

IMPROVING HEALTHCARE WORKER HAND HYGIENE ADHERENCE BEFORE PATIENT CONTACT:

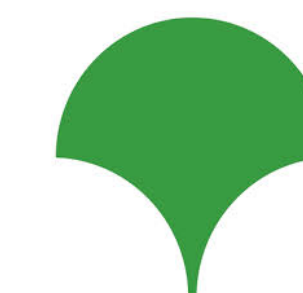
A MULTIMODAL INTERVENTION OF HAND HYGIENE PRACTICE IN THREE JAPANESE TERTIARY CARE CENTERS

Hitoshi Honda MD¹ Tomoko Sakihama MSN² Sanjay Saint MD^{3,4} Karen E Fowler MPH³ Toru Kamiya MD⁵ Yumiko Sato RN⁶ Ritsuko Iuchi MSN⁵ Yasuharu Tokuda MD MPH⁷

¹Division of Infectious Diseases, Tokyo Metropolitan Tama General Medical Center, Tokyo, Japan. ²Department of Nursing, International University of Health and Welfare Graduate School, Tokyo, Japan.

³VA Ann Arbor Healthcare System, Ann Arbor, MI, USA. ⁴University of Michigan Medical School, Ann Arbor, MI, USA ⁵Division of General Internal Medicine & Infection Diseases, Rakuwakai Otowa Hospital, Kyoto, Japan.

⁶Division of Infection Control, Teine Keijinkai Medical Center, Sapporo, Hokkaido, Japan. ⁷Japan Community Healthcare Organization, Tokyo, Japan



REVISED ABSTRACT

BACKGROUND: Proper hand hygiene is an important strategy to prevent healthcare-associated infection. We previously showed low hand hygiene adherence among healthcare workers in four Japanese hospitals (adherence between 11% and 25%). In the current study, we evaluate a contest to improve hand hygiene in three Japanese tertiary care centers.

METHODS: Hand hygiene adherence was re-evaluated in three to four wards in each hospital - a surgical unit, a medical unit, an intensive care unit, and/or an emergency department – after a six-month hand hygiene intervention. While all hospitals were provided guidance about the World Health Organization (WHO)-based multimodal hand-hygiene intervention, each hospital could tailor the intervention to their facility. Post-intervention hand hygiene adherence rates before patient contact for each unit and hospital were compared to pre-intervention rates. The hospital that achieved the highest hand hygiene adherence after the intervention was offered a prize consisting of 500,000 Japanese yen (approximately \$5,000 USD) and a trophy, provided by an American collaborator not affiliated with any of the Japanese hospitals.

RESULT: A total of 2,982 post-intervention provider-patient encounters were observed in ten units across the three participating hospitals. Overall, the post-intervention hand hygiene adherence rate was improved (18% pre- to 33% post-intervention; P<.001). The improvement in adherence rates varied considerably, however, by hospital (Hospital A +29%, Hospital B +5%, Hospital C +7%). Hospital A was the contest winner with 40% adherence post-intervention.

CONCLUSION: Use of a contest during implementation of a WHO-based multimodal intervention was successful in improving healthcare worker hand hygiene adherence in three Japanese hospitals. However, more work is required as hand hygiene adherence remains low.

INTRODUCTION

- Improving hand hygiene practice for healthcare workers is considered a core strategy to decrease the incidence of healthcare-associated infection
- It is estimated that improving hand hygiene compliance could reduce healthcare-associated infection from 9% to 50%
- We reported results from an observational study that assessed the rate of healthcare worker hand hygiene adherence before touching the patient in four geographically diverse hospitals in Japan
- The purpose of this study is to evaluate a multimodal intervention to improve levels of healthcare worker hand hygiene in three of these hospitals.

METHODS

Participating Institutions

Three Japanese hospitals that had participated in the prior observational study chose to participate in this intervention. Evaluation of hand hygiene practice was performed in at least three wards of each hospital including an inpatient surgical ward, an inpatient medicine ward, and intensive care units or an emergency ward.

Intervention

To improve hand hygiene compliance in these facilities, we initiated a multi-modal hand hygiene intervention based on WHO recommendations and the findings from the prior study. The recommended strategies consisted of 15 components (Table 1).

