

# Hand-washing Practices of Facial Plastic Surgeons

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**Objectives:** (1) To define and characterize knowledge of effective hand hygiene and its scientific basis among practicing facial plastic surgeons; (2) to review the existing literature of, basis for, and guidelines on hand washing in clinical practice; and (3) to motivate and facilitate optimum hand hygiene among facial plastic surgeons.

**Methods:** National Web-based physician survey and literature review.

**Results:** We conducted a national Web-based survey of members of the American Academy of Facial Plastic and Reconstructive Surgery regarding general patient safety practices. A subset of the survey assessed physicians' knowledge of hand hygiene, including supporting rationale and actual practices. One hundred and twenty-two

facial plastic surgeons of various demographics replied to the online survey. Of these, 65 (53%) correctly knew which hand washing agents are most effective at killing microorganisms, 88 (74%) knew the preferred hand-washing method for visibly soiled hands, and 51 (42%) correctly identified the indications for hand washing.

**Conclusions:** Adherence to hand hygiene practices is sub-optimal among facial plastic surgeons. There seems to be a lack of knowledge regarding indications, methods, and appropriate agents for hand hygiene. Promotion of Centers for Disease Control and Prevention guidelines is an important step in increasing hand hygiene compliance among facial plastic surgeons.

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**H**AND WASHING IS THE MOST important way to prevent the spread of infections. This idea was first introduced to the world by Viennese obstetrician Ignaz Semmelweis, MD, in 1847. He realized that by not washing their hands, physicians were the cause of puerperal fever, which was the leading cause of maternal deaths in hospitals.<sup>1</sup> However, it was not until 1867 when British physician Joseph Lister, MD, published his revolutionary articles on antisepsis that sterile surgical technique was accepted.<sup>2</sup>

Methicillin-resistant *Staphylococcus aureus* (MRSA) has been a growing health concern among hospitalized patients over the past few years. A recent study found that MRSA colonization and infection prevalence among US health care facilities is 46.3 per 1000 inpatients.<sup>3</sup> Patients who are infected or colonized with MRSA serve as a reservoir for the infection, whereas health care workers may transmit the bacteria among patients. The major mode of transmission is via hands, which may have become contaminated through contact with patients, devices, items, or environmental surfaces that harbor the bacteria. Hand washing is one of the most effective means for preventing the spread of MRSA.<sup>4</sup>

Today, although it is well understood that hand washing reduces the spread of infection, the compliance rates remain poor. The overall mean rate of adherence to the recommended hand hygiene measures is 40%.<sup>5</sup> We composed a national Web-based survey for facial plastic surgeons to identify the prevalent beliefs and practices of hand hygiene measures.

## METHODS

A national Internet-based survey was sent to all members of the American Academy of Facial Plastic and Reconstructive Surgeons (AAFPRS) through the Academy newsletter. A link to a Web site containing a questionnaire on patient safety was sent to all members for whom an e-mail address was on file with the AAFPRS. The survey (**Figure 1**) assessed demographic information and included 3 questions regarding hand hygiene. The responses were stored in a specific database and analyzed in table and graphical form to identify physicians' knowledge of hand hygiene.

## RESULTS

One hundred and twenty-two facial plastic surgeons of various demographics re-

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**Please Provide the Demographic Information Below**

Years since residency       <5       5-15       >15

Type of practice       >80% Facial plastic surgery       Balance of facial plastic surgery and other specialty       <20% Facial plastic surgery

Primary surgical setting (>50% of cases)       Hospital operating room       Ambulatory surgical center       Office operating area

Relationship with hospital       Active staff member, regularly admit       Courtesy staff or rarely admit       No hospital affiliation

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Describe your practice setting       Nonacademic practice, no residents       Academic practice, train residents       Train AAFPRS fellows (with or without residents)

**1. Which hand hygiene agent is most effective in the absence of visible dirt?**

Soap and water       Alcohol-based agents       Chlorhexidine       Iodine-based agents

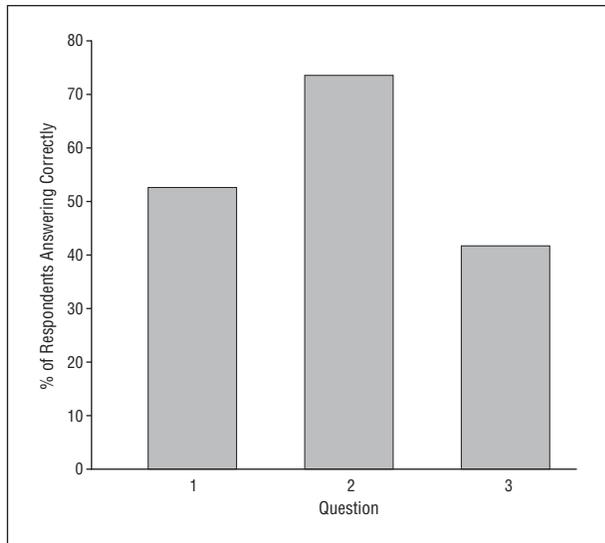
**2. Which of the following is the preferred hand hygiene method for visibly soiled hands?**

