



**A Qualitative Analysis of Facilitators and Barriers to
Hand Hygiene Improvement at New Hampshire Hospitals during a
Statewide Hand Hygiene Campaign
Final Report**

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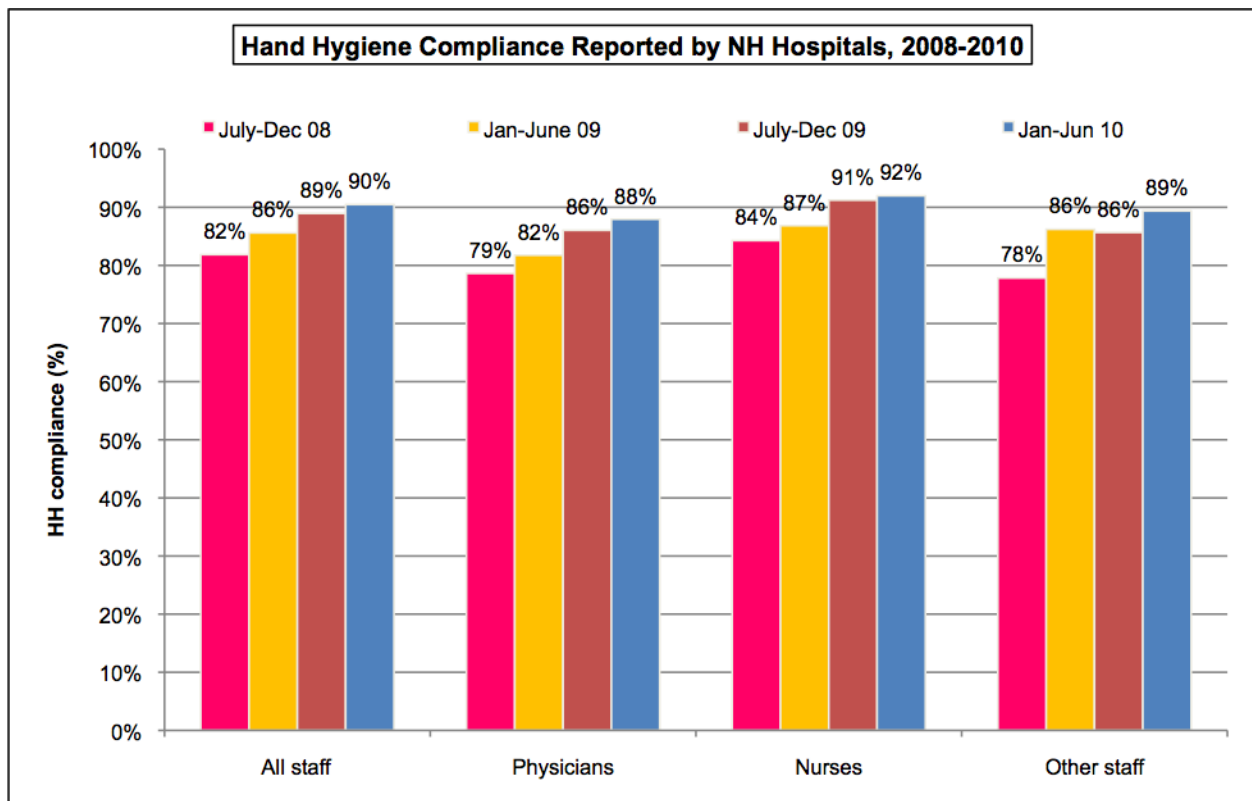
(This report is available at www.HealthyNH.com.)

NH Department of Health & Human Services - Division of Public Health Services, Bureau of
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Background

In 2008, the New Hampshire Healthcare Quality Assurance Commission with the Foundation for Healthy Communities sponsored a statewide campaign to improve hand hygiene practices among healthcare professionals in New Hampshire hospitals, with the aim of reducing the risk of healthcare-associated infections. During the campaign, “High Five for a Healthy New Hampshire,” each hospital developed strategies for hand hygiene improvement that fell into 5 general categories: 1) leadership and accountability; 2) measurement and feedback; 3) education and training; 4) availability and convenience of hand hygiene products; and 5) marketing and communication. Each hospital submitted observed hand hygiene compliance data to the NH Healthcare Quality Assurance Commission every 6 months from July through December 2008.

Over the first 2 years of the campaign, hand hygiene reported by New Hampshire hospitals improved significantly overall, from 82% to 90% ($p < 0.001$). Moreover publicly reported rates of selected healthcare-associated infections in New Hampshire were lower than the national benchmark in 2009 and 2010.



Embedded in the overall successful campaign, however, were patterns of variation that are not fully understood. For example, some hospitals started with already high levels of performance, some hospitals started as low performers and improved dramatically, and a few institutions actually got worse during the campaign. More detailed data from Dartmouth-Hitchcock shows similar variability in hand hygiene performance among different inpatient units. Finally, in many settings, physicians did not perform as well as nurses and other healthcare staff. In order to reduce unwanted variation in hand hygiene performance in and within hospitals around the state, we wanted to understand the causes of this varied response to the campaign. This project was undertaken to gather qualitative data that we hoped would help us to 1. Understand how different New Hampshire hospitals approached hand hygiene improvement; 2. Develop and test hypotheses about what works and what doesn't work where, and why; and 3. Provide the New Hampshire Healthcare Quality Assurance Commission and individual hospitals with feedback on current practices and guidelines for improvement.

Summary of Visits and Sources of Data

Between October 12, 2010 and June 20, 2011, a project team consisting of Dr. Kathy Kirkland, a senior staff member at Foundation for Healthy Communities (Shawn LaFrance, Rachel Rowe, or Judy Proctor), and at times, additional participants including, Dr. Rick Pollak, Dr. Sienna Craig, Emily Unger (a Dartmouth student), and Lisa Lawlor, a member of the Infection Prevention staff at Dartmouth-Hitchcock, traveled to 26 hospitals and 3 Ambulatory Surgical Centers in New Hampshire. During these site visits we conducted focus groups, interviews, and tours. Focus groups and interviews were taped and later transcribed; notes were taken by Dr. Kirkland and by the FHC staff member. During each visit, observations about placement of hand hygiene products and awareness-raising signage were recorded; during some visits photographs were taken. In addition, all hospitals were given the opportunity to submit a self-assessment, and any additional materials they wished us to review. No audits of hand hygiene performance were conducted during the site visit.

Focus groups

We facilitated a total of 29 focus groups, involving total of 242 staff members. On average there were 8 (range 3 to 18) staff members per focus group. A wide range of both frontline and managerial staff participated, including 122 nursing staff, 19 housekeepers, and 25 physicians.

Interviews

At 24 hospitals, we conducted interviews with infection preventionists. Other infection preventionists participated in the focus group instead. We interviewed someone directly involved in hand hygiene audits during 12 site visits. At 18 hospitals, at least one senior leader (Chief Executive Officer, Chief Operating Officer, Chief Medical Officer, or Chief Nursing Officer) participated in an interview or a focus group.

Self-assessments

Twenty-two hospitals submitted self-assessment forms that included information about activities during the High Five Campaign.

Data Management and Analysis

Audio files from site visits were given to student research assistants after each site visit. These files were then transcribed into word documents, during which time any identifying features (names, etc.) of participants were removed from the data. These transcript documents served as the basis for preliminary, iterative data coding and analysis. Members of the project team reflected together on recent site visits and transcripts as they were completed, discussing key themes and developing codes for key or otherwise common responses to focus group prompts and interview questions. We discussed such issues via email and during in-person meetings approximately once a month. This work helped us to develop and refine themes and hypotheses that were further developed and explored during subsequent site visits.

During the formal analysis period, after all the site visits had been completed, Dr. Kirkland reviewed hospital self-assessments, notes taken at focus groups and forms completed during hospital tours (both submitted by the FHC representative present at the site visit), transcriptions of all recorded focus groups and interviews, and notes and reflections submitted by the Dartmouth research assistants (students in anthropology and sociology) who transcribed these sessions. Professor Craig also reviewed all the transcripts and provided her input over the course of the project period, and during the analysis and writing phase.

This stage of analysis was based on grounded theory approaches¹ to qualitative research and analysis, in that we did not begin with fixed hypotheses about each of the five aspects of the campaign, but rather let codes emerge from our initial reading of transcripts. These initial codes were of three general types: codes that referred to particular types of *behavior* (e.g. reprimand/“being policed”, trusting numbers); codes that described aspects of *organizational culture* (e.g. team oriented, hierarchical); and codes that focused on the *mechanics* of hand hygiene and audit procedures (e.g. product placement, “secret shoppers”). These codes were then further sorted and grouped during in person meetings and by email, aided by reflection memos that were written by student research assistant at the conclusion of each transcript. These reflection memos have, over time, helped us to make the overarching analytical insight that different hospitals are at different stages of hand hygiene improvement.

Although we had initially thought about organizing to focus in on the five aspects of the campaign as the primary organizing principle of this database of qualitative information, this approach was not sufficient to successfully capture, further sort, and analyze data. Instead, these

¹ Glaser BG, Strauss A. (1967). *Discovery of Grounded Theory. Strategies for Qualitative Research.* Sociology Press, 1967

Strauss, A. (1987). *Qualitative analysis for social scientists.* Cambridge, England: Cambridge University Press.

Glaser, B. (1992). *Basics of grounded theory analysis.* Mill Valley, CA: Sociology Press.

Charmaz, K. (2006). *Constructing Grounded Theory: A Practical Guide Through Qualitative Analysis.* Thousand Oaks, CA: Sage Publications.

iterative coding exercises and reflection memos led us to classify each hospital as either in the *initiation, implementation, or maintenance* stages. We used the same methods of coding, sorting and memos to define and refine what “success” means in the context of this campaign and to develop a matrix, described below, for classifying aspects of this success and, using experiences from specific hospitals, providing some general principles aimed at successfully moving through the three stages.

This grounded theory approach helped us to see analytical trends with respect to issues of gender, generation/age, and educational background of physicians and staff, size of hospital, management structures, and presence/absence of clinical research and teaching as core elements of institutional identity. Several of these themes have been documented in secondary literature, for which research assistants have prepared extensive annotated bibliographies over the duration of this project. In the coming months, we will be further coding and analyzing the database of interview and focus group transcripts using the qualitative data analysis software Atlas-ti, with the goal of writing 2-3 articles that explore these themes comparatively and in more depth.

Executive Summary with Overview of Key Findings

There is ongoing engagement in hand hygiene improvement in hospitals across the state. Every facility had active initiatives related to hand hygiene. Our project team was welcomed for the site visits, and the site coordinators (usually infection preventionists or quality managers) had organized both focus groups and interviews for us. Infection preventionists and other hospital leaders seemed quite open to share their successes and frustrations, and eager to hear of tools and initiatives that had been successful at other facilities.

Focus groups were well-attended in general. We found that the optimal size to promote conversation was 6-8 participants, and in some cases groups were too large to facilitate open conversation among group members. As a rule, the most productive focus groups were those that consisted of front-line staff, and did not include infection preventionists, or senior leaders.

Focus groups were made up predominantly of female (83%) healthcare personnel over the age of 30 years. The majority (58%) were over 45 years old. Physicians represented a small minority (11%) of the more than 250 participants in focus groups and interviews. Only one hospital was able to convene an all-physician focus group, and only 8 chief medical officers participated in either an interview or a focus group.

Several key findings emerged from the series of site visits.

- Our concept of “success” evolved over the course of the year. Early in the project we began to question the validity of using hand hygiene compliance data reported to the state to categorize hospitals as more or less “successful.” There was a great deal of variation in auditing and measurement methodologies that rendered the data less useful for inter-hospital comparisons, as described below. Through preliminary analysis or transcriptions of focus groups and interviews, our project group developed a theory that the most “successful” facilities were those where hand hygiene had become an embedded activity in which all levels of hospital employees were invested in hand hygiene, empowered to reinforce good practice and address missed opportunities when they happened. In such institutions, hand hygiene improvement work appeared to have transitioned to a maintenance phase.
- As we reframed our definition of “success,” it became apparent that hand hygiene campaigns seemed to evolve through different phases, from Initiation through Implementation and finally into Maintenance. Different hospitals that we visited appeared to be at different points along this continuum. Some facilities seemed to be moving through the transitions at a steady pace, and others appeared to have plateaued or even to be “stuck” in one phase or another. We have focused the report on facilitators of success at different phases of the campaign, and potential barriers associated with slower progress. For each barrier, we have drawn on the experiences of hospitals that are further along to propose potential approaches to overcome it.

