

A NEW APPROACH TO CONTROLLING SUPERBUGS



Getting Started Kit

Effective March 14, 2019 the Canadian Patient Safety Institute has archived the Infection Prevention and Control intervention.
For additional inquiries, please contact info@cpsi-icsp.ca

Safer Healthcare Now!

We invite you to join *Safer Healthcare Now!* to help improve the safety of the Canadian healthcare system. *Safer Healthcare Now!* is a national program supporting Canadian healthcare organizations to improve safety through the use of quality improvement methods and the integration of evidence in practice.

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This Getting Started Kit (GSK) has been written to help engage your interprofessional/interdisciplinary teams in a dynamic approach for improving quality and safety while providing a basis for getting started. The Getting Started Kit represents the most current evidence, knowledge and practice, as of the date of publication and includes what has been learned since the first kits were released in 2005. We remain open to working consultatively on updating the content, as more evidence emerges, as together we make healthcare safer in Canada.

Note:

The Quebec Campaign: *Together, let's improve healthcare safety!* works collaboratively with *Safer Healthcare Now!*. The Getting Started Kits for all interventions used in both *Safer Healthcare Now!* and the Quebec Campaign are the same and available in both French and English.

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A New Approach to Controlling Superbugs

GSK Contributors

Cathy Egan

Regional Infection Control Network Manager
Ontario Agency for Health Protection and Promotion

Dr. Michael Gardam

Director of Infectious Disease Prevention and Control
Ontario Agency for Health Protection and Promotion

Leah Gitterman

Technical Specialist / Project Coordinator, MRSA Intervention
University Health Network, Toronto

Paige Reason

Project Coordinator
Ontario Agency for Health Protection and Promotion

Liz Rykert

Strategic Advisor
Ontario Agency for Health Protection and Promotion

Marlies van Dijk

Western Node Leader
Safer Healthcare Now!

Liz Van Horne

Senior Infection Prevention and Control Professional
Ontario Agency for Health Protection and Promotion

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Introduction

Does this sound familiar?

You've been working as an infection control professional for the past five years, but this past week has probably been the worst you've experienced. Monday, you had your monthly infection control committee meeting, but half the people didn't show up - including the chair, the chief nursing officer who you had begged for the past 6 months to join the committee. Tuesday, you got into a shouting match with one of the housekeeping staff after trying to explain why she must stop using the same toilet-cleaning brush in both isolation and non-isolation rooms. Wednesday, you had to speak to staff on the medical floor about hand hygiene, screening and cleaning: they looked pretty bored and the nurse manager hinted that her staff knew this stuff already. Thursday afternoon, most of the medical staff didn't show up to your seminar on controlling health care associated infections, and one who did sarcastically suggested that perhaps your hand hygiene talk was better suited for a kindergarten class. Finally, on Friday, you presented some ventilator-associated pneumonia data to the ICU— data you'd been slaving over, which showed a very worrisome trend: the rate of pneumonia had doubled over the past six months. Nobody seemed to care. In fact, the head of the ICU asked you why you bothered, since pneumonias are inevitable when patients are put on ventilators.

You stagger home Friday night, throw your stuff in the corner of the hallway and think about quitting.

We've all been there.

In our experience, infection control can be a frustrating job. And this frustration isn't unique to infection control staff: most people who care about health care-associated infections usually realize fairly quickly that not everybody shares their passion or their concerns. Over the past few years, we've heard many stories from front line staff in hospitals and long-term care homes across Canada -- housekeepers, pharmacists, nurses, and others -- about how their efforts to raise awareness about infections have been shot down. Infections seem to happen every day -- usually in patients but sometimes in staff - and seem to be treated as just one of the costs of doing business.

How this new kit can help.

The first Getting Started Kit (GSK) for controlling antibiotic resistant organisms was full of proven techniques to improve infection rates, but it didn't really deal with the elephant in the room - which is that health care workers seem to have a hard time following infection control precautions consistently. But, if you have been using strategies from the first GSK and they are working for you, keep going! This new approach is meant to add on to the more traditional quality improvement techniques we talked about in the original GSK than it is to replace them entirely.

This new approach has been completely rewritten to help deal with the elephant. Rather than give you detailed infection control recommendations you can find in other places, this approach will give you strategies to help your health care workers to act differently towards infection control precautions and hopefully, eventually think differently.

“The recent declines are less about implementing new technical solutionsand more about improved interactions between people Infections are being prevented at Billings Clinic by changing relationships.”

Dr. Wolters
Billings Clinic

What, you say? Tackling this elephant won't be easy? We admit, it won't be easy but it's what we have to do.

How will this kit help? First, it's written to help ANYONE who wants to help her/his institution reduce health care-associated infections. You don't have to work in infection control to help change your institution's direction or improve practice. Second, we focus on ways to get people interested in infection prevention, keep them interested, and help them make sustainable changes in their actions: changes that eventually become their routine “don't-even-have-to-think-about-it” practice. Third, we're going to talk about all “superbugs”, not just Methicillin Resistant *Staphylococcus aureus* (MRSA). One of the main criticisms of the first GSK is that MRSA isn't as big a problem in some institutions as Vancomycin Resistant Enterococci (VRE) or *Clostridium difficile*. We aren't crazy about the term “superbugs” to describe antibiotic-resistant organisms but - thanks to media coverage -- that's the term most people outside infection control use, so that's the language we're going to use. (We're sure you'll get over it, just as we have.) Besides, most of the measures we use to control these organisms are identical so it makes sense to lump them all together - and to throw many drug-resistant gram-negative organisms into the pile as well. Finally, the advice in this approach can be used beyond superbugs (might as well jump right in...) to include many other common organisms that cause deadly infections, like methicillin sensitive *S. aureus*, Coagulase negative *Staphylococci*, *E. coli* and others. We undoubtedly transfer these organisms from patient to patient in the course of their care and many of the same control measures that reduce superbugs will reduce other infections. To be blunt, good hand hygiene will reduce them all!

So, if your facility can do a good job at controlling the superbugs, you may well see decreases in infections caused by other organisms as well.

How this kit is organized

The kit is divided into four steps:

Step 1: Understanding the Challenge. We provide an overview of why antibiotic resistant organisms and the infections they cause are a big deal in our health care facilities. We also talk about why tackling infections in health care is so difficult.

Step 2: Learning from the Real Experts. We describe a technique you can use to help health care providers change behaviour, called Positive Deviance.

Step 3: Spreading the Word. We focus on social marketing: helping you get your message to the people you want to influence.

Step 4: Measuring Progress. We introduce you to our “measurement buffet”: different, easy-to-use measures to give you a clear picture of what's going on in your institution.

Are you psyched?

We hope you will find this new approach useful. We believe it will help people within your institution reassess their attitudes towards (and practices against) hospital-associated infections. One word of caution—this is going to take awhile. When we talk about transformative change, we are talking in terms of years, not days. So kick back, relax, maybe do some yoga. Take a deep breath; this is going to be a long journey. Just remember: places that have been successful in using the techniques in this document definitely feel it was worth it.

Step 1: Understanding the Challenge

Why are superbugs such a big deal?

Because we have not yet seen, nor can we imagine, a case where a superbug is “a good thing”. Most patients in Canada who acquire a superbug have at least some negative effects from the infection - and thousands die every year. The absolute best-case scenario for a patient who becomes colonized or infected with a superbug is: no impact on health.

MRSA

Simply becoming colonized with MRSA prolongs a patient's length of stay - partially because of the control measures required to keep other patients from being infected, which can hamper their care and discharge plans. And those measures are justified: roughly 20% of patients who are colonized will become infected with MRSA in any number of places, including the urinary tract, the blood, bones, joints, heart valves, the lungs, and surgical wounds. So allowing MRSA to spread to other patients results in more infections

MRSA is a resistant form of *Staphylococcus aureus* - a major human pathogen that is responsible for a lot of illness and death.

MRSA infections are more deadly than those caused by Methicillin-Sensitive *Staphylococcus aureus* (MSSA) - possibly because of delays in receiving the right antibiotics - and because, for certain types of infections, the antibiotics we are forced to use for MRSA simply do not work as well as those for MSSA.

It shouldn't come as any surprise that infections with MRSA cost money. Given our Canadian hospitals' fixed budgets, the costs are not always obvious on the balance sheets, but they affect day-to-day operations. We see their impact in longer waiting times, prolonged lengths of stay, busier emergency departments, over-taxed staff and general mayhem in the system. MRSA infections also cause us to spend more time and money per patient than we need to and because of the havoc they play with the system- ironically enough - they can lead to an increased spread of superbugs.

Finally, a word about community-associated MRSA. While MRSA has traditionally been thought of as an organism that one picks up in the health care setting, new strains have arisen in the community over the past decade. In fact, upwards of 18% of all patients going to emergency departments in some parts of the country with nasty skin infections have community-associated MRSA. These strains are genetically different from the usual health care-associated strains and are often more susceptible to antibiotics. They are currently a very big deal in Western Canada and are becoming increasingly common in the East. So what happens when a person with community MRSA gets admitted to hospital and we don't do a great job with our hand washing and environmental cleaning? That's right: they spread around the hospital just like the health care-associated kind. On the other hand, what can happen when a patient with health care-associated MRSA is discharged? Right again: the organism can spread in the community. What we have seen over the past several years is a partial blending of these two types of MRSA: community strains in hospitals and hospital strains in the community. We could examine this trend in more detail and become thoroughly confused, but let's not. For our purposes, the two types spread in healthcare settings in the same way, so we will treat them the same way in this approach.

VRE

The good news about VRE is that, like all Enterococci, these organisms are not nearly as virulent (nasty) as many of the other superbugs we deal with - like MRSA. They are often quite content just to colonize someone rather than actually cause an infection. However, when they do decide to cause an infection, they are very hard to treat. Enterococci are naturally resistant to most of the antibiotics we use, and VRE is especially so. VRE tends to focus on places like the urinary tract, heart valves, and the blood, and also on any prosthetic devices they can get their little bacterial hands on, such as artificial joints, prosthetic heart valves and intravenous catheters. VRE infections require prolonged (often months-long) treatment with antibiotics, and the treatments frequently fail. If prosthetic material is involved, the infections are almost impossible to treat without removing the material - an approach that can be disastrous for the patient.

C. difficile

This organism causes problems when it sets up shop in the colon; it can produce a toxin that damages the lining of the intestines, resulting in symptoms that range from mild diarrhea all the way to death. Fortunately, not all strains produce toxin, and not all strains that can make toxin actually do so. In general, people become sick with *C. difficile* when they become colonized with a toxin-producing strain that actually starts to produce toxin - usually because the patient has received antibiotics that kill off other naturally occurring bacteria in the intestines and allow the *C. difficile* to thrive.

Those of you who have been working in health care for a while probably remember a time when *C. difficile* was seen as a minor annoyance that very rarely caused serious illness. Well, *the times, they are a-changin'* (those of you born after 1970, please ask your parents as to the origin of this reference). In the last decade, a new strain of *C. difficile* has emerged -- NAP-1 - and it is relentlessly spreading across North America and, more recently, Europe. In general, this strain causes far worse disease than previous strains and has likely been responsible for thousands of deaths in our health care institutions. A Canadian study has shown that between 4% and 15% of patients with *C. difficile* in hospital are dying as a result of NAP-1. So why is this strain so good at what it does? Basically, the “switch” for the gene that produces the toxins is permanently stuck in the “on” position, so the bacteria produce up to 24 times more toxin than other strains. More toxin means more sick people with diarrhea, leading to more environmental contamination, leading to more *C. difficile* to infect other patients.

