

Improving hand hygiene compliance: harnessing the effect of advertised auditing

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Abstract. *Background:* Good hand hygiene can prevent healthcare-associated infections. The observer effect is the tendency of research participants to behave differently from the way they otherwise would when aware of being studied. This effect may be associated with improved hand hygiene compliance when utilised in the prior advertisement of auditing.

Methods: An observational study was carried out between 1 June 2012 and 31 August 2012 at the Liverpool Hospital, an 877-bed tertiary teaching hospital in south-western Sydney, Australia, to determine the association between prior notification of hand hygiene auditing by recognisable observers and compliance rates and to evaluate the acceptability of such a practice. Surveys regarding the general acceptability of hand hygiene auditing were conducted, followed by advertised and unadvertised audits over the study period. Participants were made aware of being audited by prior notice and conspicuous identification signs.

Results: The auditors recorded 2080 moments over 3 months, of which 462 (22.2%) were done with prior notification. A significant improvement in overall hand hygiene compliance from 82.3% to 87.9% ($P=0.004$) was found. Subgroup analysis revealed improved compliance for the moments 'before patient contact' (71.8% to 81.3%; $P=0.018$) and 'after patient contact' (85.8% to 93.8%; $P=0.019$). Over 60% of healthcare workers rated hand hygiene as a high priority in daily work and 55% or more regarded weekly auditing as being acceptable.

Conclusion: Advertised auditing is associated with an increase in the overall hand hygiene adherence rate as well as in the subgroups 'before' and 'after patient contact' and appears to be acceptable to healthcare workers. This association requires validation with multicentre randomised controlled trials.

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Introduction

Transmission of multi-resistant organisms through the contaminated hands of healthcare workers may lead to patient colonisation and subsequent healthcare-associated infections.^{1–3} Healthcare-associated infections confer significant mortality and morbidity, as well as increase cost and length of hospitalisation.⁴ The use of alcohol-based hand rub has been established as the gold standard of care in the prevention of healthcare-associated infections.^{1,2,5,6} The World Health Organization (WHO), through its First Global

Patient Safety Challenge, developed '5 moments' during which hand hygiene practices should be performed.^{6,7} Hand hygiene compliance and the resultant benefits have been shown to be better sustained by multifaceted culture-change programs involving healthcare worker education, regular auditing and feedback, hospital-wide campaigns and administrative support.^{8–11} The Australian Commission on Safety and Quality in Healthcare has therefore established the National Hand Hygiene Initiative to promote the above programs in all Australian hospitals.^{6,11}

Implications

- The promising association between advertised hand hygiene auditing and increases in overall hand hygiene compliance as well as in the subgroups ‘before’ and ‘after patient contact’ require validation with large multicentre randomised controlled trials.
- If and when advertised auditing of hand hygiene is found to significantly improve compliance, consideration should be given for the adoption of this approach in all hospitals in order to sustain hand hygiene adherence over time.

The tendency of individuals to modify their behaviour when aware of being studied is termed the observer effect. This was first described by Elton Mayo during studies of worker productivity at the General Electric Hawthorne Works near Chicago between 1927 and 1932.¹² The observer effect has therefore been better known as the ‘Hawthorne effect’ until subsequent analyses of the original data from these studies revealed that this effect was minimal at best.^{13–15} As such, the usefulness of the term ‘Hawthorne effect’ has been questioned. Nevertheless, recent hand hygiene studies have revealed that observation, within the setting of clinical audits, is associated with improvements in hand hygiene compliance.^{16–19} Bittner *et al.* discovered that the number of hand washing episodes per occupied bed per hour by healthcare workers using soap and water improved in the presence of live observers.¹⁶ A study by Harbarth *et al.* revealed a similar effect on compliance with the use of alcohol-based hand rub among directly observed healthcare staff.¹⁷

The observer effect may be associated with improved hand hygiene compliance when used with the prior advertisement of auditing. As an analogy, compliance with speed limits can be enforced by the use of speed cameras. Motorists will typically slow down upon spotting a speed camera. Speeding may be further reduced if signs warning of their presence are encountered. To date, there is no published research regarding the use of advertised auditing as an active intervention to affect hand hygiene compliance rates at a hospital-wide level and involving all 5 moments for hand hygiene. Observational studies have been conducted predominantly in intensive care settings, with one trial (Kohli *et al.*) revealing an increased hand hygiene compliance only in high-performing units.^{18,19} The study conducted aims to determine if the prior advertisement of hand hygiene auditing can improve the overall compliance rate and to evaluate the general acceptability of such a practice.

Methods

Setting and local hand hygiene program

The Liverpool Hospital in an 877-bed tertiary teaching hospital and trauma centre in south-western Sydney, New South Wales, Australia. Standard hand hygiene is achieved by

Table 1. Proportion of hand hygiene moments recorded according to type of healthcare worker

Type of healthcare worker	Flagged audits (%)	Unflagged audits (%)
Nurses and midwives	254/284 (89.4)	944/1096 (86.1)
Medical practitioners	116/134 (86.6)	265/317 (83.6)
Allied health	24/28 (85.7)	41/54 (75.9)
Student nurses and midwives	4/5 (80)	52/70 (74.3)
Student doctors	5/5 (100)	3/3 (100)
Others ^A	3/6 (50)	27/43 (62.8)
Total	406/462 (87.9)	1332/1618 (82.3)

^AAdministrative staff, wardsmen and cleaners.

the use of alcohol-based hand rub (Aqium Antibacterial Hand Gel). Hand hygiene auditing is mandated by the New South Wales Ministry of Health and is conducted in accordance with the WHO ‘5 moments’ by accredited auditors.

Hand hygiene acceptability survey

A voluntary and anonymous paper survey regarding the acceptability of hand hygiene auditing (Appendix 1) was conducted over the first and second week of May 2012, before the actual study. The healthcare professions surveyed were fully representative of the healthcare workers that were subsequently audited for their hand hygiene compliance (Table 1). Throughout the survey period, survey forms were handed out weekly by the study coordinator to all the ward nurse managers for distribution among nurses, nursing students, allied healthcare workers, doctors and administrative staff in their respective wards. Survey forms were also concurrently distributed to medical students and doctors during tutorials and hospital Grand Rounds that occurred throughout the working week. All survey forms contained the address of the Study Coordinator and instructions to the responders to return the forms by internal mail. Healthcare workers were advised to each respond to the survey only once.

Hand hygiene audit

Upon completion of the hand hygiene acceptability survey and receipt of returned survey forms, a prospective observational study was conducted from 1 Jun 2012 to 31 August 2012, to compare the hand hygiene compliance rate following prior advertisement of auditing with the adherence rate for audits performed covertly. Audits performed without prior notification of auditing will hereafter be referred to as unadvertised audits while audits carried out following prior notification of auditing will be referred to as advertised audits.

In practice, covert audits were performed without notifying the healthcare professionals being audited. Advertised audits were carried out by advising ward staff at the commencement of a working shift (during handover) that an audit would be conducted. The auditors were made more conspicuous by the use of signs that read ‘Hand Hygiene Auditing’ which were attached to their clipboards while auditing. The auditors had been instructed to alternate between advertised and

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