

Actionable Patient Safety Solutions™ (APSS™): Hand Hygiene

How to use this guide

This APSS provides evidence-based actions and resources for executives, leaders, clinicians, and performance improvement specialists. This document is intended to be used as a guide for healthcare organizations to examine their own workflows, identify practice gaps, and implement improvements. In it, you'll find:

Best Practice Summary: A high level summary of evidence-based, clinical best practices. (page 2)

Executive Summary: Executives should understand the breadth of the problem and its clinical and financial implications. (page 2)

Leadership Checklist: This section is for senior leaders to understand common patient safety problems and their implications related to hand hygiene. Most preventable medical harm occurs due to system defects rather than individual mistakes. Leaders can use this checklist to assess whether best practices are being followed and whether action is needed in their organization around hand hygiene. (page 3)

Clinical Workflow: This section includes more specific information about hand hygiene across the continuum of care. Leaders should include the people doing the work in improving the work. This section outlines what should be happening on the frontline. Clinicians can use this section to inform leaders whether there are gaps and variations in current processes. This is presented as an infographic that can be used for display in a clinical area. (page 5)

Education for Patients and Family Members: This section outlines what frontline healthcare professionals should be teaching patients and family members about hand hygiene. Clinicians can inform leaders whether there are gaps and variations in the current educational processes. (page 6)

Performance Improvement Plan: If it has been determined that there are gaps in current practice, this section can be used by organizational teams to guide them through an improvement project. (page 7)

What We Know About Hand Hygiene: This section provides additional detailed information about hand hygiene. (page 11)

Resources: This section includes helpful links to free resources from other groups working to improve patient safety. (page 11)

Endnotes: This section includes the conflict of interest statement, workgroup member list, and references. (page 12)

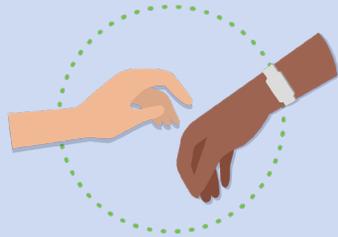
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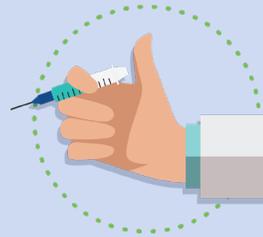
Best Practice Summary

5 Moments for Hand Hygiene Infographic

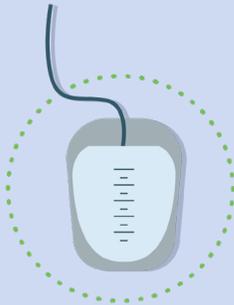
5 MOMENTS FOR HAND HYGIENE



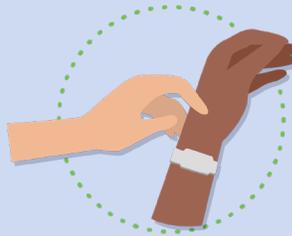
1 Before touching a patient



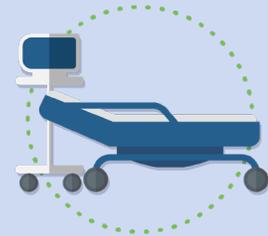
2 Before clean/aseptic procedures



3 After body fluid exposure/risk



4 After touching a patient



5 After touching patient surroundings

**Adapted from the World Health Organization's 5 Moments for Hand Hygiene*

Adopted from the [World Health Organization's "My 5 Moments for Hand Hygiene"](#). Hand hygiene should be performed at all of the stages outlined above to prevent infection and complications.

A floor map outlining the current state of hand hygiene related equipment could offer insight into hand hygiene barriers and opportunities for all. Additionally, this internal evaluation could shed light on opportunities to customize hand hygiene into role-specific routines to increase compliance by removing covert barriers.

