



衛生防護中心
Centre for Health Protection

Scientific Committee on Infection Control

Recommendations on Integrating Gloves and Hand Washing Practices

Terms and Review of Scientific Data

Hand washing is a widely accepted and the single most important procedure for preventing institutional transmission of micro-organisms. The principles and practices of hand washing and hand hygiene have been recently reviewed at length [1-5]. Infection control practitioners (ICPs) may refer to the documents for the review of the scientific data regarding hand hygiene. In this document, the SCIC discussion on several infection control issues related to hand hygiene is presented for information by the local ICPs.

2. For purpose of discussion, the follow definitions are used:
 - (a) *“Hand washing” is defined as a vigorous, brief rubbing together of all surfaces of lathered hands with plain or antimicrobial detergent, followed by rinsing under a stream of running water [2].*
 - (b) *“Alcohol-based hand rub” is defined as the application of an alcohol-containing preparation (60 to 95% alcohol) to the hands forreducing the number of viable micro-organisms on the hands. After applying such an agent, the hands are rubbed together until the agent has dried [3-5].*
 - (c) *“Hand hygiene” is a general term that applies to either hand washing or alcohol hand rub[3-5].*



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Gloving Policies

3. Healthcare workers (HCWs) wear gloves to 1) reduce the risk of personnel acquiring infections from patients, 2) prevent health-care worker flora from being transmitted to patients, and 3) reduce contamination of the hands of personnel by flora that can be transmitted from one patient to another. This shouldn't be translated to mean that HCWs should wear gloves "all the time" in patient areas for the following reasons:

- (a) The fallacy of wearing gloves "all the time" is based on the idea that a glove offers better protection than our own skin for infectious material. This is not true, if any defects on the skin are already protected by the proper dressing. The sensation in our skin would alert us to any contact with secretions or fluids (which has the most infectious hazards) and they can then be immediately removed by a good hand wash. The gloves on the other hand would make one oblivious to such a contact and subsequently further contamination of our working environment would inevitably ensue. Consequently, the potentials for infectious transmission by indirect contact means will increase. Therefore in infection control, gloves are only worn for obnoxious procedures or those with excessively gross contamination. Under such circumstances, gloves use is important, because hand hygiene may not remove all potential pathogens when hands are heavily contaminated [6].
- (b) The proper use of gloves requires some judgments. As is the case for most medical decision, the HCWs will need to take into considerations factors such as the nature of the procedures, type of activity, the duration of contact, the status of patient, the nature of the pathogens involved, and the clinical settings. In principle, gloves are strongly recommended for anticipated contacts with blood, body fluid, secretion, excretions, mucous membrane and non-intact skin. Examples of such kind include sputum suction, taking nasopharyngeal aspirate, changing napkin, handling of urinals and bedpans. Indiscriminate use of gloves (i.e. "all the time") removes the value-added "professional judgment" which characterized the health care workers.
- (c) Several studies have found that misuse of gloves may expose patients to increased risk for infections [7-9]. Gloving "all the time" easily gives the worker a false sense of security. When gloves become a "second" skin, they become a vehicle for transmission of microorganisms from dirty to clean areas in the same patient and the environment, and from one to another patient. In this regard, improper and excessive gloving were found to decrease hand hygiene frequencies [7;9;10]. According to Girou et al, the improper use of gloves was associated with personnel missing more than half of the opportunities for hand hygiene [7]. In the study by Thompson et al, gloves were appropriately changed in only 16% of instances [10].

- (d) Regular use of glove contributes to skin problems and latex allergies [11]. In highly exposed groups, it may even increase the occurrence of certain serious IgE-mediated reactions. This subject was recently reviewed [12].
- (e) Alcohol-based hand rub solutions are designed and evaluated for application on the hands and not on gloves [3, 22-23]. There is no need to apply alcohol-based solution to “disinfect” unused gloves, which are sufficiently “clean” for infection control purposes. Actually, alcohol rub solutions will harden the latex and thus loosening out the integrity and the gloves may become not protective from glove micro-leaks [27]. The same pair of used gloves should not be used between patients or move from “dirty” to “clean” body sites in the same patient. Used and dirty gloves should be removed. Worn gloves should **not** be washed or disinfect with alcohol-based solutions and reuse [14]. Failure to remove gloves after “patient contact” or between “dirty” and “clean” body-site care on the same patient is an instance of nonadherence to standard hand-hygiene recommendations [3, 26].

