers (HCP). Hence, this introduces a new concept which the author refers to as the theory–practice–ethics gap. This theory–practice–ethics gap must be considered when reviewing some of the unacceptable outcomes in healthcare practice [3]. The literature suggests that there is a crisis of *ethics* where theory and practice integrate, and healthcare providers are failing to fulfill our duty as patient advocates.

Hypothesis: Physician hand hygiene practices and compliance at King Abdulaziz Cardiac Centre (KACC) are consistent with those of other physicians in the global healthcare arena. That is one of noncompliance to King Abdulaziz Medical City (KAMC) organizational expectations and the World Health Organization (WHO) requirements?

Methods: An observational study was conducted on the compliance of cardiac surgeons, cardiologists and nurses in the authors' cardiac center from January 2010 to December 2011. The hand hygiene (HH) compliance elements that were evaluated pertained to the WHO's five moments of HH recommendations. The data was obtained through direct observation by KAMC infection prevention and control practitioners.

Results: Physician hand hygiene compliance at KACC was consistently less than 60%, with nurses regularly encouraging physicians to be diligent with hand hygiene practices in the clinical area.

Conclusion: Hand hygiene compliance will not improve unless evidence-based recommendations are adopted and endorsed by all healthcare professionals and providers.

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Introduction

The origins of HH and the empirical use of disinfectants date back to as early as 800 BC (Fig. 1) when Homer reported the use of sulfur 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 and HH in hospital wards. The late 19th century ushered in the acceptance of Louis Pasteur's Germ Theory of infection, which initiated infection control practices which were the genesis of evidence-based practice [4].

It was Dr. Oliver Wendell Holmes in Boston in 1843 and Dr. Ignaz Semmelweis in Vienna in 1861, who advocated hand washing to prevent the transmission of infectious disease. Streptococcus pyogenes bacteria were then specifically implicated in puerperal sepsis, a serious form of septicemia that resulted in high mortality during or shortly after child birth. Both physicians independently concluded that disease was transmitted from patient to patient by physicians and nurses on their hands and clothing [4-6]. Semmelweis instituted a strict hand washing policy with antiseptic in his practice and, by doing so, decreased mortality rates from 5-30% to 1-2% within a 3 month period [5].

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

is in Exodus 30:18-21. 'So they shall wash their hands and feet, so they die not.' In the Qur'an (5.6), washing and cleanliness is 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 (Peace Be Upon Him) says that 'cleanliness is half the faith'.

Scientific application of infection control practices commenced more than 180 years ago, with publications by Dr. Ignaz Semmelweis in prominent British and Austrian medical journals endorsing HH [7-9]. Hand hygiene has become an integral part of our culture. Hand washing is taught at every school, advocated in the work environment, and emphasized during medical, nursing and paramedical training programs. According to the Center of Disease Control and Prevention (CDC) in the United States of America and the National Health Service (NHS) in the United Kingdom, HH is simple, cost effective and an important strategy for the prevention of the spread of infection. In addition, it is recognized as the single most important factor in reducing and preventing healthcare associated infection (HCAI) [10-12].

However, in spite of more than one century of HH knowledge and evidence, many HCP, especially physicians, fail to apply HH in their day to day practice. This moral, ethical and practice failure has grave consequences. Healthcare literature