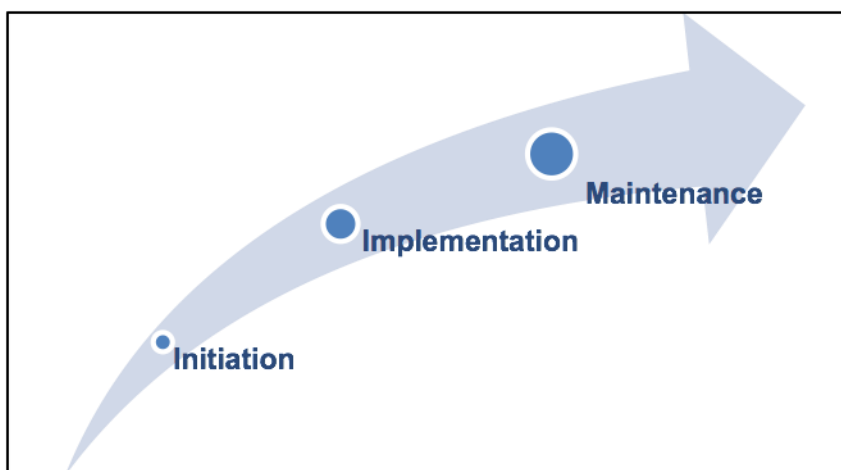
- We focused our initial inquiries on the 5 elements of the High Five Campaign, in order to understand whether these elements were instrumental in implementing hand hygiene improvement, and which were more or less important at different times. We found that each of the elements was important, but the optimal implementation of the element varied depending on the phase of the campaign.
- Over the course of the project, we came to see the five elements as a standard structure on which successful hand hygiene campaigns were built. However, although these elements appeared necessary for sustained improvement, they were not sufficient, alone, for success. During our interviews and focus groups several additional elements, beyond the 5 around which the campaign was focused, emerged as key cultural factors associated with successful progress through implementation of a hand hygiene program toward the maintenance phase.
 - **Positive attributes** (when these elements were present, they were often associated with “success”)
 - A sense of teamwork, collaboration, and shared responsibility, especially when it included physicians
 - A focus on the patient experience
 - **Negative attributes** (when these elements were absent, they were often associated with “success.”)
 - Evidence of a hierarchical culture
 - Lack of trust and safety related to peer and cross-disciplinary feedback (including tolerance of disruptive behavior)
- The following composite description of what the “ideal” maintenance phase facility might look like, may help frame the following more detailed analysis of the ways in which the various elements influence the progress of a facility through the 3 phases of program development.
 - **Leadership and accountability**
 - Senior leaders articulate ongoing commitment to high hand hygiene performance as an institutional priority
 - Physicians and staff are held to the same standards
 - Local managers are accountable for hand hygiene performance of direct reports (and have support of local hand hygiene champions)
 - Individuals with patterns of failure are held accountable through a system that everyone understands and that is fairly implemented (e.g. Just Culture)
 - All staff feel responsible to and for each other’s hand hygiene behavior, as a team effort
 - **Measurement and feedback**
 - Covert auditing is used on a small scale to monitor ongoing performance, identify opportunities for targeted improvement and state reporting
 - Auditing methodology is explicit and transparent
 - Auditors are trained

- Overt observation with immediate feedback/feed forward occurs in all clinical areas, and is used for education and improvement only
 - Local champions serve as a resource to facilitate peer feedback in each area
 - All staff, including physicians, receive training in peer feedback that includes rehearsing scenarios, scripts, and linking to accountability in the case of disruptive behavior
- **Product availability and convenience**
 - Hand sanitizer is placed in standard locations, dictated by the routine process of care
 - Hand sanitizer is accessible within 3-6 feet of the actual point of care
 - Multiple dispenser types are available
 - Staff are involved in product selection
- **Marketing and communication**
 - Use of posters and screensavers carrying brief messages
 - Frequent refreshment of marketing materials to avoid staleness
 - Ideal themes:
 - Link hand hygiene to infection prevention
 - Display local data (especially linking to infection rates)
 - Emphasize personal responsibility
 - Edgy or scary themes may be more effective a
- **Culture**
 - Sense of team:
 - No double standard for physicians
 - Little indication of hierarchical structure
 - Disruptive behavior not tolerated
 - Focus on the patient experience
 - Good morale despite stressors

The Phases of Hand Hygiene Improvement: A New Paradigm for Understanding Success

Although the original High Five Campaign for a Healthy New Hampshire was initiated as a year-long program to improve hand hygiene at hospitals around the state, we found that, 2 years later, hospitals were at different stages of implementation, and were progressing at different paces through these stages. While some hospitals seemed to be moving easily along the continuum toward sustainable change, others struggled to make progress, and a few seemed “stuck,” or vulnerable to becoming so. A better understanding of the phases and of factors that facilitate and hinder progress along this improvement continuum might help hospitals move forward and continue to sustain already achieved successes. For this reason, much of our analysis has focused on defining the phases of implementation, and identifying both activities and characteristics of hospitals that were at different phases when we visited.

Our view of the stages of the New Hampshire High Five Campaign is depicted in this figure, which actually represents more of a continuum than discrete stages.



Initiation

“Well I think what we’ll be focusing on first, is actually getting the baseline data, and then actually getting the things installed in one unit. It was very overwhelming to think of doing this in the entire...I want to accomplish something in addition to measuring something.”
(infection preventionist interview, hospital in initiation phase)

The first step of any campaign involves defining the problem being addressed, establishing the goals, and galvanizing enthusiasm and participation of all staff. During this phase, a strong

leader and a clear message are essential. After kickoff, the next step in initiation usually involves piloting new initiatives or conducting small tests of change. During this first stage of the hand hygiene campaign, it is critical that the hospital system provide resources and support for staff to facilitate the process of behavior change. We have also observed that it is essential for top leadership to adopt the goals of the hand hygiene campaign and take responsibility for reaching these goals such that the work of implementation and maintenance does not rest entirely on the infection preventionist.

Almost all New Hampshire hospitals had successfully initiated their campaigns, and thus we had the experience of many to draw on to understand what it takes to complete this phase. Successful initiation of hand hygiene improvement campaigns appeared to require a focus on the basics, from leadership buy-in to product availability. The “five fingers” of the High Five Campaign provide a useful schema for describing the necessary components of a successful initiation phase.

Implementation

“I think we’ve made some good progress but we have certainly a long way to go.” (focus group, hospital in implementation phase)

“I think 94% is good, but its not as good as it needs to be... I would say keep the light shining on it as long as it take to get up to 100%.” (leader interview, hospital in maintenance phase)

After successful campaign kickoff and initiation, hospitals move into a longer, more heterogeneous phase of implementation, during which activities become more routine, participation is more widespread, and, if successful, hand hygiene habits begin to become more engrained. During this phase, different activities are needed. In addition, there are many opportunities for campaigns to falter and even get stuck during this stage of a campaign. The basic “five fingers” still provide a framework on which to build new activities and initiatives, but during the phase of implementation, fundamental cultural and relationship issues tend to play more of a role. In some situations, a hospital’s fundamental culture and structure serves to facilitate movement through implementation; in others, it presents barriers that have to be addressed.

Maintenance

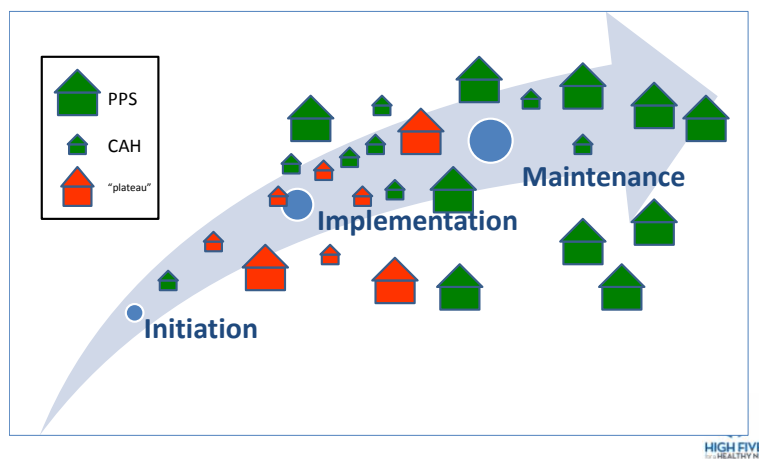
“You can’t just have a campaign and have an end date. It really has to be an ongoing process.” (focus group, hospital in maintenance phase)

“It’s not a project, it’s a forever thing.” (focus group, hospital in maintenance phase)

“To tell you the truth, I think it’s going to get easier. The hard part is getting up over the hill, in other words, dealing with the grumbling, dealing with the noncompliance. Once, I think, you change the culture, then it tends to be more sustainable, because people say, instead of that being at-risk behavior, that becomes reckless behavior. All of a sudden now, it’s a change. It’s the organization that decides that.” (focus group, hospital in maintenance phase)

About a third of New Hampshire hospitals have moved through successful initiation and implementation and are in the process of sustaining embedded hand hygiene performance. They, too, have some commonalities in how they currently address the “five fingers” of the campaign; in addition, there are certain cultural and relationship issues that they share, and which may be key to sustaining hand hygiene as part of a hospital’s normal routines.

The following figure is a “snapshot” which places the 26 New Hampshire hospitals along a continuum between Initiation and Maintenance, based on our review of all the data collected from that hospital at the time of our visit. It is likely that some hospitals, particularly those whose visits occurred last fall, have progressed to points further along the continuum since we visited.



In the following sections, we offer observations about common features of different stages, and ideas that might help hospitals that are struggling, stuck, or simply trying to maintain progress.

Key Elements of and Influences on Hand Hygiene Improvement Campaigns in New Hampshire Hospitals

The following section of the report provides a more detailed analysis of the ways in which hospitals have implemented hand hygiene improvement campaigns, and progressed through the different phases of the campaign. The analysis is organized by element, beginning with the 5 “fingers” of the High Five Campaign, and including the role of culture, relationships and other influences. For each element, we provide an overview of what we learned about its role, followed by an analysis of the ways in which the element may be optimized during each phase of a campaign.

Leadership

“We’ve had a lot of support from the administration and down the chain, having as many resources available for hand hygiene as possible which has been key to our success.” (focus group, hospital in maintenance phase)

“I felt this is a no brainer, this is something that needs to be supported. So I’ve been keeping track of how its going, asking how I can be supportive of it, trying to be more conscientious myself about hand hygiene because I know part of it is example. Of course I don’t treat any patients, but having the leaders step up makes a big difference.” (leader interview, hospital in maintenance phase)

“I’m not bragging, but when the senior manager of the organization gets in front of everyone and says this is something we have to do and there is goodness associated with this, and it will help everybody I think it’s a tremendous boost to the institution, I really do. I’m very very pleased with how the organization responded and actually responded beyond my expectations. I think it helps when it comes from the top, in this case.” (leader interview, hospital in maintenance phase)

“I’m very empowered here to do what I need to do. And I’m known as the very direct, no-nonsense girl around here. I’m not afraid to go up and tell anybody, and I tell my staff to tell anybody, that that is not correct. And that’s really the culture, not just about hand hygiene, but about everything in this organization. If people are not doing what they’re supposed to be doing, we’re all empowered to speak up and do what we need to do.” (infection preventionist interview, hospital in maintenance phase)

“I am responsible for the financial performance of the hospital and that is something that is very near and dear to my heart but I’ve said to folks “when it comes to preventing an infection, you’re going to be hard pressed to tell me we’re putting in too many resources.” (leader interview, hospital in maintenance phase)

Leadership: General Observations

While it was not always clear which senior leader was ultimately responsible for hand hygiene at some facilities, it is clear that New Hampshire infection preventionists continue to provide key leadership for the campaign at virtually every hospital. Although their specific role shifts as the campaign gains momentum, the leadership provided by these hardworking content experts is absolutely crucial. We designated several programs as “vulnerable” in terms of campaign progression simply because they were at a point of transition in filling the infection preventionist role.

There are clear roles for senior leaders at every phase of the campaign. One prominent association was the link between infection preventionist morale and senior leadership support. Visible, active engagement of senior leaders characterized more advanced campaigns, and these leaders articulated a deeper understanding of the “business case” for hand hygiene, although, without exception, they placed this secondary to patient suffering as justification for the campaign.

Physician leaders involved in hand hygiene were a rarer breed, but our sense is that their leadership is necessary for truly sustained physician engagement, although not sufficient to overcome other barriers to progress.

The emergence of more “grass roots” leadership was common as facilities transitioned from implementation to maintenance. During later phases, we saw a shift away from reliance on formal leaders to a shared responsibility framework.

Leadership during Initiation

The New Hampshire Foundation for Healthy Communities took the lead in laying out the goals of the campaign, and in this way provided leadership support for campaign leaders at every hospital. At the initiation stage, the overt acknowledgement that each hospital is part of a statewide effort helped not only to initiate campaigns at a diverse array of institutions, but also in legitimizing the effort and supporting individual campaign leaders.

By signing onto the statewide goal of 100%, individual hospital CEOs had a chance to take an early leadership action. While for some hospitals this goal may have seemed unachievable at first, our sense is that by accepting a goal of 100% compliance, hospitals may have a better chance of avoiding one of the later barriers to progress. If hospital leaders and staff can agree that anything less than 100% compliance should be not a long-term sustainable outcome, then issues related to quibbling with aspects of accuracy of measurement, sampling, and data validity may be productively jettisoned.

Early on a single, strong campaign leader is a critical component. In most cases, the infection preventionist has served in this role. Based on content knowledge and experience in leading change efforts, New Hampshire infection preventionists have been logical leaders for the

campaign. Without their energy and dedication, it is likely that initiation will fail or be significantly delayed.

During this phase of the campaign, after making the commitment to make hand hygiene a hospital priority, the role of senior hospital leaders is, most importantly, to provide resources (e.g. for the purchase of additional hand hygiene products), and to provide moral support for the campaign leader. Display of “symbolic” leadership (e.g., attendance at the campaign kickoff event, willingness to pose for a campaign poster, or be interviewed for a newsletter) may be sufficient, although more concrete actions such as including hand hygiene on meeting agendas begins to engage operational leaders in hand hygiene improvement efforts.

Despite the possibility of successful campaign initiation without more active engagement of senior leaders, those hospitals where a senior leader was a passionate advocate from the beginning tend to have more rapid progression to a successful and sustainable hand hygiene program. Likewise, hospitals where physician leaders are engaged from the very beginning appear to move more easily into later phases of the campaign.