As an added incentive, we initiated a contest, where the facility that obtained the highest hand hygiene adherence post-intervention would win a trophy and 500,000 Japanese Yen (approximately \$5,000 US Dollars).

Observation of hand hygiene practice

One of the study authors (S.T.), a Japanese board-certified infection control nurse, conducted all of the hand hygiene observations for post-intervention studies. Appropriate hand hygiene was defined as the use of soap and water or alcohol hand rub before patient contact, which corresponds to moment one of the WHO's five moments of hand hygiene. Hand hygiene practice prior to patient contact for each individual provider-patient encounter was observed and recorded using the hand hygiene observation form adapted from a previous study by Saint et al.

Statistical analysis

Overall hand hygiene adherence rates were calculated and compared between the pre- and the post-intervention periods. Comparison of hand hygiene adherence by HCW subgroup and by hospital unit between the pre- and the post-intervention periods was also performed. Comparison of hand hygiene adherence rates by observational periods was calculated by Pearson chi-square tests and 95% confidence intervals (CI) were estimated using binomial distribution. Pearson correlations were used to determine the relationship of hand hygiene between physicians and nurses in the same unit. Two-tailed p-value less than 0.05 was considered statistically significant.

RESULTS

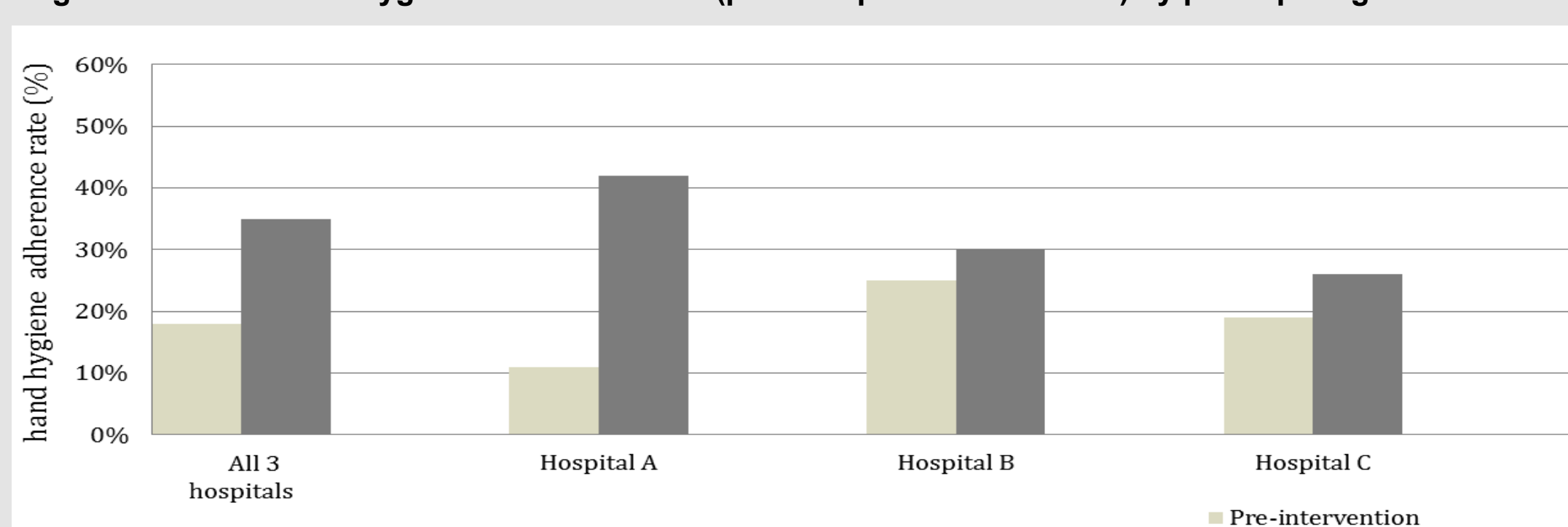
Table 1. Recommendations and achievement for a multimodal intervention for hand hygiene practice