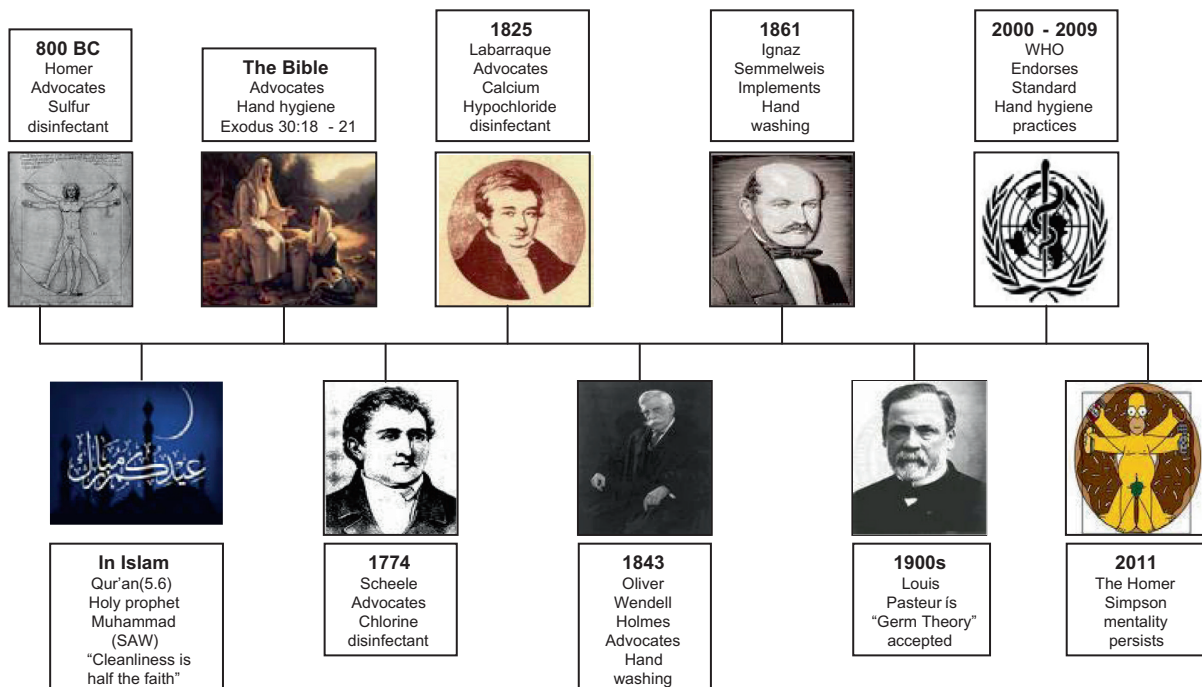


Figure 1. A historical timeline.

confirms that HH practices amongst HCP, is one of noncompliance, which leads to increased mortality and morbidity rates and increased financial costs [13–17].

The authors believe a 'Homer Simpson' mentality (Fig. 1) may have emerged in recent years. The ongoing noncompliance of HCP to HH recommendations is by default an ethical dilemma. This dilemma becomes a patient advocacy issue which the authors choose to call the hand hygiene 'theory–practice–ethics gap'. The evidence derived from infection prevention, control literature and from the authors' own clinical observations and experiences suggest indifference to evidence-based practice (EBP) recommendations. We have all observed educated and knowledgeable HCP fail to practice organizational hand hygiene recommendations. One possible explanation for this is that there is an 'ethical gap' [3].

Methods

Trained and validated infection prevention and control practitioners (IPCP) observed the hand hygiene practices of adult cardiac surgical ICU health-care workers at the point-of-care. Observed professional categories included nurses and physicians. Although observers conducted observations openly, the anonymity of healthcare workers was maintained. The compliance rate was calculated by adherence to the following WHO five elements of Hand Hygiene: (1) Before patient contact. (2) Before a clean or aseptic procedure. (3) After patient contact. (4) After contact which the patient environment (5) After contact with body fluids or spore-forming bacteria.

Results

In 2010, the overall HH compliance rate achieved by cardiac surgeons was 83.1% while car-

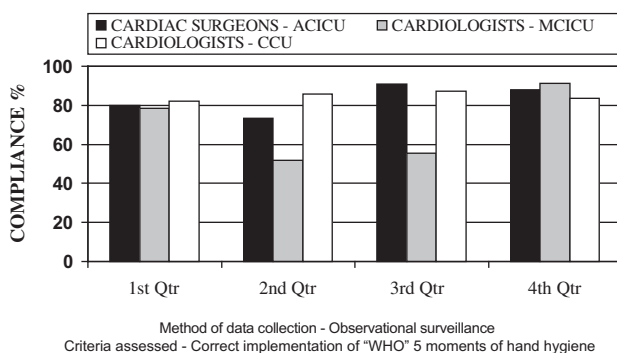


Figure 2. Physicians hand hygiene compliance 2010, Data obtained – KAMC – Infection Prevention Control Department.