Want more information on how awful these organisms are? Please see these references:

1. Kelly CP, LaMont JT. *Clostridium difficile* - More Difficult Than Ever. *N Engl J Med* 2008;359:1932-40.
2. Miller MA, Hyland M, Ofner-Agostini M, Gourdeau M, Ishak M. Morbidity, Mortality, and Healthcare Burden of Nosocomial *Clostridium difficile*-Associated Diarrhea in Canadian Hospitals. *Infect Control Hosp Epidemiol* 2002;23:137-140.
3. Grabsch EA, Burrell LJ, Padiglione A, O’Keeffe JM, Ballard S, Grayson ML. Risk of Environmental and Healthcare Worker Contamination with Vancomycin-Resistant Enterococci During Outpatient Procedures and Hemodialysis. *Infect Control Hosp Epidemiol* 2006;27:287-293.
4. Bonten MJ, Willems R, Weinstein RA. Vancomycin-resistant enterococci: why are we here, and where do they come from? *Lancet Infect Dis.* 2001;1(5):314-325.
5. Hardy KJ, Oppenheim BA, Gossain S et al. A study of the Relationship Between Environmental Contamination with Methicillin-Resistant *Staphylococcus aureus* (MRSA) and Patients’ Acquisition of MRSA. *Infect Control Hosp Epidemiol* 2006;27(2):127-132.
6. Kim T, Oh PI, Simor AD. The economic impact of methicillin-resistance *Staphylococcus aureus* in Canadian hospitals. *Infect Control Hosp Epidemiol* 2001;22(2):99-104.

So how do we control these superbugs?

Start with a simple question: How might bacteria realistically get from one patient to another? Now, consider the obvious answers: contaminated hands on equipment, contaminated environment and equipment in general (bed, toilet, or commode), or possibly short distances through the air itself. While bacteria likely can spread over short distances through contaminated sloughed off skin cells (one of the best, most graphic descriptions of this involved a heavily colonized health care worker who was shedding so much MRSA, researchers were able pick it up on agar plates that had been arranged around him in concentric circles, earning the poor fellow the unflattering nickname of “staph cloud”), this route of spread is believed to be minor when compared to the bacteria spread by contact with hands, the environment and equipment.

The obvious, simple solution: We can stop transmission by having health care workers clean their hands, properly clean the environment (including washrooms), clean equipment between patients, and find and treat the occasionally colonized healthcare worker. Done. Problem solved. We can all go home now.

Unfortunately, we all know that getting these simple things to happen all the time is actually remarkably difficult. Typically less than 50% of health care workers comply with hand hygiene. That blood pressure cuff that goes room to room may not have been properly cleaned in months, and the design of our health care facilities filled with 4-bedded rooms makes it quite hard to ensure that patients will not acquire an organism in a washroom they are forced to share with someone else.

Cleaning everything is neither a simple nor a small task. You can imagine the amount of contamination that can occur if a patient has a large MRSA-infected draining wound, or uncontrolled diarrhea from *C. difficile*. Not only can the next patient going into that room or bed (or the current patient in the bed nearby) become colonized or infected, but the superbugs can be transferred onto the hands of health care workers and passed along to other patients in other locations. Even if everyone is vigilant about cleaning hands and equipment that has obviously been exposed, the job is not complete. Those superbugs are devious, and are able to hide anywhere in the environment. How often are those privacy curtains between patient beds changed in your facility? Are you using the same toilet brush to clean multiple toilets? (If so, the organisms will thank you for the free transportation.)

While all superbugs can live in the environment quite happily for weeks, *C. difficile* can potentially hang around for years. This is because these bacteria have the ability to make spores. Spores are highly resistant to hospital disinfectants. In fact, most disinfectants don't kill them at all, and we end up just pushing the spores around the hospital when cleaning rooms. Spores do not go away easily: they either have to be physically removed by wiping (and then the cloth needs to be immediately discarded), or else killed with harsh chemicals like diluted household bleach or highly-concentrated accelerated hydrogen peroxide.

No, the simple solution is not so simple, after all. We need to find some other strategies, too.

Another solution to the problem is to isolate colonized or infected patients, using contact precautions. How difficult can that be? All we need is a single room (when one is available), and a strict requirement that everybody entering the room wears a gown, gloves, and maybe a mask (sometimes used for MRSA control because the bacteria likes to live in the nostrils). Maybe this isn't so simple after all: while this strategy has clearly been shown to work in multiple studies, it doesn't work so well if health care workers don't actually follow it. And they often don't follow it.

By the way, let's not forget the patient in this discussion. Research has shown that isolated patients often feel depressed, are visited less often by their health care providers and are more likely to suffer from medical errors. In fact, some researchers have used these sad truths to suggest that we shouldn't isolate patients with these organisms. As we mentioned before though, isolation is an unfortunate necessity as without it, even more patients will become colonized and possibly infected. If we control the spread of these organisms and decrease this problem, we won't have to use this solution very often.

Are there other solutions? Well, another research-proven strategy to control these organisms is screening: admission screening for colonization or infection, along with screening at other times as part of a larger surveillance program. Patients can be screened for MRSA and VRE colonization when they enter a health care facility; however, there currently is no accepted, useful, and practical means of screening people for asymptomatic *C. difficile*.

Some facilities screen patients with risk factors for MRSA and VRE (e.g., previous admission to a health care facility), some screen all admissions, and still others have different screening criteria for different parts of the facility depending on the patient populations. Some facilities also choose to screen patients on discharge, or on transfer to another floor or facility; they may screen patients who have had a prolonged stay in the hospital, or they may even screen whole units on a given day. Which of these strategies is correct? All ... or none ... depending on your local situation. Your facility needs to decide what makes sense given the local epidemiology, both inside and outside the facility. For example, if you live in a part of the country where community MRSA is very common, you may decide that screening upon

admission for hospital-associated MRSA (i.e., previous stay in a hospital) may not pick up a large percentage of your MRSA positive patients because they are picking up the superbug in the community. If you have a particular problem on a couple of floors, you may decide to screen all admissions and discharges from those floors. Whatever you decide to do, though, it should make sense with what you are experiencing. Sometimes doing a pilot study over a couple of months can help guide your strategy: if your plan isn't working, change the plan.

Different laboratory techniques can be used for screening as well. While most laboratories still use traditional agar-based culture methods to look for MRSA and VRE, some facilities have moved to molecular testing methods. These methods have the advantage of being quicker than agar methods, but they also cost more in terms of lab supplies. Again, you need to work with your laboratory to figure out which method is best for your setting.

If you would like to read more about how to control the spread of superbugs, please see the following references:

- Health Canada. Infection Control Guidelines - Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Health Care. *CCDR* 1999; 25S4.
- Health Canada. Infection Control Guidelines - Preventing the Spread of Vancomycin-Resistant Enterococci (VRE) in Canada. *CCDR* 1997; 23S8.
- Provincial Infectious Diseases Advisory Committee. Routine Practices and Additional Precautions in All Health Care Settings. MOHLTC 2009.
- Provincial Infectious Diseases Advisory Committee. Best Practices for Infection Prevention and Control of Resistant *Staphylococcus aureus* and Enterococci in All Health Care Settings. MOHLTC 2007.
- Provincial Infectious Diseases Advisory Committee. Best Practices Document for the Management of *Clostridium difficile* in all health care settings. MOHLTC 2009.

So why is it so hard to control the spread of superbugs?

Yes, health care workers should wash their hands between patients, and rooms should be thoroughly cleaned before the next patient is admitted into a room vacated by somebody with *C. difficile* - absolutely.

But we are learning that these simple strategies aren't as simple as they seem to the average layperson. Improving our record with these control measures is actually quite complex...far too complex for us to get into the subject in any great detail in this document. However, here's a brief summary of just some of the obstacles you will likely encounter:

"Sure, sure, I know: clean my hands. I'll try." As we are learning, getting health care workers to wash their hands consistently is complicated. Some factors that affect hand hygiene compliance include: how busy each person is; the layout of the room, and the

location and availability of hand-washing product and sinks; the prevalent culture on the unit; peer pressure; the positive (or negative) influence of the nurse manager or senior physician; the role of the person in the patient's room (i.e., nurse, physician, environmental cleaning)... the list goes on and on.

“Why prevent an infection when you can just treat it with antibiotics?” Our misguided medical and scientific arrogance is a constant issue. We know that prevention is *always* better than treatment for a whole bunch of reasons - not the least of which is why get sick if you don't have to -- but we keep forgetting. Besides, we used to be just so darned good at treatment. (To a person with a hammer, every problem looks like a nail...). But let's face facts. We are starting to run out of antibiotics that work against some of these superbugs, and new ones aren't being developed that quickly. If we don't want to see more patients die of infections that we have a hard time treating, we have to do things differently.

“Medicine should be evidence based; where are the randomized controlled trials (RCTs) showing that all this cleaning is worth it?” How do you deal with this question, other than point out the absurdity of running such an RCT? Do we ask patients to sign consent forms randomizing them to health care workers who always wash their hands versus those who never do? Do we place some patients in dirty rooms and then just see what happens? Not likely. There is, in fact, ample evidence that infection control measures work and that they are cost effective. Some health care workers will always insist on having more evidence. While the need for more data can be valid sometimes, it is often used as a delaying tactic, to avoid having to change.

“This isn't my problem. Hundreds of hands have touched the patient over the week, not to mention countless pieces of equipment.” Yes, prevention practices are different from a medication error where you can usually trace back to where the error was committed. That does not make prevention unimportant, just different. Spreading superbugs is a lot like littering: we all contribute to it, and we are all responsible for a piece of it. It's everybody's problem.

“There's nothing we can do about this, anyways.” Actually, as we have discussed, we can do a lot about it. Saying “nothing can be done” is a great stalling tactic, but it is not a legitimate concern. Don't let it derail your plan.

“Just look at the design of this place: it's almost like we were built to spread infections.” This is a legitimate concern. From multi-bedded rooms, to lack of storage space, to insufficient numbers of sinks, to inadequate facilities to eliminate human waste; it seems our hospitals were made to spread infections. Yet, you would be amazed at some of the inventive ways that some hospitals have been able to at least partially minimize the negative effect of poor design.

And we could go on and on ... but we're depressing ourselves. The remarkable thing is that, despite all these obstacles, some organizations have been able to decrease the spread of superbugs - in some cases dramatically. You will hear about them in the next couple of chapters.

Step 2: Learning from the Real Experts - People who Work with Patients

Why turn to a behaviour change approach?

Because the other approaches that institutions use - like education, reminders, and other top-down systems - don't work. Or, at least, they don't work well without behaviour change.

We've all tried education. Institutions often invest a lot of resources in top-down programs to cut infections. Health care workers know what they are supposed to do: they just don't always do it. Thinking and knowing don't necessarily result in a change in actions. Knowledge alone doesn't change behaviour. Just issuing reminders or buying more hand sanitizer or installing more dispensers won't help much on their own.

Let's face it, asking health care providers to ask each other to practice proper hand hygiene and other prevention practices isn't necessarily normal - yet; it may not even feel comfortable for some. Health care providers have to get into the habit of talking to each other and feeling normal about making these conversations a part of their all-day, every-day practice. To get them into the habit, we have to help them change their actions, which will lead to a change in the way they think and behave.

What works to change behaviour?

Somewhere along the way, we've all heard different theories of behaviour change - like Stages of Change, Social Cognitive Theory, and the Theory of Reasoned Action. Perhaps we've even tried to use them - with mixed success - with our patients, coworkers, or with our children.

Now there's something a bit different to help. Some experts in infection control have adopted a relatively new evidence-based approach that works to create change in health care institutions, called Positive Deviance.

What is Positive Deviance?

Positive Deviance (PD) is a relatively cheap and cheerful way to mobilize organizations and communities to change. It is based on the observation that in every community you can always discover certain individuals or groups who are better at solving problems than their peers. When faced with the same or a worse challenge and given the same resources, they will find a way to do things better. It seems to be part of their nature to see problems and solve them. They are people who often deviate from the norm and who find it easy to change - or positive deviants. These people can come from anywhere and can hold any job or title.

Positive Deviance is an asset-based, problem-solving and community-driven approach that enables the community to discover successful behaviours and strategies, and develop a plan of action to promote their adoption.

With PD we focus on helping people to uncover existing practices that work, or create new practices, acquire new habits, and eventually act their way into a new way of thinking.

PD involves learning from the problem solvers already in your institutions. How do you find these people and their practices? First, you have to identify the problem you are trying to solve - in this case, superbugs - and what you want to change or your desired outcome - in this case, fewer patients colonized or infected with superbugs.

