

Hand Hygiene Auditing Resource

Hand hygiene in healthcare settings is complex and building a high-quality hand hygiene program isn't easy. Since 2004, The Joint Commission (TJC) has expected hospitals to address hand hygiene as outlined in National Patient Safety Goal 07.01.01 which requires healthcare organizations to implement a hand hygiene program, set goals for improving compliance, monitor the success of those plans, and steadily improve. While many hospitals have actionable goals and have improved over time, others have stagnated. In 2018, TJC issued an update stating that "any observation by surveyors of individual failure to perform hand hygiene in the process of direct patient care will be cited as a deficiency." This update has caused confusion and uncertainty among IPs and hospital leadership.

Sylvia Garcia-Houchins, MBA, RN, CIC, Joint Commission

Summary:

The challenge for auditing hand hygiene is difficult. Good data can help to identify the disparity between perception and practice. Auditing, or periodic performance measurement, along with feedback on performance can help improve low-level performance. Based on expert opinion and a review of the literature, benefits and limitations of the methods of hand hygiene auditing are outlined in presented in this report. The ideal approach to monitoring hand hygiene has not yet been established. A combination of using different auditing methods may be best to collect both qualitative and quantitative data. In addition, further data is needed to establish effective and ways and methods of providing feedback and motivating personnel.

Text that is marked by footnotes represent areas meant to help the reader identify the richest and/or most recent sources to help identify best strategies and strongest evidence for selection of a Hand Hygiene auditing tool. By no means is this report complete: there are many more vendors, experts, tools and guides than this short review can provide to help decisionmakers select appropriate methods. It is recommended to use J.M. Boyce's (2019) references from his article, "Current issues in hand hygiene," for additional information on this subject. However, the information from that article is summarized here in *Table 1: Hand Hygiene Comparison Chart*.

Table 1: Hand Hygiene Comparison Chart ¹			
Auditing Method	Benefits	Limitations	Other
Direct Observation	<ul style="list-style-type: none"> • Considered gold standard and is most widely adopted strategy for auditing • Ability to determine compliance with WHO's 5 Moments for Hand Hygiene • Can be used in all settings • Ability to provide immediate feedback to Health Care Provider 	<ul style="list-style-type: none"> • Compliance rates generated are often 2 to 3 times higher than. automated systems but can be reduced with "secret shoppers" 	<ul style="list-style-type: none"> • There are free digital apps and others to conduct and analyze data
Automated Hand Hygiene Monitoring Systems	<ul style="list-style-type: none"> • Useful for studying trends in frequency of hand hygiene over time or between units 	<ul style="list-style-type: none"> • Electronic dispensers cannot distinguish between staff, patients, or providers. • Cannot provide information about compliance rates because hand hygiene opportunities are not established • Little validation of algorithms that measure hand hygiene opportunities 	<ul style="list-style-type: none"> • Algorithms for hand hygiene opportunities can be estimated based on patient to nurse ratio, patient census, and other factors
Group Monitoring (Activity Monitoring)	<ul style="list-style-type: none"> • Useful for studying trends in frequency of hand hygiene over time or between units • Uses a sensor to monitor times the room doors are opened as a proxy for opportunity • Less expensive than badge-based systems • Less intrusive • Can record magnitudes more hand hygiene opportunities • Not affected by observer bias • Some can notify when refills or batteries are needed 	<ul style="list-style-type: none"> • Requires supplementary activities for sustained improvement • Cost with implementation • Electronic dispensers cannot distinguish between staff, patients, or providers. • Cannot monitor compliance of WHO's Movements 2 and 3 	<ul style="list-style-type: none"> • Validation revealed good sensitivity (92.7%) and decent positive predictive value (82.4%)

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Auditing Method	Benefits	Limitations	Other
Badge-Based Systems	<ul style="list-style-type: none"> • Ability to provide immediate feedback • Improves performance of good hand hygiene • Weekly emails can be sent to unit or department managers or texts to the badged clinician • Can record magnitudes more hand hygiene opportunities • Not affected by observer bias <p>Some can notify when refills or batteries are needed</p>	<ul style="list-style-type: none"> • Greater complexity • More cost • Occasional poor accuracy in detecting hand hygiene opportunities • Occasional poor acceptance by providers 	<ul style="list-style-type: none"> • Systems without real-time reminders may not have improved results
Video Camera Based Systems	<ul style="list-style-type: none"> • Limited experience shows improved compliance of up to 80% • Can monitor other performance behaviors 	<ul style="list-style-type: none"> • Limited experience and data • Costly • Requires more auditor time 	<ul style="list-style-type: none"> • Concerns about liability if confidentiality is not maintained

Experts

John M. Boyce, M.D.—J.M. Boyce Consulting

Website: <https://jmboyceconsulting.com/>

John M. Boyce, MD is Clinical Professor of Medicine at Yale University School of Medicine and retired in May 2015 from his position as Director of Epidemiology and Infection Control at Yale-New Haven Hospital. He received his MD degree from University of Washington School of Medicine, completed a fellowship in infectious diseases at Herman Hospital in Houston, and obtained his training in epidemiology in CDC’s Epidemic Intelligence Service.

