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Is It Necessary to Perform Hand Hygiene for Healthcare Workers Before Initial Patient Environment Contact?

To the Editor—Hand hygiene is considered the simplest, most effective way to prevent healthcare-associated infections and stop the spread of pathogens.¹ In recent years, more and more attention has been given to hand hygiene, and many guidelines already have been developed to improve hand hygiene practices in healthcare settings.^{2,3}

According to the WHO Guideline on Hand Hygiene in Health Care 2009, the indications for hand hygiene were divided into 5 groups: (1) before touching a patient, (2) before a clean/aseptic procedure, (3) after body fluid exposure risk, (4) after touching a patient, and (5) after touching patient surroundings.⁴ It was especially noted that hand hygiene is not required before touching items in the patient zone but is required before direct contact with the patient.⁵

According to the *Guideline for Hand Hygiene in Healthcare Settings*, which was issued by the Healthcare Infection Control Practices Advisory Committee of the Hospital Infection Control Practices Advisory Committee/Society for Healthcare Epidemiology of America/Association for Practitioners in Infection Control/Infectious Diseases Society of America (HICPAC/SHEA/APIC/IDSA) Hand Hygiene Task Force in 2002, the indications for hand rubbing with an alcohol-based hand rub or hand washing with soap and water were consistent with those of the World Health Organization (WHO).

Meanwhile, in *Best Practices for Hand Hygiene in All Health Care Settings*,⁶ which was developed by the Provincial Infectious Diseases Advisory Committee (PIDAC) of Canada, there

are 4 moments when hand hygiene is performed: (1) before initial patient or patient environment contact, (2) before an aseptic or clean procedure, (3) after body fluid exposure risk, and (4) after patient or patient environment contact.

So, is it necessary for healthcare workers to perform hand hygiene before initial contact with the patient environment? These hand hygiene guidelines are significantly different.

During healthcare delivery, a patient's hands often directly touches the surfaces and substances in his or her immediate environment. With each patient-to-environment contact, a bidirectional exchange of microorganisms occurs between the patient and the touched items.¹ Therefore, the patient and his/her immediate environment, also known as the patient zone, form an organic whole. This so-called patient zone includes some surfaces and items that are temporarily and exclusively dedicated to this patient. These surroundings include all inanimate surfaces that are contacted by or are in direct physical contact with the patient, such as the call button, remote control, bed rail, bedside table, bed linen, infusion tubing, and other medical equipment as well as personal items. Importantly, this zone contains surfaces frequently touched by healthcare workers while caring for the patient, such as knobs, equipment buttons, monitors, and other touchable surfaces.⁵

Healthcare workers' hands can become increasingly colonized by germs and potential pathogens during daily practice.^{7,8} If healthcare workers do not perform hand hygiene before touching patients, the germs and potential pathogens on their hands can be transmitted to the patients. When healthcare workers perform procedures without hand hygiene prior to entering a patient's surroundings, the surfaces and items the healthcare worker touches can be also be contaminated by germs and potential pathogens colonized on the healthcare worker's hands. These germs and potential pathogens can then be transmitted to the patients through the patient's contact with these surfaces and items.⁹ Potential pathogens on surfaces in the surrounding environment can be eliminated by cleaning and disinfection;¹⁰ however, those surfaces that are frequently touched by healthcare workers' hands may be quickly recontaminated.

In conclusion, healthcare workers should perform hand hygiene immediately before entering the patient zone, which includes both a patient and his or her surroundings.

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The Carbapenemase Menace: Do Dual Mechanisms Code for More Resistance?

To the Editor—Carbapenems (imipenem, meropenem, and doripenem) are used as the drugs of last resort to treat patients with resistant bacterial infections. These drugs possess a broad range of activity against numerous β -lactamases. The increasing

TABLE 1. Relation of Minimum Inhibitory Concentrations to Carbapenemase Mechanisms in the Predominant Enterobacteriaceae

Mechanism (N = 74)	Organism	Imipenem ($\mu\text{g/mL}$)			Meropenem ($\mu\text{g/mL}$)			Doripenem ($\mu\text{g/mL}$)					
		<2	2–4	6–12	16– \geq 32	<2	2–4	6–12	16– \geq 32	<2	2–4	6–12	16– \geq 32
OXA-48/181 (29)	<i>Escherichia coli</i> (4)	-	4	-	-	1	1	2	1	1	-	-	2
	<i>Enterobacter</i> spp. (11)	-	4	2	5	-	2	9	-	1	1	1	9
	<i>Klebsiella</i> spp. (14)	1	5	5	3	1	-	12	1	1	1	1	11
NDM-1 (28)	<i>Escherichia coli</i> (9)	1	1	1	6	-	1	6	1	2	-	-	6
	<i>Enterobacter</i> spp. (6)	-	2	2	2	-	3	2	-	3	1	1	2
	<i>Klebsiella</i> spp. (13)	2	3	1	7	-	2	8	1	3	1	1	8
OXA 48/181 plus NDM-1 (12)	<i>Escherichia coli</i> (3)	-	-	2	1	-	-	3	-	-	-	-	3
	<i>Enterobacter</i> spp. (6)	-	-	-	6	-	-	6	-	-	-	-	6
	<i>Klebsiella</i> spp. (3)	-	-	-	3	-	-	3	-	-	-	-	3
NDM-1 plus VIM (5)	<i>Escherichia coli</i> (1)	-	-	-	1	-	-	1	-	-	-	-	1
	<i>Enterobacter</i> spp. (2)	-	-	-	2	-	-	2	-	-	-	-	2
	<i>Klebsiella</i> spp. (2)	1	-	-	1	-	-	1	1	-	-	-	1

NOTE. NDM-1, New Delhi Metallo-beta-lactamase-1; OXA 48/181, Oxacillinase 48/181; VIM, Verona integron-encoded metallo- β -lactamase.