diologists stood at 76.9% (Fig. 2). This compliance rate is high in comparison to the data reported in the international arena. However, the authors' organizational goal is 100% HH compliance. In addition, the compliance outcomes that were achieved by physicians in Fig. 2 were primarily due to collegial motivation, education and support from nurses in the clinical area. Note in Fig. 2, when the nurse-initiated support to physicians was temporarily withheld, there was a significant decrease in HH compliance in the MCICU during the 2nd and 3rd quarter. Physician HH compliance dropped to 51.9% and 55.3%. For the year 2011, the overall hand hygiene compliance rate achieved by cardiac surgeons was 55.7% which is well below the required WHO and KAMC organizational target of 90% (Fig. 3). Low compliance in the adult surgical ICU (ACICU) was attributed to a lack of physician interest, understanding or belief in the HH program. Noncompliance increased after nursing staff withdrawal of motivation and encouragement to ensure that physicians achieved compliance. In other clinical areas such as the MCICU, where nurses provided ongoing daily support, reinforcement and feedback, compliance rates remained higher (Fig. 3).

Discussion

The goal of HH recommendations in infection, prevention and control programs is to prevent transmission of pathogens from HCP to patients and subsequently from patients to HCP. Hospitals are dangerous places; in developed countries statistics show that 5–10% of patients contract a healthcare acquired infection (HCAI) during their hospital confinement. It has been estimated that HCAI is responsible for 90,000 deaths per year in the US and 5000 deaths in the UK per year. [18] This is a worldwide problem with more than 1.4

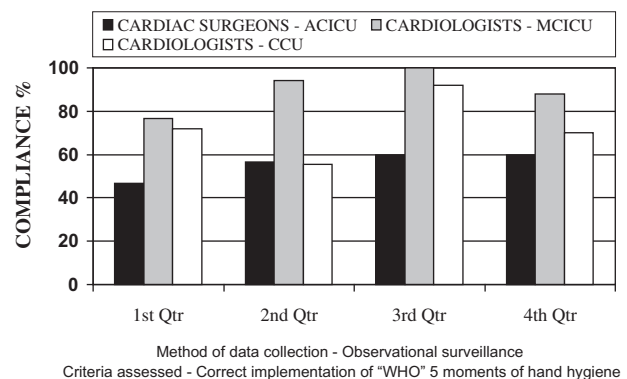


Figure 3. Physician hand hygiene compliance 2011, Data obtained – KAMC – Infection Prevention Control Department.

million people acquiring infections in hospitals per year [19]. HCAI is not related to its original admission complaint or diagnosis. One third of HCAI is preventable and we, as HCP, are also at risk of contracting HCAI [20].

The CDC in the US states that two million Americans acquire an infection in hospitals. Of the two million patients, 90,000 die of HCAI. The US healthcare sector spends an additional 4.5–4.7 billion dollars per year to treat HCAI [21], and the same problem costs the NHS more than one billion pounds per year in the UK.

Despite remarkable scientific, medical and health care advancements over the last century HCAI still exists, resulting in substantial mortality and morbidity [23]. Unquestionably, today the most important tool in the HCP arsenal for preventing infection transmission is effective HH practices [10]. The basic rule in hospital is to wash hands between patient contact. In 1861, Semmelweis proposed a theory on the importance of hand cleanliness as a preventative measure in pathogen transmission. This theory was not acknowledged or accepted by the medical profession until the early 1900s. This lack of acknowledgement for new knowledge would become known as the Semmelweis reflex-effect. A metaphor for a certain type of human behavior, the Semmelweis reflex-effect is characterized by rejection of new knowledge because it contradicts entrenched norms, beliefs and paradigms.