Leadership during Implementation

Important leadership activities during this often protracted phase, when the excitement of a new initiative has faded, and the engrained habitual hand hygiene has not yet been achieved, include maintaining focus and addressing organizational culture. As a campaign evolves from kick-off to implementation, leadership requirements change. Whereas a strong infection preventionist operating “solo” or with passive leadership support can lead successful initiation of a campaign, implementation is likely to slow or fail at this phase, if it continues to rely on a single individual. In fact, one marker of a faltering campaign was sense that the infection preventionist was weary or overwhelmed.

During this phase of the campaign, successful facilities tended to develop a leadership team, or a steering committee that took on responsibility for guiding the campaign, often under the direction of the infection preventionist, whose role shifted to oversight and support. This evolution in leadership, from a single “face” of the campaign, to a steering committee or leadership team, often made up of local managers, to larger and larger groups of local “champions” who took responsibility for the campaign, was a sign of successful progress toward sustainability.

In addition, the more active involvement of senior leaders, speaking knowledgeably about hand hygiene at staff meetings and asking for updates on progress against goals, seemed important for maintaining momentum toward a sustainable program. At hospitals where senior leaders continued to take a more passive approach or were distracted by other issues (e.g. electronic medical record implementation, facility expansion, finances), campaigns were more likely to lose momentum after even quite successful initiations. We saw distinct differences in the belief of hospital leaders in the potential positive financial impact of investing in hand hygiene and infection prevention programs.

Physician leadership at this stage of the campaign seems crucial. At many hospitals, there was a sense of a divide between hospital staff and physician staff, and this divide created a

vulnerability to the evolution of unequal expectations around hand hygiene. The most successful programs had key physician leaders who actively participated in the campaign, delivering consistent messages to physician colleagues about expectations, rules of observation, consequences, etc. Having a physician leader involved appeared to add legitimacy to campaigns for all staff, including, but not limited to physicians.

Leadership during Maintenance

Successful hospitals demonstrate a clear recognition of the need for an ongoing commitment to sustain their achievement. At every successful hospital we visited, there was a strong and dedicated infection preventionist who spends a majority of his or her time on the clinical units serving as a resource and support person for staff, reinforcing good behaviors and helping people succeed. The strong presence of the infection preventionist in daily activities (and not simply as the campaign leader) was specifically mentioned by staff at every sustaining hospital. The IPs themselves seemed enthusiastic, committed, and energized. We suspect that in part this high morale and sense of accomplishment was associated with support of organizational leaders, and successful sharing of the leadership for the campaign with local staff.

There was clear evidence of active engagement of senior administrative and physician leaders at each of the hospitals we visited that had successfully moved into the sustaining phase. In most cases, we interviewed these senior leaders and they were able to speak personally of the work that had been done and the successes achieved in their facilities. There was a sense of pride and commitment among these leaders that we did not find at all hospitals.

Despite the presence of strong commitment of the infection preventionist and the titular leaders, the sense of *everyone* being a leader in hand hygiene was also strong at the most advanced hospitals. Almost without exception, these hospitals had implemented some form of unit-based champions. In most cases, these local champions had received training and had clear responsibilities and support. In a few hospitals, where local champions had emerged more organically, additional attention to developing more formal programs to ensure consistency and provide training, especially in peer feedback opportunities, would strengthen their programs.

The requirement of the state to continue to submit hand hygiene data serves to reinforce the ongoing importance of hand hygiene, but hospitals that have successfully implemented campaigns tend to use the state requirement as a minimum threshold. For instance, several hospitals submit data on thousands of hand hygiene opportunities rather than the required minimum.

Accountability

“...at the end of the day, if I’m still getting push-back, I say to them, “Look, you’re a great physician. You care deeply about your patients. So help me to understand why you’re pushing back on this so much when the literature is so clear.” And then what some of them will say is, “Well I don’t believe the literature. The last studies that were done on central-lines, whether it makes a difference whether you put it in subclavian, or IJ, were done in 1989, and I just don’t believe it.” And I say, “Look, I don’t have time to argue with the CDC. So if you have some literature that would refute some of this, I’d be happy to forward some of it to the CDC. But in the meantime, that’s the national standard. That’s what the public expects. That’s what our payers expect. That’s what we’re being rated against. And to tell you the truth, I’m way too overwhelmed with all of the things I need to do on behalf of you and your colleagues to start arguing with governmental agencies and national Quality agencies. So they harrumph, but then they usually do it.” (leader interview, hospital in implementation phase)

“One of the big differences that we had was if I had a disagreement with you and you were the nurse or you were the doctor and I was a housekeeper and you spoke nastily to me in front of other people, you’d wait till you weren’t upset about it anymore, but they’ll actually, and it was very hard, but they’ll actually go to you and say can I talk to you for a minute. Yesterday, I know I made a mistake because I did something, but you yelled at me in front of everybody else and that really made me feel bad and it embarrassed me. Which was something that was very hard for people to learn and to accept and to do and that is what they practice and that is what they practice with each other and its developed and it’s become more and more so that there’s a comfort level there that there’s not going to be any retaliation for that you’ve approached the doctor. They’ll actually go to the doctor and say you know... we learned how to have difficult conversations” (focus group, hospital in maintenance phase)

“...it comes down to money too, its 33% of goal sharing, I don’t know what it means for a full time employee, but its hundreds and hundreds of dollars you could get if you, you could be missing out on if people don’t wash their hands. I think that this hospital is educated enough that there’s no excuse not to wash your hands, that’s my view.” (leader interview, hospital in maintenance phase)

“So I think really what we need is just a commitment on the organization’s part. That we understand that we don’t have individual level data, but this is a team sport. This metric in particular is about collaboration and team. We’re all responsible. And this is a good one to start on, it’s measured. We know that people do better; there are clear differences in how people do. So I think for this particular metric, it’s really about the leaders’ willingness to set the expectation and hold people accountable to it...and have the conversation...despite the fact that we don’t have all of the best evidence. Because many organizations have strategies that hold people accountable.” (leader interview, hospital in implementation phase)

“Well we encourage people to speak to one another if they see anything—whether it’s hand hygiene, or some other safety concern. Immediately, real time. And if that that isn’t, if they’re not comfortable, then they would go to their immediate supervisor.” (focus group, hospital in maintenance phase)

“And I said ‘I don’t want to hear that a physician pushed back at one of those observers, if I heard that I’m going to be coming and talking to people.’” (leader interview, hospital in maintenance phase)

“I do with every orientation session, where I’m talking to them about our culture of patient safety and I’m very direct with, it’s the broad audience of all new hires here, I’m very direct in linking this in their minds to patient safety and going so far as to say to them, you do not want to be a component of the instrument of potential morbidity and death of a patient over simply not washing your hands. I really link it to the concept of high reliability and simple rules, so the simple rule is in and out, so there’s no decision making that goes in there. There’s no thinking about did I touch anything in the room, did I touch the patient. The rule is simple. You go in you wash your hands, you go out you wash your hands and you move on.” (leader interview, hospital in maintenance phase)

“But after a while of letting people know that this is not an option, this is best for the patient whether you like it or not, it’s best for you too, eventually, it’s become the culture. It went from an optional thing to there isn’t an option here. And that’s how you change things. It starts with ‘This is ridiculous,’ or ‘My hands are clean’ to everyone is pretty much on board. And now we get people who legitimately forget, rather than people who are defiant.” (focus group, hospital in maintenance phase)

“It really does boil down to personal accountability. You can have an ICP nipping at people’s heels until the cows come home, reminding people. But in the end, people have to take it in as their own personal accountability.” (infection preventionist interview, hospital in implementation phase)

Accountability: General Observations

Issues related to accountability emerged as an important determinant of the ease with which a hospital moved from initiation through implementation and into a maintenance phase of their hand hygiene improvement programs. As proposed by Goldmann in an essay published in the *New England Journal of Medicine* in 2006, two aspects of accountability seem to be worthy of attention. First is the accountability of the “system,” (in this case the facility and its senior management) to provide education about why and when hand hygiene is important and the instruction on how to do it correctly, to provide the products necessary to perform hand hygiene in

convenient locations, and to communicate clearly the expectation that all staff are expected to perform hand hygiene at designated times. Second is the accountability of the individual healthcare personnel to meet these expectations. Measurement is a tool provided by the “system” which allows assessment of whether expectations are being met. The five fingers of the High Five Campaign emerged from this framework of system and personal accountability.

While most hospitals were fairly successful in meeting their “system” obligations, there was a lack of consistency related to how and whether healthcare personnel were held accountable for their hand hygiene performance. In focus groups, responses to a question about what happens when a staff member or physician repeatedly misses opportunities to practice appropriate hand hygiene, gave a clear picture of the degree to which staff were held accountable. In hospitals that were in the maintenance phase, focus group participants generally were able to outline a fairly detailed process that was in place to deal with such individuals, and could often provide an example of the system having worked as it was intended. When the question was met with eye-rolling, or cynical responses, the hospital was likely to have slowed down in its progress through the phases. Similarly, when staff described a double standard related to staff versus physician accountability for hand hygiene, this often correlated with the hospital being “stuck” in some phase of implementation.

Establishing a standard process, accessible to staff, and supported by the organizational management structure, through which staff and physicians can be (and are) held accountable for expected hand hygiene behaviors emerged as important “system” responsibility necessary for successful implementation of a hand hygiene program. Paradoxically, when such a system is in place, its activation seems to be required less often over time, as hospital staff become more comfortable resolving most issues without resorting to the formal process.

Accountability during Initiation

During this first phase, establishing and verifying system accountability is important, as much of the work involves education of staff, removal of barriers to hand hygiene, and setting of expectations, all of which are responsibilities of the system as a whole, not of each individual. For successful campaign initiation, a structured plan for how staff will be held personally accountable for hand hygiene performance is not a necessary component. However, hospitals that moved most quickly through the stages were those that began planning for this aspect of the campaign early on although there was a lot of variation in how individual hospital leadership structured these systems of accountability. In addition, several hospitals included a personal pledge of commitment as part of their campaign kick-offs, foreshadowing the need to evolve toward a culture of personal accountability for hand hygiene compliance.

Accountability during Implementation

For successful transition out of the initiation phase and into implementation, it is important that all staff and physicians have received a clear message through orientation, education, and messages from medical center leadership and local managers about what is expected of them with respect to hand hygiene. This clarity can come in a number of ways, but one of the most effective

may be the requirement that all staff and physicians sign a statement of commitment as part of their initial hire, and subsequent contract renewals, re-credentialing process, or performance appraisal process. Although it may seem obvious, having a signed statement of understanding and commitment creates an explicit compact between the organization and the individual, upon which accountability can be built. Personal conversations between a chief medical officer and each new physician are in place at a few hospitals, and serve to reinforce both the expectation and the way in which failure to meet it will be addressed.

It is most commonly during implementation that the importance of a standard, fair system for holding people accountable for hand hygiene practices becomes important. Although education and coaching is adequate to address the majority of lapses early on, most hospitals have one or more staff members or physicians who resist the campaign, and display a pattern of missed opportunities. Also relatively widespread are stories of staff, usually physicians, exhibiting disruptive behavior in response to receiving reminders about hand hygiene. When such stories are accompanied by stories of how such episodes were handled through peer review, local performance management, or some other structure in place at the facility, they pose little challenge to progress. When such episodes are tolerated, or participants in focus groups are unable to articulate the process for managing them, or are afraid to make use of a system that is in place, for fear of retribution of some kind, these are markers of potential vulnerability to failure to progress through implementation.

At some facilities there was a troubling sense that a double standard existed related to different expectation and accountability for staff vs. physicians. Some hospitals explained this as a difficulty controlling physicians who were not employed by the hospital. Although several hospitals cited ease of establishing expectations for hospitalists and other employed physicians, it was not clear to us that the double standard was related to employment status. A sense of equality and fairness for all characterized the most successful facilities, and seemed linked to the presence of accountability fostered and supported by an institution's structure, as well as its leadership. In particular, staff at hospitals that had implemented a specific accountability framework called "Just Culture," seemed less likely to describe a hierarchical culture in which there were different standards in place for different types of professionals, physicians in particular.

Formal frameworks for accountability such as "Just Culture" are one type of tool that hospitals have used successfully in building personal accountability for hand hygiene. Others included building hand hygiene performance into performance management systems, and linking it to eligibility for advancement, for re-credentialing, or for merit raises.

Accountability during Maintenance

As hospitals move through the final stages of implementation, a clear sense that hand hygiene is something for which the accountability is primarily *personal* begins to emerge. Hospitals at this phase appear to have moved beyond a point where staff argue with the data, the methodology, the rationale, or the individual feedback, toward a point in which hand hygiene is an engrained part of their work in healthcare. We describe such institutions as having entered the maintenance phase.

At these facilities where hand hygiene behaviors have become embedded and the focus is on sustaining the changes, the system remains accountable for providing the basic support (convenient products, education and training) and for troubleshooting problems as they arise. Successful programs provide a clear system of accountability supported by the organizational structure, and staff are clear that disruptive behavior is not tolerated. Many of the most successful hospitals have used tools to enable staff to make overt personal commitments to hand hygiene (e.g. signing pledge boards, signing an accountability statement as part of credentialing), which reinforces the fact that each individual is accountable for doing the right thing. Evidence of the evolution of personal responsibility is apparent at many of the hospitals through various shared stories. For instance, at Portsmouth Hospital a hotline that was established (and used) early in the implementation phase to allow anonymous reporting of missed opportunities has not been used for months, as staff describe their increasing comfort with reminding each other as a matter of routine.

