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## ORIGINAL ARTICLE

Qualitative interview study exploring frontline managers' contributions to hand hygiene standards and audit: local knowledge can inform practice

Dinah Gould PhD RN, City, University of London, London, UK.

Jacob McKnight PhD, Altitude Medical and Oxford Health System Collaboration, University of Oxford, Oxford, UK.

Claire Keene, Oxford Health System Collaboration, University of Oxford

\*Edward Purssell PhD RN, City, University of London, London, UK.

**KEYWORDS:** infection prevention; hand hygiene; audit; managers

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\* Corresponding author: School of Health Sciences, City, University of London,  
***Myddelton Street Building 1 Myddelton Street***, London EC1R 1UW.

Telephone: 07782 374217

*Email address:* edward.purssell@city.ac.uk

## Abstract

**Background:** Frontline managers promote hand hygiene standards and adherence to hand hygiene protocols. Little is known about this aspect of their role.

**Methods:** Qualitative interview study with frontline managers on two acute admission wards in a large National Health Service Trust in the United Kingdom.

**Results:** Managers reported that hand hygiene standards and audit were modelled on World Health Organization guidelines. Hand hygiene outside the immediate patient zone was not documented but managers could identify when additional indications for hand hygiene presented. They considered that audit was worthwhile to remind staff that hand hygiene is important but did not regard audit findings as a valid indicator of practice. Managers identified differences in the working patterns of nurses and doctors that affect the number and types of hand hygiene opportunities and barriers to hand hygiene. Ward managers were accepted as the custodians of hand hygiene standards.

**Conclusions:** Frontline managers identified many of the issues currently emerging as important in contemporary infection prevention practice and research and could apply them locally. Their views should be represented when hand hygiene guidelines are reviewed and updated.

181 words

## BACKGROUND

Healthcare-associated infection (HCAI) is the most common adverse event in healthcare (1). Nurses are widely regarded as the custodians of infection prevention and nurse managers are considered by policy-makers to play an important leadership role promoting adherence to infection prevention guidelines (2). This potentially influential group could do much to change the infection prevention behaviour of their staff but little is known about this important aspect of their role.

HCAI is spread mainly via health workers' hands and hand hygiene has potential to break the chain of infection (3). The World Health Organization (4) has developed comprehensive guidelines for hand hygiene now implemented in many countries but adherence to hand hygiene protocols is suboptimal and the impact of campaigns to increase adherence is hard to sustain (5). The WHO endorses 'My Five Moments for Hand Hygiene' based on the concept of a hypothetical zone of high risk around the bedside. Five Moments promotes hand hygiene when entering and leaving the patient zone and when risk of transmitting nosocomial pathogens is high (6). Hand hygiene audit, often in line with Five Moments, is undertaken regularly as part of quality assurance. Rates of hand hygiene adherence are reported at senior level in healthcare provider organisations and are frequently presented on their websites to demonstrate that infection prevention procedures are in place and operating effectively. Hand hygiene audit is often conducted by nurse managers but little is known about how it is undertaken or the strategies they use to promote adherence.

## STUDY DESIGN

The aim of this qualitative study was to explore how frontline managers in National Health Service (NHS) trusts in the United Kingdom (UK) implement hand hygiene adherence and audit in general hospital wards.

### **Study setting**

The trust in which the study took place provides acute medical and surgical services and a wide range of specialist services (trauma, cardiac, cancer care) to a diverse urban and rural population. There are 1,300 inpatient beds and 1,200 staff. According to the national body in the UK that oversees standards in premises where healthcare is delivered (Care Quality Commission) arrangements for infection prevention are

adequate. The study took place on two wards with high throughput of acutely ill patients admitted directly from the accident department. Ward managers audit hand hygiene every month by direct observation in line with Five Moments. Health workers receive the results verbally in groups. If a ward under-performs, audit is repeated until there is improvement. All health workers receive the same infection prevention training at induction. Annual online hand hygiene updating is mandatory.

All frontline managers on the two wards were invited to participate in the study thus avoiding selection bias. There were no refusals. Eight participants were nurses, two were doctors leading clinical teams and one was the head of housekeeping services. All were 'hybrid' managers with service and managerial responsibilities and had been in their current posts for at least five years.

Ethical approval was given by the research ethics committee of the university leading the study and the Trust Research and Development Department. All participants gave informed consent.

### **Data collection**

Data were collected with semi-structured interviews undertaken in an office adjacent to the clinical area at a time convenient to participants and digitally recorded with permission. Using a semi-structured interview schedule enabled the interviewers to cover all topics of interest with the flexibility required to obtain information from individuals in different occupational groups and with different responsibilities. Data were collected January - March 2019. Throughout this time the Trust recorded 90-100% hand hygiene adherence on the study wards.