Soap and water       Alcohol-based agents       Chlorhexidine       Iodine-based agents

**3. When do you need to wash your hands? (check one or more)**

Before patient contact       Before putting on examination gloves       After patient contact       After removing examination gloves

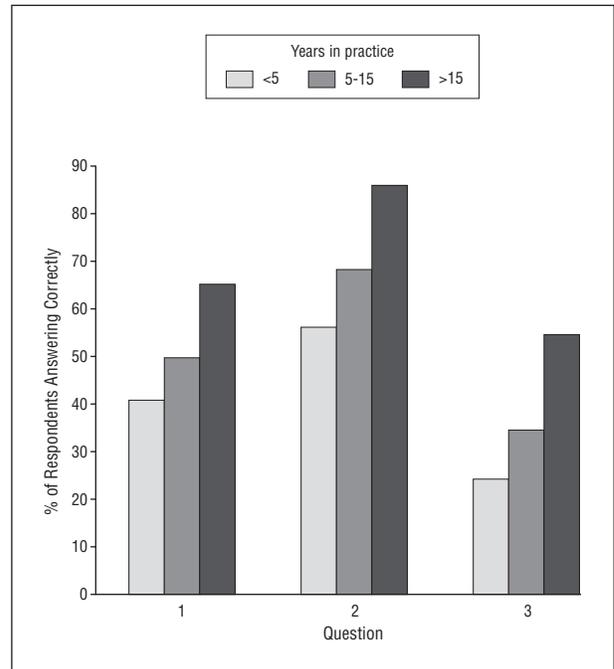
**Figure 1.** Hand-washing survey of the American Academy of Facial Plastic and Reconstructive Surgery (AAFPRS).



**Figure 2.** Percentage of physicians who answered each of the questions correctly.

plied to the online survey. Responses varied widely between physicians depending on the number of years they have practiced, primary surgical setting, and practice setting.

Of the 122 facial plastic surgeons, 65 (53%) correctly knew that alcohol-based agents are the most effective at killing microorganisms in the absence of visible dirt, 88 (74%) knew that soap and water is the preferred hand-washing method for visibly soiled hands, and 51 (42%) correctly identified that hand washing is indicated before patient contact, before putting on examination gloves, after patient contact, and after removing gloves (**Figure 2**). The knowledge regarding hand washing varied based on the number of years in practice (**Figure 3**),

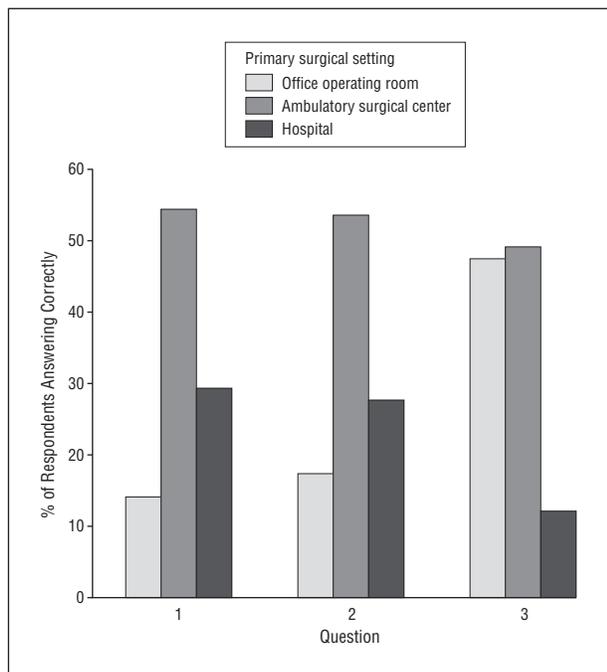


**Figure 3.** Percentage of facial plastic surgeons who answered the questions correctly based on the number of years in practice.