Executive Summary

Routine Care

Hand hygiene compliance in most hospitals is less than 50%, which significantly contributes to the annual healthcare associated infection (HAI) rates of 7.1% in Europe and 4.5% in the United States. This translates to 37,000 deaths in European countries ([Hand Hygiene, 2020](#)) and nearly 99,000 deaths in the U.S. each year ([Stone, 2009](#); [Patient CareLink](#)). Adequate and thorough hand hygiene is the single most important, least costly, and most basic method of reducing HAIs in hospitals ([Mathur, 2011](#)). A 10% improvement in hand hygiene is associated with a 6% decrease in HAIs ([Sickbert-Bennett, et al. 2016](#)).

The Cost

HAIs are the most common adverse event in hospitalized patients globally ([WHO, n.d.](#)) and cost \$28-\$45 billion annually ([Stone, 2009](#)). The annual European financial loss due to HAIs is approximately 7 billion Euros with an estimated 16 million extra days in the hospital. In the U.S., that number is estimated to be \$6.5 billion annually ([World Health Organization, 2009](#)). It is estimated that every \$1 spent on hand hygiene compliance improvement is associated with a \$23.7 benefit for hospitals ([Chen, et al. 2011](#); [WHO, n.d.](#)). Additionally, in 2008, Medicare opted for non-payment to U.S. hospitals in which patients acquired a predetermined set of eight HAIs ([Peasah, McKay, Harman, Al-Amin, & Cook, 2013](#); [CMS, 2008](#)). HAI prevention efforts via hand hygiene are estimated to save nearly \$35 billion annually ([CDC, 2018](#)).

The Solution

Many healthcare organizations have successfully implemented and sustained improvements to increase hand hygiene compliance. This document provides a blueprint that outlines the actionable steps your organization should take to successfully improve hand hygiene compliance and summarizes the available evidence-based practice protocols. This document is revised annually and is always available free of charge on our website.

Leadership Checklist

On a monthly basis, or more frequently if a problem exists, the executive team should review hand hygiene practices and compliance. Use this checklist as a guide to determine whether current evidence-based guidelines are being followed in your organization:

Implementation and Culture

- Initiate a PI (performance improvement) project. Set a clear compliance target and a stretch goal. The target should be the minimum aim to show improvement from previous quarter or year. Uphold 100% compliance as a target goal.
- Ensure frontline involvement in hand hygiene compliance improvement activities. Maintain their engagement and remove barriers to progress.
- Debrief on a regular basis to solicit team feedback about barriers to sustained compliance. Adjust the plan quickly and nimbly as needed.
- Hold staff accountable for providing the standard of care and reward success.
- Ensure that leaders have a simple process to oversee hand hygiene compliance improvement work while also considering how it aligns with other initiatives across the organization.
- Ensure there are hand hygiene stations near all entrances and exits, and encourage everyone to sanitize their hands upon arrival and when leaving.
- Embed person and family involvement into hand hygiene initiatives to establish a standardized communication process with patients, families, and visitors around hand hygiene performance. If the organization has a PFAC, provide continuous hand hygiene initiative updates to the group and strategize with the PFAC around hand for PFAC feedback around hand hygiene initiatives. Work with members of the PFAC for community education events around hand hygiene. See "[Person and Family Engagement](#)" APSS for more information.
- Use hand hygiene as a 'pilot' trial for establishing a culture of safety and a culture of trust within the organization, because this is an area that "touches" everyone.

- Incentivize performance, whether financial (e.g., free meals), verbal (e.g., praise for performance), or professional (e.g., employee evaluation).
- Use the patient's prompt to the clinician ("Have you washed your hands?") as a test for clinicians' responses and ultimately for the organizational culture.

Frontline Involvement and Competencies

- Ensure adequate training and documentation of competencies and skills. Create an organizationally-consistent standard for proper hand washing and align competency checklists accordingly. Ensure new hires and floating staff are trained around the standard hand hygiene method.
- Model effective hand hygiene behaviors yourself.
- Involve volunteers and community members in hand hygiene education for patients and visitors.
- Ensure that hand hygiene protocols are embedded into clinical workflows, whether electronic or paper.