### **Analysis**

The data were analysed thematically employing an inductive data-driven approach (7). The initial stage of analysis consisted of reading and re-reading the transcripts to become fully conversant with the data. Salient features across the whole dataset were documented to generate preliminary codes. Next the preliminary codes were collated into potential themes. These emerging themes were reviewed and applied to each transcript to ensure they captured the content and meaning for every respondent as well as collective meaning. The refined themes were named. Finally extracts were

selected to exemplify each theme. Two members of the research team undertook analysis with discussion across the team and third party arbitration when interpretation was equivocal. By the end of interviewing, no new information was emerging.

## RESULTS

All participants knew that infection prevention was a national policy issue and that the Trust Board placed a premium on being able to report high rates of hand hygiene adherence. Managers suggested that constant emphasis meant that hand hygiene had become an entrenched part of clinical practice and rates of adherence were considered to be acceptable throughout the organisation. Managers encouraged staff to complete the online hand hygiene update annually but considered hand hygiene to be a practical skill learnt most effectively in the clinical setting. Colleagues operating as good role models were perceived to influence behaviour more than official policy. Analysis generated four themes: 1 'Hand hygiene in line with Five Moments'; 2 'Hand hygiene beyond Five Moments'; 3 'Barriers to hand hygiene'; and 4 'Nurse managers are accountable for hand hygiene standards'.

### *Hand hygiene in line with Five Moments*

Managers reported that official Trust policy influenced the way they were expected to operationalise hand hygiene standards and undertake audit. There was a powerful organisational impetus requiring them to demonstrate high levels of adherence in relation to Five Moments. Hand hygiene events outside Five Moments were excluded:

'Walking into a clinical area and gelling your hands isn't what you're supposed to do. It's not part of Five Moments. So you don't get many nurses walking through the doors and gelling hands.'

Emphasis on Five Moments meant that awareness in relation to direct patient care was high. An advantage was that continuous clinical decision-making by clinicians had become unnecessary:

'You do it without realising. Sometimes you see yourself changing sheets and all that without gloves on ... then you realise and wash your hands.' (Ward manager)

‘Buy in’ to official policy in relation to hand hygiene audit varied, however. While one nurse manager took pride in the 100% adherence reported on her ward, others were sceptical. They recognised that results could be affected by observer bias and the approach taken to sampling hand hygiene opportunities and events. A typical comment is reproduced below:

‘It gives you a snapshot picture of what’s going on at a particular time, not the whole picture.’

Although they were aware that it generated flawed results, managers still considered that the process of audit was valuable because it reminded staff, especially doctors that their hand hygiene practice was under scrutiny. They often conducted audit in an overt manner to prompt adherence by employing verbal or non-verbal cues until the health worker being observed realised that a hand hygiene opportunity had been overlooked.

#### *Hand hygiene beyond Five Moments*

Managers identified a need for hand hygiene away from the immediate bedside and suggested that auditing should be undertaken for all health workers irrespective of whether they had direct patient contact, were ward-based or peripatetic. For example, they suggested that hand hygiene was necessary when individuals entered the ward or moved between different ward locations. Levels of contamination and traffic were perceived to be high in general hospital areas compared to the more controlled ward environment. Managers considered that some areas of the hospital and ward were more heavily contaminated than others and recognised that this might place patients at risk when staff, equipment or other items moved between locations even when health workers did not have direct patient contact:

‘Catering staff, ward clerks, people bringing notes ... we have an endless stream of staff that aren’t involved in patient care. They don’t ever get to participate in Five Moments.’ (Nurse manager)



The most obvious separation was between ‘dirty’ and ‘clean’ tasks. The housekeeping manager said:

‘If I’ve been touching the WC for example, just lifting the lid, I need to wash my hands before serving food.’

Demand for hand hygiene was perceived to differ for the same activity depending on circumstances:

‘You can shake hands with people in the street and don’t need to wash hands every time.’ (Medical manager)

Managers reported variation in behaviour according to the working patterns and movements of occupational groups. Doctors were known to spend much less time in direct patient contact than nurses. They moved between wards located in different parts of the hospital and between ward-based offices and clinical areas within the same ward much more. There was a feeling that their hand hygiene opportunities were influenced by these changes in location. Doctors admitted that they did not always act on them, however:

‘If I’m going from the office to the nursing station I walk past two or three (alcohol handrub dispensers) on the wall but you’re not going to use them all the time.’

Medical staff reported higher rates of adherence before entering locations where patients were particularly susceptible to HCAI (e.g. critical care units or children’s wards).

Nurse managers encouraged patients’ visitors to cleanse hands before entering the ward. Uptake was reported to have improved in recent years.