Then, you look around and see who in your institution is already achieving that desired outcome. Does one unit or specialty or team have a much lower rate of infections than another? Who are the people in the unit, specialty or team who are making a difference? And what are they doing differently? You can in fact look at any unit or team, even those that are “problem areas” with high rates; you will undoubtedly find individuals who have uncommon, positive infection control practices.

PD differs from traditional problem-solving approaches in that it shifts the focus from the problems to possible solutions. And it does not require us to find a new solution; instead, it merely requires us to identify the positive deviants: the people who have already found one or more solutions.

How do we know Positive Deviance works?

PD has been shown to be successful in dealing with some pretty seemingly intractable problems like childhood malnutrition in developing countries. It has also been used to solve what seemed like unsolvable problems in public health, education and child protection. For example, PD has been used to:

- Reduce childhood malnutrition by 65% to 80% in Vietnamese communities, reaching a population of 2.2 million
- 50% increase in the number of primary school students in 10 Argentinean schools who stayed in school
- Reduce neo-natal mortality and morbidity in Pakistan and Vietnam.

Sure - a technique like PD may work in public health or in developing countries with few resources. But what makes us think it will work in high-tech care environments like hospitals? Because we have proof. A number of US hospitals are now using PD to reduce their MRSA rates. Here’s what John A. Jernigan, MD, MS, who is an epidemiologist at the National Centers for Disease Control and Prevention (CDC), says about the research conducted in 6 pilot project hospitals that have used the PD approach for the past few years:

“Reports of successful multicenter interventions to reduce endemic antimicrobial resistance problems among U.S. hospitals are extremely rare. These extremely encouraging findings add to a growing body of evidence that hospitals can make a difference in their endemic MRSA rates, and further might be able to improve the chances that infected patients have the best possible treatment options available. It shows that hospitals can make an important difference in antimicrobial resistance even at a time when the availability of new antibiotics has stagnated.”

Put a little more simply: the other things that hospitals are doing aren’t having the same kind of impact. PD is working, and it proves that people and their institutions can change.

When to use positive deviance

You can use PD when you have a problem that meets the following criteria:

- It seems “intractable”: other solutions have not worked.
- The problem is not only technical but requires a change in behaviour, attitude or culture.
- Positive deviants exist: some people and their practices are finding ways to solve the problem.
- There are leaders committed to solving the problem.

Many of the sites that participated in the Positive Deviance MRSA Prevention Partnership in the US did so because they had all tried the typical approaches and were not making progress. They were frustrated and open to new ways of doing things.

How to use Positive Deviance in your institution

So, how do you find the positive deviants in your organization who can and are making a difference? How do you learn from them? And how do you spread their ideas - instead of more superbugs - across the organization? It's not as hard as it sounds, but it will take time and commitment.

Start with people who are interested. Start with the health care workers and managers who volunteer to participate. This is a very important point: don't try to drag people who don't want to be there just because they hold important positions. Focus on those who have already recognized that superbugs are a problem and want to do something about it. How do you find these people? Some institutions have held “kick off” meetings where all staff are invited to learn about superbugs. At the end of the meeting, those that are interested can sign up to participate.

Start with people on the front lines. It's crucial to have front-line people because - as the awareness iceberg below so aptly illustrates - they can identify 100% of the problems, compared to the 4% of problems known to top managers. In PD the front line staff are considered the gurus, the real experts. They are the ones who really know how things work, what the problems are, and how to fix the problems.

Recruit managers and leaders. It's important to recruit other managers and leaders too: they may not know all the problems but they can “roll the boulders out of the way” and support staff who want to try new approaches. Leaders:

- guide the process and remove barriers
- facilitate and allow the discovery to take place
- allocate scarce resources

Re-defining the Experts

Part of what Positive Deviance does is change how organizations think and work. Most institutions tend to be top-down. Ideas start at the top and then try to work their way down. PD flips the organizational triangle on its head. With PD, people on the front line are the gurus. They know the problems and have the solutions.

But PD is not about the senior team giving up all leadership. They still play key role in behaviour change by helping to move the process along. For example, they can let everyone know they support the process and are looking forward to the results. With PD, you need both people at the front lines and senior managers on the same team.

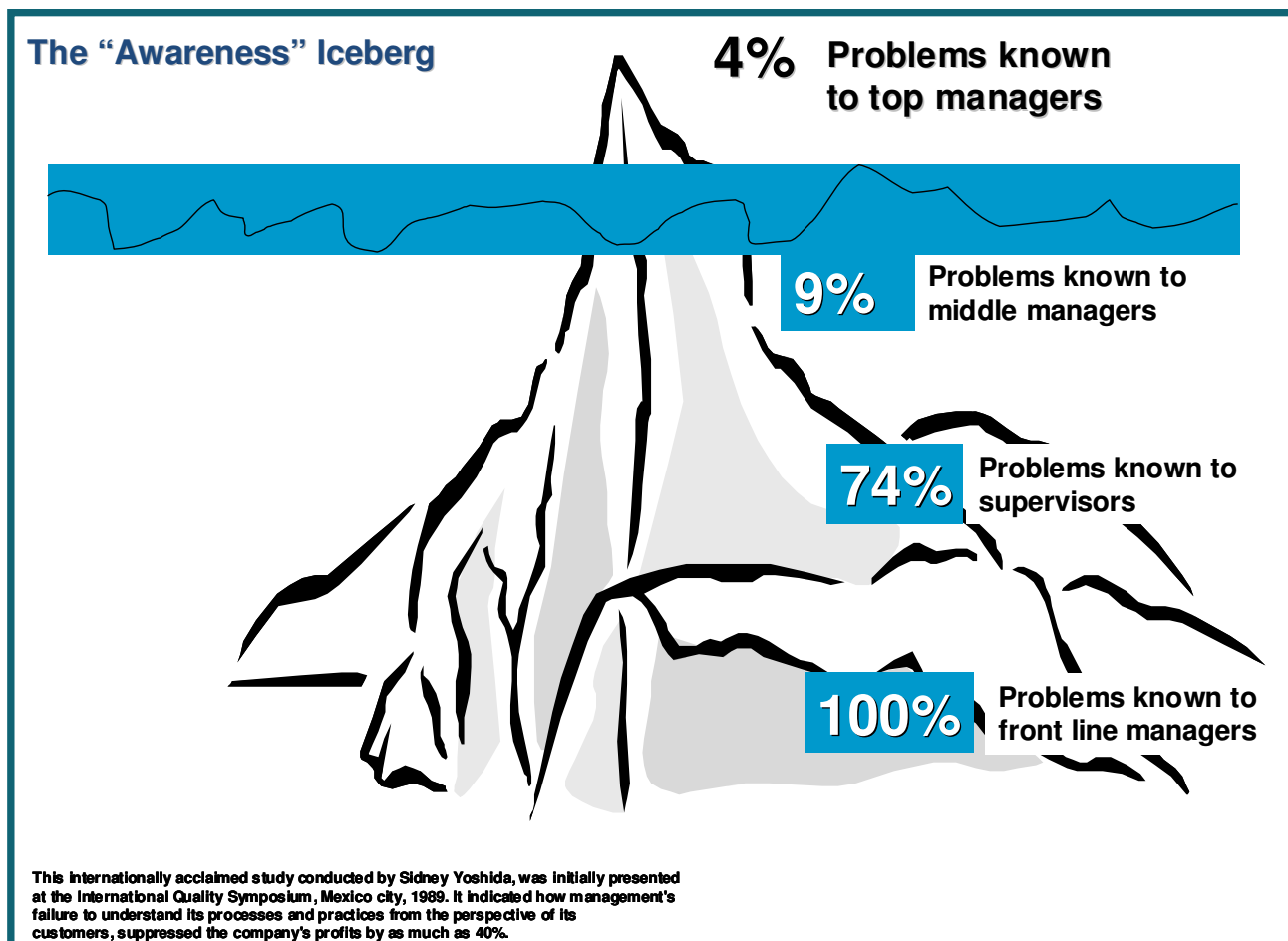


Figure 1: The “Awareness” Iceberg

Talk to staff. There's a wealth of good ideas in your institution. You just have to find them. You can use PD to uncover hundreds of “hidden” practices that can improve infection control and prevention and help stop superbugs. This is a very important point—there is no one solution that will solve your superbug problems. Rather, there are hundreds of solutions in different contexts; each solution will take a small bite out of the problem.

For example, MRSA coordinators in the US-based Veteran's Affairs hospital sites asked more than 400 staff questions about their infection rates and their practices. From the answers, they uncovered little, isolated pockets of successful practices. These ideas were solutions just waiting to happen.

“[Frontline staff] are the ones that have contact with patients and families, and are in and out of rooms, and are moving equipment around, so they know what's going on, and it's their actions and behaviours that directly affect infections and infection prevention.”

*Curt Lindberg
Chief Learning and Research Officer
Plexus Institute*

“How has the role of the infection control unit changed since the PD/MRSA initiative got underway?” we ask Ms. Iversen from Billings Clinic in Montana, US. Ms. Iversen’s eyes glow: “The network maps tell us that we are moving toward building resilience within Billings Clinic, so that we are not dependent on a few individuals in infection control for MRSA prevention.”

One of the real advantages of PD is that it isn’t just for clinical staff. It involves other health staff, environmental services, dietary staff, maintenance staff, transportation services, pastoral care workers and volunteers - everyone! Experience from the US PD pilot sites was that many of their best problem solvers did not have a degree in health sciences. Housekeepers and maintenance employees are often able to identify innovative practices that can help control superbugs. But no one ever asked them.

The PD groups that come together to uncover ideas are often made up of people from across the organization who have never had a chance to work together before. But what unites them is a desire to get rid of superbugs (remember, you didn’t force the negative deviants to come to the meetings: they will show up if and when they are ready to).

You can use PD to create a work environment that encourages people to look for solutions that work in that setting. Through PD everyone involved in providing care and services - and in spreading superbugs - can see how they contribute to high rates of infection and how they can help reverse that trend.

So how do you talk to staff? Hospitals that have participated in PD projects have developed a technique called “discovery and action dialogues” or DADs. These are brief 15-20 minute huddles held with staff on a participating unit and are led by a facilitator. Whoever shows up for the DAD shows up—and different people will often show up each time. The facilitator is typically one of the hospital staff who has been trained in how to lead DADs. The training is not onerous; in fact many believe that the best way to learn how to do one of these sessions is to get right out there and start leading them right after you learn the basics. The facilitator typically asks the group the following six questions:

1. How do you know whether your patient has a superbug?
2. In your own practices, what do you do to prevent spreading superbugs to other patients or staff?
3. What prevents you from following these practices all the time?
4. Is there anyone who has a way of doing things that helps them overcome these barriers?
5. Do you have any ideas? How can we apply and spread these ideas?
6. What can we do now? Any volunteers?

A couple of key points: The facilitator asks the questions but he/she doesn’t answer them. If nobody has a ready answer or comment the facilitator shouldn’t jump in to fill the void. Wait 20 seconds before starting to speak. Twenty seconds is a very long, uncomfortable time to wait, and we mean really uncomfortable for most people...but it is very important to do so because the discussion and ideas must come from the staff. We have found that once somebody starts talking, many others start to chime in.

Question 6 is a key question because this process is also not about the facilitator coming away from the DAD session with lots of work to do. The staff identify the solutions and THEY work on them. Some infection control staff have identified this as quite difficult to do because they are so used to being the ones who scurry around doing all the infection control “stuff”.

And what happens when infection control does this? They continue to own the problem. What happens when front line staff identify and address the problem? Yup, they own it.

Talk to patients. A lot of institutions using PD also ask patients about the best ways to control superbugs. According to Dr. Jon Lloyd, Coordinator for the SW Pennsylvania MRSA Prevention Collaborative, patients are “a gold mine” and engaging them is good for their care. “Now, instead of patients being the defective, passive recipients of our expert care,” Lloyd explains, “they are part of the solution, and they love it.”

You can ask patients and involve them in the PD process any way you want. It is up to you to decide what is the best, most appropriate way for you to do this at your institution.