Measurement and Feedback of Hand Hygiene Performance

“I think that a lot of nurses feel empowered that they can go to somebody and say, “I didn’t see you wash your hands,” and they’re supported by the facility and the community as well. “ (focus group, hospital in implementation phase)

“I think that’s a key part because following up with them and finding out why they didn’t wash their hands and then they’re like ‘oh that makes sense’ and you’ll watch them again, like another time without even thinking about that you’re watching them and they’ll remember.” (focus group, hospital in maintenance phase)

“And finally what we did was we expanded that so everybody in the whole staff was given shifts to do the observations which raised their consciousness. So not only were they looking to their observations once a week or every two weeks, but they knew they were being looked at all the time and that’s when I think if you look at our data points that’s when you see that take-off, where we made that fairly quick jump.” (focus group, hospital in maintenance phase)

“I think I’d rather have immediate feedback than like get a form saying, “seven times you didn’t wash your hands.” A) because you could say maybe, “well, I did wash my hands inside.” But if I wasn’t, I’d rather have the chance to like... it would remind me to think about it more if I was forgetting to do it, if it’s right at that time...and also to change my ways.” (focus group, hospital in implementation phase)

“They were getting the feedback and they were getting it every month from me and other department chairs, and when they weren’t performing as well they saw that and their own pride took over and also this notion that they should be leading this and I also think they saw all the nurses observe them and they were actually getting approached by the nurses even if it was with some levity, all of that sort of combined. I realize in retrospect that it was hard to realize how much we were doing for this and hammering people, just kind of trying to keep it at the forefront. It would be at every dept meeting, it would be the medical staff meetings, we would do at the MBC, any opportunity I had I would.” (leader interview, hospital in maintenance phase)

“I would say she spends probably 5-8 hours a week on the floor, having a presence in hand hygiene and it’s become a sort of Hawthorne effect for her unfortunately, or fortunately, because they see her and they start cleaning their hands, but we were talking about that early, even though they do it when you’re around, you’re around so much that I think you’re probably helping them develop the habit while you’re out there. So it’s really a good thing, and real time, or as close to real time feedback is important, she will consistently correct people when she sees a problem.” (leader interview, hospital in maintenance phase)

“The other thing that bothers me there’s no room for using your brain, so for example I remember coming out of patients room, washing my hands, walking into the nurses’ station, didn’t touch a thing, didn’t do a thing, remembered that I needed to ask the patient something else went into the room to ask the patients something and got dinged. Touched nothing, didn’t touch, and so you’re not allowed to use your brain. And I saw her ding a physician inappropriately in my opinion. He did the right thing, but he didn’t follow the letter of the law so I think, and I’m not saying that this is all negative at all, I’m just saying those are some of the drawbacks.” (focus group, hospital in maintenance phase)

Measurement and Feedback: General Observations

Measurement Tools

Hand hygiene performance is being measured in some way at every facility we visited. With one exception, staff members directly observe hand hygiene behavior of other staff members. Most hospitals use the standard audit tool provided on the High Five Campaign website to record hand hygiene data. The relatively simple form includes directions to count opportunities for hand hygiene before and after contact with the patient or the patient’s environment and specifies the minimum number of observations that should be done each month. A few hospitals had modified the form to gather additional information, including the reason for failures. At two hospitals, auditors used handheld electronic devices (iPods) to collect hand hygiene data. One critical access hospital did not use any audit tool; instead they used patient reports of hand hygiene performance, collected on patient satisfaction surveys, as their only measurement tool.

Despite the state's provision of a standard definition of what constitutes a hand hygiene opportunity, several hospitals used different definitions. Most common was the practice of auditing hand hygiene on the way into and on the way out of patient rooms, regardless of whether contact occurred. This strategy made it easier for auditors to see what was happening, and thus to measure more accurately. As a campaign theme, "Wash In, Wash Out" was an easy concept to convey. However, at some hospitals staff challenged the need to clean hands when entering a room when no contact with the patient or the environment was anticipated; this valid objection may potentially undermine the success of a campaign.

Auditors

The campaign provided no specific directions about who should perform audits, how often, and for what period of time. It was also each hospital's choice as to whether audits should be done covertly, or overtly, and whether they should be paired with immediate, or delayed feedback. As a result, we observed wide variation in all of these functions.

The most frequent auditors included infection prevention program staff, and local clinical staff, who either volunteered or were assigned to do observations. When infection prevention staff performed audits they tended to do observations in a fairly consistent manner. However, even if they intended to be covert, they were often recognized and their activity suspected. In fact, recognition of any observer was quite frequent, and several hospitals believed that this fact explained periods of high performance.

In facilities where clinical staff perform audits, it is almost always in addition to their usual clinical tasks. Generally these auditors spoke of paying attention when they had the time, and often recorded what they remembered later in the day, randomly noticing when someone missed or took an opportunity. Rarely did local staff set aside time simply to observe and record hand hygiene opportunities. A few observers simply reported general summaries (e.g. "we did pretty good this month," which were then transformed into quantitative data in ways which remain mysterious.

Several hospitals had success engaging their housekeeping staff as covert auditors. This approach had the advantage of using staff members who were often inside patient rooms when healthcare personnel entered, and whose focus was on cleanliness. In more hierarchical cultures, housekeepers did not always feel comfortable with this role, and often expressed reluctance to provide feedback to individuals who had missed opportunities.

At most hospitals focus group participants and senior leaders were usually not able to specify exactly how audits were performed or what was being measured. The infection preventionist often had a better sense of how auditing was supposed to be done, but was not always confident that it was done the same way by everyone. Some hospitals described training auditors, but in most cases, it appeared auditors were simply given the form, with brief informal instruction, and asked to gather data. One notable exception was Wentworth-Douglass Hospital, which had a highly reproducible training program that includes role-playing and scripting around providing immediate feedback. Auditors are trained to observe for a specified period of time, or to observe a specified number of opportunities. Wentworth-Douglass Hospital described a unique

approach to auditing, in which 35-40 observers received training and were given the responsibility for ensuring that observations were done throughout the facility. Once these observers, who made up the Hand Hygiene Committee, had been deemed proficient, they were empowered to train as many additional observers as they wished. Ultimately, many of the staff at Wentworth-Douglass Hospital have been trained to participate in the auditing program which creates a culture in which staff are aware that anyone may be watching them and reminding them to clean their hands at any time.

Responses to Auditors

Although measurement through auditing of hand hygiene performance was a mainstay of hand hygiene improvement programs at almost every facility, not everyone embraced the concept of being watched, especially covertly. We noted a number of negative comments related to hand hygiene auditors. Auditors themselves described the experience of auditing in various ways. Some spoke of reluctance to participate as a hand hygiene auditor, not wishing to be seen by their peers as critical, as a “tattle tail,” or a “goody-two-shoes” and several described auditing using the same language as those being observed, reinforcing the sense that they were perceived as “policemen,” or even “Nazis.” On the other hand, some auditors relished their work, believing that they were making a contribution to safer patient care.

Feedback

Beyond the requirement to submit data to the state twice a year, which was met by most but not all facilities, there was a lack of consistency among the hospitals in terms of how hand hygiene performance data were shared with local staff. Some hospitals reported only to the Hospital Infection Control Committee; many stated that “leadership” and/or “Boards of Trustees” received reports. In some hospitals managers received regular unit-specific reports, and in some cases, reviewed the data with their staff.

In general, even in facilities where detailed data on unit-specific hand hygiene performance and healthcare-associated infection trends was regularly updated and readily available to all staff, it was rare to find a focus group participant, or even in an individual being interviewed, who could state with confidence his or her own unit’s or even hospital’s most recent performance. Moreover, staff often claimed not to know where or how to find the information. In fact, one of the themes that emerged in conversations with physicians in particular, was a desire to have such data put in front of them, preferably in the form of simple posters at the point of care.

Feedback on individual performance was uncommon, although, interestingly some physicians and physician leaders expressed a desire to receive such reports. Immediate feedback as part of ongoing local observation did emerge later in most campaigns that achieved the maintenance phase, and we discuss this program in that section.

Responses to Hand Hygiene Performance Data

Acceptance of hand hygiene performance data, with its inherent limitations, is a necessary step in progressing through the phases of a hand hygiene improvement program. At most facilities,

there are periods or varying lengths that precede this acceptance during which staff challenge the validity of the data, and the methodology of the audits. During our visits to hospitals that were early in their campaigns, or that seemed to have slowed in their progression through the phases of implementation, we often heard strong skepticism about the validity of the data. We heard similar skepticism about both data reflecting low performance and data reflecting high performance. Staff questioned the methodology, the ability of the auditors to see what actually happened, the definitions of hand hygiene opportunities, and the representativeness of the sampling. At one facility there was animated discussion about the validity of the decision to measure staff cleaning their hands on the way in and the way out of a room, rather than before and after contact with a patient.

At some hospitals, the degree of preoccupation with the validity of the data seemed to interfere with the ability of staff to *actually practice* hand hygiene reliably. It almost seemed as if their rejection of the measurement methodology was associated with a rejection of the idea that hand hygiene itself was a valid practice. In contrast, at other hospitals, we observed a sense of acceptance of the need to do hand hygiene regardless of the ability to measure it accurately.

Paradoxically, despite strong skepticism about its accuracy, most participants in focus groups and interviews believed in the *need* for numbers – itself a reflection of the ideology of science and the normative assumption that quantitative measurement is the “gold standard” – and that continuing to measure and report hand hygiene compliance was a key to sustaining hand hygiene improvement. Only one hospital articulated that they felt they had moved beyond needed to measure hand hygiene performance and had truly embedded hand hygiene into their culture. Most programs believed that ongoing measurement would help them maintain focus and ensure sustainability of their improvement.

Measurement and Feedback during Initiation

Developing a process for measuring hand hygiene performance is a critical component of successful initiation. Early on, the main purpose of measurement is to highlight the current state of performance and to prompt improvement activities through audits and reporting. In this way, measurement serves almost as a marketing tool, to help to galvanize attention and concern of the staff, and a desire to improve. At this stage, sharing a hospital-wide measure (as opposed to unit-specific, job-specific, or even individual level data) can be effective in showing the gap between people’s assumptions about current practices and measured performance.

Several aspects of measurement appear important to address early in the campaign in order to facilitate successful progression through the stages of improvement. First, it is crucial to establish clear rules about what is being measured and how it is being measured. To this end, developing written and spoken definitions (including policy slogans such as “Wash In/Wash Out”) of a hand hygiene opportunity is recommended. At this stage what is being measured (in and out of room, before and after contact, etc) appears less important than that a consistent approach is used. In several hospitals we found that a lack of clarity about what was being measured reappeared in later stages of the campaign in the form of preoccupation with, and argument about performance data, both of which tended to serve as a barrier to progress.

At this stage, a consistent process for hand hygiene auditing is important such that a believable baseline can be established. For this reason, relying on a single auditor, using an established process is probably optimal during initiation. Also at this stage, covert observation is preferable to overt observation, in that it removes concerns about the Hawthorne effect, which can undermine credibility. Although later in the campaign, overt observation with immediate feedback emerges as an important tool, this more individualized approach seems premature for the initiation phase. Any individual feedback during the initiation phase should consist of positive reinforcement of desired behaviors.

Measurement and Feedback during Implementation

During implementation, measurement continues to play an important role in providing evidence of progress toward goals. For this reason if hospital leaders and infection preventionists can establish and maintain a feedback mechanism that reliably provides updated data to local staff this can contribute directly to successful implementation. In addition, moving from hospital-specific data to data stratified by unit, or by healthcare worker type, can be more useful to local improvement efforts. In addition, at some hospitals the role of competition between units or healthcare worker types helped to sustain engagement in the campaign.

During the transition from initiation to early implementation, along with the distribution of campaign leadership responsibility, there may be value in distributing the auditing role beyond a single person. There were many different approaches to sustaining the audit function. Some hospitals used a centralized approach, deploying infection prevention staff, float staff, or housekeeping staff to do audits throughout the hospital. Other hospitals recruited volunteers from among local staff. At some facilities, local leaders had a responsibility for completing hand hygiene audits on their own units. In the most successful of these programs this auditing role was part of a more comprehensive ongoing responsibility for hand hygiene performance. In many, less successful situations, the local manager saw his or her responsibility ending with filling out an audit each month. Two particularly successful approaches deserve highlighting. At Wentworth-Douglass Hospital, local leaders receive training and certification in auditing hand hygiene. Once certified proficient, they are encouraged to train others on their unit to do observations. Each unit submits a minimum number of observations each month, but many units exceed this number by several hundred, generating data that they can use to improve or sustain performance. At Frisbie Memorial Hospital, the infection preventionist has responsibility for the Float Nurse Pool, and has deployed them to serve as hand hygiene ambassadors and auditors when they are carrying out assignments on different units.

Although the campaign specified that a hand hygiene opportunity was considered to occur before and after every contact with the patient or the patient's environment, several hospitals modified this definition in an effort to simplify compliance. The most common modification was to require hand hygiene at the time of room entry and room exit, regardless of what took place in the room. Although this approach did simplify the task, and eliminate the need for staff to think about what they might plan to do in each patient room, several hospitals moved away from the "wash in, wash out" approach because it tended to serve as a source of argument from some staff who preferred a more evidence-based standard, even if it might require critical thinking. This transition

tended to occur in the later stages of implementation. Preoccupation with definitions and with measurement methodology was a marker for failure to progress through implementation.

