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Original Research Article

## Implementation of directly observed patient hand hygiene for hospitalized patients by hand hygiene ambassadors in Hong Kong

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### Key Words:

Patient hand hygiene  
 directly observed  
 hand hygiene ambassador

**Background:** The importance of compliance with hand hygiene by patients is increasingly recognized to prevent health care-associated infections.

**Methods:** This descriptive study observed the effects of an education campaign, targeted to increase patients' self-initiated hand hygiene, and a hand hygiene ambassador-initiated directly observed hand hygiene program on patients' hand hygiene compliance in a university-affiliated hospital.

**Results:** The overall audited compliance of patients' self-initiated hand hygiene was only 37.5%, with a rate of 26.9% (112/416 episodes) before meals and medications, 27.5% (19/69 episodes) after using a urinal or bedpan, and 89.7% (87/97 episodes) after attending toilet facilities. Patients referred from a residential care home for older adults had significantly lower hand hygiene compliance ( $P = .007$ ). Comparatively, the overall audited compliance of ambassador-initiated directly observed hand hygiene was 97.3% (428/440 episodes), which was significantly higher than patients' self-initiated hand hygiene via a patient education program (37.5%, 218/582 episodes,  $P < .001$ ).

**Conclusions:** Directly observed hand hygiene can play an important role in improving compliance with hand hygiene by hospitalized patients.

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Hand hygiene is the most important component in hospital infection control. Despite continuous promotion of hand hygiene in health care workers for decades, the overall compliance remains low at 30%–40% in various clinical settings.<sup>1</sup> Poor hand hygiene compliance among health care workers was attributed to inadequate knowledge, heavy workload, and inaccessibility of handwashing facilities. With the introduction of alcohol-based handrubs<sup>2,3</sup> and the promulgation of the My 5 Moments for Hand Hygiene,<sup>4</sup> awareness in the importance of hand hygiene in enhancing patients' safety by the prevention of health care-associated infections has heightened

among health care workers. However, the role of patients' self-initiated hand hygiene has only recently been recognized.<sup>5</sup> Because the hospital environment is often contaminated with hospital-acquired pathogens, it would be important to remind and encourage patients to practice hand hygiene during their hospitalization.<sup>6</sup>

An education campaign on patient self-initiated hand hygiene and directly observed hand hygiene before meals and medications was promoted in our hospital beginning in 2013, as previously described.<sup>7,8</sup> Because directly observed patient hand hygiene programs have been shown to reduce risks of gastrointestinal acquisition of multiple drug-resistant organisms,<sup>8,9</sup> we enhanced the sustainability of our directly observed hand hygiene program through appointment of hand hygiene ambassadors in 2015. In the program, these ward-based health care assistants who were promoted as ambassadors would personally deliver alcohol-based handrubs to all conscious hospitalized patients, with directly observed hand hygiene practice before meals and medications. The compliance with hand hygiene in the patients' self-initiated group and health care worker-assisted group was audited and analyzed.

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## METHODS

This descriptive study was performed in Queen Mary Hospital, a university-affiliated hospital of 1,700 beds, where proactive infection control measures have been implemented to reduce the risk of nosocomial person-to-person transmission of epidemiologically important microorganisms.<sup>10</sup>

### *Self-initiated hand hygiene in patients*

Patient hand hygiene practices were promoted through a continuous education campaign beginning in 2013. Each patient was given a pamphlet highlighting the importance of hand hygiene after 3 specific moments: (1) before meals and medications, (2) after using a bedpan or urinal at the bedside, and (3) after attending toilet facilities, as modified from a previous study.<sup>11</sup> Education posters were displayed by each bedside to remind patients and visitors of the importance of hand hygiene.<sup>7</sup> Alcohol-based handrubs were available adjacent to each bed, toilet entrance, and toilet seat to encourage patient self-initiated hand hygiene.