Collect the data. PD uses data to track success. The data you are already collecting for *Safer Healthcare Now!* (SHN!) -- including MRSA infections, hand hygiene rates, alcohol sanitizer usage and PPE usage - will help you measure the impact of your PD initiative. You can also find new measures in the measurement buffet chapter of this document. The important thing is to pick measures that are both useful measures of what is going on, and that mean something to the people you are showing them to.

What results should you expect? Every institution is different, but the change can be significant. For example, the first set of US hospitals using PD found that their MRSA infections and transmissions dropped by 30% to 73%, while the use of alcohol sanitizer, gowns and gloves increased.

Summary: The Basic Steps of PD

1. Develop a team of people interested in solving the problem. As we said before, these people will largely self-select. Decide what the group wants to accomplish and be specific. Make the team as diverse as possible - the more perspectives you have on the problem, the more solutions you will find. Invite other key people - leaders - to get involved. Find at least one leader ready to champion your cause, but remember you have to find someone that is interested in the problem: don't drag someone kicking and screaming to a meeting just because they occupy a leadership position.

2. Define the problem. Involve everyone in generating and/or reviewing data to define and measure the size of the problem. Describe what you would like the future to be: if we solved this problem, what would it look like? What are your desired outcomes? Discuss the factors contributing to the problem, including current cultural or behavioural norms. Identify the barriers and challenges related to the problem. Decide who else should be involved to solve it. Tip for success: start with the problems and questions your team has identified. Don't try to answer questions that no one has asked yet. You might be inclined to think you already know what the problem is on a particular unit e.g. poor hand hygiene compliance, but the front line staff will guide which direction you will take.

3. Identify positive deviants. Are there people in your institution who are already achieving your desired outcomes? Find people who are facing the same or worse challenges or barriers as others but seem to be doing better.

4. Discover their uncommon practices. How are the positive deviants in your organization overcoming the problem? What are they doing differently? Can others be encouraged to do what they are doing? To find these uncommon practices, you may have to do some detective work. You'll need to talk to people and observe them as they work. Your positive deviants may not even be aware of what they are doing that's different.

5. Design solutions. Use the uncommon practices and good ideas to design solutions that others can use. Develop activities that will help staff apply the PD behaviours and practices together, peer-to-peer. It's usually best to start small - with one or two ideas - so you can demonstrate success, but target as many people as possible so your little ideas will have more impact. The goal is to get people to 'act their way to a new way of thinking'. To do that, you have to create opportunities for staff to practice a new behaviour together.

6. Document the impact of your solutions and activities. What indicators can you use to show people that those uncommon practices work? What measures will you use to keep evaluating a new or different practice? What's the best way to share your data with others? Perhaps yet another PowerPoint presentation or series of charts isn't the way to go. Is there a more engaging or creative way to demonstrate the impact of a change in behaviour? Keep track of everything you do and everyone who gets involved. You just never know where the next new really great solution is going to come from.

7. Disseminate your findings. Talk a lot - and loudly - about your successes and failures. Let people around you know what's working and what you have learned from what is not. Encourage the staff involved to talk up their experience with their peers. This is very important: if all the talking only comes from infection control, then once again, infection control is in the driver's seat. Get out of the driver's seat and give the keys to the front line! Write articles for newsletters. Hold an awards ceremony - anything short of running through the halls naked to draw attention to your discovery. If you started in one unit, now's the time to scale up, and spread that new practice to other parts of your institution. Use the members of your team as PD ambassadors to help you figure out how this spread should happen. Identify your champions, and use them well. Don't stop at the walls of your own institution. Make sure you share your successes with other organizations in your community, and in other communities. You can be the start of something big.

How Long Does a Positive Deviance Initiative Take?

As you've probably heard, change takes time. It could take a year or more from the time you start your PD project until you are ready to share your results. Here's a common timeline to help with your planning:

1. Getting Started (1-2 months)
2. Engaging the Organization (month 3)
3. Fuelling Change (months 4-12)
4. Documenting and Diffusing Your Findings (month 12+)

For more information on starting a PD initiative visit: www.positivedeviance.org and www.postivedeviance.ca and www.plexusinstitute.org

A word about using some other techniques as part of the discovery process -

Improvisational Theatre:

Some PD sites have found that using improv has helped teams work through some difficult issues. For example, one team used it to “replay” a confrontation that occurred between a housekeeper and a physician after the housekeeper challenged the physician on why he wasn’t wearing a gown and gloves on entering the room of an MRSA-positive patient. Another team used it to practice how to break the news to a patient that they had just been diagnosed with *C. difficile* and needed to be isolated. Only your team can decide whether improv might help.

Story telling:

One of the things most infection control teams have been guilty of is unwittingly sanitizing infection control data by feeding back rates that have been stripped of the underlying patient stories. If you think about it, letting a ward know that their rate is “5 per 10000 patient days” doesn’t mean an awful lot to most people. Letting them know whether this rate is higher or lower than some comparative group is important, but it still doesn’t properly convey the pain and suffering that patients go through when they develop these infections. Simply put, people relate to people’s stories better than they do numbers. So why not feed back the rate, but then let them know that “this rate represents 3 patients who caught MRSA on this ward this month, and briefly this is what happened to them”?

Why not ask the staff who turn up at your DADs if they want to share any stories about healthcare associated infections? They may remember a patient, a family member, a coworker or maybe even themselves when they caught an infection. These stories don’t just give a glimpse into what might motivate someone to try to decrease healthcare associated infections, but they may also stir memories in others, which could help motivate them as well.

Step 3: Spreading the Word

You know the barriers you will face trying to change behaviour. It's an age-old problem. In fact, the sayings have been passed down for hundreds of years. How about: *“Old habits die hard.”* Or *“You can't teach an old dog new tricks.”* Or *“You can lead a horse to water but you can't make him drink.”* Then there's our personal favourite, *“But we've always done it this way...”*

Changing human behaviour IS challenging, but it is NOT impossible. To change behaviour, you have to change attitudes, physical structures and/or work practices. Your goal is to make the right practice the best - and preferably easiest - choice for everyone.

As we've already agreed, our traditional approach to get people to comply with hand hygiene and cleaning - putting up posters and handing out pamphlets - has had disappointing results. It's just like when we were kids, nagging does not work.

To change the attitudes or norms of a group of people, we need different tactics - not to mention time and patience. The next few pages will tell you about social marketing techniques that you can use to spread the word, start a “buzz” in your organization and get people to actually use the best practices that prevent infections.

What is Social Marketing?

Social marketing is the clever use of marketing and advertising principles to influence human behaviour. We all know how effective advertising and marketing campaigns can be in persuading people - including us - to buy products we don't need. How many of us have a stack of small appliances or exercise equipment that we've ordered because the ads managed to persuade us they would make our lives easier, improve our health or make us more attractive?

How many of us can repeat marketing campaigns from years ago. Remember AT&T's “Reach out and Touch Someone”? Or “You're in Good Hands With Allstate”? By the way, you may have noticed that both our examples include words like “hands” or “touch” - in keeping with our focus on superbugs and hand hygiene. We just wanted to get your creative juices flowing in the right direction, right at the start!

Social marketing uses the same techniques as product or brand advertising. But, instead of trying to get people to buy a product, we're trying to get them adopt or “buy” a behaviour that will improve the health of a community or society.

Social marketing works. It has been used successfully to get people to wear their seat belts, quit smoking and stop using pesticides.

Social Marketing IS:	Social Marketing IS NOT:
<ul style="list-style-type: none"> • social or behaviour change strategy • most effective when it activates people • targeted to those who have a reason to care and who are ready for change • strategic and requires efficient use of resources • integrated and reliant on the “Installment Plan” 	<ul style="list-style-type: none"> • just advertising • a clever slogan or messaging strategy • reaching everyone through a media blitz • an image campaign • done in a vacuum • a quick process

The Fundamentals of Social Marketing

When planning a social marketing campaign, it’s a good idea to keep in mind a few fundamentals - or critical success factors.

1. Make it easy and fun.

People are more likely to adopt a new or different behaviour when it is EASY, FUN and POPULAR! And they are obviously less likely to adopt something that is hard, dull, and that nobody is doing (hey folks, let’s watch another hand hygiene video! Don’t forget to remove all jewellery! And remember to do this about 100 times during your shift in the ICU!).

They are more likely to change when they see the benefit to themselves: what’s in it for me? They are also more likely to change if they have an opportunity to “try out” the behaviour - when it is voluntary and there’s a learning period.

Everybody wants to fit in, so people are also more likely to adopt a new or different behaviour if they see other people - particularly people they respect or identify with - doing it. That’s what helps make a different behaviour the new normal.

So, how do you make hand hygiene and best practices easy and fun? It takes a bit of thinking, a bit of planning and a bit of work.

Toronto’s University Health Network (UHN) has the highest rate of staff influenza vaccination in the greater Toronto area for several years straight. They chalk their success up to a couple of key strategies: although they know that getting the flu shot will protect patients, they also know that the main reason that staff get the flu shot is to protect themselves and their families. They also know that giving out a chocolate bar as a reward for getting vaccinated can motivate a surprising number of people! They also play on the friendly competition between the three hospitals that make up the UHN and award the “flu cup” to the most vaccinated hospital.

Finally, by attaching small stickers to your ID badge indicating that you received that year’s shot, they let others know that you’ve been vaccinated, a subtle tip of the hat to peer pressure.

2. Know what you want to achieve.

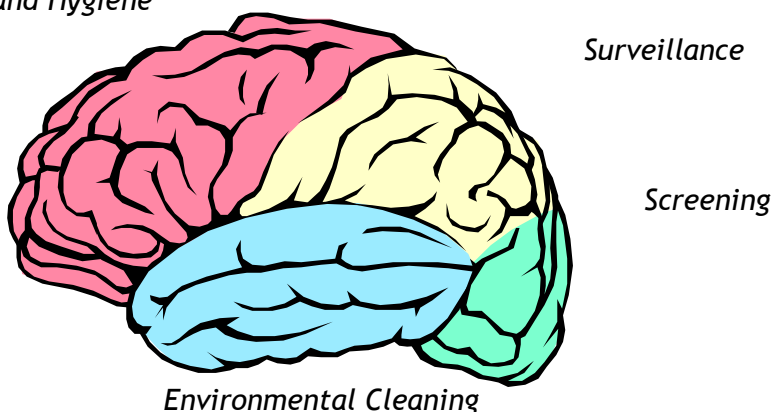
What is your vision of success? Be specific about what you want to achieve so that you can explain clearly and exactly what you want people to do. Target the behaviour you want to change.

3. Know your audience.

It is also important to know ... and understand ... the people whose behaviour you are trying to change. Remember that they may have a different perspective than you do. As the following highly sophisticated brain diagrams show, you may be totally obsessed with infection prevention and control - while the people you are trying to persuade to adopt a new behaviour are thinking about the groceries they have to pick up on the way home, the chores they have to do at home, the bill they forgot to pay or how soon they can retire - in short, everything except hand hygiene.

The Brain of an Infection Control Professional:

Hand Hygiene



Your Target Audience's Brain (*Generalization*):

Grocery list

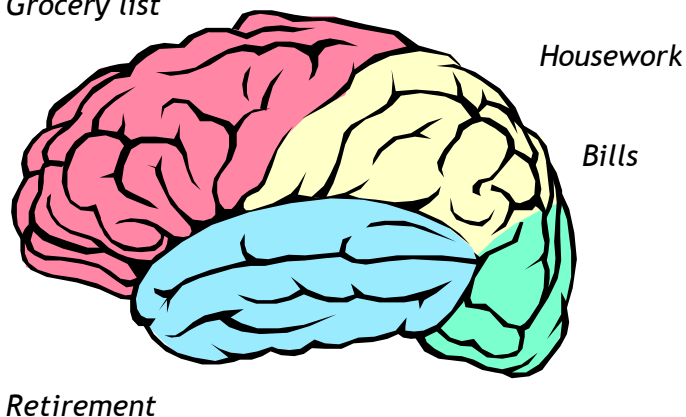


Figure 2: The Brain

To target behaviour, you have to think of its two parts: the ACTION or behaviour itself and the ACTOR or the person doing the action. The two are inseparable, so you can't change one without considering the other.

