

Can Achieving High Hand Hygiene Compliance in the Hospital be Sustainable, Reliable, and Affordable?

Adam Lipford, MPH, CPH¹, Jennifer B Cowart, MD, SFHM, FACP², Melody Wu-Ballis, DVM, MPH, CIC¹, Wendelyn Bosch, MD, FIDSA³

¹Department of Infection Prevention and Control, ²Division of Hospital Internal Medicine, ³Division of Infectious Diseases

BACKGROUND

Hand hygiene plays a pivotal role in preventing hospital-acquired infections.¹ Despite extensive research, studies still show that average healthcare provider compliance remains below 50%.² While direct observation serves as the gold standard for measuring hand hygiene practices, it can be labor-intensive and susceptible to bias due to the Hawthorne effect.³ As an alternative, many hospitals have adopted electronic monitoring systems. However, these systems come with financial, data quality, and acceptance challenges. We sought to overcome common barriers with a more effective program, using existing resources.

METHODS

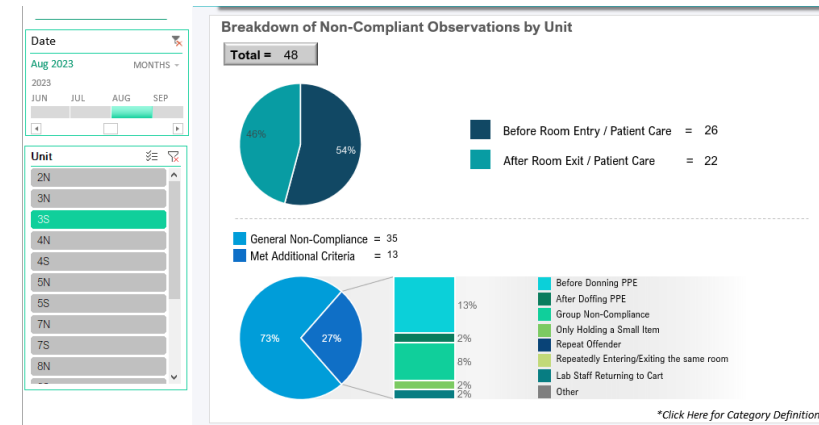
Before 2018, our hospital employed a direct observer or “secret shopper” program for monitoring hand hygiene. However, this approach had several limitations, including confounding due to the Hawthorne effect, minimal impact on improving compliance, and resource-intensive requirements.

In 2018, we adopted the Lean Six Sigma 5-phase method (Define, Measure, Analyze, Improve, and Control) to guide the implementation of a new program. In this updated approach, light-duty clinical staff perform observations using security camera live feeds. Observers are given standardized training and feedback to improve inter-rater reliability. Upon returning to their units, they act as hand hygiene champions, providing real-time feedback. Results are shared monthly with leadership and frontline staff, highlighting areas for improvement and recognizing top performing units and service lines.

In May 2023, we made three key changes to enhance compliance further:

- **Modifying Data Collection and Analysis:** Specific non-compliant behaviors are now included (see Fig. 1).
- **Monthly Education Materials:** Unit leaders receive materials tailored to specific behaviors (see Fig. 2).
- **Individual Recognition:** Staff members who excel in hand hygiene are individually recognized for their efforts.

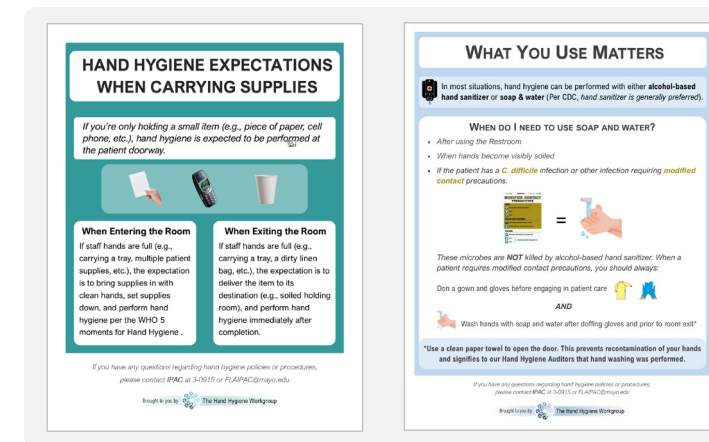
FIGURE 1: Non-Compliant Behavior Analysis