His 40-year career in infectious diseases and healthcare epidemiology involved working on a wide variety of infections. During his time with CDC, he studied various aspects of tularemia, bubonic plague, cholera and Shigella dysentery. Areas of special interest in hospital settings included healthcare-associated MRSA, VRE, outbreak investigation, antimicrobial stewardship, environmental contamination, new technologies for environmental disinfection, and hand hygiene. He was co-author of the HICPAC/SHEA/APIC/IDSA Guideline for Hand Hygiene in Healthcare Settings, and was a member of the core group that developed the WHO Guideline for Hand Hygiene in Healthcare. He served as a member of expert panels for the American Hospital Association, the Institute for Healthcare Improvement, and the Joint Commission.

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Sandra Assasnik, Director, Safety and Quality

Maria L. Greskowiak, BSN, RN, CHPN—Gulfside Healthcare Services

Website: <https://twitter.com/gulfsidehs>

Gulfside is a community-based organization providing hospice, non-hospice palliative services, and skilled home health care throughout Pasco County and the Tampa Bay area since 1989. Prior to automation, the home hand hygiene program utilized the direct observation method with an opportunity-based approach yielding 60-80 observations per month. To date, there has been no automated method to measure and report HHE that occur in home health settings. The SafeHaven™ Personal Hand Hygiene System (personal devices with alcohol gel sanitizer, wireless data transfer, and web-based reporting), was deployed to 40 home care professionals over a 3-month period. The personal hand hygiene system measured over 21,000 hand hygiene events using a multi-modal approach which resulted in sustained hand hygiene performance rates across all disciplines, improved hand hygiene awareness of individual and group rates, and visibility of hand hygiene practice across the continuum of care.

Sylvia Garcia-Houchins, MBA, RN, CIC - The Joint Commission

Website: <https://www.jcrinc.com/directory/sylvia-garcia-houchins/>

Sylvia Garcia-Houchins has provided infection prevention and control consultation in a variety of health care settings, including hospitals, health clinics, and dialysis centers. She has trained nurses, microbiologists, and public health graduates to certification in infection control. Garcia-Houchins has served on the faculty for the Association for Professionals in Infection Control and Epidemiology (APIC) basic training course and as member of APIC National Program Committee. Garcia-Houchins has also conducted hospital assessments and developed educational programs responsive to the needs of the community, geographic region and country and has authored articles and book chapters related to infection control, including a chapter in the APIC Text. Ms. Garcia-Houchins has been a consultant for JCR/JCI for more than four years.

Amna Handley, MSN, FNP-C, APRN, CIC - Georgia-Pacific

Linked in: [linkedin.com/in/amna-handley-msn-fnp-c-aprn-cic-7300aa15](https://www.linkedin.com/in/amna-handley-msn-fnp-c-aprn-cic-7300aa15) Amna Handley,

MSN, FNP-C, APRN, CIC Director of Clinical Development at GP PRO (Georgia-Pacific Professional) is a healthcare executive and professional with over 24 years of experience working across the continuum of care and most recently at GP PRO with a focus on hand hygiene practice. She earned her M.S.N. in Health Systems Leadership, is a Post-Masters Board Certified Family Nurse Practitioner, and is Board Certified in Infection Prevention and Control. She has previously served as a Director of Infection Control in acute care, served as an International Infection Prevention Consultant, served as President of the Chattahoochee Valley Georgia APIC Chapter 2006 and was awarded Certificate of Appreciation, CDC & Georgia Division of Public Health in 2002-2003. Amna currently serves in a national role working on the

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Sandra Assasnik, Director, Safety and Quality

innovation, development, and clinical application of automated hand hygiene delivery systems in healthcare at GP PRO.