To understand why the people in your organization aren't using best practices every time all the time to reduce the spread of superbugs, you must know your audience.

To start with, you have more than one audience. The people you work with can be divided into several different groups such as: physicians, managers, nurses and housekeeping staff: each one with a different role in improving practice. For example, you may want physicians to model correct hand hygiene procedures, managers to support and enforce policies, and housekeeping staff to ensure that hand rub dispensers are always working and full.

When developing your social marketing campaign, you have to tailor your messages for each audience. Which group will have the biggest impact? Which one will be easiest to change (you probably want to start with that group)? What's the best way to communicate with each audience? What's the best way to motivate each group?

Remember: start with people who are interested. This is important because we often spend a lot of time during the day going after people who really are not interested in hearing our message. If we were companies we'd have gone out of business long ago! The ones who aren't interested will likely join in later, as they see what their colleagues are doing.

For each audience you identify, complete an audience analysis chart. We've included an example below. To collect the information you need to complete your charts, you may have to gather some information. You may want to hold focus groups with some key people, or conduct personal interviews. You can also casually observe people as they work to be able to understand their practice now - and factors that may keep them from using best practices consistently.

Example chart: Targeting physicians (Tool: *Lagarde*; Example is original)

Audience:	<i>Physicians</i>	
What you want them to do (the behaviour):	<i>Model hand hygiene behaviour for medical residents and other healthcare providers</i>	
	<i>Those who have adopted the behaviour</i>	<i>Those who have not</i>
Demographics	Pathologists	Surgeons
Why would they?	Reduce personal risk	Peer pressure
Why not?	"never had issues in the past"	"never had issues in the past"
Who has an influence on them?	Infectious disease specialists	Patients
What media do they pay attention to?	Professional journals Provincial Medical Association, CMPA,	Professional journals Provincial Medical Association, CMPA
Where do they go? Where can you reach them?	Staff lounges Rounds	Medical Advisory Committee

4. Using the 4 + 1 “P”s.

Traditional marketing focuses on four “P”s or domains of influence: product, price, place and promotion. For any particular message, it is helpful to refer to these to steer your message. For social marketing, a fifth “P” has been added at the end.

The “P”s”	Definition	For Hand Hygiene
PRODUCT	Desired behaviour you would like the audience to do	Clean their hands
PRICE	The “cost” of barriers that are preventing the behaviour change	No time to stop between patients; Dry skin on hands.
PLACE	Where the audience will perform the desired behaviour	Any place that care is provided
PROMOTION	Communication messages, materials, channels and activities that reach your audience	Personal interactions, posters, other prompts and reminders

Product or what you want your people to do. The product you are “selling” is/are the behaviour(s) you want your people to practice (hand hygiene, cleaning, etc.) to reduce the spread of superbugs.

To get your people to “buy” the change, you have to be explicit about what you want them to do. And you have to be able to describe the change in two minutes or less. You probably have lots of policies and procedures on your shelves or your website that describe best practices, but chances are that nobody reads them. Instead, develop a description of the change that will capture people’s interest, and then try it out on someone. “Wouldn’t it be great if our staff always cleaned their hands when they should?” If your test person isn’t interested and engaged, keep refining it until you get it right.

One of the best ways to sell your behaviour is to describe it in a way that people feel you are offering them something they already want or need. For example, a group developing a social marketing campaign to reduce sexually transmitted infections (STIs) in teenagers found out that the teens were more interested in preventing pregnancy than STIs - so that became the focus of future presentations. In the end, it didn’t matter WHY the teenagers began to use condoms: the incidence of STIs was reduced. You may remember this message from the earlier chapter on positive deviance: you need to find out what motivates the people you are trying to influence—what is important to them?

Price or the costs or barriers your target audiences face in making the behaviour change. Find out what is stopping people from cleaning their hands, completing screening on patients who are admitted, or cleaning the environment. Is hand rub not available close to where they deliver care? Do people think it takes too much of their time? Do they get more approval or satisfaction for doing other things? Then you can identify ways to reduce or remove the “price of complying” with best practices. Again, there are clear parallels here with the discovery and action dialogues described earlier on.

You have to offer your audiences something they already want – their desire to do the activity is already there. You just have to find and provide the connection.

Place or where people will perform the behaviour. It is important to understand where infection control practices will be carried out, so you can put the right messages and prompts in the right places. Hand hygiene should be done wherever patient care is provided, so you will have to put your messages in many places.

Promotion or craft the right messages for each audience. To reach each audience, you need the right messages. A good message will grab and keep your audience's attention. It will have the right tone - not harmful, blaming or offensive. And a credible messenger should deliver it. The message itself should start with the strongest point. It should clearly state the action you want your audience to take, and make it easy for people to remember what to do, how to do it and when to do it. An example of this would be the Ontario Ministry of Health and Long-Term Care's "Your 4 Moments for Hand Hygiene" that asserts that "you" are responsible for cleaning your hands, and the posters and decals that have been developed provide details on moments when hands should be cleaned. Your message should also include the benefits and incentives (the 'what's in it for me?') that your target audience will receive from adopting the new behaviour. (*Adapted from The Health Communication Unit*).

Once again, one size does not fit all. You will need different messages and different delivery mechanisms and times for each audience. Use the following table to help track your messages and plan how and when to deliver them. Ideally, have the people you are trying to influence help you craft the message. If you think about it, who better to spread an idea and influence teenagers...than other teenagers?

Audience	Message	How to deliver message?	Where to deliver message?	When to deliver message? How often?

(Lagarde)

Policies or how to enforce the behaviour. In our approach to social marketing, we've added a fifth "P": policies. Sometimes it's useful to be able to fall back on the traditional technique of developing simple written policies. Policies help communicate the desired behaviour. You can use them to enforce the behaviour with people who - after a positive deviance initiative, after social marketing, after education, after all the other techniques - still do not comply with best practices. On behalf of healthcare workers everywhere, please keep your policies brief and to the point. We've seen some policies that are so long that trees weep when these policies are printed.

5. Talk it Up.

What gets talked about gets done. Every chance you get, talk about the issue and the desired changes. Incorporate the messages into hour-by-hour communications, not just the monthly meetings: make the message LIVE in your organization!

“Switching to stories and slide-less presentations is a small revolution in itself, but with great positive consequences.”

(Leandro Herrero)

Spreading the word informally often works better than more formal methods of communication. For example, talking about an issue at meetings, at coffee breaks, and in the hallways - making it part of the conversation among co-workers - is often a better way to get the word out than presentations.

Stories travel better across an organization than technical, clinical PowerPoint presentations - and they have more impact. People are better at remembering stories than twelve bullet points on a slide or information on a fact sheet or pamphlet. In fact, stories can be a kind of “organizational glue”: people hear and repeat the stories, and the retelling helps the desired behaviour become the norm.

When developing your stories, remember: they should “stick” and be easy to remember. They should also motivate people to act and to tell the story to others. Look at this, yet another parallel between social marketing and positive deviance. It’s almost like they go together....we should put them together in a single document someday. Wait....we did!

6. Find the Right Motivation.

The right motivation can help people change. If you have children, you are probably already an expert motivator. The trick is to take some of the techniques you use at home and adapt them to your workplace. For example, how do you persuade your children to eat their vegetables? Which strategies work best? What motivates them? Does the promise of dessert help? Probably telling them that they are good for them doesn’t work all that well.

We are not suggesting that you put a bucket of ice cream beside every hand washing station, but we are encouraging you to think about what motivates the different people you are trying to influence. Is it recognition? An award? The opportunity to be part of the team? And don’t just think about it yourself; ask the front line what motivates them and follow their lead!

7. Get People to Commit.

One of the best ways to engage people is to get them to make a commitment - preferably a public commitment -- to adopt the new behaviour or practice. When people say publicly - in front of their managers and peers -- that they are going to do something, they are more likely to do it. Commitments can take many forms, but it’s usually better to have people sign a written commitment rather than keeping it verbal. While in years past, signing in blood was a particularly good way of ensuring commitment, we are no longer recommending this approach - it is just too 18th century and can unfortunately lead to the spread of blood borne pathogens.

To encourage members of your audience to make a commitment, you have to actively involve them in the change and help them see themselves as champions of best practice. Let them know they are the kind of people who can influence others. People are usually flattered to know that others look to them to set an example - and they will want to set a good example.

Instead of working person by person to get a commitment to change behaviour, it can be more effective to seek a commitment from a whole group. Group commitments are often more effective than individual commitments because they create a critical mass of people who are agreeing to try the change - which makes it more of a norm. Besides that, the people in the group will know their co-workers are watching and won’t want to let down their group or team.

People are more likely to follow through on their commitment when it's public. Ask people to state their commitments at team meetings or other public venues. This reminds everyone that we have a common goal and we all have to participate to achieve that goal. Another strategy is to ask individuals and groups to demonstrate their commitment by wearing a button that promotes best practice or by creating a banner to display in their unit.

These visual signs of the change you're trying to make help remind the team about their commitment. They also tell patients, visitors and staff that patient safety and the fight against superbugs is important.

The hospitals and public health units in the Waterloo Wellington area partnered with the Regional Infection Control Network (WWICN) to promote hand hygiene in hospitals across the area during Infection Control Week 2008. The goal was to increase awareness of hand hygiene for everyone who entered any of the hospitals including patients, visitors, volunteers and staff. The planning group wanted the activity to be fun and encourage the use of strategies that go beyond traditional in-services and posters.

This campaign was developed using some basic social marketing principles:

- One clear message
- Prompts to remind of the desired behaviour
- Signed commitments
- Personal interaction

A "tree" was erected in the lobby or other high traffic area of each of the area's ten hospital sites for one day during Infection Control Week. A team of Infection Prevention and Control Professionals from the host hospital, public health, other hospitals and the WWICN was on hand to interact with passers-by as they came to the hospital to work, seek treatment or visit loved ones. As people entered the hospital, one of the team noted whether they used the alcohol-based hand rub to clean their hands. Other members of the team would interact with each individual to discuss the importance of hand hygiene and invite them to sign a "hand/leaf" and post it on the tree where other passersby would see it. Each participant was offered a bottle of alcohol-based hand rub and a bookmark reminding them of their commitment to keeping hands clean.

Each hospital retained their "tree" to use it in hospital events such as orientation and skills fairs.

8. Prompt People Often.

Prompts - like stickers or signs near a patient care area that remind people to clean their hands before and after providing care and before moving to another task - are great ways to remind people about behaviour they are trying to adopt. Posters placed strategically are also good reminders.

When designing your prompts, make sure they grab attention. And make sure the message is clear and positive: you're not trying to browbeat or nag people to do what's right, you want them to WANT to do what's right for patients and for themselves.

Remember: put your signs, posters and other prompts as close as possible - in time and space - to where your audience will be using the new behaviour. (McKenzie Mohr)

Your Social Marketing Checklist

Are you ready to use social marketing to spread the word? You have your plan, but is it incorporating the fundamentals of social marketing?

If you answer YES to these five questions, you have designed a social marketing campaign:

- Do you understand and have any insight into your target audience?
- Are you focusing on *behaviour* as your product? (What are you encouraging your people to adopt or sustain?)
- Will your campaign influence or try to alter the relative balance of incentives and costs for adopting the new behaviour?
- Will your plan make it easier for your target audience to try the new behaviour and to maintain it?
- Are you using communication and other promotional techniques to get your audience's attention, motivate them, and get them to act?

For more information about social marketing and behaviour change, check out the following references:

- Turning Point Social Marketing National Excellence Collaborative, "The Basics of Social Marketing", www.turningpointprogram.org
- McKenzie-Mohr, D. (2006) *Fostering Sustainable Behaviour*. New Society Publishers, British Columbia.
- Herrero, L. (2008). *Viral Change*. Meetingminds, UK.
- The Health Communication Unit - Health Communication Message Review Criteria. www.thcu.ca
- Lagarde, F. (2004). Worksheets to Introduce Some Basic Concepts of Social Marketing Practices. *Social Marketing Quarterly*, 10(1), 36-41.
- Smith, W.A. (1999). Marketing with no budget. *Social Marketing Quarterly*, 5(2), 6-11.
- SalterMitchell. (2009). the little book on social marketing. www.salterMitchell.com

(Michael Rothschild - socialmarketing.blogs.com)

Step 4: Measuring Progress

In healthcare, we are constantly being asked to evaluate things and to make decisions that will affect the care we deliver. Too often we evaluate just for the sake of producing reports that few people seem to read and even fewer act on. Not only is this experience totally frustrating, it makes us wonder why we bother.