In later stages of implementation, many successful programs begin to shift from auditing for measurement to auditing for education and to coach for behavior change. At this point, the role of covert auditing seems to become less important (though still may play an important role to monitor true hand hygiene performance) and there is often a shift to overt auditing with immediate feedback. This shift seems to parallel the successful engagement of local champions who see sustaining high hand hygiene practices as part of their ongoing work and their sense of professional duty.

Measurement and Feedback during Maintenance

At hospitals successfully sustaining hand hygiene improvement, the role of the local champion begins to eclipse that of the traditional auditor. At most hospitals, local champions provide real-time education and feedback at the point of care, and help local units maintain focus on hand hygiene as part of their daily work. While the role for covert measurement to monitor performance is still important, it might be done less often, and serve to identify problem areas for targeted work. Sustaining hospitals are characterized by their tendency to want to initiate new programs and improve even further. With respect to measurement, several hospitals were considering ways to measure the quality of hand hygiene practices, and the opportunities during care, in addition to simply quantifying compliance before and after patient contact. Some hospitals were considering whether use of a surrogate measure of hand hygiene performance, ranging from the amount of hand sanitizer consumed per month to RFID technology to count hand hygiene events per day per staff member.

At most of the successful hospitals we visited, staff had access to regular reports of hospital, unit, and job specific hand hygiene compliance rates. Data were used to understand patterns and implement targeted programs. There was a general sense of acceptance that the data were accurate enough, and a lack of interest in challenging the methodology. This attitude contrasted with that of staff at hospitals that had become mired in the early implementation process; at those hospitals much energy was devoted to questioning the accuracy and critiquing the methodology of the auditing process. In general, it seemed that as real-time peer feedback programs became established, staff tended to focus less on the institutional data, although we were assured that if the numbers fell people would be concerned. We heard many times that the response to feedback provided at the point of care was “thank you.”

Hand Hygiene Product Availability and Convenience

“I think this hand gel has changed the world. I mean, it’s everywhere and you see everyone using it – I mean visitors, doctors, nurses, everybody uses it.” (focus group, hospital in maintenance phase)

“They’re in, they’re in the rooms, they’re outside of the rooms. And if you take a trip to med-surg you’ll see they are every like, four feet, every three feet, they’re in the room, they’re outside the room. There, there’s no reason why someone cannot sanitize their hands.” (focus group, hospital in maintenance phase)

“We made conscious decisions because some people like the sink and soap and some people like the hand sanitizer. So in every patient room, every exam room, every treatment room in the ED, there’s the hand sanitizer and the sink and the foam. And it’s both inside and outside the room. So there’s an opportunity for people to do, to wash their hands no matter where they are in the clinical areas. So that’s one of the things that I think has really helped a lot.” (leader interview, hospital in implementation phase)

“Some of the things that we did early on were to go around and look at where our alcohol foam dispensers were, we wanted to have them in standard spot throughout the hospital so it would become rote to any user where to reach for so we decided on every nursing floor, that they would be on the door jamb closest to the nurses’ station, and we felt that when they were going to answer a call bell they would be coming from that direction typically anyway, could grab their hand foam, go in and do what they needed and then when they came out they would just by habit be reaching for that same side of the wall. And we’ve affixed those to every door jamb of every patient room in the entire hospital.” (leader interview, hospital in maintenance phase)

“We made sure that there was alcohol sanitizer everywhere. I made it my mission to go around the hospital and to put those suckers wherever the fire marshal would let me.” (leader interview, hospital in maintenance phase)

I feel like the work they did putting Purell around the hospital really has made a difference over the last few years, making it easier. It’s positioned right by the door, and in the patient room in a more predictable place...and then extra bottles on surfaces. So that seems better to me. (focus group, hospital in implementation phase)

Product Availability and Convenience: General Observations

Providing easy and unlimited access to products that enable staff to clean their hands at the expected times is a key system responsibility during every phase of a hand hygiene improvement program. The improved access to products was the most frequently mentioned factor leading to

hand hygiene improvement in the focus groups and interviews that we conducted across the state. Although product availability is not sufficient alone to ensure high hand hygiene performance, it is a critically necessary step toward achieving this goal.

Hand Sanitizer

The addition of more and more conveniently located hand sanitizer was a key part of every hospital's hand hygiene campaign, and ensuring product availability is an ongoing necessity for maintenance of improvement. We observed many different hand sanitizer brands and dispenser types in use around the state. Fifteen hospitals used Purell brand hand sanitizer, in various formulations; no other single brand was dominant. Some hospitals used more than one brand. A number of product types were in use, including gels, different types of foam, and wipes. Most facilities had added wall-mounted dispensers (manual and automatic) of hand sanitizer in hallways, inside patient rooms or both. Many facilities had desktop hand sanitizer dispensers at nursing stations. At one hospital, bottles of hand sanitizer were attached to the tops of charting tables outside each room using Velcro. A small number of facilities made use of personal hand sanitizer devices, with mixed success. Only one facility used bed-mounted devices.

Many hospitals had involved staff in decision-making about which products to purchase, and where to place them. This had the positive result of engaging local staff. An unintended consequence in some facilities was a high degree of variation in product placement from unit to unit. This non-uniform product placement was particularly challenging for staff that travel from unit to unit, such as physicians, radiology technicians, physical therapists, and others. The general consensus among focus group participants was that having the product in standard places on every unit is the greatest facilitator of habitual hand hygiene practice.

The most commonly cited barriers to adding additional hand sanitizer were fire code regulations, which limit the volume of alcohol that can be available in a smoke compartment and limited financial resources for purchasing more products. Moreover, at hospitals where purchases of hand sanitizer (or soap) are charged to the local units, there may be an unintended disincentive to purchase more, which could impede hand hygiene improvement efforts.

At many facilities, staff members were uncertain how to request more product or insure rapid refilling of empty dispensers. One hospital (Dartmouth-Hitchcock Medical Center) used a red tab on the top of wall-mounted sanitizer that could be flipped up when the container was empty to alert housekeeping of the need to refill.

While most hospitals had added more products (and some could show data to quantitate how much), not all had optimized their location with respect to the work processes involved in patient care. Many hospitals did not have access to hand sanitizer or a handwashing sink inside the patient rooms, close to the point of care. Hallway dispensers were sometimes located halfway between patient rooms, making it convenient for neither. Some treatment rooms used for multiple patients had just one sink and no hand sanitizer, making hand hygiene between patients inconvenient for staff. At several facilities we saw both soap and hand sanitizer mounted at sinks, which could lead to confusion about which product to use when.

Impediments to convenient placement and access to hand sanitizers and sinks included the presence of mobile equipment that was stored in front of fixed stations and mobile hand sanitizers that were placed “out of the way” behind other equipment. Attempts to “get by” with fewer hand sanitizer stations led some facilities to place products that were not in the line of workflow in and out of any patient room. Several hospitals mentioned the difficulty of practicing hand hygiene when staff often entered patient rooms carrying equipment or computers. One hospital planned to add drop-down counters in the rooms so that staff could place items there and practice hand hygiene after entering the room. In some facilities we saw hand sanitizer mounted on mobile carts such as computer workstations and phlebotomy carts, but this was not always consistent. In others, some staff carried individual containers of hand sanitizer in their pockets, on their belts, or attached to their uniforms. Impediments to using personal devices included the added weight and the need to use two hands to uncap and dispense the product.

A number of hospitals had initiated programs to improve the hand hygiene practices of patients and their families and visitors, and the community in general. Often, alcohol wipes were provided to patients for this purpose. We also saw hand hygiene stations at the public entrances to many facilities, often with signage to raise awareness among the community.

Handwashing with Soap and Water

Sink placement was more variable. Only facilities which had undergone recent renovation or construction projects spoke of adding sinks in new places. Sinks were frequently in hallways on patient care units, or in patient bathrooms, although some facilities had sinks in patient rooms. A number of hospitals mentioned working with architects and planners to add sinks during recent renovation and construction projects. Hands-free faucets were in use in a number of hospitals. One hospital expressed a desire to install automatic handwashing machines as a way of encouraging hand hygiene among staff.

At a minority of hospitals, there was a belief that handwashing with soap and water is superior to disinfection with hand sanitizer. However a very common misconception we encountered is the belief that under routine (non-epidemic) circumstances, handwashing with soap and water must be used as an alternative to hand sanitizer for the care of patients with *C. difficile* infection.

Availability and Convenience during Initiation

Successful initiation of hand hygiene improvement campaigns always involved providing more and more conveniently located hand sanitizers. Although handwashing sinks and soap are still necessary, and some hospitals did add sinks during the campaign, especially in new construction, the emergence of alcohol based hand sanitizers has revolutionized infection prevention over the last decade. These products are effective and efficient, and easy to place in consistent predictable locations near the point of care. Providing the necessary products within the workflow of busy hospital staff is one of the most important ways that a system shows its support for hand hygiene.

Although all hospitals had improved access to hand sanitizers as part of initiating their campaign, some still have room for improvement. Barriers to further addition of products included concern about fire safety codes that limit the amount of alcohol allowed in healthcare facilities, concerns about resources, and in a few places, a lingering belief that washing with soap and water is preferred to the use of hand sanitizer. We believe that maintenance of easy access to hand sanitizer close to the point of care is likely key to ongoing progress through the campaign, as it facilitates the development of habitual, engrained hand hygiene behavior.

Based on our observations, we would recommend a few specific approaches to product selection and placement within hospitals:

1. Establish a uniform location for hand sanitizer throughout the facility, or certain parts of the facility (e.g. just inside every inpatient room, or to the right of the door outside each inpatient room, or on the table next to the chair in the infusion suite). This helps to embed the hand hygiene habit in staff who travel between units
2. Provide access to hand sanitizer inside patient rooms, ideally within 3-6 feet of patients, to facilitate hand hygiene during patient care
3. Provide access to personal hand sanitizer as an option for busy staff. This approach may be particularly helpful in settings where care is not always routine, such as emergency departments.
4. Involve staff in selection of products; be wary of purely financial decision-making, as cheap products that are not used by staff will undermine progress.

Availability and Convenience during Implementation

During this stage of the campaign, availability of product continues to be an important facilitator. The same principles apply as during the earlier phases. Periodic reassessment to optimize placement and to ensure that staff are able to procure hand sanitizers without difficulty may be important. It may be useful to track purchase orders for hand sanitizer in order to monitor for unexpected decreases in amount of product purchased that might prompt investigation. In some facilities, establishing a working relationship with the facility safety officer with respect to weighing the risks related to fire hazards against the risk of healthcare-associated infections may be necessary to maintain adequate hand sanitizer supplies as compliance improves.

Availability and Convenience during Maintenance

Maintaining a commitment to making hand hygiene products available where they are needed is an important part of sustaining hand hygiene improvements. In keeping with their interest in innovation, sustaining hospitals are looking for opportunities to try new products and placement options. Successful hospitals are also characterized by simple systems that allow staff to request and receive the products that they need.

Hand Hygiene Education and Training

“I think it is important for people to be hearing this message from more than just the infection surveillance people as well. At the time that this campaign started I really started incorporating this message into the education.” (leader focus group, hospital in maintenance phase)

“I think that everyone’s a little bit exhausted by—Here’s one more thing you need to do, and people are watching and that kind of stuff. And people are just so fed up with that kind of thing, that at the end of the day, you need to really believe—you really need to have that education piece. People really need to realize, this is really important”. (focus group, hospital in implementation phase)

“I thought one of the best things they did in the mandatory education day, I don’t know if other hospitals have done this or if you can take this back to them, I thought one of the best things that people were really like wow, was they did random swabs of the stairwell, the sharps, the doorknobs, the front of the hospital, there was stuff that you don’t want to imagine. That’s just another wake up call, there’s stuff everywhere.” (focus group, hospital in maintenance phase)

“That’s one of the education pieces I – I say that all the time: I want you to picture yourself, sitting in the exam room, waiting to have your physical, um... and your, your – your doc comes in. And... you know you’re going to be thinking: are his hands clean?” (focus group, hospital in maintenance phase)

“And just a word on education and training: we have E-Learning modules that... are not very effective. It’s set up that they can go straight to the test without doing the module. And there’s like three test questions that are, you know, kindergarten level.” (IP interview, hospital in implementation phase)

Education and Training: General Observations

Education about when, why, and how to perform hand hygiene was, at most facilities, incorporated into new employee orientation, as part of infection prevention education. Most often a presentation was made by the infection preventionist. Often the Dartmouth-Hitchcock hand hygiene instructional video was used as part of the presentation. In many facilities electronic modules are used for required yearly education of staff about hand hygiene. In some places, electronic learning modules are required, but can be avoided by successfully completing a relatively simple test at the end. A requirement to demonstrate competency in hand hygiene was implemented in only a few hospitals.

Physician orientation and education appear to be much less standardized. At one hospital, each new physician is required to meet with the Chief Medical Officer, at which point expectations

around hand hygiene performance (and other patient safety expectations) are made clear. A barrier commonly mentioned to physician education and training was the fact that many physicians are not actually employed by the hospitals where they work. Some hospitals that do have employed physicians have been somewhat more successful in setting expectations for physicians for completing education. The credentialing process does not seem to be commonly used for this purpose.

Several tools were repeatedly mentioned as very useful in education and maintenance: Glo-germ and the use of culture plates to demonstrate contamination of the hands of personnel or of high-touch areas in patient rooms were the most common, and described as very effective with a range of audiences.