Nancy Osborn, RN, CIC

Linked in: [linkedin.com/in/nancy-osborn-19998b13a](https://www.linkedin.com/in/nancy-osborn-19998b13a)

Nancy L. Osborn, RN, CIC, is Manager of Infection Prevention and Epidemiology at The Medical Center, Navicent Health in Macon, Georgia. She has worked in Infection Prevention for more than 35 years with experience spanning the healthcare spectrum, including acute, ambulatory, and long-term care settings. Osborn has served on the Board of Directors for both the Western New York Infection Control Organization and the National APIC Virginia Association. She has also served as President of the Central Georgia chapter of APIC as well as Chair of the Vizient MidSouth Infection Prevention Council. She has authored or co-authored a number of poster/abstract presentations, including winning the 1st place Quality and Patient Safety Award for hospitals with greater than 300 beds, PHA, Georgia Hospital Association, 2012. Osborn has also received a Healthcare Environmental Manager certification.

Michael Shabot, MD, Chief Medical Officer, Memorial Hermann System².

LinkedIn: <https://www.linkedin.com/in/michaelshabot/>

Shabot transformed his HAI rates to zero or near-zero system-wide after implementing Transforming Healthcare's hand hygiene TST. His work is cited below under "Journal Articles."

Wava Truscott, PhD, MBA.

LinkedIn: [linkedin.com/in/wava-truscott-phd-mba-22005b13](https://www.linkedin.com/in/wava-truscott-phd-mba-22005b13)

Email: Wava.Truscott@kcc.com

Wava Truscott is Director of Medical Sciences & Clinical Education for Kimberly-Clark Health Care. She received her doctorate from the University of California, in Comparative Pathology with major emphasis in Microbiology, Immunology, and Pathology. Her MBA is from the University of La Verne and her BS from Brigham Young University. Truscott utilizes her years of experience in healthcare, knowledge of disease states and passion for infection prevention, to support product research, create accredited continuing education courses, and author articles. She is an international speaker and has written over 70 articles. Truscott was also the Vice President of Safe Life Corporation, an antimicrobial-based technology company; Vice President of Safe Skin, a glove company; Director of Regulatory and Consumer Affairs and, earlier, Manager of Divisional Laboratories for Baxter Pharmaseal; and Laboratory Supervisor and

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Technician at MIDECO (currently Nelson Laboratories). She is ASTM D11.40 Chairman of the Antimicrobial Glove Working Group.

Tools/Guides

- [Indiana State Department of Health](#)'s hand hygiene observation tool includes detailed instructions for infection prevention staff and staff assigned to act as observers. It allows for 30 separate observations.
- [Johns Hopkins Medicine](#) developed two tools to help organizations observe and document hand hygiene compliance. One includes four rules for conducting hand hygiene observations, and the other tool allows for more details, such as room type and healthcare worker type.
- Joint Commission and others (APIC, CDC, IHI, WHO, etc.) [Measuring Hand Hygiene Adherence: Overcoming the Challenge](#). The large monograph with comprehensive guidelines is attached. The Joint Commission also has a wealth of other information available [online](#). Get information about the TST (Targeted Solutions Tool) for hand hygiene by visiting: www.centerfortransforminghealthcare.org or call Customer Service at 603-792-5800 or email at tst_support@cth.org.³
- [Park Nicollet Hospital](#) in St. Louis Park, Minnesota, offers an observation tool that presents a basic audit of hand hygiene compliance.
- Southern Health NHS Foundation Trust—The Hand Hygiene Compliance Audit Guide is attached. The guide is very easy to use.³
- [University of California, San Francisco](#) – Department of Hospital Epidemiology and Infection Control has an Institutional Hand Hygiene Improvement Program. UCSF's policy is located online [here](#). UCSF also has an entire section of their web dedicated to hand hygiene that includes [general education](#), [observer training](#), [resources](#), [product information](#) and an [observational tool](#).³
- [World Health Organization](#) offers a free, downloadable observation form that includes a basic compliance calculation table as well as general recommendations for successful hand hygiene observations.³

Vendors

AeroScout. Hand-hygiene compliance is one application of the [AeroScout](#) solution for real-time monitoring, visibility and analytics. It is available from Stanley Healthcare, Waltham, Mass. It captures hand-hygiene opportunities (when a caregiver enters or leaves a

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patient room) and events (the successful use of a hand-hygiene dispenser). Staff members wear a small wireless badge, which is typically attached to their ID badge. The system automatically records when they enter and exit a patient room and when they use a dispenser.