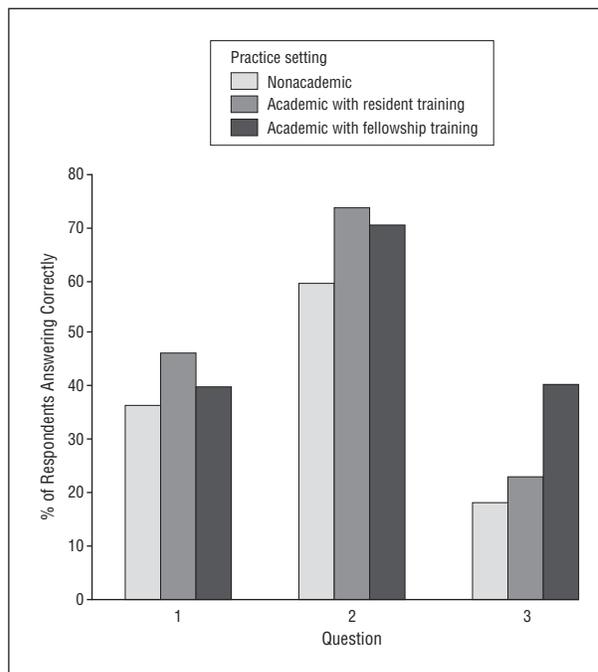
the physician's primary surgical setting (**Figure 4**), and the physician's practice setting (**Figure 5**).

#### COMMENT

For an infection to spread from physicians to patients, the following events must happen: (1) organisms on a patient's hand or inanimate object are transmitted to the physician's hand, (2) the organisms have the ability to



**Figure 4.** Percentage of facial plastic surgeons who answered the questions correctly based on primary surgical setting.



**Figure 5.** Percentage of facial plastic surgeons who answered the questions correctly based on practice setting.

survive for at least several minutes, (3) hand washing by the physician is either not performed, inadequate, or the agent used does not kill the organism, (4) the physician's contaminated hands contact another patient or an inanimate object that will eventually come in contact with the patient. Physical contact between physicians and patients is necessary in the field of medicine. Furthermore, it is well established that certain organisms are capable of surviving on human skin and fomites. Thus, the only way to prevent transmission of pathogens is to perform proper hand-washing measures with appropriate antimicrobial agents.<sup>5</sup>

The Joint Commission, which evaluates and accredits more than 15 000 health care organizations and programs in the United States, made reduction of health care-associated infections one of the 2008 national patient safety goals. To achieve this goal, health care workers must comply with current World Health Organization or Centers for Disease Control and Prevention (CDC) hand hygiene guidelines.<sup>6</sup>

In 2002, the CDC recommendations were designed to improve hand-washing practices of health care workers and to reduce the transmission of microorganisms in hospital settings. Hand washing is indicated before having direct contact with patients, before donning sterile gloves when inserting a central intravascular catheter, after contact with a patient's intact skin, after contact with inanimate objects (including medical equipment) in the immediate vicinity of the patient, and after removing gloves.<sup>5</sup>

In addition to hand washing, it is imperative that physicians know which agent to use under different circumstances. Health care workers should wash hands with soap and water when visibly dirty, contaminated, or soiled and use alcohol-based rubs when hands are not visibly soiled

to reduce bacterial counts.<sup>5</sup> Plain soap and water is good at reducing bacterial counts, but antimicrobial soaps (ie, chlorhexidine, 4%) are even more effective. However, alcohol-based hand rubs (ie, isopropanol, 70%) are the most superior agents at killing bacteria.<sup>7</sup>

The ideal product is one that has broad antiseptic activity, has few adverse effects, and is easily accessible. These characteristics would lend itself to greater acceptance among health care workers.<sup>5</sup> Alcohol-based rubs seem to be well suited for decontamination because they are rapidly active against all bacteria and most clinically important viruses, yeast, and fungi. In addition, because no washbasin is necessary, these agents may be placed in dispensers that are easily available. Furthermore, these alcoholic hand rubs spread easier on the hand and evaporate quicker than standard aqueous solutions.<sup>8</sup> Although their use is widespread throughout many hospitals, these preparations have drawbacks as well. First, they are not indicated when hands are visibly dirty or contaminated with proteinaceous materials. Second, alcohol hand rubs may cause a stinging pain at the site of any skin injury. These preparations have a harsh odor that may be poorly tolerated by health care workers, especially those with respiratory allergies. Moreover, skin rashes or reactions may result in people with hypersensitivity to alcohol or various additives present in the preparation. Finally, alcohol rubs are flammable, which necessitates a special dispenser system.<sup>5</sup>

Although there is clear evidence that clean hands are the single most important factor in preventing the spread of pathogens and antibiotic resistance in health care settings, adherence to recommended guidelines is unacceptably low. Overall adherence rates are estimated to be around 40%.<sup>5</sup> Larson et al<sup>9</sup> evaluated adherence to the 2002 CDC Hand Hygiene Guidelines after widespread

dissemination of the guidelines to 40 US hospitals. All study hospitals had changed their policies and procedures in compliance with guideline recommendations. Although 90% of staff members reported that they were familiar with the guidelines, only 56.6% adhered to the hand hygiene recommendations.<sup>9</sup> Efforts need to be undertaken to bridge the gap between knowledge and awareness of the guidelines and their actual clinical use.