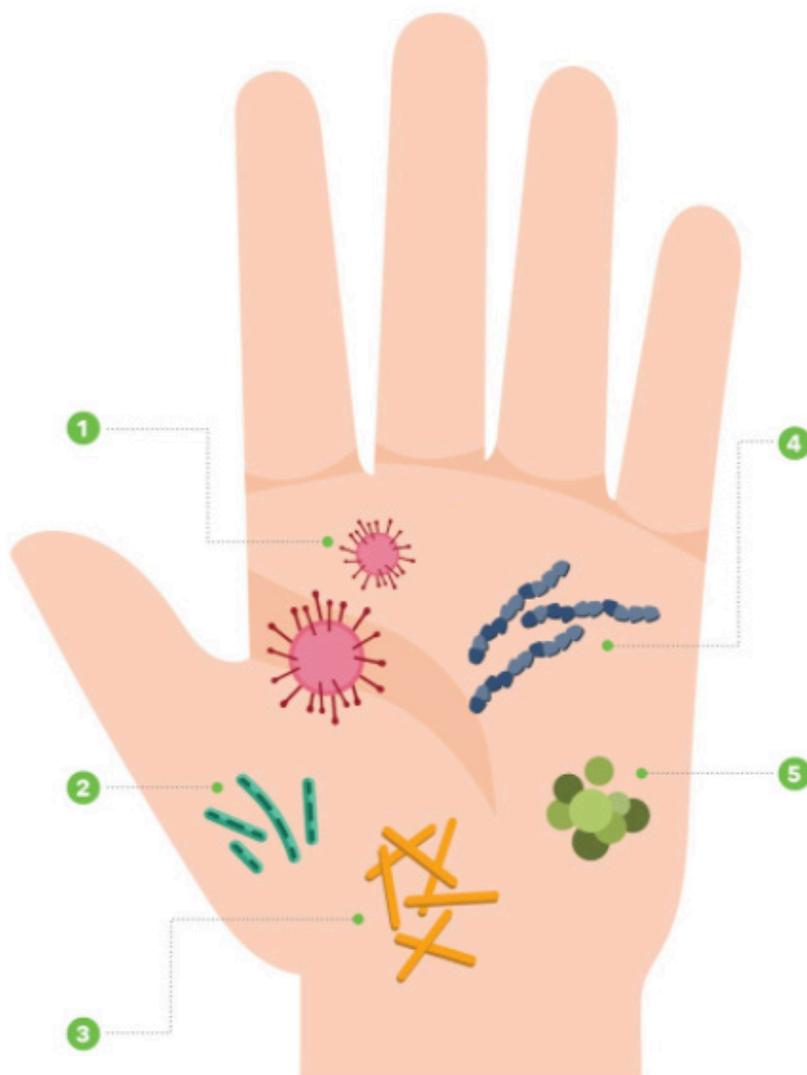
Observation and Measurement

- Measure and report hand hygiene rates monthly (total compliant actions/total opportunities) $\times 100 =$ % adherence rate). Note trends in areas with low compliance but high HAI rates. Routinely reassess outcomes.
- Provide context for the clinical activities that align with the data reported. Train observers to remain vigilant around specific clinical activities in which hand hygiene is compromised to frame strengths that can frame strengths and areas for improvement throughout the full hand hygiene care process.
- Emphasize the key role of observers in the data collection process and highlight the importance of their role as more than just a complement in their day to day duties. Provide recognition for their efforts and make this recognition known to the frontline staff members to highlight the observer role as legitimate and esteemed. Defer to observer expertise for owning the hand hygiene initiative.
- Ensure there are enough staff to effectively manage hand hygiene compliance. Especially if full time observers are not indicated within the organizational budget, coordinate observations discreetly to mitigate improved performance upon knowledge of observation.
- Eliminate barriers to making rapid changes to documentation templates. Ensure documentation includes time and date of observations to assess for bias longitudinally.
- Coordinate a balance between observing and intervening/coaching in live time when hand hygiene is not performed.
- Identify the environmental and behavioral barriers associated with poor hand hygiene compliance. See "Performance Improvement Plan" section.
- Define key categories for hand hygiene noncompliance for data tracking.

Clinical Workflow

What's Living on Your Hands Right Now Infographic

WHAT'S LIVING ON YOUR HANDS RIGHT NOW?