Several facilities invested a great deal of energy and creativity into facility-wide educational and awareness raising events, which combined elements of education, promotion, commitment and celebration, targeting everyone in their institution. One particularly good example of this type of approach was a weeklong Hand Hygiene Fair, with multiple stations including education about why and when to use hand hygiene, how hand hygiene observations were conducted, demonstrations of contamination of high touch areas. This hospital required all staff to visit the fair sometime during the week. They would begin by demonstrating hand hygiene competency, and end by signing a pledge of commitment to practice hand hygiene. Food and prizes were used to keep the atmosphere fun. Staff who were unable to attend the fair had the opportunity to view a podcast that covered the same materials, and then to take a post-test which included signing the same pledge.

Education and Training during Initiation

Education may be viewed to some extent as a form of marketing during this part of the campaign, although it also serves an important purpose of communicating expectations and how success will be measured. Thus, in addition to developing educational tools about how to perform hand hygiene appropriately, it is important to educate people about when hand hygiene should be done, and which opportunities will be “counted” as part of auditing. Although well known to campaign leaders, the fact that hand hygiene opportunities that are counted are usually a subset or a surrogate for all hand hygiene opportunities is not widely known to physicians and staff. Educational materials should be designed to make this clear from the beginning in order to avoid confusion and pushback later in the campaign.

Demonstrations can be an extremely useful part of education at this stage. Two particularly effective demonstration tools involve the use of “glo-germ” to highlight areas of hands that are frequently missed during hand hygiene, and photos of culture plates that show contamination of unwashed hands, or items in the environment.

As part of initial education, providing evidence of the link between hand hygiene and the ultimate goal of infection prevention is key to establishing this connection, and laying groundwork for sustained commitment. This can take many forms – from literal reminders of this connection

through use of technologies mentioned above, to the presentation of data about this relationship at key locations and in an array of formats throughout the hospital.

Although most hospitals used some form of yearly electronic module for ongoing education, it may be even more important to provide ongoing education through the use of posters, signs, screensavers, and newsletters—we found that the line between marketing and education is blurred. In addition, many staff and physicians seem almost overwhelmed with the volume of electronic information that they must process every day, making a poster with a simple educational message a potentially more effective tool.

Education and Training during Implementation

During this phase, education continues to overlap considerably with marketing, as many hospitals try to reduce just-in time educational messages to a few words and a compelling image that will draw the attention of busy health care personnel. Such formats are particularly suited for communicating the link between hand hygiene and healthcare-associated infections, the *why* of the campaign.

Ideally more comprehensive education occurs yearly in the form of required modules for staff and physicians. These modules also provide an opportunity to introduce new products, new initiatives, and changes in auditing methodology, campaign targets or expectations. However, creativity and educational innovation have not made their way into standard educational modules for healthcare personnel, and our sense is that the impact of these methods is limited. At many facilities, infection preventionists bring a good deal of their own creativity to bear on educational materials for staff and they have had some success with individual campaigns, especially where they have partnered successfully with marketing staff.

In anticipation of transitioning to the maintenance phase, attention to training of auditors is important. Ensuring that covert observers who are responsible for auditing for performance measurement are trained to a consistent process is one important component of auditor education. Developing a program to train local observers to perform more overt observations for the purpose of immediate feedback and education is a worthwhile investment that will support progress toward sustainability of the initiative.

Education and Training during Maintenance

Refresher courses in hand hygiene are generally incorporated into yearly required infection prevention education at most hospitals. An expectation that completion of such education was required for advancement, or for merit pay increases, is fairly common at facilities in the maintenance phase. One element that keeps hand hygiene education compelling is the continued emphasis on the link to prevention of healthcare-associated infections.

One education and training program stood out as exemplary. Wentworth-Douglass Hospital has developed a program to train local staff to serve as auditors and to provide immediate feedback to peers, and across disciplines in order to maintain high performance on a day-to-day basis. Because the program included an aspect of “train-the-trainer” (proficient auditors were certified to

train other staff on their unit) it served not just as auditor training but as part of ongoing staff education in hand hygiene. This program could be useful for other hospitals that wish to establish formal programs of trained local champions who can model peer feedback and oversee hand hygiene initiatives at the local level.

Hand Hygiene-Related Marketing and Communication

“We have one [sign] in the back of the door in the bathroom that says, “One out of every six people don’t wash their hands, I hope it’s not you.” Visitors see that and they go, “Gasp.” I love that sign. So that, to me, was effective.” (focus group, hospital in implementation phase)

“They don’t stop looking at them...because there’s something new to look at.” (focus group, hospital in maintenance phase)

“I think it’s going to be easier in the inpatient area to say instead of focusing on the measurement as hand hygiene, let’s focus on the outcome of decreased infection in more days.” (leader interview, hospital in implementation phase)

I think signs could be larger, or also more strategically-placed. Maybe rotate a bit more. But I don’t think... They might become invisible for us, but that doesn’t mean that they’re not effective for others. (focus group, hospital in implementation phase)

“We had a lot of resistance about – you know, this was years ago, about having the posters up – we’ll back off on that a little bit, we’ll let it sit for a month or two, and then we’ll bring it back again. Or we’ll revamp the way it looks.” (focus group, hospital in maintenance phase)

Marketing and Communication: General observations

Although the state made a number of posters and promotional materials available on the High Five website, and we saw them in use in hospitals across the state, many hospitals went beyond these materials, pulling in additional ideas from other sources, and creating their own materials. We saw many clever and effective ideas for raising awareness about the importance of hand hygiene.

Examples of marketing and communications tools used in hospitals around the state include posters, screensavers, stickers, pins, buttons, newsletters and newspaper articles, FAQs, games (such as crossword puzzles, word finds, and Trivial Pursuit), questionnaires, tips of the week, and cards as well as videos, songs, and dances. At times, these tools were used to commend good behavior (sometimes even combined with a raffle ticket or another form of “reward”) or to point out missed opportunities. Hospitals had created materials made specifically for patients and families as well.

Common and novel themes appeared on posters across different hospitals, such as:

- Germs on hands, and on objects in the environment, illustrated with either cartoons or photographs
- Patient-centeredness, often with photos of patients (especially babies)
- Role models, with photos of staff or signatures/handprints of staff (“Caught in the Act” at St. Joseph Hospital)
- “How-to” illustrations of how and when to use hand sanitizer or soap and water
- “OK to ask” for patients
- Employee wellness
- Guilt-inducing, thought-provoking messages that focus on risk and responsibility

A few of the more unique posters we saw included:

- Seasonal themes, such as S.P.R.I.N.G. (Stop.Prevent.Remove.Infectious. Nosocomial. Germs) at Androscoggin Valley Hospital
- Modified fairy tales and literary classics (e.g. Gone with the Wind, Moby Dick) at Cottage Hospital (borrowed from Allegheny County Health Program) or use of art masterpieces (e.g. Mona Lisa) at Littleton Regional Hospital
- The “nest” concept at Dartmouth-Hitchcock Medical Center to emphasize hand hygiene during patient care
- Illustrations linking better hand hygiene to lower HAI rates (Dartmouth-Hitchcock Medical Center)

We received conflicting input from focus group participants regarding their preference for positive versus negative or edgy messages and themes. For instance, one hospital had little success with a campaign that labeled staff members who missed opportunities as “Dirty Ernies.” Another found negative reactions to the use of a “FROG” (Friction Rubs Out Germs) card that admonished the recipient about a missed opportunity. However, others expressed a preference for posters that emphasized the harm caused by unclean hands, or pointed fingers at those who failed to interrupt the chain of infection.

Two consistent messages that emerged from focus groups and interviews were the need to keep the message fresh and short. Because of the increasingly burdensome quantity of information that healthcare personnel must process and the limited amount of time available for receiving messages, the use of such media as posters, screensavers, buttons, and stickers may serve a critical purpose. A shared repository of such items in a central location might provide a helpful resource for hospitals committed to sustaining hand hygiene performance.

Marketing and Communication during Initiation

At the start of a campaign, marketing and communication is an absolutely crucial tool for generating enthusiasm, establishing a common goal, and creating a positive tone. Successful kick-offs often began with a celebration of some sort, often including elements of education, demonstration, and formal commitment ceremonies, food, and prizes. If senior leaders appear at such celebrations, this sets a positive tone. Some hospitals included trustees in these kick-off events. Early on, a series of posters or signs helps keep the campaign vibrant. These tools can also

serve to educate, provide feedback on performance against goals, illustrate leadership commitment (though photos of senior leaders cleaning their hands), and demonstrate the link between hand hygiene and infection prevention, the focus on patient safety.

Marketing and Communication during Implementation

Succinct messages with key information are generally more effective than long policies, or even articles in newsletters. Keeping the message fresh and front of mind is the key role for marketing during the implementation phase. Messages tailored for local audiences, or to introduce key concepts can be important. For example, one hospital used a newsletter specifically for physicians to share evidence and rationale for the hand hygiene campaign going into a depth that other staff may not have needed. Many hospitals developed poster concepts targeting specific units, such as pediatrics or geriatrics. At many facilities, marketing initiatives capitalized on current events such as H1N1, MRSA outbreaks, and other news items. Successful facilities were able to display multiple poster concepts and other marketing tools; staff often mentioned this. If people noted a loss of interest in developing new ideas and tools the campaign at that hospital was likely flagging.

Marketing and Communication during Maintenance

Marketing continues to play a role in this phase of the campaign, by maintaining awareness through fresh messages. Several hospitals at this stage were implementing mini-campaigns to introduce new concepts, such as “Be Seen Being Clean” at Cottage Hospital.

Issues Involving Culture and Relationships

“I think it’s just been an evolution. That we’re going from doctors working on doctor things, nurses working on nurse things, Respiratory working on Respiratory things, to a collaborative culture. And that’s the way it is. And I think it’s been an evolution.” (IP interview, hospital in implementation phase)

“Most of us, even though I know I’ve washed my hands before I go into the room, I want the patient to see me washing hands. So, we go into the room, and I’ll do it then. And then maybe I’ll do it again when they’re walking to the examining table. So the patient can have the confidence in seeing the docs, or nurses, or whomever wash their hands.” (focus group, hospital in implementation phase)

“I’m a little wary about going to the doctors, just because, not because I’m under them or anything, but they have more knowledge and education than I do so umm...I haven’t really said anything to the doctors but I have made them aware, they know by the papers, by [the IP] and she said she talked to them. I mean I kind of say something to them but I just feel-- going to my own peers is easier for me to do than the doctors.” (focus group, hospital in implementation phase)

“In healthcare, at the in-patient unit level, almost all the metrics are team metrics. It’s teamwork. So it’s sort of like you rise or you sink together. And in this way, it’s peer pressure, which is powerful. Some people say it’s unfair, but it is how it is. And it’s a very basic expectation, and you should be having these conversations with your colleagues if they’re not washing their hands. Part of your job as a nurse is to advocate for your patient. And if you see that person not washing their hands, what is the best way to advocate for your patient than to say, ‘I noticed that you didn’t wash your hands; it’s really important that you do that.’ Whatever, however you do that in a nice way.” (leader interview, hospital in implementation phase)

“I would be very uncomfortable telling a provider, physician, to wash their hands, because there is a real stratification in our department. And it could make things very uncomfortable. I have no problems telling a co-worker to wash their hands.” (focus group, hospital in implementation phase)

“If you get in the habit of doing it in the room in front of the patient, then that question is not going to come before you. So it’s really looking at the location that you’re doing it, changing your practice of where you do it, so maybe when you go into the room, maybe you might grab it on the way out. But that’s what’s going to make the difference, when you’re doing it and the patient will not have to ask.” (focus group, hospital in implementation phase)

“It’s for the patients predominantly, but it’s also for all of us, which again, eventually, it’s for the patients.” (focus group, hospital in maintenance phase)

Cultural Issues during Initiation

Successful initiation is possible simply through focus on the basic activities outlined above, and sometimes through the use of initial pilot projects, involving one or two units in a larger facility. However, there are additional opportunities during the initiation phase to establish groundwork upon which later stages can be built, and which may make successful progression more likely. Such opportunities include:

- Build a consistent approach to communication about goals, progress against goals, and next steps
- Anticipate the need for a consistent, equitable system to hold staff and physicians accountable for their hand hygiene performance; ideally such a system is embedded in the larger organizational structure, not specific to hand hygiene, and therefore bypasses some of the issues that can mire hand hygiene improvement efforts in unproductive gender-, generation-, or institutional culture-based dynamics that thwart improvement.

- Recognize potential challenges related to physician autonomy and related issues of authority and hierarchy within the hospital.
- Make an assessment of the hospital culture, considering the general response to QI initiatives, performance measurement, degree to which hierarchy affects interpersonal relationships

Cultural Issues during Implementation

As hospitals moved successfully through the later stages of implementation and spread, toward a point of sustainability, a number of new activities and emphases emerged.

- **Peer feedback and feedback across disciplines.** Hospitals that are successfully moving through implementation tend to have incorporated peer and cross-discipline feedback into their programs. We believe that as hospitals shift from a single leader campaign mentality to an environment where hand hygiene is *everyone's* responsibility, people are realizing that the ideal time for feedback is in the moment. Successful programs tend naturally to shift focus from auditing for measurement to auditing to ensure appropriate hand hygiene behavior. In fact, most sustaining programs ultimately get to a point where the effort is to “feed forward,” with staff reminding each other at the point of care, rather than waiting to give feedback after the opportunity has been missed.

