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*Conflicts of interest: authors report none.*

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## ABSTRACT

Despite recent national emphasis, outpatient hand washing can be less than optimal. We tested a new approach involving both patient and physician hand washing. The study consisted of 384 questionnaires, 184 from phase 1 and 200 from phase 2. Patients stated doctors washed their hands 96.6% before examining them pre-intervention and 99.5% of the time post-intervention. Patients endorsed the importance of hand washing 98.7% of the time. "Co-washing" may offer a process to increase the practice of hand washing and decrease infection risk.

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## INTRODUCTION

Hand hygiene has been identified as being critical in preventing the spread of hospital-acquired infections.[1] Although hand hygiene by health care clinicians is a standard component of patient safety, a review of hand hygiene studies initiated by the World Health Organization (WHO) found that baseline compliance with hand hygiene among health care workers was only 38.7% on average, with a range from 5% to 89%.[2]

Although the emphasis of effective hand hygiene practice has been placed on health care workers, it was noted that there was a significant decrease in hospital-acquired Methicillin-resistant *Staphylococcus aureus* once patients were encouraged to wash their hands.[3] In the general population, it was widely recognized that hand washing could lower the risks of respiratory infections, eye infections, diarrhea, intestinal problems, pneumonia, and impetigo.[4,5] Patient performance of hand washing has been advocated by the WHO Alliance of Patient Safety and the Centers for Disease Control and Prevention (CDC).[6] Patients have been noted to carry multidrug resistant organisms on their hands 24.1% of the time when they leave an acute care facility.[7] We examined hand-washing rates in a busy outpatient clinic and explored whether a "co-washing" approach would be of benefit.

## METHODS

This project was a quality improvement (QI) study. There were 2 phases of data collection and an intervention before the second phase. The institutional review board approved this as an exempted study.

A patient hand-washing questionnaire (Supplemental Appendix, http://www.annfammed.org/content/15/2/155/suppl/DC1) was created by the QI team of 7 family medicine health care clinicians. It consisted of 7 questions, 4 regarding patients' observations of hand-washing performance by health clinicians, and 3 assessing patients' attitudes toward patient hand washing. Each patient's age and sex were recorded in the questionnaire.

Beginning in October 2013, the QI team started distributing the questionnaires in their clinics. Because this was the baseline assessment for patient hand-washing attitudes, the clinician asked—without any signs of encouragement—whether or not the patient would like to wash hands at the beginning of the visit.

After the initial collection of the questionnaires, the QI team displayed flyers and offered gel in the clinic encouraging hand washing by patients. Two months after the installation of the flyers, 6 remaining providers of the QI team implemented a new procedure. In the new procedure, the clinician offered sanitizer to the patient and also used the sanitizer to wash their own hands in front of the patient. Patients were again surveyed regarding their attitudes and observations of hand washing.

Data were analyzed using SAS version 9.3. 2012 (SAS Institute Inc). Descriptive analysis was performed for all the variables. To compare the differences in patients' sex, observation, and attitudes between the 2 phases, we incorporated bivariate statistics, using $\chi^2$ analysis. Fisher's exact test instead of $\chi^2$ analysis was carried out once more than 20% of the expected cell sizes were less than 5. A *t*-test was also performed to examine the difference in patients' age between the 2 phases. We used an alpha of 0.05 to determine the significance of all statistical tests.

## RESULTS

A total of 399 questionnaires were collected during the project. Fifteen questionnaires were excluded due to the respondent being aged younger than 18 years. The final study sample consisted of 384 questionnaires, 184 from the phase 1 (pre-intervention) and 200 from the phase 2 (post-intervention). Patients stated doctors washed their hands 96.6% before examining them pre-intervention and 99.5% of the time post-intervention.

As shown in the Table 1, the majority of patients participating in the project were females (65.6%) and the mean age of the patients was 47.5 years. While there were no significant differences in proportions of responses to the first 5 questions before and after the intervention, more patients gave positive responses to the last 2 questions after "co-washing" was implemented: "did the nurse or doctor encourage you to wash your hands?" (83.8% vs 61.3%, $P$ <.001) and "did you wash your hands?' (87.9% vs 79.0%, $P$ =.02).

## DISCUSSION

In summary, patients endorsed hand washing and participated in hand washing 83.7% of the time. Of note, the physicians in this study were reported as washing their hands 98.1% of the time before they examined the patient and 92.6% of the time after they examined the patient. There were no significant differences in clinicians' performance of hand washing after "co-washing" began. Data in this study greatly exceed those normally observed in the hand washing literature.[8,9] Although no prior efforts have been made in the clinic to promote or quantitate patient hand washing, a prior audit of the clinic had lower results of 84% for physician hand washing.

The study expands on the model in which patients are requested to report on whether or not their doctor washed their hands in the hospital setting.[10] The strengths of this study are that it is patient centered and addresses an important patient safety issue. The offering of hand sanitizer to the patient and clinician at the same time, which we deemed "co-washing," is a simple intervention that can be done in almost any practice. This was a QI study designed as quaisi-experimental before-and-after study. There was no control group and the patients self-reported their hand washing which can weaken the validity and exaggerate the results.

**Table 1. Patients' Characteristics, Observations, and Attitudes Toward Hand Washing**

| Questions | n = 384 | Phase 1 (n = 184) | Phase 2 (n = 200) | *P* Value[a] |
|---|---|---|---|---|
| Age (mean ± standard deviation, y) | 47.5 ± 16.9 | 47.9 ± 16.6 | 47.2 ± 17.2 | 0.66 |
| Sex (%) | | | | |
| Male | 34.5 | 38.3 | 31.0 | 0.13 |
| Female | 65.5 | 61.7 | 69.0 | – |
| Did the nurse or other staff wash hands before touching you? (%) | 90.7 | 92.2 | 89.4 | 0.35 |
| Did the nurse or other staff wash hands after touching you? (%) | 88.6 | 89.5 | 87.9 | 0.64 |
| Did the doctor wash hands before examining you? (%) | 98.1 | 96.6 | 99.5 | 0.06 |
| Did the doctor wash hands after examining you? (%) | 92.6 | 90.2 | 94.5 | 0.14 |
| Did you feel patient hand washing is important? (%) | 98.7 | 98.3 | 99.0 | 0.67 |
| Did the nurse or doctor encourage you to wash your hands? (%) | 73.3 | 61.3 | 83.8 | < 0.0001 |
| Did you wash your hands? (%) | 83.7 | 79.0 | 87.9 | 0.02 |

[a] *P* value comparing differences of age, sex, and positive responses to the questions between phase 1 and phase 2 using *t*-test for the continuous variable (age) and $\chi^2$ analysis for the dichotomous variables (sex and questions).

Note: Numbers of subjects in each category may be different due to the missing values in responses.

Further research is recommended to determine whether "co-washing" enhances clinic hand washing or hand washing at home by patients, and whether it can reduce infection rates.

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**Key words:** hand washing; infection control; quality improvement

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**Supplementary materials:** Available at http://www.AnnFamMed.org/content/15/2/155/suppl/DC1/.

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