Therefore, although education is necessary to promote proper hand-washing practices, there are numerous other barriers that prevent implementation of clinical practice guidelines. The following have been observed risk factors for lack of adherence to recommended hand hygiene practices: physicians (rather than nurses), nursing assistants (rather than nurses), male sex, working in an intensive care unit, working during the week (rather than weekends), and wearing gowns and gloves. Self-reported factors for poor compliance include the following: agents cause irritation and dryness, sinks are inconveniently located or there is a shortage of sinks, lack of soap and paper towels, insufficient time, patient needs take priority, interferes with patient relationship, low risk of acquiring infection from patient, lack of knowledge of guidelines or protocols, forgetfulness, disagreement with the recommendations, and no role model from colleagues or superiors.<sup>10</sup>

To our knowledge, no survey has ever been performed among facial plastic surgeons regarding hand-washing practices. Our results show that 74% of surgeons knew the appropriate agent to use for visibly soiled hands and 53%, for hands not visibly soiled. Furthermore, only 42% knew the proper indications for hand washing. Interestingly, we found that hand-washing knowledge and practice vary with physician experience. The more years that a physician has practiced medicine, the more educated and adherent he or she is about hand hygiene. This may be important when considering methods of improving compliance, whereby more experienced physicians need to be role models in promoting proper hand-washing practices. Furthermore, hand-washing knowledge among facial plastic surgeons varied among primary surgical setting. Surgeons who operate mainly in a hospital setting were less informed about hand hygiene compared with surgeons who operate in an office operating area or ambulatory surgical center. These outcomes are surprising given the fact that most hand hygiene campaigns take place in a hospital setting. Knowledge of proper hand hygiene also varied between academic and nonacademic facial plastic surgeons such that physicians who train residents and/or fellows knew more about hand washing than nonacademic physicians.

To improve hand hygiene measures among health care workers, collaborative efforts need to take place at the individual and system level. Education is the most important part of any hand hygiene campaign. As shown from our survey, many physicians do not possess the necessary knowledge regarding the appropriateness and efficacy of hand hygiene agents. Therefore, the proper guidelines need to be disseminated and understood to expect any improvement in adherence to hand hygiene recommendations. Our survey demonstrates that experienced

surgeons are more educated about hand washing than novice surgeons. This may be used to implement a mentorship type of program whereby more senior physicians can lead through both practice and didactics to improve adherence.

Once the importance and understanding of hand hygiene principles are established among health care workers, the next goal is for the institution to implement a multidisciplinary program that has sufficient administrative support and financial resources. The hospital administration should present written guidelines explaining and promoting hand hygiene agents and facilities, as well as provide readily accessible and appropriate hand-washing products. Once this framework is in place, health care workers' compliance must then be monitored to assure patient benefit. One indicator used to measure adherence is observing and recording the number of hand-washing episodes performed by health care workers and compare those with the number of hand-washing opportunities that were presented. Another objective measure is to record the volume of hand-washing agent used during a specified time period.<sup>4</sup> Health care workers should be made aware of their performance whether positive or negative. Hopefully, personnel who are given laudatory performance feedback continue their ideal hand hygiene practices, and poor feedback given to personnel who did not adhere to hand-washing principles would be an impetus for behavioral change. In addition, these objective hand hygiene measures would identify specific hospital locations where adherence rates varied widely. This information may suggest areas in which an institutional change may be necessary. The hand hygiene campaign must be a dynamic process whereby both health care workers and hospital administration are willing to make changes for the benefit of patient safety.

In conclusion, nosocomial infections are a major problem for hospitals worldwide. Hand washing is the most effective means of preventing these infections, yet health care workers' adherence to hand hygiene guidelines is abysmal. Within the field of facial plastic surgery, there seems to be a lack of knowledge regarding indications, methods, and appropriate agents for hand hygiene. Promotion of CDC guidelines is an important first step in increasing hand hygiene compliance among facial plastic surgeons. Ultimately, an effective hand-washing campaign requires a multimodal and multidisciplinary approach.

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