In 2012, nearly 180 years after the proposed Semmelweis theory, many cases of HCAI continue to be caused by pathogens transmitted from one patient to another patient through HCP who have not washed their hands between patient contact. Research data reports HH compliance amongst HCP remains alarmingly low [24,25] and with the current evidence-based research emphasizing its importance, it is difficult to rationalize why HCP continue to resist HH practices.

Research conclusions regarding HCAI purport that HCP are not aware of HH practices, citing orientation and education deficits [24,26,27]. They also reveal that ineffective HH compliance is due to low prioritization, insufficient time, inconvenience of hand wash equipment placement, allergy and intolerance to antiseptics, and lack of leadership, whether role models or senior management [28]. Researchers also found that specialty occupations and high risk cross-transmission procedures increase the non-compliance risk [5,15].

Other researchers suggest that education and training can contribute to increased compliance with hand hygiene, targeting those HCP who continue to demonstrate noncompliance [29]. This was confirmed in the author's healthcare organization (Fig. 2). Of note is that during 2010 with ongoing nursing-initiated and nursing-directed HH education, observation and feedback to all physicians, compliance was maintained at greater than 70% except for the 2nd and 3rd quarter in MCICU when the nursing-initiated HH was temporarily inactive. Figs. 2 and 3 show that when nursing-initiated and directed education and feedback were not provided to physicians, MCICU cardiologists compliance was reduced to 51% in the 2nd and 3rd quarters of 2010, while for 2011 ACICU cardiac surgeons did not achieve greater than 60% compliance rate.

The majority of recommendations to improve HH compliance suggest more research pertaining to scientific evidence based information demonstrating a direct relationship between good HH practices and lowered incidence of HCAI. The primary objective for HH recommendations has always been to reduce nosocomial pathogen transmission and HCAI which, in turn, should reduce patient morbidity and mortality. There is no paucity of research data that advocates HH as a practice that can reduce HCAI. The CDC reminds HCP that cleaning hands is the single most important act in the promotion of good health and prevention of pathogen transmission [10,13,24,27]. Remarkably, fundamental problems with HH compliance still exist, despite ongoing education and monitored observation. Hand hygiene compliance has been measured as low as 30% with maximum levels obtained less than 50% [25]. Even the spread of multi-drug resistant pathogens, such as multi-resistant staphylococcus aureus (MRSA) has not compelled HCP to adopt recommended practices [26]. The UK has one of the highest rates of MRSA in the world [30]. In many healthcare organizations, infection control strategies are in place, but failure in compliance remains high [5,13,31,32].

Some observational researchers report a blatant disregard for evidence-based practice (EBP) by HCP. [33] This essential proven infection control methodology is not always respected or practiced. Of more concern is that some HCP choose to ignore the evidence that recognized world authorities such as the WHO, the CDC and accreditation organizations like the Joint Commission International for Hospital Accreditation (JCIA)

support and endorse. The evidence supports the view that effective HH can reduce HCAI and inhibit the spread of multi resistant organisms [10,13,17, 32,33]. Studies show that HH compliance is inversely related to status, so that doctors are less likely to wash their hands than nurses. Doctors and nurses wash their hands one third as often as they are supposed to. Compliance, however, is better amongst nurses compared to other HCP [34,35].

Surgeons, anesthesiologists and critical care physicians wash hands the least often. One paper reported that only 12% of physicians in pediatric intensive care washed hands after patient contact; this was despite intensive education, monitoring and feedback [34,35]. These discipline-related practices were also observed within the authors' organizations; and nurses were observed as more compliant (above 80% for nurses; Fig. 4).

It is a frightening indictment on HCP that valid recommendations that save lives must be repeatedly reinforced and often enforced for something as simple as hand washing. For physicians, the Hippocratic Oath states that 'first, do no harm'. For nurses, the 'caring profession' emphasizes a duty of care. If HCP transmit pathogens on their hands, harm can be and is being caused.