Resistance to peer feedback is often seen in the early implementation phase and persistence of resistance can be associated with failure to progress. Smaller hospitals and those with staff longevity may have a slightly easier time with this aspect of implementation. Staff morale and hospital culture, and particularly the degree to which an institution operates within an entrenched or rigid social hierarchy, seem to predict the degree to which staff express comfort with the concept. An organizational structure that supports accountability for behavior facilitates peer feedback, as an oft cited reason for discomfort with the idea, is the fear of pushback, or disruptive behavior from the recipient, especially, but not limited to, physicians. Other reasons for hesitation include fear of being perceived as critical, as self-righteous, and as a tattler, or even as a reprimanding or nagging “mother” figure.

Several hospitals have implemented programs designed to make it easier for staff to give feedback to each other, and these may be useful to hospitals that are “stuck” in the early implementation phase. At Wentworth-Douglass Hospital, auditors receive training in how to give both positive and negative feedback; this training includes role-playing and rehearsing various scenarios. These auditors express comfort with providing negative feedback. Since certified auditors go on to train other local staff in the same way, ultimately many staff members go through rehearsals and develop comfort with, and expectation of both giving and receiving feedback. Other hospitals are in the process of experimenting with the use of scripts, as well as standard hand signal reminders in an effort to support staff in giving each other feedback.

Lakes Region General Hospital and Franklin Regional Hospital have developed a program designed to identify local champions for each unit whose role is to oversee hand hygiene behavior on that unit, observing performance and providing real-time feedback and education to staff. By separating out the auditing for improvement function from their auditing for measurement (which remains covert), they hope to create an environment where peer feedback is modeled on every unit. The program, called CHAMPS (Clean Hands Are Making Patients Safe) was in the early stages of implementation when we visited, but the concept is one that we believe could help other hospitals formalize their own programs for auditing with real-time feedback.

- **Focus on patients.** Patient-centeredness emerged in many interviews and focus groups as a dominant theme. In early implementation, many hospitals tried to include patients in their campaigns, often using the theme, “It’s OK to ask.” We found evidence of ambivalence about this approach at many of the hospitals we visited, hearing many stories from hospital staff and physicians who had been hesitant to ask their own providers to clean their hands. Some hospitals appeared stuck at this stage at which they felt it was not ok for patients to ask, in reality, but it should be.

Successful facilities tended to have moved to a different approach, in which their focus was to eliminate the need for a patient to ask, by moving hand hygiene in front of the patient. At Cottage Hospital, a program called Be Seen Being Clean, a formalization of this approach, had just been approved. (Interestingly, it was voted down initially, by physician staff.) Several hospitals used scripts for providers and staff to use to help make it easier to remember to mention hand hygiene in front of the patients.

Other initiatives that indicated a focus on the patient included the use of Press-Ganey surveys to ask patients about hand hygiene observed during visits, more real-time use of cards or interviews of patients about their observations, the provision of hand sanitizer and educational materials to patients at the time of hospitalization.

Cultural Issues during Maintenance

Hospitals that have reached the maintenance phase of the High Five Campaign exude a sense that hand hygiene is embedded in their daily work. Although they certainly take pride in their accomplishments, there is almost a sense of surprise at being asked to participate in a project to learn about what works. It is clear that staff believe that high performance is not only possible, but also that it is not an onerous task. Staff and leaders articulate the importance of team, of collaboration to provide patient-centered, safe care. Even when staff discussed physician hand hygiene behavior, they tended to characterize such interactions as respectful and inclusive. Pushback was uncommon. In contrast, physician hand hygiene behavior often provoked more negative discussions at other hospitals in earlier phases of implementation. .

When describing morale and work environment, maintaining hospitals tended to talk about the positive impact of financial challenges, the feeling of community at their hospitals, and the absence of hierarchical culture. Evidence of absence of hierarchy was apparent as we watched

senior leaders interacting with housekeepers in focus groups, or heard an LNA refer to the CEO by her first name. People seemed to have confidence in their leaders, and their accountability structure, and were clear that disruptive behavior was not tolerated, often citing examples of staff or physicians being held accountable.

Although many of the hospitals that had advanced the farthest seemed to have started with favorable cultures and organizational structures, it appears that some of them worked to improve their culture through their hand hygiene campaigns. Helpful strategies for such culture change included implementation of a Just Culture system of accountability, and the use of scripting to enable staff to undertake crucial conversations with peers, or across disciplines.

Common Barriers to Progress and Proposed Solutions

In this section we identify common barriers to progress at different phases of the campaign and draw on potential solutions from the experiences of hospitals that have overcome them.

The process of successful and sustainable implementation of a hand hygiene improvement initiative is not necessarily linear. Most New Hampshire hospitals have followed circuitous pathways, encountering barriers that slow or even halt progress temporarily, and then finding ways to surmount the barriers and move forward. The following section highlights some of the common barriers to progress and draws on the experience of all New Hampshire hospitals to offer suggestions for overcoming them.

Early Barriers that May Hinder Initiation

“Recently, more so I’d say in the last couple of years: there’s too much on one person to cover. They’re taking on more than one department to direct, and I don’t see how you can hit all of it.” (focus group, hospital in implementation phase)

“Nothing was handed off to me. There was no one here. There was no one here for almost 9 months, almost a year. So I just kind of jumped in and started from scratch. And kept hearing about things that I was supposed to be doing, or responsible for. And ‘oh, okay!’” (IP interview, hospital in initiation phase)

“Even though I have a hand hygiene team it’s hard with all their other duties to get them together to help me work on the campaign. Basically I am the hand hygiene campaign.” (infection preventionist interview, hospital in implementation phase)

“It’s not outside every room. There’s one, like, every other room. And I know when I came out, it wasn’t actually easy for me to find the hand sanitizer.” (focus group, hospital in initiation phase)

- Lack of established/maintained connection with New Hampshire Hospital Association and the Foundation for Healthy Communities
 - Establish clear contact person with link to infection preventionist
- Turnover in infection preventionist position
 - Assure hand-off of key information
- Existence of multiple competing roles for infection preventionist or a sense of being alone in a challenging role
 - Establish overt senior leadership support for infection preventionist role
 - Review potential for competing roles to undermine or create disincentive to perform infection preventionist role

- *Develop steering committee, leadership team for hand hygiene campaign*
- *Provide opportunities for infection preventionist to network with other infection preventionists*
- *Recognize that this can be a cultural issue, linked to lack of accountability structure*
- **Concern that resources are not committed or accessible**
 - *Senior leadership commitment*
 - *Assess whether budget structure penalizes units for ordering more hand hygiene products*
- **Lack of visible senior leadership support for campaign**
 - *Identify a single senior leader who has oversight for campaign*
 - *Develop scripts for senior leader to use in meetings*
 - *Establish regular meetings for campaign leader with senior leader and provide regular report to mark baseline and progress*
 - *Involve senior leader in campaign kick-off*
 - *Feature senior leader in campaign marketing materials*
- **Inconveniently located, or not enough, hand sanitizer**
 - *Use multidisciplinary steering committee to establish uniform location for hand sanitizer for all inpatient units, outpatient clinics, and other patient care areas so that healthcare personnel do not have to look for the product*
 - *Ensure that hand sanitizer is available inside patient care areas, within 3-6 feet of the patient*
 - *Confirm that resources are available to purchase necessary hand hygiene products*

Barriers during Implementation

“For me, I think it’s the perception of risk, and I think that was one of the things that—me looking at the numbers and saying, ‘Ok, we’re really not making much headway here. Those numbers need to get better.’ And expressing that frustration to my senior leader, and it felt at that point, and I do still sort of feel that when you’re in a small organization and it’s one person driving that ship, it becomes muted. And at a certain point, I tend not to be that person nipping at people’s heels, because I have two other programs that I need to make equally as successful. And I’m very cautious to put myself in that position where I’m always pushing that agenda on people because I will lose face. If the whole culture isn’t there, I will lose face on my other two programs, and I can’t afford to do that. So those were things that I expressed and so I think the measure that we’re taking now are a direct result of that. To say, ‘this has got to be everybody being involved.” (infection preventionist interview, hospital in implementation phase)

“Basically I am the hand hygiene campaign.” (infection preventionist interview, hospital in implementation phase)

“Everybody’s job here is as important as the next person: from doctor, right on down to dietary. But, then you have that—you have tiers. You just don’t cross the line when it comes to a physician. And somebody in my position—I’m a transportation Tech—I get the feeling that I don’t have the right to go up to a doctor and say, ‘You know, I saw you come out of two rooms. You didn’t wash your hands.’ Or, ‘Could you wash your hands?’ That’s not going to be received very well. If we can’t even ask them to move out of our way when we come through with a bed, and they stand there and you say, ‘Excuse me,’ they don’t move, and you go a little bit louder, we get reported for going that little bit louder. But we have a bed coming through with a patient, going to the OR--possibly to meet them in the OR. They don’t move. So there’s definitely a cut-off point. You can approach some people; if I was to go to my supervisor and say, ‘Look Dr. So and So didn’t wash his hands,’ what’s my supervisor going to say. He’s going to say, ‘How important is that to you—do you want to press this farther? Because this is definitely going to go up the ladder.’ And in the scheme of things, that physician is going to say, ‘I had other things on my mind at that point; I was getting prepared for the OR; I was....’ Where does that hand washing come into the level of importance? It was important. It was important to me. But at that point, wasn’t that important to them. Could they have done it down the hall [rubbing hands together] on the way? So there are just certain boundaries that you don’t cross.” (focus group, hospital in implementation phase)

“I think that, again, it’s that human nature. People are afraid to hurt people’s feelings. People are afraid to embarrass people in front of others, and so it’s a very difficult, difficult thing.” (focus group, hospital in maintenance phase)

“They felt that they washed their hands and they didn’t want the family and patients asking them. The ER said I want to ask the patients to wash. Say nothing about whether I’ve washed or not.” (infection preventionist interview, hospital in implementation phase)

“So we’re back to resources again we’re in this day and age of streamlining and downsizing and leaning you know, we don’t have resources to do that kind of stuff.” (leader, hospital in implementation phase)

“...nurses will come to me and say, ‘A surgeon is taking a dressing off without any gloves on.’ So I’d say, did you remind him or speak to him? And they say, ‘I’m not going to do that... are you crazy?’” (focus group, hospital in implementation phase)

“Our financial reports are: we pay people X amount of salaries and provided benefits, and we have revenues, and all the things that we did. We don’t measure the number of infections that we didn’t have. We don’t even measure the number of infections that we did have, because infections aren’t an event that’s billable or denominated in dollars, like everything else we do. So it makes it far more difficult to draw the strong correlation between improving hand hygiene and some demonstrable financial impact that you can actually measure.” (leader interview, hospital in implementation phase)

“It’s hard to implement new things or push or accelerate things when the organization is just sort of consumed with day-to-day and trying to keep things going and trying to keep their lives going outside.” (focus group, hospital in implementation phase)

- Failure to establish clear criteria for hand hygiene opportunity and what is being measured
 - *Use steering committee to create a written document establishing definitions of hand hygiene opportunities, designating which hand hygiene opportunities will be counted and how, and how compliance is calculated*
- Lack of consistency in auditing (leading to lack of confidence in the data)
 - *Develop a standard training program for auditors (e.g. Wentworth-Douglass Hospital has a good one) that is consistent with written definitions, that includes standard criteria for how to conduct audits, for how long, and what to document. Require that auditors who collect data for measurement purposes be trained.*
- Lack of active engagement of senior leaders
 - *See ideas in previous section*
- Lack of physician involvement (especially if this is accepted)
 - *Identify a physician leader to take explicit responsibility for being part of the hand hygiene team, and raising and helping to address physician issues*
 - *Establish and communicate explicit expectations about physician participation in hand hygiene improvement*
 - *Include a personal commitment to be accountable for hand hygiene as part of credentialing process for physicians*
 - *Involve physicians in selecting products and product locations; provide choices including personal hand sanitizer*
 - *Ensure that disruptive behavior by physicians is not tacitly tolerated*
 - *Consider use of competition between physicians and other staff, or among physician groups, to engage participation and drive improvement*
 - *Consider collecting individual level data on physician hand hygiene compliance*
 - *Use evidence in communication with physicians (including link between hand hygiene and healthcare-associated infections)*
- Hostility between administration and physicians or administration and staff
 - *Recognize that this is a problem and develop a plan to address it*
 - *Create safe spaces for face to face or even anonymous interactions across these barriers, developing different scripts, focusing some of the education activities on overt*

activities that may help to address underlying power relations (such as age, gender, or educational background/training at work in such hostile moments).