4. For the above reasons, the SCIC has the following recommendation:

There is evidence that the improper use of gloves is a hazard to patients. Institutions and infection control practitioners are suggested to take measure to monitor and to promote the proper and judicious use of gloves for isolation precautions.

Gloving and Hand Washing

5. Gloving doesn't remove the need for hand washing. Following removal of gloves, alcohol-based hand rub is normally NOT a substitute for hand washing. The rationale is as follows:

- (a) Hands can be contaminated even when gloves are used, and are easily contaminated in the process of removing gloves [13]. Following removal of gloves, studies have shown that hands are commonly contaminated by nosocomial pathogens such as methicillin-resistant *Staphylococcus aureus* (MRSA) with rates of up to 50% [14]. Despite attention to how gloves were removed, occult breaks in unused latex gloves can cause substantial contamination of the hands [15]. It should be pointed out that the tests approved by the U.S. Food and Drug Administration for assessment of the barrier quality of gloves includes visual inspection and a water leak test; neither methods directly evaluate ability of gloves to prevent penetration by bacteria and virus. According to Korniewicz et al, 20% of latex gloves which had passed the watertight test allowed penetration of bacteria to the hands [16]. After use in clinical settings, studies found that glove leaks were frequent

(42.6 and 8.5% and for vinyl and latex gloves respectively) and that most health care workers failed to report awareness of the presence of glove leaks which were subsequently demonstrated [13].

- (b) Powdered latex gloves are the most common type of gloves available for use in health care settings. On the application of alcohol hand rub, the cornstarch powder intended to facilitate donning forms agglutinates. Besides discomfort, the donning powder may compromise the antiseptic efficacy of alcohol hand rub. At present, the latter issue has not been adequately evaluated from a scientific point of view.
- (c) Despite gloving, soiling of the hands by organic material may occur when gloves are worn for dirty patient care procedures (e.g. sputum suction, handling excreta, changing napkin). The readers are suggested to refer to the Fulkerson's scale [17] for further information on types of contacts that are "dirty." In presence of soiling, alcohol-based hand rub is less effective. Furthermore, alcohol-based hand rub (the same is true for all hand antiseptics) is poorly active against *Clostridium difficile* spores [18] that may be present in the feces of 10% or more of hospitalized patients [19]. Under such circumstances, the physical action of washing and rinsing for removal of bacterial spores is important. As *Clostridium difficile* infections emerge [20], hand washing assumes even more important roles for their prevention.

6. For the above reasons, the SCIC has the following recommendation:

Hand washing should be practised after removal of gloves. Hand washing but not alcohol-based hand rubs is the preferred method for hand hygiene after removal of gloves.

Hand Washing Versus Alcohol Hand Rub

7. The indications for hand hygiene and the proper hand hygiene techniques have been recently reviewed [3-5]. In choosing between hand washing and alcohol hand rub, the following rules serve as references:

- (a) Hand washing and alcohol-based hand rub only gives the desired effect if each hand hygiene action is properly performed [17]. Alcohol-based hand rub requires good technique to apply the agent to all parts of hands. Recently, Widmer et al found that antimicrobial effectiveness of alcohol-based hand rub was strongly influenced by techniques and recommended that special training be provided before the alcohol-based hand rub was used as a substitute for hand washing [21].
- (b) If hands are visibly soiled (including visibly dirty or when you feel that it is dirty) or potentially contaminated with proteinaceous material, then

hand washing should be practised. Under such circumstances, waterless alcohol-based hand rub is NOT a substitute for hand washing.

- (c) If hands are not dirty or visibly contaminated, an alcohol-based hand rub is an acceptable substitute for hand washing during routine patient care activities. In this regard, alcohol-based hand rub is at least as effective as standard hand washing in two randomized clinical trials [22;23].