1 NOROVIRUS
can cause vomiting,
diarrhea, fever, fatigue

2 KLEBSIELLA PNEUMONIAE
can cause UTIs, wound
infections, upper respiratory
tract infection, osteomyelitis

3 CLOSTRIDIUM DIFFICILE
can cause diarrhea,
abdominal pain, rapid
heart rate, fever, blood
in stool, nausea

4 VANCOMYCIN-RESISTANT ENTEROCOCCI (VRE)
can cause infections in the
urinary tract, wounds
associated with procedures,
and the bloodstream
leading to fever, swelling,
redness and discharge

5 STAPHYLOCOCCUS AUREUS / MRSA
can cause boils (skin infections),
meningitis (infection of the
membranes lining the brain),
osteomyelitis (infection of the
bone and bone marrow), pneu-
monia (infection of the lungs),
septic phlebitis (infection of the
veins), and endocarditis (infection
of the heart valves)

Both patients and healthcare workers may be unaware of the pathogens that live on hands that can cause serious infections, including C. diff and UTIs. This visual representation can be posted in bathrooms, on doors, and in lounges as an eye-catching, bold reminder of the importance of hand hygiene.

Education for Patients and Family Members

Patients and family members should understand that most HAIs are preventable through proper hand hygiene. Patients and family members should expect their healthcare workers to communicate with them upon entry/admission to the facility and continuously throughout their stay/visit to ensure that they have performed proper hand hygiene and should continue to reinforce this behavior upon visitation.

- Describe to patients and family members those they will encounter regarding hand hygiene (e.g., surveyors, volunteer educators, etc).
- Ensure that patients understand that they should hold an expectation for their provider's hand hygiene.
- Incorporate assessment of patient's hand hygiene in routine assessments: "Have you washed your hands?"
- Inquire about barriers to patient hand hygiene performance (e.g., pain, mobility, etc).
- Watch when patients and family members perform hand hygiene (e.g., after touching remote, before eating, etc).
- Provide promotional material to prompt patients, family members, and general public members to ask their doctors to wash their hands.
- Set up the patient's environment to remind them to perform hand hygiene (e.g., hand hygiene products with food trays, pamphlets at the bedside, etc).
- In the outpatient setting, assess waiting areas, lines, etc. for possibility to advertise hand hygiene. See [Hand Hygiene in the Home and Community Setting](#) for more information.
- Verbally emphasize to the patient the moments for hand hygiene as clinicians are performing it in live time. This is a way to remind both themselves (the clinician) and the patient.
- Illustrate the direct link between hand hygiene and implications for care.
 - Ensure family members understand their capacity to spread infections to their loved one through poor hand hygiene.
 - Engage in conversation about what loved ones can do to help rather than inadvertently harm through poor hygiene.
 - Consider the patient's level of healthcare literacy as hand hygiene education is provided but be aware of implicit bias (e.g., visceral reaction to simplify information for certain groups of people without understanding their literacy level as an individual). See [Healthcare Literacy APSS](#) for more information.

For more information:

- [Patient Safety Institute: Links to Hand Hygiene Resources Worldwide](#)
- [Patients' Hand Hygiene and Reducing Hospital-acquired infections](#)
- [Patient-centered Hand Hygiene: The Next Step in Infection Prevention](#)
- [American Journal of Critical Care: Use of a Patient Hand Hygiene Protocol to Reduce Hospital-Acquired Infections and Improve Nurses' Hand Washing](#)

Performance Improvement Plan

Follow this checklist if the leadership team has determined that a performance improvement project is necessary:

- Gather the right project team.** Be sure to involve the right people on the team. You'll want two teams: an oversight team that is broad in scope, has 10-15 members, and includes the executive sponsor to validate outcomes, remove barriers, and facilitate spread. The actual project team consists of 5-7 representatives who are most impacted by the process. Whether a discipline should be on the advisory team or the project team depends upon the needs of the organization. Patients and family members should be involved in all improvement projects, as there are many ways they can contribute to safer care.

Complete this Lean Improvement Activity:



Conduct a [SIPOC](#) analysis to understand the current state and scope of the problem. A SIPOC is a lean improvement tool that helps leaders to carefully consider everyone who may be touched by a process, and therefore, should have input on future process design.