- Resistance of concept of performance measurement
 - *Use physician and nursing leaders to coach*
 - *Refocus on the patient experience*
- Continued reliance on a single campaign leader
 - *Transition to a multidisciplinary team or steering committee for oversight*
 - *Develop (recruit or assign) a group of local champions to serve as on the ground campaign leaders on their own units*
 - *Ensure that all staff sign a statement of personal accountability for hand hygiene*
 - *Engage senior leadership team in promoting hand hygiene to all staff*
- Ongoing resource issues, including requiring local units to 'pay for' hand hygiene products
 - *Senior leadership support for providing all products necessary to achieve goals, period.*
 - *Remove barriers that create disincentives for units to maximize hand hygiene*
- Fire code restrictions
 - *Partner with New Hampshire Hospital Association and other hospitals to endorse revision of state fire code to adopt new (2012) more lenient national standard*
 - *Establish dialogue with senior safety officer and other institutional stakeholders to weigh risks and benefits of fire and healthcare-associated infections related to availability of alcohol-containing hand sanitizer*
 - *Work with units and hospital fire safety personnel to maximize allowable hand sanitizer*
 - *Incorporate use of small, personal hand sanitizers that are not counted within fire code limits, and can add convenience*
- Preoccupation with validity of data and negative reactions to it: suspicion, disbelief, blaming
 - *Review definitions and auditing process to ensure that standard approach is being adhered to by auditors*
 - *Goal of 100% can help diffuse resistance by conceptualizing failure to practice hand hygiene a 'never event'*
 - *Begin shift to overt observation with immediate feedback and coaching*
- Hierarchical culture
 - *Establish a fair and consistent accountability structure that is equitable across disciplines and does not tolerate disruptive behavior*
 - *Make shift to overt observation and immediate feedback a 'mini-campaign' with clear, advance communication, marketing, and education*
 - *Start with trained champions who have rehearsed scripts for different scenarios*
 - *Use trained champions to train other staff*
 - *Address pushback through accountability structure*
- Resistance to patient involvement in hand hygiene campaign
 - *Understand source of resistance to 'It's OK to ask' (in some cases it is based on belief that it is not safe and therefore a desire to protect patients; in others there is a hierarchical view of what patients should and should not be empowered to do)*

- *Delay telling patients it's OK to ask until peer feedback program is established and accepted*
- *Consider using a proactive approach such as 'Be Seen Being Clean' (Cottage Hospital) that moves hand hygiene to the point of care, so that patients don't need to ask*
- *Provide scripts for talking about hand hygiene or responding to patient questions about hand hygiene*
- Continued reliance on covert audits only (can interfere with team building)
 - *Phase in overt auditing with immediate feedback or reminders to complement covert audits for measurement*
 - *Involve local staff in overt audits*
- Resistance to concept of peer feedback, just-in-time reminders
 - *Develop agreed upon scripts, hand signals, etc for communicating reminders*
 - *As above, begin with trained champions, who have rehearsed scripts, hand signals, etc*
 - *Involve physician leader in planning and implementation*
 - *Assure accountability structure is in place*
 - *Use a marketing campaign to introduce concept*
- Tolerance of disruptive behavior
 - *Must be addressed by organization*
 - *Assure that there is not a double standard for staff and physicians*
 - *Use hospital credentialing process if physicians are not employed*
 - *Be transparent (but anonymous) when disruptive staff are held accountable*

Threats to Programs in the Maintenance Phase

"I think there's always a possibility of attrition, especially for behavioral drift as it's called. I think that's a kind of thing our data will show us and we can go back and push things back as people kind of sort of drift forget." (focus group, hospital in maintenance phase)

"I don't think it's, it's self-sustaining by itself, I think that there's somebody - a group, or individuals or, or you know, all of us have to drive it, all of these have to drive it, I don't think it's just - I don't think it's self-sustaining, where we fixed it and we can move on to something else, that kind of thing." (leader, focus group, hospital in maintenance phase)

"I think as long as we can keep it right there and it's an automatic thing, I guess we'll be okay. But if you're asking what my concern would be, it's if there are competing priorities for what they have to do, and it gives any room for them to say, 'well it'll be alright this time,' then we might start slipping." (leader interview, hospital in maintenance phase)

"If you want something to happen, you have to remove as many barriers as possible to people getting it done." (leader interview, hospital in maintenance phase)

- Complacency
 - *Maintain steering committee to oversee maintenance of program*
 - *Continue to develop new initiatives, at a sustainable pace*
 - *Review fundamentals ('five fingers') periodically to ensure ongoing system accountability*
 - *Continue to track hand hygiene compliance and HAI rates*
 - *Maintain high visibility of IP*
- Competing quality improvement initiatives
 - *Embed quality work into daily work (doing and improving as a philosophy of healthcare)*
 - *Senior leader presence in clinical areas promoting hand hygiene performance along with other QI initiatives*
- Redirection of resources
 - *Maintain designated senior leader involvement*
 - *Include financial expert on steering committee*
- Lack of formalized program to train, sustain, and provide ongoing support for local champions
 - *Maintain a standard training curriculum for both covert auditors and local champions*
 - *Hold regular meetings for local champions to come together for educational programs, to share observations, concerns and ideas, and to provide support and a sense of team*

Insights into Variation in Hand Hygiene Performance across Different Disciplines

“We were looking for a Doc to be on the team, so that he could talk to Docs. Since you guys don’t tend to listen to a lot of people; a lot of Docs don’t listen to other people, only Docs.”
(infection preventionist interview, hospital in initiation phase)

“So, we do not do as good a job with our physicians to enculturate them into what we expect. And we just don’t have an orientation process for our physician colleagues that is as defined as what we have for some of our nurses and allied-health professionals. So in nursing and allied-health, week 1 you do this, week 3 you do this, and we have very clear ways that we bring them into our expectations for their role. We have different resources, we have different expectations. And we haven’t done that as well for our physician colleagues. And I do think that there’s still an aura of independence in our physician education, still. And culture of... we train them that you are an independent thinker, and you have to make your own decisions. We have historically taught them, it’s okay if you do something totally different than anyone else, as long as you have your rationale for why you’re doing that.”
(leader interview, hospital in implementation phase)

“I think it’s important because when you’re trying to communicate, engage, request support from the high offenders, and frankly it’s the physicians, it is a challenge to communicate to them as scientists what the data is, how it was gathered and then therefore say based on this we need your behavior to change. It is a challenge, does that mean it can’t be done? No I’m not saying that. But it does create a speed bump to that conversation.” (leader interview, hospital in implementation phase)

“My understanding is that physicians are probably the worst record of compliance in hand hygiene. It’s hard to say why. I think, in my experience, there are some visits here, in my department that are very much hands-off--a lot of consultation, a lot of review of tests and stuff. Perhaps the providers don’t feel the need to do hand hygiene, because well, I’m not laying hands on the patient. I suppose it’s also possible to believe that the physicians are just too good for common folk, but I digress. [chuckling] ... I think that may be part of the issue. Some care is very hands-on, some care is not. For us nurses, I think it’s almost always hands-on.” (focus group, hospital in implementation phase)

“Well I think that the nurses and the LNAs up on the floor are pretty diligent when they’re coming in and out of a patient’s room, but I don’t see that so much and I don’t know if physicians, I don’t know how to prompt them a little better, its easier for me to work with the nurses and the LNAs. So some suggestions on that would be helpful. As you know they are a difficult group, they are a very difficult group...” (leader interview, facility in implementation phase)

Even after visits to 26 hospitals and 3 ASCs, physician hand hygiene issues and challenges remain extremely varied. Given the problems with measurement methodology outlined above, it is challenging to know what to do with evidence of the variations in performance that the data have suggested, and which participants in focus groups and interviews have noticed.

Not every hospital reported significant gaps in hand hygiene between physicians and other staff. Those that did always reported the same trend: namely, that physicians were outperformed by other staff. In focus group discussions, difficulty engaging physicians in improvement efforts was a commonly mentioned issue and one which was particularly prominent at facilities whose hand hygiene campaigns were not progressing.

Clearly, there was less participation by physicians in the site visits for this project; fewer frontline physicians participated in focus groups and fewer physician leaders engaged in individual interviews. Only one hospital was able to convene a focus group comprised only of physicians (and that may have been related to the fact that the project leader works at that hospital!). Why is there less physician participation? Did they exclude themselves or is it possible that they felt excluded from focus groups and interviews? Are physicians uninterested in hand hygiene? Do they see it as 'not a physician issue?' Or might the conveners of the groups for interviews and focus groups not see it as a 'physician issue?'

Many aspects of hand hygiene campaigns at New Hampshire Hospitals were planned by, and focused on, non-physician staff. It is not clear whether this focus influenced physician response to the campaign, but it is possible. Within hospitals, hand hygiene programs tend to be assigned to a senior nursing leader. Education is geared toward non-professional staff going through orientation, and even yearly modules are often 'one-size fits all,' making them relatively basic. Hand hygiene metrics never provided department specific feedback for physicians, but only unit-specific information, which was geared more to non-nomadic staff. Feedback, when shared with staff at all, tended at most hospitals to be limited to hand hygiene performance, and not link to prevention of infections. Physicians clearly look for a link between hand hygiene and infection rates. In some facilities, where units made individualized decisions about location of hand sanitizer, even the placement of products was less tailored to physicians (and other staff who work on multiple units).

Historically, nursing students learn about hand hygiene in part through the story of Florence Nightingale, a beloved figure in nursing history. In contrast, the physician hand hygiene 'hero,' is Ignaz Semmelweis, an intense and rigid personality, prone to ranting about the need for hand hygiene, a man who, although he was right, was unable to publish his data, and who died in an asylum for the insane. For a role model, physicians drew the shorter straw.

That said, more positive role modeling may be important for physicians. At Dartmouth-Hitchcock Medical Center, it seems clear that medical students emulate their senior physician colleagues when it comes to hand hygiene behavior. At some hospitals we visited where a strong

physician leader was present to speak about hand hygiene, staff did not see problems with physician hand hygiene. At others, this did not hold true.

Hierarchical cultures and perhaps gender relations appear to reinforce the hand hygiene gap between physicians and other staff. At a number of hospitals we visited, non-physician staff made it clear that there was no accountability for physicians around hand hygiene, and that staff did not feel comfortable reminding them of the need to clean their hands.

Some staff suggested that generational issues played a role, and that younger physicians performed better than older ones. An explanation offered was that young physicians know about quality improvement, and expect to follow rules and protocols. They learned about hand hygiene during their training.

Some focus groups were asked about gender issues and whether women might be more likely to clean their hands than men. Interestingly, most participants did not think this was an issue, despite the overwhelming preponderance of women in focus groups.

Only one all physician focus group was held. It occurred late in the project period, and included physicians who are employed by the medical center, and who also hold faculty positions at the medical school. These 6 people may not constitute a representative sample of all physicians, but because they may provide some window into understanding variation across disciplines, we offer a few perspectives that emerged during that focus group, some of which have implications for potential interventions.

- Physicians do not seek out electronic data reports but do respond to local unit data that is posted prominently in the units where they work, especially if it creates a sense of competition, or personal responsibility
- In general, physicians eschew electronic communications, and prefer to receive short messages displayed on eye-catching posters, preferably (to this group) using edgy or scary themes.
- Physicians find the link between hand hygiene and healthcare associated infections an important one, and respond to materials that demonstrate this link, especially if they use local data. There appears to be a need to see repeated illustrations that this link is real, and to question the degree to which further improvements in hand hygiene are associated with further reduction in infection rates.
- Physicians prefer uniform locations for hand sanitizer so that they do not have to search for it in different units.
- Physicians have a strong sense of boundaries between departments such that a physician leader in one unit does not feel he has any authority over physicians who work in his unit but are members of other departments.
- For physicians feedback of their own individual performance is much more powerful than data that shows performance of all physicians, or physicians working in a certain area. For this reason, a program of overt observation and immediate feedback, if implemented in the context of adequate training, the use of scripts, and in a system

where there is accountability for disruptive behavior, may be ideal for improving physician performance.

- Physicians have a somewhat complex view of the patient's role in reminding healthcare personnel to clean their hands. Although they acknowledge that it should be okay for a patient to ask them to do so, some physicians articulate a sense of annoyance, or even outrage at the idea of one actually doing so. 'Who do they think they are?' If this view is pervasive, it may be preferable to implement programs such as Be Seen Being Clean, which move hand hygiene activities in front of the patient, rather than campaigns that attempt to empower patients to actively remind their physicians.

Conclusions and Recommendations

1. The statewide campaign to improve hand hygiene in New Hampshire hospitals has been successful, as measured by the degree to which every hospital is actively engaged in improvement activities, and by the temporally associated low publicly reported statewide rates of healthcare-associated infections.
 - a. Similar campaigns that unite hospitals to work toward common goals should be considered potentially worthwhile investments
 - b. A great deal of learning occurred through carrying out comprehensive visits to assess the degree to which hospitals had implemented the campaign
2. Much of the variation seen in hand hygiene performance in New Hampshire hospitals appears to be related to the phase of the campaign the hospital is in, and the rapidity with which it moves through the continuum
 - a. Facilitators and barriers were identified that are associated with these factors
 - b. Drivers of cross-disciplinary variation remain incompletely understood
3. Ideas for overcoming barriers to progression through the campaign emerged from the project and will likely be useful to hospitals currently in earlier phases
 - a. The general report includes common barriers with proposed solutions
 - b. Each hospital will receive a brief individual report with specific ideas for next steps
4. Creation of shared resources may be helpful to hospitals at all phases of the campaign
 - a. Marketing materials
 - b. Training materials for auditors, including training for peer observation and feedback
 - c. Scripts and a set of standard activities to assist hospital leaders in becoming involved in the hand hygiene campaign
 - d. Several representative initiatives started at individual hospitals could be implemented more widely
 - i. CHAMPS (Lakes General Regional Hospital and Franklin Memorial Hospital)-program of local hand hygiene champions responsible for education, peer feedback
 - ii. Be Seen Being Clean (Cottage Hospital)-program designed to have hand hygiene routinely performed in front of the patient
 - iii. The Nest concept (Dartmouth-Hitchcock Medical Center)-program focused on the times when hand hygiene is needed during patient care, includes introducing hand sanitizer closer to the point of care
5. Further exploration of physician knowledge, attitudes, and beliefs about hand hygiene and other safety initiatives, and of other incompletely developed themes related to gender, generation, and hierarchical structure, may be of benefit