In fact, that's a really important question to ask. Why bother? If you're not careful, you could spend all your time collecting data. It's important to carefully select the things you measure so the information is meaningful to your setting. If your findings don't resonate with the people you send them - if they're not engaged or interested - you need to ask why you're collecting that information.

Why measure?

There are three main reasons to measure:

1. To establish benchmarks. You can use benchmarks internally to monitor your own superbug rates, such as MRSA colonization. You can also use benchmarks externally to compare your institution's superbug rates to those of other comparable institutions. Remember, if you're going to try to benchmark externally, you have to be using the same definitions and collection methodologies as the other institutions.
2. To monitor compliance with policies and procedures. If your policy says that all patients or residents will be screened on admission for superbugs like MRSA and VRE, you should measure to see whether everyone is complying with that policy. The findings can help you identify where you need to change behaviour. If only 30% of people being admitted are being screened, you know that process has to be reviewed.
3. To understand the impact/efficacy of your interventions. If you want to know whether installing hand rub stations at key places has resulted in more people washing their hands at the right times, you have to measure.

When you are trying to decide what to measure, check to see if the measurement will give you information that will help you with the three tasks above.

What types of measurement should you use?

In general, there are two types or categories of measurement: *process* measurements and *outcome* measurements.

Process measurements are designed to measure "how" people do things or the process they use. You use process measurements to assess things like donning and doffing of personal protective equipment or the cleaning of a patient room. Most process measurements are done by auditing or observing what providers do. The purpose is to verify that health care providers are following procedures and/or standards of practice.

Outcome measurements are designed to measure the impact of what people do. For example, the number of surgical site infections in a specific population in a hospital is one way to measure the outcome of the care they received. Measuring the number of residents in a long-term care home who acquire an antibiotic resistant organism is another example of an outcome measure. When these numbers are low, you know that staff are following best practices. When they are high, you know there's work to be done.

Regardless of whether you use process measurements, outcome measurements or both, it's important to use that information. You should continually review the data and develop action plans to address any issues.

What to measure

Think of measurement and surveillance as a huge buffet table, laden with food. You have endless choices. Everything looks appealing. It's up to you. You can try everything and leave the table feeling stuffed and not sure that you've tasted the best that the buffet had to offer. Or you can be selective and just try those items that you think will be really good. (There is a third option—stuff more food into your pockets or purse, but do you really want to eat that stuff later, with pocket lint all over it?) The main difference between our buffet and a restaurant buffet, is that we are not required to have a sneeze guard...and of course we are talking measurements, not food. But, whether you are trying to decide what to eat or what to measure, the goal is the same: choose things that will complement each other and leave you feeling satisfied. Don't just produce pages of data: measure the things that provide value for your setting.

To decide what to measure, ask yourself the following questions.

1. Will the information be relevant to the setting? Has anyone ever asked questions about this? Will gathering data on this add value to my organization?
2. Can this process or outcome be measured? Is it possible to gather the data?
3. Is this process or outcome easy to measure? More importantly, can you set up a system so that the Infection Prevention and Control professional doesn't have to collect all the data?
4. Can the data be reported and fed back to frontline staff in a way that makes sense to them? To be effective, information must get back to the people that need it in a way they can use it. If we're measuring care, then it's the people providing the care who need to see the information. The frontline provider is the one person who can understand why things happen the way they do.

If you can measure it, the information will add value and it's relatively easy to collect, then go for it. In addition to the things you will measure because they can help you and other health care providers improve patient safety and care, you may also be asked by your institution or the health system to provide data on other indicators. Unfortunately, there is little you can do about that. Try to find the simplest way to obtain those data and get on with it.

The measurement buffet menu

Process measures for Hand Hygiene (see Appendix A-1)

1. **Volume of alcohol based hand rub used for the area being monitored per month. NEW!**
This is an indirect measurement of hand hygiene compliance. This could be the volume of ABHR used on a ward or for your facility. Although you may not look at this measurement now, certainly somebody in your institution must already know this information: finance people tend to want to know where the money is being spent! They're funny that way.
2. **Volume of hand hygiene soap used for the area being monitored per month. NEW!**
Like process measure 1, this is an indirect measurement of hand hygiene compliance.

3. **Hand hygiene compliance for a given area per month.**
This measurement is the same as the one in the original Getting Started Kit GSK). Auditing hand hygiene compliance is obviously a pretty direct way of measuring...hand hygiene compliance. It is a great measure. And it requires trained auditors and a fair amount of time to do it well. Some provinces e.g. Ontario already require hospitals to measure and report healthcare worker hand hygiene compliance. If you want to choose this measure, we refer you to www.justcleanyourhands.ca
4. **The percentage of bed spaces or patient areas being monitored at which the ABHR dispenser is:**
 - a) easily visible and accessible at point of care
 - b) easy to activate and full (i.e dispensers are not left empty)

This measurement is the same as the original GSK except we have left out the measurement of the accessibility of gloves (this is because glove use is not a hand hygiene measure and its inclusion confused many people).

Process Measures for New Approach to Controlling Superbugs (See Appendix A-2)

1. **Number of gowns used for the area being monitored per month. NEW!**
This indirectly measures compliance with contact precautions. Like above, somebody already knows this information, it may just not be being used as an infection control compliance measurement.
2. **Boxes of gloves used for the area being monitored per month. NEW!**
This also indirectly measures compliance with contact precautions.
3. **Percentage of eligible patient admissions (according to your local facility policy) screened for MRSA for the area being monitored per month. NEW!**
Almost all facilities have admission screening policies but compliance with these policies is often less than 100%.
4. **Percentage of eligible patient admissions (according to your local facility policy) screened for VRE for the area being monitored per month. NEW!**
As per measurement 3.
5. **The percentage of "High Touch Areas" in the patient environment where there was appropriate environmental cleaning as demonstrated by the complete removal of the Fluorescent Marker. Compliance by individual HIGH TOUCH AREA is also monitored.**
This was one of the more popular measures from the original GSK and we are reluctant to remove it. After all, measuring the presence or absence of fluorescent goo is fun.
6. **Reduction in Mean Time to Placement on Contact Precautions for Patients with Known or Probable MRSA, VRE, or *C. difficile* at the Time of Admission.**
This original GSK measurement makes a lot of sense as using contact precautions are a proven, effective control measure to prevent the spread of AROs. Reduce the mean time to being placed on contact precautions for patients with known or probable MRSA at the time of hospital arrival. The recommended industry standard is within 2 hour of hospital admission. Our experience over the last year was that many facilities found this time difficult to measure: while the time of admission was often easy to determine, the time that a patient was actually placed in contact precautions was often not documented.

7. **Reduction in Mean Time from Notification by Lab of MRSA, VRE or *C. difficile* Status to Placement on Contact Precautions for Patients identified as MRSA, VRE or *C. difficile* positive (if not already pre-emptively isolated).**

Like measurement 6, measuring this time interval makes a lot of sense and was found to be quite difficult to determine, again often because of inadequate documentation as to when a patient was placed in contact precautions.

Outcome measures for New Approach to Controlling Superbugs (see Appendix A-2)

8. **Surveillance for new healthcare-associated MRSA clinical isolates.**

We are following the MRSA clinical isolate case definition developed by the standardized measures for infection control working group (CPSI December 2008).

9. **Surveillance for new healthcare-associated VRE clinical isolates.**

We have adapted the MRSA case definition developed by the standardized measures for infection control working group (CPSI December 2008) by simply replacing the description of MRSA with VRE.

10. **Surveillance for new cases of healthcare-associated *C. difficile* infection.**

We are following the *C. difficile* infection case definition developed by the standardized measures for infection control working group (CPSI December 2008).

How to get started

1. **Take a critical look at your setting.**

If your facility has very few patients or residents with an antibiotic resistant organism then it may not be worth the time involved to collect data on all superbugs in your setting. There may be no value added for your work from this effort. You could run a small pilot project in some areas to make sure. However, it may be worthwhile to conduct process audits on various activities to help manage superbugs because any break in process may leave residents/patients vulnerable to acquiring a superbug.

2. **Identify the data you need to collect.**

The data you have to collect will depend on the measurements you have decided to use. If you are mainly going to measure process, you need to think about how to gather that data. Audits are a common tool for process measurements. Check the appendices for examples of audit tools. If you measuring outcomes, then identify tools that will help you collect the data you need to measure. And most importantly, never forget that you need to collect data that mean something to the group(s) you want to feed it back to.

3. **Get help.**

Collecting data is time consuming. It's important to have a system in place that helps people collect the information you need. An audit tool makes it relatively easy for data to be collected consistently, once the people doing the audits have been trained. A line listing of definitions will also help staff enter the numerator information required for outcome

measurements. Engage staff in the process of collecting data: they are the experts, so it's important to use that expertise.

4. Pick a time period and start gathering information!

Be realistic about what you can do. Remember the buffet. It may take two or three trips around it to determine what it is that you really want. Don't be discouraged if data collection doesn't go smoothly. If you run into glitches, speak with the staff that are helping collect the data. They can help you identify and solve data collection problems.

5. Review your data and analyze the information.

Once your data collection process is running smoothly, you can start reviewing the data and analyzing the information. However you decide to report the data, make sure it will be meaningful to the people who will use it. Does it make sense to report certain information as a rate? Will a graph have more meaning? Do your findings have to be placed in context for the people who will read it? Ask the people who will use the data what makes sense to them.

Making measurements make sense

Once you have your measurements you need to figure out what to do with them. (Actually, you should have thought about this before you got started, remember?)

Look at the data. What do they tell you about your setting? Consider various interpretations. For example, the amount of alcohol-based hand rub used may indicate that staff is complying with hand hygiene, or it may mean that visitors are cleaning their hands, or it may indicate that a high number of clients are using it to feed their substance abuse issues, at least in high traffic areas such as the Emergency Department. Each piece of data - such as the amount of hand rub used - gives you some information on its own, but it's not enough to draw conclusions. In this case, the amount of hand rub used combined with audits of the hand hygiene process staff use will be a good indicator of overall hand hygiene performance in your setting.

Critically review the information you have with the staff primarily involved. What's working? What's not working? What can be done to improve the measurements? What do the staff believe needs to be done? Can staff develop a plan for improvements? Work together to implement the changes, and then use your measurement tools to monitor and report back on the impact of those changes.

Your measurements will change over time as you continue to work to improve practices in your setting.

Wrap up

We hope you have found this approach useful. We also hope you managed to read it through without having to a) nap; b) swallow repeated espresso shots; and c) fight the urge to claw your eyes out. We tried to make this approach different, because we think that tackling healthcare associated infections requires additional, different approach from what we have been doing the past several decades. That said, there are numerous strategies for achieving change, and it is important to use the right one for the task at hand. For example, The PDSA cycle discussed in the last GSK may be useful for helping to improve compliance with the *Safer Healthcare Now!* Central Line Insertion Bundle, but not necessarily for successful behaviour change.

So we don't want to give you the impression that all the things like education, surveillance, and other infection control strategies we've been using over the last 40 years aren't worthwhile. They are very worthwhile and in some organizations, have been very successful in controlling superbugs using them. We feel that we need to do all those things AND tackle the culture challenges. This new approach is meant to be an important add-on to the other work that we do.

We plan to regularly update this new approach. We also plan on adding other techniques you can use to the SHN! Website. Should you have questions or comments, please send us an email at leah.gitterman@uhn.on.ca or michael.gardam@oahpp.ca.