CleanHands-Safe Hands. [The Clean Hands – Safe Hands](#) system can double—or even triple—hand hygiene performance rates. First, it accurately measures hand hygiene data, allowing you to make better decisions. Second, it also provides real-time reminders to busy clinicians, reminding them to clean their hands in the moment. (References: D. Reed. S. A. Kemmerly, *The Ochsner journal* 9, 27 [Spring, 2009]. 2 D. Pittet, *Emerging infectious diseases* 7, 234 [May – Apr, 2001]. 3 E. Zimlishman et al., *JAMA internal medicine*, [Sept 2, 2013]. 4 McGuckin, M, et al. “Hand Hygiene Compliance Rates in the United States—a One-Year Multicenter Collaboration Using Product/ Volume Usage Measurement and Feedback.” *American Journal of Medical Quality: the Official Journal of the American College of Medical Quality*, U.S. National Library of Medicine, 1 May 2009, www.ncbi.nlm.nih.gov/pubmed/19332864.)

EnMotion. [enMotion](#) dispensers from Georgia-Pacific offer touchless soap, sanitizer and paper towel dispensing, which helps to minimize cross-contamination. The dispensers are complemented by a portfolio of paper towel, soap and sanitizer options for acute care settings and the SafeHaven automated hand-hygiene monitoring system. The SafeHaven system measures hand-hygiene compliance upon entry and exits in real time and provides individual, group and unit-level compliance data via automated reporting.

GOJO. [GOJO](#) offers an adaptable hand hygiene observation form for ambulatory surgery centers.

Journal Articles

Acquarulo, B., et al., (2019). Mixed-methods analysis of glove use as a barrier to hand hygiene. *Infection Control & Hospital Epidemiology*, 40(1), 103-105. Examination gloves have been previously noted as a possible barrier to hand hygiene. We performed a prospective quantitative and qualitative study to investigate. Glove usage was found to be a potential barrier to hand hygiene; this was driven by desire for personal safety and potentially learned during professional training.

Boyce, J.M. (2019) Current issues in hand hygiene. *American Journal of Infection Control Supplement*. Volume 47, A46-A52. Excellent state of the science review. The author thoroughly covers methods, strategies, monitoring and provides 92 references from a current literature search.⁴

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Cheng, V.C.C. et. al. (2019). Directly observed hand hygiene—from healthcare workers to patients. *The Journal of Hospital Infection*. Volume 101, Issue 4.

Despite the tremendous effort put into the promotion of hand hygiene for decades, hand hygiene compliance among healthcare workers and patients remains suboptimal. A novel approach is required to identify and address the remaining gaps despite the World Health Organization's Five Moments for Hand Hygiene. Directly observed hand hygiene (DOHH) may fill this gap and ensure 100% hand hygiene compliance during crucial moments outside the WHO's Five Moments. The concept of DOHH was inspired by directly observed therapy for treating tuberculosis, where drug compliance is of utmost importance. As the patient receives antituberculous medications under direct observation by a healthcare worker, the compliance of the patient can be ascertained.

Greskowiak, M.L. (2019). Quantitative measurement of hand hygiene behavior in hospice environments using an automated personal hand hygiene system. *American Journal of Infection Control*, Volume 47, Issue 6, S47

The APHHS (personal devices with alcohol gel sanitizer, wireless data transfer, and web-based reporting), was deployed to 16 home hospice care professionals over a 3-week period. The system measured total HHE and HHE per hour of clinical time. A multi-modal approach included a shared group performance dashboard, periodic individual email performance summaries, leadership communication, ongoing positive feedback via the personal device, HH education, and recognition of sustained individual performance. Prior to automation, 60 HHE were observed per month utilizing the direct observation method and an opportunity-based approach. Following system deployment, 1,387 HHE were captured per week on average. Average hourly HHE rates for the home hospice care team were measured at: Medical Doctor 8.6, Nurse Practitioner 3.4, Registered Nurse 3.7, Certified Nursing Assistant 6.5, Social Worker 5.2, and Chaplain 4.8.

Hummel, A.T., et al. (2019). A quality improvement initiative for improving hospital visitor hand hygiene. *The Journal of Hospital Infection*. Volume 101, Issue 4, 422-423.

Hand hygiene is crucial for the prevention of hospital-acquired infections. Hand hygiene promotions generally target healthcare workers, with variable success, but hospital visitors have poor hand hygiene and are infrequently encouraged to improve it. Improving the hand hygiene of visitors thus offers an opportunity to reduce the transmission of pathogens between healthcare settings and the community. However, there are few data on effective strategies to promote visitor hand hygiene. Here authors present a low-cost quality improvement initiative that improved visitor hand hygiene in our facility.

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Sandra Assasnik, Director, Safety and Quality

Maruyama, S., et. al. (2019). Multidisciplinary team audit rounds promote hand hygiene in a community hospital in Japan. *American Journal of Infection Control*. Volume 47, issue 6, Supplement, S37.