Is noncompliance due to a lack of scientific information on the definitive impact of HH on improved HCAI outcomes? Or is it a more serious issue that HCP just choose not to comply with? [10,13,17,32,33,35].

If noncompliance with HH were the result of a theory–practice gap, then Argyris and Schon's model of double-loop learning which subjects all variables to critical scrutiny could modify and explain current hand hygiene outcomes [36]. Even those institutions with ongoing guideline based infection control education found that their efforts were not very effective in changing behavior [13,16,25,28].

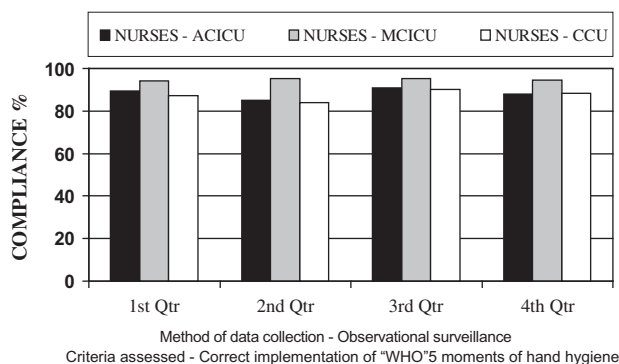


Figure 4. Nurses hand hygiene compliance 2010, Data obtained – KAMC – Infection Prevention Control Department.

Several studies which surveyed HCP understanding of hand washing found that most HCP understood the role of hand washing in the prevention of HCAI [13–16,25,36]. The same studies found that the majority of these HCP did not wash their hands or did so incorrectly. The pioneer of antiseptic procedures, Dr. Ignaz Semmelweis who introduced the concept of hand hygiene to medical and nursing colleagues in 1861, had the same problem at the time. We, as patient advocates, need to reinforce the concept of moral obligations to provide effective hand hygiene practices regardless of empirical views. It seems a terrible indictment on HCP that a proven, effective practice such as hand washing can only achieve compliance with ongoing observational surveillance. Even reviewing hand hygiene practices of the authors' organizations and reflecting on collected data (Figs. 2 and 3) of physician compliance. Hand hygiene compliance during 2010 was greater than 70% (Fig. 3) with nursing-initiated and directed education and feedback. This nursing education was not active during the 2nd and 3rd quarter. Compliance during 2011 (Fig. 3) was no higher than 60% when nursing support and feedback was not provided to cardiac surgeons. This repetitive pattern of noncompliant behavior has been observed in numerous studies [5,13–17].

Conclusion

History and plentiful evidence in the literature has shown us that global hand hygiene practices amongst physicians will likely continue to be problematic and compliance will remain alarmingly low. The evidence is particularly concerning for physician HH compliance in the KAMC – KACC as demonstrated in Fig. 2, with physician HH compliance only 51.9% and 55.3%. With an overall hand hygiene compliance rate achieved by cardiac surgeons at 55.7% in 2011 (Fig. 3), such statistics should alarm all physicians and healthcare providers who acknowledge a duty of care to their patients.

Scientific arguments are not sufficient. The authors recommend that healthcare organizations (HCO) emphasize the moral and ethical obligations of HH to the HCP, especially physicians on commencement of employment, during employment and as a contractual obligation. Second, that HCO provide ongoing feed back to all HCP which informs and validates their compliance or non-compliance. Third, if achieving and maintaining high HH compliance is an organizational goal,

then strategies employed by the organization, must include a message of a duty of care when caring for our patients. In addition, infection control departmental HH surveillance must involve all HCP regardless of status and position in order to achieve and maintain high compliance levels.

In conclusion, achieving HH compliance will not succeed unless EBP recommendations are adopted and endorsed by the very same HCP that are currently derelict and noncompliant in this practice. All HCP especially physicians are role models as well as patient advocates and have a moral obligation to be caring, compliant and, most importantly, effective when performing global standard precautions such as hand hygiene.

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