Want to know more about the PDSA cycle? See the 2008 *Safer Healthcare Now!* GSK at www.saferhealthcarenow.ca/EN/Interventions/aro_mrsa/Pages/gsk.aspx

Appendices

Appendix A1 - Technical Description for Measurement - Hand Hygiene

Technical Description of the Measurement Worksheets:

Implementation Stages - Definitions apply to all interventions and measures

Baseline Stage Pre-intervention - Data collected for Baseline should be collected prior to implementing small tests of change and reflect the current process.

Early (Partial) Implementation Stage - The team has set a clear aim(s) for the New Approach to Controlling Superbugs intervention, identified which measures will indicate if the changes will lead to improvement, and started to implement small tests of change (PDSA) to identify and refine processes, procedures and practices which will lead to improvement and achieving the aim. When the team is close to goal they are ready to move to Full Implementation.

Full Implementation Stage (At Goal) - The processes, procedures and practices are finalized and have lead to significant improvement. These practices on the selected unit are being consistently applied and monitored, showing a sustained performance at or close to goal. The team has achieved their aim(s) and is ready to spread to other areas.

The measurement methodology and recommendations regarding sampling size referenced in this GSK, is based on The Model for Improvement and is designed to accelerate the pace of improvement using the PDSA cycle; a "trial and learn" approach to improvement based on the scientific method.¹

It is not intended to provide the same rigor that might be applied in a research study, but rather offers an efficient way to help a team understand how a system is performing. When choosing a sample size for your intervention, it is important to consider the purposes and uses of the data and to acknowledge when reporting that the findings are based on an "x" sample as determined by the team.

The scope or scale² (amount of sampling, testing, or time required) of a test should be decided according to:

1. The team's degree of belief that the change will result in improvement
2. The risks from a failed test
3. Readiness of those who will have to make the change

Please refer to the [Improvement Frameworks GSK \(2015\)](#) for additional information.

¹ Langley, G., Nolan, K., Nolan, T., Norman, C., Provost, L. The Improvement Guide: A Practical Approach to Enhancing Organizational Performance. San Francisco, Second Edition, CA. Jossey-Bass Publishers. 2009

² Provost, Lloyd P; Murray, Sandra (2011-08-26). The Health Care Data Guide: Learning from Data for Improvement (Kindle Locations 1906-1909). Wiley. Kindle Edition

HH 1 - Volume of Alcohol Based Hand Rub Used for the Area being Monitored - Measurement Worksheet												
Intervention: Hand Hygiene (HH)												
Definition The volume of alcohol based hand rub used for the area being monitored per month is an indirect measurement of hand hygiene compliance. This could be the volume of ABHR used on a ward or for your facility. Although we recommend you obtain this data on a monthly basis you may have to rely on the measurement schedule established in your institution. In many cases this information will be available through the finance department.												
Goal Annual increase in volume of ABHR used to reflect corresponding increases in hand hygiene compliance.												
Data Collection Details												
Hospital Name												Team #
Health Region												Hospital Type
Patient Sample <i>Describe the area being monitored and for which this data is being collected e.g. entire healthcare facility or patient ward/unit/clinic</i>												
<div> <div>2007</div> <div>2008</div> <div>2009</div> </div>												
Calculation of Denominator												
Frequency of Measurement												
Final Count												
1.1 Enter the total volume in litres of ABHR used for the area being measured.												
GOAL:												
*The primary goal for this measure is to increase in one year the volume of ABHR used as a reflection of the corresponding increases in hand hygiene compliance. The goal for hand hygiene compliance is 80%. In order to determine the percent improvement required in order to reach the goal of 80% by your baseline value. For example, if the baseline rate for overall Hand Hygiene Practice Bundle Compliance is 34% your goal rate would be $25 \times 235\% = 25 \times 2.35 = 58.75$ litres. Enter this in your goal cell in every monthly cell in row 17 above. (Please refer to the "SHN Instructions for Data Entry and Submission" for further information on how to calculate your baseline value.)												
Comments												

1.0 Volume of Alcohol Based Hand Rub Used for the Area being Monitored- Technical Description

Intervention(s): Hand Hygiene (HH)

Definition: The volume of alcohol based hand rub used for the area being monitored per month is an indirect measurement of hand hygiene compliance. This could be the volume of ABHR used on a ward or for your entire facility.

Goal: Annual increase in volume of ABHR used to reflect corresponding increases in hand hygiene compliance. (see “Comment” below)

CALCULATION DETAILS:

Numerator Definition: Does not apply to this measure

Denominator Definition: Does not apply to this measure

Final Count: Enter the total volume in litres of ABHR used for the area being measured for the measurement reporting period.

Measurement Period Length: Measure monthly. Although we recommend you obtain this data on a monthly basis you may have to rely on the measurement schedule established in your institution.

Definition of Terms:

- Alcohol-based Hand Rub:** An alcohol-containing preparation designed for application to the hands for reducing the number of viable microorganisms on the hands. In Canada and the United States, such preparations usually contain 60%-95% ethanol or isopropanol. Dispensers for alcohol-based hand rubs do not require plumbing and can be made available adjacent to each patient's bed and at many other locations in patient-care areas. Healthcare organizations are encouraged to install dispensers in patient rooms, treatment rooms, suites and all other appropriate locations. Healthcare facilities should work with local fire marshals to ensure that these installations are consistent with local fire codes, which may differ from the national codes. To avoid any confusion between soap and alcohol hand rubs, alcohol hand-rub dispensers should not be placed adjacent to sinks.

Calculate as: No calculation required

Comments: Determining your goal - The primary goal for this measure is to increase in one year the volume of ABHR used as a reflection of the corresponding increases in hand hygiene compliance. The goal for hand hygiene compliance is 80%. In order to determine your goal for the increase in AHBR volume of you have to determine your baseline for overall Hand Hygiene Practice Bundle Compliance (HH Measure 3.0), and estimate the percent improvement required in order to reach the goal of 80% by dividing the 80% by your baseline value. For example, if the baseline rate for overall Hand Hygiene Practice Bundle Compliance is 34% your goal rate would be $[(0.80 / 0.34) \times 100] = 235\%$ increase in baseline volume of AHBR. Therefore if you baseline volume of AHBR for your unit or facility is 25 litres your goal would be $25 \times 235\% = 25 \times 2.35 = 58.75$ litres.

COLLECTION STRATEGY:

Data Collection Approach:

- In many cases this information will be available through the finance department on a monthly or quarterly basis.
- Baseline data should be collected prior to implementing the Superbugs intervention and may be the amount of ABHR used in the quarter prior to implementation.

HH 2 - Volume of Hand Hygiene Soap Used for the Area being Monitored - Measurement Worksheet												
Intervention: Hand Hygiene (HH)												
Definition The volume of hand hygiene soap e.g. Chlorhexidine used for the area being monitored per month is an indirect measurement of hand hygiene compliance. This could be the volume of Hand Hygiene Soap used on a ward or for your facility. Although we recommend you obtain this data on a monthly basis you may have to rely on the measurement schedule established in your institution. In many cases this information will be available through the finance department.												
Goal Annual increase in volume of Hand Hygiene Soap used to reflect corresponding increases in hand hygiene compliance												
Data Collection Details												
Hospital Name											Team #	
Health Region											Hospital Type	
Patient Sample Describe the area being monitored and for which this data is being collected e.g. entire healthcare facility or patient ward/unit/clinic												
<div> <div>2007</div> <div>2008</div> <div>2009</div> </div> <div> <div>Nov</div> <div>Dec</div> <div>Jan</div> <div>Feb</div> <div>Mar</div> <div>Apr</div> <div>May</div> <div>Jun</div> <div>Jul</div> <div>Aug</div> <div>Sep</div> <div>Oct</div> <div>Nov</div> <div>Dec</div> </div>												
Calculation of Denominator												
Frequency of Measurement												
Final Count												
2.1 Enter the total volume in litres of Hand Hygiene Soap used for the area being measured.												
GOAL*:												
The primary goal for this measure is to increase in one year the volume of Hand Hygiene Soap used as a reflection of the corresponding increases in hand hygiene compliance. The goal for hand hygiene compliance is 80%. In order to reach the goal of 80%, you would need to increase the volume of Hand Hygiene Soap used by 20% (80% - 60% = 20%). For example, if the baseline rate for overall Hand Hygiene Practice Bundle Compliance is 60%, and you want to reach the goal of 80%, you would need to increase the volume of Hand Hygiene Soap used by 20% (80% - 60% = 20%).												
Comment												

2.0 Volume of Hand Hygiene Soap Used for the Area being Monitored- Technical Description

Intervention(s): Hand Hygiene (HH)

Definition: The volume of hand hygiene soap e.g. Chlorhexidine used for the area being monitored per month is an indirect measurement of hand hygiene compliance. This could be the volume of Hand Hygiene Soap used on a ward or for your entire facility.

Goal: Annual increase in volume of Hand Hygiene Soap used to reflect corresponding increases in hand hygiene compliance

CALCULATION DETAILS:

Numerator Definition: Does not apply to this measure

Denominator Definition: Does not apply to this measure

Final Count: Enter the total volume in litres of Hand Hygiene Soap used for the area being measured for the measurement reporting period.

Measurement Period Length: Measure monthly. Although we recommend you obtain this data on a monthly basis you may have to rely on the measurement schedule established in your institution.

Definition of Terms:

- **Hand Hygiene Soap:** soap used specifically for hand hygiene. It may or may not contain antibacterial agents such as chlorhexidine or triclosan.

Calculate as: No calculation required

Comments: **Determining your goal** - The primary goal for this measure is to increase in one year the volume of Hand Hygiene Soap used as a reflection of the corresponding increases in hand hygiene compliance. The goal for hand hygiene compliance is 80%. In order to determine your goal for the increase in Hand Hygiene Soap volume you have to determine your baseline for overall Hand Hygiene Practice Bundle Compliance (HH Measure 3.0), and estimate the percent improvement required in order to reach the goal of 80% by dividing the 80% by your baseline value. For example, if the baseline rate for overall Hand Hygiene Practice Bundle Compliance is 34% your goal rate would be $[(0.80 / 0.34) \times 100] = 235\%$ increase in baseline volume of Hand Hygiene Soap. Therefore if your baseline volume of Hand Hygiene Soap for your unit or facility is 25 litres your goal would be $25 \times 235\% = 25 \times 2.35 = 58.75$ litres of Hand Hygiene Soap.

COLLECTION STRATEGY:

Data Collection Approach:

- In many cases this information will be available through the finance department on a monthly or quarterly basis.
- Baseline data should be collected prior to implementing the Superbugs intervention and may be the amount of Hand Hygiene Soap used in the quarter prior to implementation.