Weekly multidisciplinary team hospital-wide rounds improved hand hygiene practices. From the points of view other than nurses, we could hand necessity of hand hygiene to all-class healthcare workers. We wish for further improvement of hand hygiene by routine rounds.

Sendall, M.C., et. al. (2019). Cleaning staff's attitudes about hand hygiene in metropolitan hospital in Australia: a qualitative study. [International Journal of Environmental Research in Public Health](#). Volume 16, Issue 6. 1067.

In 2009, the National Hand Hygiene Initiative (NHHI) was implemented in hospitals across Australia with the aim of improving hand hygiene practices and reducing healthcare-associated infections. Audits conducted post-implementation showed the lowest rates of compliance with hand hygiene practices are among operational staff including hospital cleaners. There is limited information about hand hygiene issues in hospital cleaners to inform development of evidence-based interventions to improve hand hygiene compliance in this group. Aim: This qualitative study was undertaken to explore the attitudes of hospital cleaning staff regarding hand hygiene and the National Hand Hygiene Initiative. Methodology: Focus groups were conducted with 12 cleaning staff at a large Australian hospital implementing the National Hand Hygiene Initiative. Findings: Hospital cleaners recognize the importance of hand hygiene in preventing healthcare-associated infections. Cleaners cite peer support, leadership, and the recognition and reward of those excelling in hand hygiene as strong motivators. Barriers to optimal hand hygiene practice include the presence of multiple conflicting guidelines, hand hygiene "overload" and a lack of contextualized education programs. This exploratory qualitative study reveals three themes about attitudes of hospital cleaning staff towards hand hygiene. These themes are: (1) "The culture of hand hygiene: It's drummed into us"; (2) "Reminders and promotion for hand hygiene: We just need a big 'Please wash your hands' sign"; and (3) "The personal value of hand hygiene: Like he said, it's second nature to us". Conclusion: Hand-hygiene messages and training need to be more consistent and contextualized to achieve improvements in hand hygiene practices in hospital cleaning staff in Australia.

Shabot, M.M., et al. (2016). Sustaining improvement in hand hygiene and healthcare-associated infections. [Journal on quality and Patient Safety](#). January 2016, Volume 42, Number 1. This describes a hospital system's experience using the Joint Commission's web-based [Targeted Solutions Tool \(TST\) for improving hand hygiene](#). The TST enabled MHHS to measure compliance rates, identify reasons for noncompliance, implement and test interventions by the TST, and sustain improvements. ICU CLABSI and VAP rates decreased in association with the hand hygiene compliance improvements.

Van Dijk, M.D., et al. (2019). A multimodal regional intervention strategy framed as friendly competition to improve hand hygiene compliance. *Infection Control & Hospital Epidemiology*. Volume 4, Issue 2, 187-193

The multimodal, friendly competition intervention consisted of mandatory interventions: monitoring and feedback of hand hygiene compliance and optional interventions (i.e., e-learning, kick-off workshop, observer training, and team training). Hand hygiene opportunities, as formulated by the World Health Organization (WHO), were unobtrusively observed at 5 time points by trained observers. Compliance data were presented to the healthcare organizations as a ranking. The overall mean hand hygiene compliance at time point 1 was 42.9% (95% confidence interval [CI], 41.4–44.4), which increased to 51.4% (95% CI, 49.8–53.0) at time point 5 ($P < .001$). Nurses showed a significant improvement between time points 1 and 5 ($P < .001$), whereas the compliance of physicians and other HCWs remained unchanged. In the multilevel logistic regressions, time points, type of ward, and type of HCW showed a significant association with compliance. Between the start and the end of the multimodal intervention program in a friendly competition setting, overall hand hygiene compliance increased significantly.

Wu, KS, et al. (2017). A nationwide covert observation study using a novel method for hand hygiene compliance in health care. *American Journal of Infection Control*, Volume 45, Issue 3, 240 – 244.

Researchers conducted a 2-year, nationwide, prospective, observational study in teaching hospitals across Taiwan. Medical students and students who may have contact with patients in their careers were recruited as participants. A novel, shorthand notation method for covert observation was used. Observation results were reported through a study website. There were a total of 25,379 HH opportunities covertly observed by 93 observers. Overall HH compliance was 32.0%. Health care workers had the highest HH compliance for indication 4 (42.6%), and the lowest for indication 5 (21.7%). Overall hand rubbing percentage was high, reaching 83.6%. The HH compliance increased significantly with an increase in the number of indications within 1 HH opportunity ($P < .001$).