To evaluate the effect of the patient education program, the compliance of self-initiated hand hygiene practice was audited by the infection control team during a 40-minute observation period per ward per day in the first 6 months of 2015 in the medical, surgical, orthopedics, and obstetrics-gynecology wards. The results of patient self-initiated hand hygiene in conscious patients were recorded according to the specified moments 1-3, as previously described, along with the epidemiologic information for further analysis. For moment 1, only self-initiated hand hygiene compliance before snacks and drinks or pro re nata medications outside meal times and regular medication rounds was included because health care worker-assisted directly observed hand hygiene of all conscious hospitalized patients before main meals and regular medication rounds was introduced in 2013.<sup>8,9</sup>

### *Health care worker- and ambassador-assisted hand hygiene*

Health care worker-assisted directly observed hand hygiene in all conscious hospitalized patients before main meals and regular medication rounds was introduced in 2013. To enhance the sustainability of directly observed hand hygiene for patients, we initiated a hand hygiene ambassador program in 2015 where ward-based health care assistants, the most frontline rank of health care workers in the clinical areas, were promoted as hand hygiene ambassadors. A 15-minute talk was given to each nominated health care assistant at the bedside to explain the significance of patient hand hygiene in infection control. To emphasize the importance of our newly appointed hand hygiene ambassadors, they were given the opportunity to meet with the infection control officer, hospital chief executive or professor of microbiology, and senior nurses

from the respective wards. A formal certificate was also presented to them in the official hand hygiene ambassador appointment ceremony. The hand hygiene ambassadors were empowered to deliver alcohol-based handrubs to all conscious patients, with directly observed hand hygiene before meals and medication rounds in their designated wards.

The compliance of ambassador-assisted hand hygiene was audited in 20 wards (6 acute medical wards, 10 surgical wards, and 4 orthopedic wards) for 22 consecutive working days in July 2015. On each audited day, 3 conscious patients were randomly selected from each of the 20 wards and interviewed to find out if they could recall ambassador-assisted directly observed hand hygiene being performed on that day. The ambassador-assisted hand hygiene was considered to have been complied if all 3 randomly selected conscious patients in the same ward reported that the ambassadors have assisted directly observed hand hygiene of these patients on that day.

## STATISTICAL ANALYSIS

Fisher's exact tests was used to investigate any differences in the compliance of patient hand hygiene with respect to the 3 studied moments and age groups. The  $\chi^2$  test was used to investigate the association between hand hygiene practice and each of the epidemiologic characteristics of the patients. A *P* value of  $<.05$  was considered to be statistically significant. SPSS version 23 (SPSS, Chicago, IL) was used to perform the statistical analyses.

## RESULTS

### *Self-initiated hand hygiene in patients*

Between January 14, 2015, and June 30, 2015, a total of 582 conscious patients were observed for 114 working days, with an average of 5 patients per day. The median age was 62 (range, 18-98) years, and 256 (44%) were men. Two hundred and forty patients (41%) were observed in the medical wards, 135 (23%) were observed in the surgical wards, 121 (21%) were observed in the orthopedic wards, and 86 (15%) were observed in the obstetrics and gynecology wards. Twenty-one (4%) patients were referred from residential care homes for older adults. At the time of hand hygiene audit, 301 (52%) of the patients were hospitalized for  $\leq 2$  days, 143 (25%) were hospitalized between 3 and 6 days, and 138 (24%) were hospitalized for  $\geq 7$  days.

The overall compliance of patient self-initiated hand hygiene moments 1-3 was 37.5% (218/582) according to the specified age groups (Table 1). The compliance in moment 1 (26.9%, 112/416) and moment 2 (27.5%, 19/69) was significantly lower than that of moment 3 (89.7%, 87/97;  $P < .001$ ). With reference to the age group, patients aged  $\leq 34$  years tended to have lower hand hygiene compliance in moment 1 than those aged  $\geq 50$  years ( $P = .010$ ), but they had higher compliance in moment 2 than those aged  $\geq 80$  years

**Table 1**  
Compliance of self-initiated patient hand hygiene with respect to different age groups

Age group	Observed moment 1	Observed moment 2	Observed moment 3	Overall <i>P</i> value
$\leq 34$ y	12.2 (6/49)	66.7 (4/6)	90.9 (20/22)	$<.001$
35-49 y	21.0 (17/81)	33.3 (2/6)	86.4 (19/22)	$<.001$
50-64 y	34.7 (33/95)	28.6 (4/14)	81.0 (17/21)	$<.001$
65-79 y	32.7 (36/110)	30.8 (8/26)	95.7 (22/23)	$<.001$
$\geq 80$ y	24.7 (20/81)	5.9 (1/17)	100 (9/9)	$<.001$
Overall	26.9 (112/416)	27.5 (19/69)	89.7 (87/97)	$<.001$

NOTE. Values are percentages (compliance with hand hygiene/total observations) or as otherwise indicated.

Moment 1, hand hygiene before snacks and drinks at the bedside and before pro re nata medication; Moment 2, hand hygiene after use of a bedpan or urinal at the bedside; Moment 3, hand hygiene after attending toilet facilities.

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