RECOMMENDED HAND HYGIENE IMPROVEMENT TEAM

- Nurses
- Respiratory therapists
- Physicians
- Engineering staff
- Information services
- Physical and occupational therapists
- Laboratory/Imaging staff
- Pharmacy
- All outpatient providers, such as those in primary care, surgery centers, ambulatory care centers, etc.
- Environmental service staff
- Facilities
- Dietary staff
- Infection control specialists
- Students/residents
- Clinical educators
- Information technology
- Patient/family members
- "Secret Shoppers"/Safety Champions
- Housekeeping staff
- Public health promotion specialists

Table 1: Understanding the necessary disciplines for a hand hygiene project improvement team. While hand hygiene is expected of every single provider across the continuum of care, the hand hygiene team is responsible for coordination and observation, organizations may consider inviting representatives from each discipline above.

- Understand what is currently happening and why.** Reviewing objective data and trends is a good place to start to understand the current state, and teams should spend a good amount of time analyzing data (and validating the sources), but the most important action here is to go to the point of care and observe. Even if team members work in the area daily, examining existing processes from every angle is generally an eye-opening experience. The team should ask questions of the frontline during the observations that allow them to understand each step in the process and identify the people, supplies, or other resources needed to improve patient outcomes.

Create a [process map](#) once the workflows are well understood that illustrates each step and the best practice gaps the team has identified ([IHI, 2015](#)). Brainstorm with the advisory team to understand why the gaps exist, using whichever [root cause analysis tool](#) your organization is accustomed to ([IHI, 2019](#)). Review the map with the advisory team and invite the frontline to validate accuracy.



HAND HYGIENE PROCESSES TO CONSIDER ASSESSING

Sanitation and Equipment

- Placement of sanitizing stations
- Level of alcohol or hand soap in dispensers
- Availability of hand sanitizer and hand hygiene stations
- Basic infrastructural availability for hand hygiene (e.g., access to clean water)

Education and Promotion

- Promotional hand hygiene messaging in inpatient, outpatient, and community settings
- Use of digital message boards and print messaging for hand hygiene promotion (e.g., screensaver, bus stops, community pharmacy, etc)
- Involvement of students and residents in hand hygiene curriculum
- Opportunities for patients to engage in their own hand hygiene
- Literacy level of the public health promotional messaging materials. See Healthcare Literacy APSS

Workflow

- Hand hygiene within the routine workflow for all groups
- Floor map of hand hygiene equipment (i.e. placement of trash cans)
- Department-specific workflow
- Groups who struggle with the problem disproportionately
- Hand hygiene performance at different times of the day and during different shifts
- Local fire code regulations
- State/federal regulations around concentration of hand hygiene stations (e.g., number of hand sanitizer stations in a specific area)
- Hand hygiene performance upon removing PPE
- Reasons for noncompliance and use of organizational categories for noncompliance
- Action items taken after examination of categories for noncompliance
- Staff hand hygiene performance across various 'moments' for hand hygiene
- Variations in method of washing/sanitizing hands
- Hand hygiene compliance based on differing volumes of patients
- Hand hygiene performance during critical points for hand hygiene
- Patient ambulation to nearest hand hygiene station (e.g., room sink)

Observation and Measurement

- Engaging patients in observing hand hygiene behaviors
- Processes for gathering and reporting hand hygiene compliance rates
- Compliance with minimum target goal and organizational stretch goal
- Healthcare professional reaction upon intervention from leaders, colleagues, and patients upon not witnessing hand hygiene

Table 2: Consider assessing these processes to understand where the barriers contributing to hand hygiene may be in your organization.

- **Prioritize the gaps to be addressed and develop an action plan.** Consider the cost effectiveness, time, potential outcomes, and realistic possibilities of each gap identified. Determine which are a priority for the organization to focus on. Be sure that the advisory team supports moving forward with the project plan so they can continue to remove barriers. Design an experiment to be trialed in one small area for a short period of time and create an action plan for implementation.