RESULTS

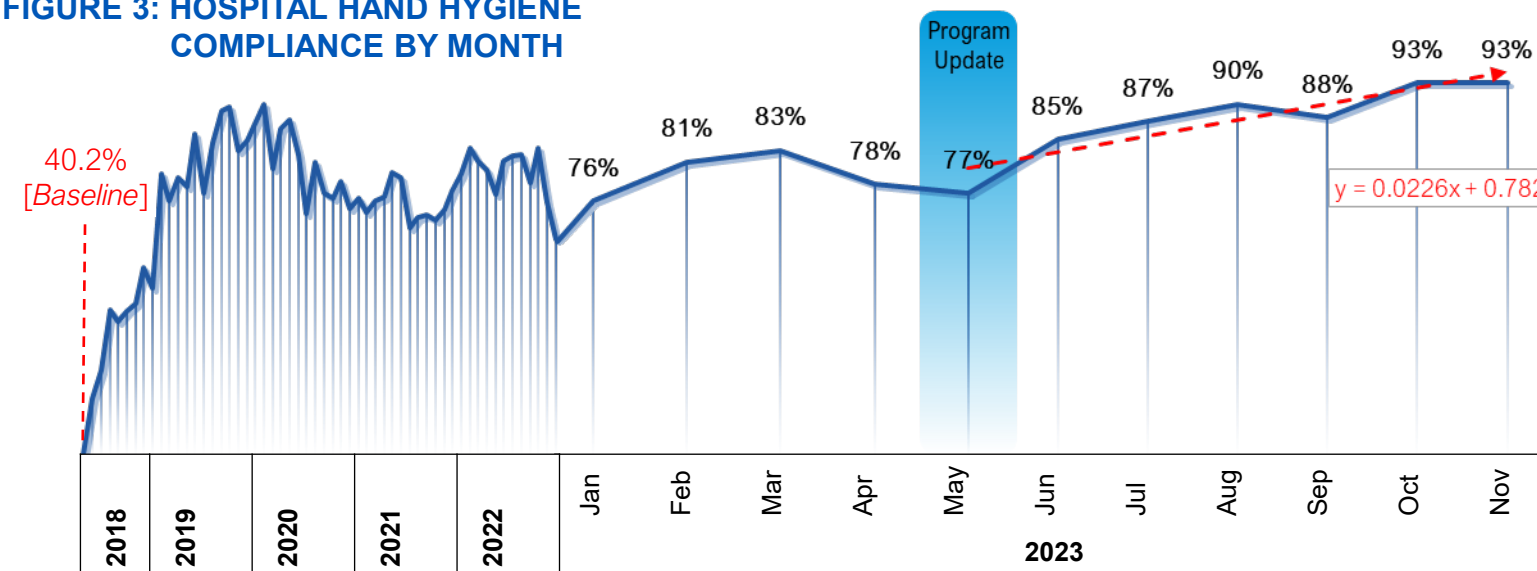
- **Baseline Hand Hygiene Compliance (May 2018):** Initially, hand hygiene compliance stood at 40.2%.
- **First-Year Improvement:** By the end of the first year, compliance had risen significantly to 78.4%.
- **Steady Compliance (2019 to May 2023):** From 2019 until May 2023, compliance remained steady, with a mean of 80.6% and a median of 80.2%.
- **Program Update Impact (May 2023):** Following the program update in May 2023, hand hygiene

FIGURE 2: Non-Compliant Behavior Education



- compliance surged to an impressive 92.7% over the subsequent six months.
- **Positive Outcomes:** During this period, all hospital-acquired infection rates declined, except for one.
- **Observations:** Between January and November 2023, eight light-duty staff members meticulously recorded over 32,000 observations, including nights and weekends. Additionally, 9 IPAC staff members contributed over 20,000 observations.

FIGURE 3: HOSPITAL HAND HYGIENE COMPLIANCE BY MONTH



CONCLUSIONS

Using the Lean Six Sigma DMAIC method, we successfully developed a sustainable and reliable hand hygiene program, achieving high compliance with existing resources. Our multimodal strategies drove sustained improvement:

- **Eliminating the Hawthorne Effect:** We increased efficiency by performing observations through security camera live feeds.
- **Ensuring Data Quality and Staff Acceptance:** Observers received standardized training and feedback.
- **Minimizing Resource Requirements:** We utilized light-duty clinical staff and existing analytic software.
- **Increasing Clarity for Staff Improvement:** Data collection and analysis now include specific non-compliant behaviors.
- **Promoting a Culture of Safety:** Light-duty observers provide feedback at all levels and are established as hand hygiene champions.
- **Facilitating staff engagement:** Unit leadership are provided monthly education materials based on specific non-compliant behaviors.
- **Promoting Joy in Practice:** We recognize both individual and unit-level top performers.

REFERENCES

1. Centers for Disease Control and Prevention: Guideline for hand hygiene in health-care settings: Recommendations of the Healthcare Infection Control Practices Advisory Committee and the HICPAC/SHEA/APIC/IDSA Hand Hygiene Task Force. MMWR. Morbidity and Mortality Weekly Report 51(RR-16):1–45, Oct. 25, 2002.
2. Centers for Disease Control and Prevention. Clean Hands Count for Safe Healthcare. Published February 25, 2020. <https://www.cdc.gov/patientsafety/features/clean-hands-count.html>
3. The Joint Commission. Measuring Hand Hygiene Adherence: Overcoming the Challenges.; 2009. https://www.jointcommission.org/-/media/tjc/documents/resources/hai/hh_monograph.pdf