We asked managers if official policy should change to take account of the hand hygiene opportunities they highlighted outside Five Moments. They identified numerous challenges: re-writing current guidelines, amending induction information for new staff and mandatory updating would need to be amended. They predicted that

suggestions for change would not be well received at Trust Board level because senior executives had a vested interest in preserving the high levels of adherence currently being reported.

### *Barriers to hand hygiene*

Despite the powerful official hand hygiene policy, nurse managers knew that health workers sometimes omitted hand hygiene. The intense pace of work on the wards was considered to be a major obstacle:

‘Sometimes we don’t follow it (Five Moments) one hundred percent because we’re so busy. But everybody tries.’ (Ward manager)

Competing priorities arising through patients’ complex care needs, case-mix and fast patient throughput resulted in fragmentation of nursing work between clinical and non-clinical tasks increasing the risk of hand hygiene being overlooked:

‘Sometimes you can be really busy and juggling with multiple things ... you’re with a patient ... then you’re called to the ‘phone. You try to multi-task.’

The diverse patient population on the acute admissions wards was a particular challenge for nurses compared to other occupational groups. They had to cope with the potential risk of cross-contamination when moving rapidly between patients and tasks:

‘‘We’ve got so many surgical patients ... you need to dress wounds, we’ve got cannulas ... we’ve got patients with diarrhoea all over the place ... ‘

### *Nurse managers are accountable for hand hygiene standards*

Nurse managers regarded hand hygiene adherence as an indicator of professionalism:

‘It’s central to my daily practices ... part of our professional training. We have a responsibility to all patients to make sure we maintain standards.’

They assumed accountability for hand hygiene standards operating on their own wards, for example by ensuring that all other staff working on, or coming to the ward had access to alcohol handrub and used it. Medical staff acknowledged that nurses were the leaders of infection prevention and relied on them to issue reminders:

‘The nurses are very on top of it. They notice if you haven’t disinfected your hands.’  
(Senior doctor)

Nurse managers’ perceived that their accountability extended to standards of infection prevention and ward cleanliness generally. They designated tasks to housekeeping staff, especially when cases of infection were detected and used performance feedback to promote high standards. Support from the infection prevention nurses was appreciated and nurse managers worked collaboratively with them to identify system failures when adverse events were reported (root cause analysis). Ward managers thought that the infection prevention team was too busy dealing with crises at organisational level to help resolve ward-based issues, however. One of the nurse managers said:

‘They come if there’s something specific ... If we get a case of C. diff (*Clostridium difficile*) they make sure we know what to put in place. But normally they deal with major infection.’

## DISCUSSION

Ours appears to be the first study to explore how frontline managers promote hand hygiene standards and audit. Previous research has established that ownership of infection prevention strategies is important to embed infection prevention guidelines into practice (8) and that ward managers play an important role implementing them (9, 10). Our study goes further. It demonstrates that frontline managers can identify key issues related to hand hygiene standards and audit where they practise grounded in their local experience. They acknowledged that official Trust policy based on Five Moments was the impetus behind hand hygiene audit but identified additional indications for hand hygiene that arise away from the bedside not captured by audit restricted to Five Moments. These hand hygiene opportunities were envisaged to apply to all health workers and visitors both with and without direct patient contact.

Managers also recognised the limitations of obtaining hand hygiene audit data by direct observation, obstacles that could reduce adherence and differences in the working patterns of nurses and doctors that could affect hand hygiene opportunities and adherence. Nursing and medical managers regarded nurses as the ambassadors of hand hygiene.

Our study was undertaken with a small sample of managers in a single NHS trust in the same clinical setting but their opinions reflect the findings of earlier research. Nurses adhere to hand hygiene protocols better than doctors (11), the same barriers to adherence emerged (12) and nurses assumed leadership for hand hygiene (1, 2, 13). Little was previously known about managers' involvement in hand hygiene standard-setting and audit so despite the limitations of sampling, our study fills an important gap in knowledge.

An earlier study undertaken with a large sample of managers and health workers in England explored perceptions of government-driven standard-setting in relation to infection prevention (14). As in our study, performance management emerged as the key determinant of behaviour. In this earlier study participants reported frustration at the 'top down' emphasis placed on specific infections and clinical procedures at the expense of others they perceived to be equally or more important. Our study corroborates these findings and demonstrates that by virtue of their 'on the job' experience, frontline managers could identify issues currently emerging at the 'cutting edge' of hand hygiene research.