Be sure the plan includes the following:



- Assess the ability of the culture to change and adopt appropriate strategies
- Revise policies and procedures
- Redesign forms and electronic record pages
- Clarify patient and family education sources and content
- Create a plan for changing documentation forms and systems
- Develop the communication plan
- Design the education plan
- Clarify how and when people will be held accountable

TYPICAL GAPS IDENTIFIED IN HAND HYGIENE

Data collection

- Decreased trust in data quality due to the following, which causes a 'not me' mentality:
 - Little standardization for observation e.g. timings, frequency, sample size, produces poor quality data that is not representative nor statistically significant
 - Individual interpretations of observation standards leads to variability in data which compromises data quality and invalidates trends and longitudinal studies.
 - Data collection timings is not spread out evenly throughout the day, week and month leading to biases.
 - Professions are not broken down to individual roles resulting in feedback that is too generic to drive ownership and change in behavior
 - General feedback of compliance rate lacks the granularity and context for individual staff to understand context or how they have contributed to the score and what can be done to improve.
- Lack of emphasis on key role of observers
 - The rigorous skillset for quality data collection through observation is not emphasized as esteemed. Therefore, there is little interest in, and appreciation for the observer role. Hand hygiene observation is seen as just another task on the to do list without the high regard for its importance. This perception is counter productive to hand hygiene efforts and, ultimately, for creating a culture of safety.

Environmental

- Complex work environment with many distractions
- Emergent patient needs
- Environmental cleaning
- Hands full

Cultural

- Lack of incentives aligned with performance
- Lack of person-specific accountability
- Little recognition for champions (e.g., in monthly reports)
- Little organizational focus on hand hygiene
- Lack of leadership oversight and commitment
- Inconsistent communication
- Misperception of the need for hand hygiene when wearing gloves
- Lack of buy in from frontline about expectations
- Poor integration of expectations into existing frontline
- Little clear relevance via examples for each workflow (e.g., not using general terms, but giving clear examples relevant to the person)

Staffing

- Inconsistent education of new protocols

- New or visiting staff members
- Staffing needs
- Skin irritation/dryness
- Lack of assessment of patient barriers to performing hand hygiene (e.g., pain, mobility, etc)

Infrastructure

- Access to clean water, soap, hand sanitizer
- Plumbing for sink availability/convenience
- Wasted water and efficiency of water use
- Lack of adequate supplies

Table 3: By identifying the gaps in hand hygiene compliance, organizations can tailor their project improvement efforts more effectively

□ **Evaluate outcomes, celebrate wins, and adjust the plan when necessary.** Measure both process and outcome metrics. Outcome metrics include the rates outlined in the leadership checklist. Process metrics will depend upon the workflow you are trying to improve and are generally expressed in terms of compliance with workflow changes. Compare your outcomes against other related metrics your organization is tracking.

Routinely review all metrics and trends with both the advisory and project teams and discuss what is going well and what is not. Identify barriers to completion of action plans, and adjust the plan if necessary. Once you have the desired outcomes in the trial area, consider spreading to other areas ([IHI, 2006](#)).

It is important to be nimble and move quickly to keep team momentum going, and so that people can see the results of their labor. At the same time, don't move so quickly that you don't consider the larger, organizational ramifications of a change in your plan. Be sure to have a good understanding of the other, similar improvement projects that are taking place so that your efforts are not duplicated or inefficient.

HAND HYGIENE METRICS TO CONSIDER ASSESSING

Outcome Metrics

- Infection transmission
- C. diff or MRSA rates
- HAI Rates
- Length of Stay (LOS)
- Transfers to ICU/Higher Level of Care

Process Metrics

- Environmental safety checklist use
- Use of PPE
- Traffic in and out of patient rooms
- Use of alcohol versus hand soap
- Post-discharge/post-service surveys with questions specific to hand hygiene (e.g., "Did you observe your provider washing their hands?")
- Recognition of staff

Consistently reevaluate how the environment is set up to encourage hand hygiene as the default.

Table 4: Consider evaluating related metrics to better understand hand hygiene compliance and contributing factors. Do not hold the 'compliance' rate as the direct end goal, rather, identify contributing and predictive factors for compliance to build the environment for default compliance for those on the frontline.