	Hospital A		Hospital B		Hospital C	
	Pre-intervention (2/15)	Post-intervention (10/15)	Pre-intervention (9/15)	Post-intervention (10/15)	Pre-intervention (6/15)	Post-intervention (8/15)
1. Infrastructure (3 components)						
Hand washing faucets for each room	No	No	Yes	Yes	Yes	Yes
Placement of AHR at patient's room entrance	Yes	Yes	Yes	Yes	Yes	Yes
Portable AHR distributed for each HCWs	No	Yes	No	Yes	No	No
2. Training / education (2 components)						
Educational resources	No	Yes	Yes	Yes*	Yes	Yes
Periodic seminars and lectures regarding HH education	No	Yes	Yes	Yes	Yes	Yes
3. Evaluation and feedback (5 components)						
Evaluation of HH practice by direct observation	No	Yes	Yes	Yes	No	No
Evaluation of HH practice by the amount of AHR consumption	No	No	Yes	Yes	Yes	Yes
HH rate feedback at infection control committee	No	Yes	Yes	Yes	No	Yes
HH rate feedback to designated departments	No	Yes	Yes	Yes	No	Yes
Granting the award of top-rated person	No	No	No	No	No	No
4. Reminders in the workplace (1 component)						
Poster notification	Yes	Yes	Yes	Yes	Yes	Yes
5. Institutional Safety Climate (5 components)						
Commitment of hospital president or hospital executives	No	Yes	No	No	No	No
Commitment of nurse managers and physicians leaders	No	Yes	No	No	No	No
Meeting regarding HH practice by the designated wards/units	No	No	No	No	No	No
Identifying champions at the designated wards/units	No	No	No	No	No	No

NOTE. HH: hand hygiene, AHR: alcohol hand rub

RESULTS

Figure 1. Overall hand hygiene adherence rate (pre- and post- intervention) by participating institutions.



RESULTS

Wards/ Units	HCW subgroup	Pre-intervention period		Post-intervention period		Improvement after intervention (%)	P value
		Number of observations	HH rate (%)	Number of observations	HH rate (%)		
Hospital A							
Surgery	Nurse	147	8	173	39	31	<.001
	Physician	136	14	137	47	33	<.001
Medicine	Nurse	158	10	191	58	48	<.001
	Physician	157	12	180	42	30	<.001
ICU	Nurse	151	11	202	32	22	<.001
	Physician	57	7	111	40	33	<.001
ER	Nurse	30	13	38	34	21	.048
	Physician	92	12	98	12	0	.951
Hospital B							
Surgery	Nurse	152	30	147	44	14	.012
	Physician	142	33	147	35	2	.775
Medicine	Nurse	146	20	149	31	11	.043
	Physician	147	32	155	42	10	.073
ER	Nurse	140	16	135	25	9	.730
	Physician	140	16	176	7	-9	.019
Hospital C							
Surgery	Nurse	156	20	160	39	19	<.001
	Physician	146	8	164	46	38	<.001
Medicine	Nurse	151	40	168	26	-14	.007
	Physician	131	2	117	5	3	.154
ICU	Nurse	154	30	177	17	-13	.008
	Physician	146	10	157	20	6	.009

CONCLUSION

- Although there was overall improvement, the adherence rates were quite varied by each participating hospital
- We evaluated whether an institutional-level contest with financial incentives contributed to improved hand hygiene adherence of healthcare workers. The contest appeared to have a modest effect to help motivate the participating hospitals to try to improve their hand hygiene adherence rate, although changes in motivation by the contest appeared to vary in each participating institution
- Hospital A which initiated the most new components during the intervention period was most successful with improving hand hygiene adherence among healthcare workers although all participating hospitals achieved a similar number of the 15 recommended intervention components during the intervention (8 to 10 per hospital).
- Hospital A also successfully involved hospital executives, and elicited the commitment of a nurse manager or physician leader.
- The study demonstrated that implementation of a WHO-based multimodal intervention was successful in improving healthcare worker hand hygiene adherence in three participating hospitals.
- Altering healthcare worker behavior is likely the key element to improve hand hygiene adherence, and behavioral modification may be achieved with the support of leadership at the unit and facility level.
- Further intervention is needed in this setting to optimize hand hygiene practice because of relatively lower hand hygiene adherence rates even after the implementation of a multi-modal intervention.