Managers' ability to recognise the importance of hand hygiene outside the patient zone and the possibility of cross-contamination via equipment and items used by health workers is supported by evidence from microbiological studies. Nosocomial pathogens survive on surfaces in distant parts of the ward and can be transferred into the near patient environment (15,16) on health workers' hands (17), clothing (18) and equipment shared between patients and items carried by health workers (e.g. pens, mobile telephones) (18). Although hand hygiene is considered to be the most effective means of breaking the chain of infection and theoretically should be effective (3), adherence is typically 40% or less (11) and often cursory (19), explaining why HCAI continues to be reported despite intense hand hygiene campaigns (3). A possible

solution has been offered by social scientists who suggest that additional hand hygiene and other infection prevention precautions are needed outside the patient zone (20, 21). They use the concept of ward geography to propose the existence of boundaries between different ward locations and tasks (20) and argue that crossing a boundary from a location or task where risk of contamination is low to one where there is a higher risk should trigger hand hygiene and other infection prevention precautions (e.g. putting on personal protective clothing). Hand hygiene when crossing boundaries would not replace hand hygiene in accordance with Five Moments but would be a necessary addition (21). Spatial awareness could also operate as the trigger to prompt cleaning or disinfection when equipment is moved between patients and locations (18).

The methodology of hand hygiene audit is a rapidly developing avenue of research in the drive to ensure that the findings are a valid indicator of practice (22). Sampling and observer bias are accepted as major shortcomings when audit is undertaken by direct observation for brief periods of time (23). The managers we interviewed readily identified the limitations of audit using this method. They ventured beyond existing Trust policy in their approach to auditing by conducting observation overtly to promote adherence, especially for recalcitrant staff. Overt observation and the deliberate creation of a 'continuous Hawthorne effect' have previously been used in a number of successful hand hygiene campaigns (24, 25).

The need to promote hand hygiene for peripatetic health workers who move between wards and visit each briefly is gaining recognition (26, 27, 28), there is evidence that the hands of patients' visitors can be contaminated with nosocomial pathogens and that disinfection should take place before they enter clinical areas (29). Managers were aware that transient visitors can be a source of cross-contamination. Those in charge of wards reported that their endeavours to encourage visitors to use alcohol handrub had been successful. The use of automated prompts at ward entrances can increase hand hygiene adherence among staff and visitors (27). Such devices might be of particular value on the wards where we collected data because of the very high levels of traffic.

Finally there is growing awareness that ward-based nursing and medical staff work in different ways thus influencing the number of patient contacts initiated and resulting hand hygiene opportunities (30, 31). Managers in our study knew that nurses need to disinfect hands more frequently than doctors during routine ward practice. In fact their descriptions add to what is already reported in the literature: while nurses' hand hygiene opportunities arise mainly in relation to activities in the close patient environment, hand hygiene opportunities for doctors frequently occur when they move between different ward and ward-hospital locations. Using boundaries as triggers for hand hygiene may be especially useful for doctors as well as for other peripatetic staff and patients' visitors.

The perils of inferring generalisability from a small scale study conducted within a single setting to a larger population are well known. Many authors suggest that findings should be corroborated with a larger, more representative sample before they can be of practical use. Large scale, randomised studies are time-consuming and challenging to undertake, however. Bias may be introduced because some individuals or organisations may not take part, especially those concerned that they will not emerge well from the investigation. Pooling data from different organisations and clinical settings might not be the most fruitful approach as the findings of clinical studies are known to be heavily influenced by the context in which they are collected and unique to that setting, with implications for transferability (31). Instead of further research we recommend a different approach building on earlier studies demonstrating that hand hygiene opportunities and rates of adherence vary between different clinical settings within the same organisation (33, 34). These studies also demonstrate the inappropriateness and impracticality of imposing of a common standard on all health workers. A practical and more useful alternative might be for individual health providers to review local arrangements for hand hygiene for each clinical setting and the specific groups of health workers involved. Such local studies will not have external validity but this approach has potential to be more useful than the findings of larger, pooled databases as it will identify local needs. Our findings show that managers in acute admission wards could identify issues currently emerging as important in contemporary infection prevention practice and research, could apply them locally and could innovate successfully. For example, they promoted visitors' hand hygiene and used overt prompts to stimulate health workers'

adherence. The use of boundaries to prompt hand hygiene may be particularly valuable in the acute admissions wards where we collected data. These wards were characterised by high levels of traffic. All patients were emergency admissions. Some remained on the ward for 48 hours or less while others were very sick and transferred to different wards. A great many were sent for investigations or procedures away from the ward which was visited by particularly large numbers of clinical and ancillary staff. Hand hygiene opportunities and adherence in this highly pressurised environment and the pattern of work are therefore likely to be unique. The insights of the managers we interviewed suggest that clinical practice in relation to hand hygiene is keeping abreast of research and that when policies and guidelines are reviewed frontline managers have an important contribution because they are able to offer solutions geared to meet local challenges.

## CONCLUSION

Frontline managers identified many of the issues currently emerging as important in contemporary infection prevention practice and research and could apply them locally. Their views should be represented when hand hygiene guidelines are reviewed and updated.

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