What We Know About Hand Hygiene

Hand hygiene

Research shows that microbes causing HAIs are most frequently spread between patients on the hands of healthcare workers. Patients may carry microbes without any obvious signs or symptoms of an infection. This can happen because microbes have an impressive ability to survive on the hands—sometimes for hours—if hands are not cleaned. The hands of staff can become contaminated even after seemingly ‘clean’ procedures, such as taking a pulse or blood pressure reading, or touching a patient’s hand ([World Health Organization, 2009](#)). While on any given day, one in 31 patients has at least one HAI ([CDC, 2018](#)), this figure is likely to be underestimated as symptoms of an HAI may not come to fruition until post-discharge ([Collins, 2008](#)).

Hospital staff hands are the single most common vehicle for the transmission of infectious pathogens in the hospital environment ([Allegranzi & Pittet, 2009](#)). Patients with HAIs in the hospital or post-discharge are at higher risk for readmission and a greater length of stay ([Arefian, et al, 2019](#); [Emerson, et al, 2012](#)).

Hand Hygiene and Healthcare-Associated Infections

The inverse relationship between hand washing and HAIs is established across a number of hospital settings and this relationship sustains after varied follow up times post-intervention. It is estimated that the cost of a hand hygiene programme would be approximately \$57,000 annually for a 2600-bed hospital ([World Health Organization, 2009](#)). According to the same study, the hand hygiene promotion program would be deemed cost-saving if 1% of the HAIs reduced were due to improved hand hygiene compliance ([World Health Organization, 2009](#)).

Mandates and Regulation

As of January 1, 2018, The Joint Commission began citing individual failures to perform hand hygiene in direct patient care as a deficiency, prompting a Requirement for Improvement (RFI) – meaning that a medical provider’s accreditation is at risk when staff members are seen as noncompliant.

Centers for Medicare & Medicaid Innovation (CMS/CMMI) and its Partnership for Patients initiative are now promoting the deployment of electronic hand hygiene compliance systems to reduce infections and costs to the [Hospital Improvement Innovation Networks \(HIINs\)](#) via their website and a web broadcast ([CMS, n.d.](#))

Resources

For Hand Hygiene Improvement:

- [WHO: “My Five Moments for Hand Hygiene”](#)
- [CMS: Evidence-based Guidelines for the Selected and Previously Considered Hospital-acquired Infections](#)
- [The Joint Commission: Sustaining and Spreading Improvement in Hand Hygiene Compliance](#)
- [IHI: How-to Guide for Improving Hand Hygiene](#)
- [AHRQ: Innovations for Promoting Hand Hygiene Compliance](#)
- [AHA: The Hand Hygiene Project](#)



- [CMS: Hospital Infection Control Worksheet](#)
- [Investigating the Use of an Electronic Hand Hygiene Monitoring and Prompt Device: Influence and Acceptability](#)
- [Accurate Measurement of Handwash Quality Using Sensor Armbands: Instrument Validation Study](#)
- [The Joint Commission: Targeted Solutions Tool](#)
- [Hand Hygiene Compliance at a Canadian provincial cancer centre- The complementary roles of nurse auditor-driven and patient auditor-driven audit processes and impact upon practice in ambulatory cancer care](#)

For General Improvement:

- [CMS: Hospital Improvement Innovation Networks](#)
- [IHI: A Framework for the Spread of Innovation](#)
- [The Joint Commission: Leaders Facilitating Change Workshop](#)
- [IHI: Quality Improvement Essentials Toolkit](#)
- [SIPOC Example and Template for Download](#)
- [SIPOC Description and Example](#)

Endnotes

Conflicts of Interest Disclosure

The Patient Safety Movement Foundation partners with as many stakeholders as possible to focus on how to address patient safety challenges. The recommendations in the APSS are developed by workgroups that may include patient safety experts, healthcare technology professionals, hospital leaders, patient advocates, and medical technology industry volunteers. Workgroup members are required to disclose any potential conflicts of interest.

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Appendices

Appendix A

International prevalence of healthcare-associated infections in developed countries from the [World Health Organization \(2009\)](#)

Figure I.1
Prevalence of HCAI in developed countries*

