

## Hand Hygiene Practices and the Use of Alcohol-Based Sanitizers

Hand hygiene, a term applied to either a thorough washing of hands with soap and water for at least 15 seconds or the application of 3 to 5 ml of an alcohol-based antiseptic solution, has been reported as the most significant method to reduce healthcare-associated infections (HAIs).<sup>1</sup> The Centers for Disease Control and Prevention (CDC) estimates that approximately 90,000 patients die every year as a result of HAI acquisition.<sup>2</sup> In 2006, the Pennsylvania Health Care Cost Containment Council reported that more than 30,000 patients acquired HAIs in Pennsylvania, a rate of 19.2 per 1,000 cases, and patients with hospital infections died at a rate nearly 6 times that of uninfected patients.<sup>3</sup>

### Background

The concept of handwashing as a method of infection control dates back to 1843, when Oliver Wendell Holmes Sr., MD, authored the “The Contagiousness of Puerperal Fever” in the *New England Quarterly Journal of Medicine*.<sup>4</sup> The essay addressed Holmes’ perception that the degree of contagiousness highly suggests patient-to-patient carriage by physicians and nurses. Around the same time, Ignaz Philipp Semmelweis, MD, a Hungarian obstetrician, discovered that “hand washing was an effective method to reduce the death rate due to childbirth fever or puerperal sepsis.”<sup>5</sup> Semmelweis enforced antiseptic practices among his students, and he reduced the death rate in the postpartum population from 12% to 1% in two years. Both physicians encountered significant resistance to this practice.

During 2002, CDC, in collaboration with the Society for Healthcare Epidemiology, the Association of Professionals in Infection Control and Epidemiology, and the Infectious Disease Society of America, released its updated *Guideline for Hand Hygiene in Health-Care Settings*. Included in these guidelines was the strong recommendation for routine use of alcohol hand sanitizers in clinical settings.<sup>6</sup> Similar to findings of Holmes and Semmelweis, the guideline supports hand hygiene as an evidence-based practice to reduce HAIs as part of a multifaceted approach.<sup>7</sup>

HAIs have a global impact on healthcare delivery systems. The World Health Organization (WHO) addressed these issues in 2007 with the *WHO Guidelines on Hand Hygiene in Health Care*.<sup>8</sup> The international recommendations came on the heels of another WHO campaign, Global Patient Safety Challenge 2005-2006: Clean Care is Safe Care, which collectively supports fundamental principles to improve universal health and well-being.

### Hand Hygiene Compliance Issues

One of the most significant challenges for infection preventionists (formerly known as infection control practitioners) is the lack of overall compliance among healthcare workers in all healthcare settings, resulting

in unacceptably low rates of adherence to guidelines and practice.<sup>9</sup> A review of reports submitted through PA-PSRS revealed violations in hand hygiene practices, whereby healthcare workers (i.e., physicians, laboratory and radiology personnel) entered patient rooms, rendered care, and left without washing their hands. This included patients in contact isolation. In a 1999 study by Pittet et al., 2,834 observed opportunities for handwashing revealed an average compliance rate of 48%. Nurses had the highest rate of compliance compared to physicians, nursing assistants, and other healthcare workers.<sup>10</sup> For the most part today, the rate of hand hygiene compliance remains at less than 50% except in hospitals that have instituted extremely aggressive campaigns such as the University of Pittsburgh Medical Center, Shadyside Campus. In 2005, the hospital launched a highly visible program including promoting the use of alcohol hand sanitizer. After four months, hand hygiene compliance had risen from 17% to 60%.<sup>11</sup> Now, the center’s overall compliance rate is consistently greater than 90%.

### System Failures and Barriers to Effective Hand Hygiene

System failures encourage poor compliance by healthcare workers. Healthcare facilities (hospitals and nursing homes) need to design user-friendly, easily accessible, and simple but effective hand hygiene systems. Well-designed systems in conjunction with other pertinent factors, will ultimately lead to motivation with resultant individual accountability and compliance. Several observational studies have determined that noncompliance is multifaceted, and breaking down the barriers is critical to a successful program.<sup>12-14</sup> The following barriers are most commonly reported:

- Lack of institutional commitment
- Skin irritation, mainly as a result of handwashing with soap and water
- Time constraints, particularly when handwashing
- Inconvenient location and insufficient numbers of sinks
- Frequent lack of supplies (e.g., soap, paper towels)
- False sense of security with glove use
- Interference with worker-patient relation (hand hygiene creates a brief interruption of care)
- Forgetfulness
- Lack of guidance
- Lack of effective educational programs
- High workload and understaffing
- Lack of scientific information demonstrating impact of improved hand hygiene on hospital infection rates