Contact Precautions and Routinely Wearing Gloves when Entering the Room

8. The CDC guideline on contact precautions suggests health care workers to “*wear gloves when entering the room*” as a Category IB recommendation [24]. For patients who are isolated in single rooms, this approach is practical and may have merits. The same approach, when applied indiscriminately to other settings such as when multiple patients are cohorted in the same cubicle or in the same open ward (i.e. gloving when entering ward), may be problematic.

9. Personnel will likely wear gloves continuously and use glove as their “second skin” and may not change gloves between patients. Several reports as well as local experience have underlined the risk of hand-gloved personnel moving from patient to patient without glove change and hand hygiene [7;9;10]. In a long-term care facility, Thompson reported that gloves were changed appropriately in only 16% [10]. In an observational study of glove use in a teaching hospital, the continued use of gloves without removal resulted in 64% of all contacts being performed without adequate hand hygiene [7]. The study further found that poor compliance with gloves change was the only independently significant risk factor for hand hygiene non-compliance. This leads Girou et al [7] to conclude that “*achieving the goal of a high compliance to hand hygiene in our (their) facility is unlikely to be reached unless a profound adjustment of gloving practices occurs.*”

10. As reviewed recently by Larson et al, many studies have shown a relation between improved hand-hygiene practices and reduced infection rates [25]. Hence, high compliance in hand hygiene practices has been a central issue in infection control for decades. However, the impact of gloving on hand hygiene compliance has not been firmly established, because published studies have yielded mixed results. “Wearing gloves” has been identified as a risk factor for poor adherence to recommended hand hygiene practices [26]. If hand hygiene is not monitored, “routinely wearing gloves” may have the opposite effect in isolation precautions.

11. As mentioned in the CDC 2004 DRAFT “Guideline for isolation precautions” document, no studies have directly compared standard precautions alone and standard precautions plus contact precautions for prevention of

multiresistant organisms. In preventing transmission by the contact means, the efficacy of “routinely gloving” in contact precautions as compared to “gloving when indicated according to the type of anticipated exposure” plus good hand hygiene is unknown.

12. In Hong Kong, only a small number of patients who require contact precautions may be put in single rooms. Priority should be given to the patients with conditions that may facilitate transmission (e.g. tracheostomy, fecal incontinence, extensive skin lesions, and multiple draining wounds). For most patients, it is likely that a “cohort” approach in a multi-cubicle ward will continue to be used. Under such circumstances, “gloving” routinely on entering a cubicle or a ward and wearing gloves for every patient contact (and requiring hand washing after each glove removal) may be neither practical nor beneficial.

13. Recent experience from a few local hospital outbreaks of respiratory and gastrointestinal infections indicates that inadequate hand washing facilities in some units constitutes an important barrier for good infection control practices.

14. Since alcohol-based hand rub can decontaminate the hands effectively as long as there is no soiling and can be easily accessible, this committee opt that not requiring “routine gloving” for “clean” contact (such as those defined by the Fulkerson scale [17]) with patients placed on contact precautions in multi-patient rooms or cubicle is acceptable and preferred. In a ward where multiple patients with the same diagnosis are placed together under contact precautions, this committee discourages the indiscriminate wearing of gloves “on entering the ward” and also for ward activities that do not involve direct patient contact (e.g. using telephone, typing computer keyboards, writing case notes, touching door handles). However, measures should be taken by the infection control officer to ensure that personnel comply with proper hand hygiene practices [3-5] and that alcohol-based hand rubs do not inappropriately substitute some mandatory hand washing indications [17]. Gloves should also be worn when they are indicated according to the anticipated exposures.

15. For the above rationale, the SCIC has the following recommendation on this issue:

- (a) *Gloves should not be worn routinely on entry to areas such as a cubicle or a ward where multiple patients with the same infection are placed together for contact precautions. Instead, gloves should only be worn for “dirty” patient care procedures and when clinically indicated. For patients who require contact precautions, ICPs should take measures to ensure a high compliance to good hand hygiene practices.*
- (b) *In areas where transmission of microorganisms by the contact means is a concern, improving hand hygiene adherence including the*

provision of administrative support and resources should be an institutional priority. The SCIC recommends that hand washing facilities should be sufficient (approximately 1 hand washing facility for every 5 to 6 patient beds in multi-patient areas), accessible and easily available.

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