## Components of a Successful Hand Hygiene Program

Changing behavior is complex, and facility-wide acceptance is imperative. Infection control personnel play a key role in assisting administration with the design of an effective program. Providing evidence to facility administrators about new approaches can aid in meeting HAI reduction and prevention goals. How-to guides such as the toolkit and guide produced by the Institute of Healthcare Improvement have assisted hospitals in achieving far higher compliance rates.<sup>15,16</sup> Components of a successful system include the following:

- Institutional commitment
- Establishment of policies and procedures for hand hygiene
- Active participation in promotion at the individual and institutional/system level
- Designated champions
- Ongoing staff and patient education, including technique for handwashing and alcohol sanitizer use
- Routine monitoring and assessments with feedback (quality improvement tools)
- Readily available sinks, paper towels, and alcohol-based rubs
- Reminders such as posters and screen savers
- Personal accountability
- Sanctions for noncompliance
- Reward and recognition for good performers

## Alcohol Hand Sanitizers and Their Role in Hand Hygiene Compliance

Use of alcohol hand sanitizers appears to be superior to traditional handwashing when the caregiver's hands are not visibly soiled. Sanitizers are less irritating, require less time, act faster, have rapid bactericidal action (except for *Clostridium difficile* and spore-producing organisms), are active against the most clinically important organisms (viruses, yeasts, fungi), and contribute to improved compliance. A systematic review of the efficacy of alcohol hand sanitizers revealed that the overall compliance for hand hygiene appears to be improving since the introduction of these products and the strong endorsement in CDC's 2002 guidelines.<sup>17-19</sup> The review concluded that while hand hygiene involving alcohol hand sanitizers is increasing, relatively few well-designed studies to date reveal a reduction in the overall incidence of HAIs as a result. However, one experimental trial/study in a hospital setting demonstrated that if staff can be convinced to use alcohol hand sanitizers to a significant degree, the rate of HAIs will decrease significantly, especially if it is part of a multifaceted approach to HAI reduction.<sup>20</sup> It is important to note that alcohol hand sanitizer products within the United States usually contain 60% to 95% ethanol or isopropanol, with 60% to 70% formulations being most commonly used.<sup>21</sup>

Alcohol hand sanitizer factors that increase hand hygiene compliance include the following:

- Ease of use
- More readily available than sinks
- Less skin irritation than handwashing because of the absence of harsh chemicals as well as the addition of emollients
- Rapid evaporation
- Less time consuming than handwashing
- More efficacious, mainly due to increased use versus regular handwashing

## Risk Reduction Strategies

Approximately 165 years have passed since Holmes and Semmelweis first made the connection between handwashing and infection prevention. While there has always been the need for compliance, today with the prevalence of multidrug-resistant organisms, such as methicillin-resistant *Staphylococcus aureus*, the need for risk reduction strategies is critical.

All healthcare facilities, including acute care hospitals and nursing homes, must create their own action plans with specific risk reduction strategies that include but are not limited to the following:

- Audit the current rate of hand hygiene compliance.
- Set a target rate and time frame for improvement.
- Provide appropriate hand hygiene education to all providers of patient care.
- Encourage, reward, and recognize staff input and ideas for improving hand hygiene compliance.
- Allocate sufficient funds, and appoint unit champions.
- Survey the environment, and determine placement at point of care for the alcohol sanitizer dispensers.
- Encourage patient input on the overall plan to improve hand hygiene compliance.

Ultimately, compliance with hand hygiene needs to become part of a culture of patient safety. Healthcare advances, including alcohol hand sanitizers, have made it possible for facilities to provide the necessary components for facilitywide compliance. Effective systems as described above together with alignment of frontline team members, strong educational programs, and consistent personal accountability by all staff can help achieve 100% compliance with hand hygiene, which is a vital component of the nationwide HAI reduction initiative.<sup>22</sup>

In his recently published book, *Results That Last: Hardwiring Behaviors That Will Take Your Company to the Top*, Quint Studer, a consultant whose firm implements evidence-based leadership systems, quoted a colleague who stated that "what we permit, we promote." If we permit low rates for compliance with hand hygiene, are we promoting infections?<sup>23</sup> Facilities can look at this issue and commit to improving

patient care by promoting hand hygiene compliance today.

Notes

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