HH 3 - Percent Appropriate Hand Hygiene Practice by Health Care Workers (HCW) - Measurement Worksheet												
Intervention: Hand Hygiene (HH) Definition: The percentage of patient opportunities* in which there was compliance by health care workers (Physician, Nurse, Other) with all components of appropriate hand hygiene and glove practice according to the hand hygiene policy in place at the healthcare facility. Compliance by individual HCW appropriate hand hygiene and glove practice may be monitored by direct observation or by indirect observation throughout the month on different shifts. *A patient opportunity may include but not be limited to contact with the patient, entering the patient's room, and performing patient care. Note: The IACS Faculty recommends the use of the CPSI Hand Hygiene Observation Tool for auditing HH practice.												
Goal: 80% Data Collection Details:												
Hospital Name: _____ Team #: _____ Health Region: _____ Hospital Type: _____ Patient Sample: _____ Describe the source of the patient population e.g., Intensive Care Unit, General Medicine Unit, Healthcare Facility etc.												
2007 2008 2009 Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec												
Implementation Stage												
Collection Method												
Calculation of Denominator												
3.1 What is the total number of opportunities for Hand Hygiene Practice BY PHYSICIANS at points of care included in this monthly sample?												
3.2 What is the total number of opportunities for Hand Hygiene Practice BY NURSES at points of care included in this monthly sample?												
3.3 What is the total number of opportunities for Hand Hygiene Practice BY OTHER HEALTH CARE WORKERS at points of care included in this monthly sample?												
3.4 What is the total of ALL opportunities for Hand Hygiene Practice at points of care included in this monthly sample? (#3.1 + #3.2 + #3.3)												
Numerator for BY INDIVIDUAL GROUPS OF HEALTHCARE WORKERS and OVERALL HAND HYGIENE COMPLIANCE												
3.5 What is the total number of completed opportunities for Hand Hygiene Practice BY PHYSICIANS at points of care included # 3.1?												
3.6 What is the total number of completed opportunities for Hand Hygiene Practice BY NURSES at points of care included # 3.2?												
3.7 What is the total number of completed opportunities for Hand Hygiene Practice BY OTHER HEALTHCARE WORKERS at points of care included # 3.3?												
3.8 What is the total number of completed opportunities for Hand Hygiene Practice BY ALL HEALTHCARE WORKERS at points of care included # 3.4? (#3.5 + #3.6 + #3.7)												
FINAL CALCULATION - OVERALL HAND HYGIENE COMPLIANCE												
3.9 Compliance Calculation for Hand Hygiene Practice Compliance BY ALL HEALTHCARE WORKERS (#3.8/#3.4 X 100)												
GOAL: (calculate)												
*The primary goal for this measure is to increase the Hand Hygiene Practice by 100% in one year. Using your baseline (generally, this will be your first entry in row 26 above), calculate the goal for your patient population. For example, if the baseline is 80%, the goal would be 180%.												
FINAL CALCULATION - BY INDIVIDUAL GROUPS OF HEALTHCARE WORKERS and OVERALL HAND HYGIENE COMPLIANCE												
3.10 Compliance Calculation for Hand Hygiene Practice Compliance BY PHYSICIANS (#3.5/#3.1 X 100)												
3.11 Compliance Calculation for Hand Hygiene Practice Compliance BY NURSES (#3.6/#3.2 X 100)												
3.12 Compliance Calculation for Hand Hygiene Practice Compliance BY OTHER HEALTHCARE WORKERS (#3.7/#3.3 X 100)												
Comments												

3.0 Percent Appropriate Hand Hygiene Practice by Health Care Workers (HCW) - Technical Description

Intervention(s): Hand Hygiene (HH)

Definition: The percentage of patient encounters* in which there was compliance by health care workers (Physician, Nurse, Other) with all components of appropriate hand hygiene and glove practice according to the hand hygiene policy in place at the healthcare facility. Compliance by individual HCW category is also monitored. Direct observations may be made randomly throughout the month on different shifts. **Note:** *The Faculty recommends the use of the CPSI Hand Hygiene OBSERVATION TOOL for auditing HH practice.*

**A Patient Encounter may include but not be limited to contact with the patient, equipment and/or furniture.*

Goal: 80%

CALCULATION DETAILS:

Numerator Definition: The total number of completed opportunities of Hand Hygiene Practice that were in compliance with the Hand Hygiene Policy for the Healthcare Facility by:

1. All Healthcare Workers at points of care where observations were made;
2. Individual Healthcare Worker categories as above
 - a. Physicians
 - b. Nurses
 - c. Other

Numerator Exclusions: None

Denominator Definition: The sum of the total number of ALL opportunities of Hand Hygiene Practice at points of care by (1) Physicians, (2) Nurses and (3) Other health care workers included in the monthly sample.

Denominator Exclusions: None

Compliance by Individual HCW Category: The measurement worksheet is designed to allow the team to monitor performance for each of HCW category - Physician, Nurse and Other on an individual basis. The performance for each category will be visually displayed on the run chart titled "*Individual Compliance*". The team will be able to readily identify which if any category of HCW requires closer monitoring or whether the HCWs require additional interventions to assist in adopting best practice. Teams are encouraged to choose an observation tool with which they are comfortable, however, *the Faculty recommends the use of the CPSI Hand Hygiene OBSERVATION TOOL for auditing HH practice.* Please visit the Hand Hygiene website at www.handhygiene.ca for tools.

Measurement Period Length: Measure monthly

Definition of Terms:

- **Compliance:** Adhering to the hand washing policy as established and approved by the healthcare facility and should include when the HCW should wash their hands relative to patient contact and the appropriate product to use.

- **Point-of-Care:** A point-of-care is any place where healthcare is delivered to a patient. A point-of-care may include patient's room, bedside, clinic, treatment room etc.

Calculate as: Number of observations of Hand Hygiene Practice within bed spaces, patient areas, or at points of care in the monthly sample at which time ALL Healthcare Workers practiced appropriate Hand Hygiene / Number of observations x 100.

Comments: None

COLLECTION STRATEGY:

Data Collection Approach:

- Bundle compliance should be monitored in the same patient areas as the availability of Hand Hygiene Products is also being measured.
- The team should decide in advance the number of physicians, nurses and other HCWs to observe each month.
- Baseline data may be obtained from 10 to 20 direct observations made throughout the month on different shifts and days of the week. Observations should be performed by a designated and trained individual. Ten to twenty observations is enough to provide baseline data before implementing any Hand Hygiene quality improvement strategies.
- Continue to track the measure monthly. Using the *SHN* worksheet record your data and monitor your improvement on the run chart included in the measurement workbook. Annotate the run chart, with notes reflecting any interventions you made to improve.

Data Accuracy: Data accuracy is enhanced when all definitions are used without modification.

Sampling: 10 to 20 direct observations made each month on different shifts and days of the week. Observations should be performed by a designated and trained individual. Some teams are dedicating resources to complete 20 minute segments of auditing (ie. to aim for one 20 minute observation period per week as a sampling strategy)

HH 4 - Percent Availability of Hand Hygiene Products at Bed Spaces or Patient Areas being Monitored - Bundle Compliance - Measurement Worksheet																												
Intervention: Hand Hygiene (HH)																												
Definition	The percentage of bed spaces or patient areas being monitored at which the Alcohol-Based Hand Rub (ABHR) Dispenser (liquid or foam) is (1) Easily visible, and accessible (optimal height, within easy reach of the point of interaction) AND; (2) Easy to mechanically activate with adequate volume of product in the dispenser at the point of care. These numbered items represent the TWO elements of the Hand Hygiene Product Bundle. In this measure compliance with the individual elements and overall bundle will be monitored through a regular audit process. These bundle measures should be monitored on the same units where appropriate Hand Hygiene technique is also being monitored. Direct observations should be made randomly throughout the month on different shifts.																											
Goal	95% of all patient areas will meet the two standards for Alcohol-Based Hand Hygiene Products Bundle.																											
Data Collection Details																												
Hospital Name															Team #													
Health Region															Hospital Type													
Patient Sample	Describe the source of the patient population e.g., Intensive Care Unit, General Medicine Unit, Healthcare Facility etc.																											
	2007		2008												2009													
	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Implementation Stage																												
Collection Method																												
Calculation of Denominator																												
4.1	What is the total number of observations of Hand Hygiene Products within bed spaces, patient areas, or at points of care included in this monthly sample? e.g. recommended 10-20 random observations of a variety of points of care. A "Point of Care" is where the following 3 elements are present at the same time: (1) Patient; (2) Healthcare Provider; (3) Care involving patient contact.																											
Implementation of Bundle Components																												
Calculation of Numerator																												
4.2	What is the total number of observations of Hand Hygiene Products within bed spaces, patient areas, or at points of care in # 4.1 at which BOTH of the following elements were in place at the time of the audit? Hand Hygiene Products Bundle Elements: Alcohol-Based Rub (liquid or foam) Dispenser is (1) Easily visible, and accessible (optimal height, within easy reach of the point of interaction and additional supplies of product are readily available) AND; (2) Easy to mechanically activate with adequate volume of product in the dispenser.																											
Final Calculation																												
4.3	Overall compliance with the Hand Hygiene Bundle Elements. Divide # 4.2 by # 4.1. Multiply by 100.																											
GOAL:	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%		
Numerator for Individual Bundle Element Compliance																												
4.4	What is the total number of observations of Hand Hygiene Products within bed spaces, patient areas, or at points of care # 4.1 that were in compliance with Bundle Element #1 - Alcohol-Based Hand Rub was: Easily visible, and accessible (optimal height, and within easy reach of the point of interaction)?																											
4.5	What is the total number of observations of Hand Hygiene Products within bed spaces, patient areas, or at points of care # 4.1 that were in compliance with Bundle Element #2 - Alcohol-Based Hand Rub was: Easy to mechanically activate with adequate volume of product in the dispenser?																											
Individual Bundle Element Compliance Calculation																												
4.6	Compliance Calculation for Bundle Element #1 - Alcohol-Based Hand Rub was: Easily visible, and accessible (optimal height and within easy reach of the point of interaction). (#4.4/#4.1 X 100)																											
4.7	Compliance Calculation for Bundle Element #2 - Alcohol-Based Rub was: Easy to mechanically activate with adequate volume of product in the dispenser. (#4.5/#4.1 X 100)																											
Comments																												

4.0 Percent Availability of Hand Hygiene Products at Bed Spaces or Patient Areas being Monitored - Bundle Compliance - Technical Description

Intervention(s): Hand Hygiene (HH)

Definition: The percentage of bed spaces or patient areas being monitored at which the Alcohol-Based Hand Rub (ABHR) Dispenser (liquid or foam) is (1) Easily visible, and accessible (optimal height, within easy reach of the point of interaction) AND; (2) Easy to mechanically activate with adequate volume of product in the dispenser at the point of care. These numbered items represent the **TWO elements** of the Hand Hygiene Product Bundle. In this measure compliance with the individual elements and overall bundle will be monitored through a regular audit process. These bundle measures should be monitored on the same units where appropriate Hand Hygiene technique is also being monitored. Direct observations should be made randomly throughout the month on different shifts.

Note: *It is important to remember that the use of plain soap and water can physically remove a certain level of microbes, but antiseptic agents are necessary to kill microorganisms. SHN recommends that when hands are visibly dirty or contaminated with proteinaceous material or are visibly soiled with blood or other body fluids, wash hands with either a non-antimicrobial soap and water or an antimicrobial soap and water. However, if hands are not visibly soiled, use an alcohol-based hand rub for routinely decontaminating hands in all other clinical situations.*

Goal: 95% of all patient areas will meet the two standards for Alcohol-Based Hand Hygiene Products Bundle.

CALCULATION DETAILS:

Numerator Definition: The total number of observations of Hand Hygiene Products within bed spaces, patient areas, or at points of care in the monthly sample where BOTH of the following elements (see below) were in place at the time of the audit.

Hand Hygiene Products Bundle Elements:

Alcohol-Based Rub (liquid or foam) Dispenser is:

- (1) Easily visible, and accessible (optimal height, or within easy reach of the point of interaction and additional supplies of product are readily available). AND
- (2) Easy to mechanically activate with adequate volume of product in the dispenser.

Numerator Exclusions: None

Denominator Definition: The total number of observations of Hand Hygiene Products within bed spaces, patient areas, or at points of care included in this monthly sample.

Denominator Exclusions: None

Individual Bundle Element Compliance: The measurement worksheet is designed to allow the team to monitor performance for each of the two bundle elements listed above on an individual basis. The performance for each element will be visually displayed on the run chart titled “*Individual Compliance*”. The team will be able to readily identify which if any elements require closer monitoring, strategic revision or whether the HCWs require additional education.

Measurement Period Length: Measure monthly

Definition of Terms:

- **Alcohol-based Hand Rub:** An alcohol-containing preparation designed for application to the hands for reducing the number of viable microorganisms on the hands. In Canada and the United States, such preparations usually contain 60%-95% ethanol or isopropanol. Dispensers for alcohol-based hand rubs do not require plumbing and can be made available adjacent to each patient's bed and at many other locations in patient-care areas. Healthcare organizations are encouraged to install dispensers in patient rooms, treatment rooms, suites and all other appropriate locations. Healthcare facilities should work with local fire marshals to ensure that these installations are consistent with local fire codes, which may differ from the national codes. To avoid any confusion between soap and alcohol hand rubs, alcohol hand-rub dispensers should not be placed adjacent to sinks.
- **Easily Visible:** Dispensers for alcohol-based hand rubs should be placed in an area readily accessible and visible to the healthcare worker and in close proximity to the point-of-care. For example, at the door to the patient's room, attached to the patient's bed on the patient's bedside table or suspended on the wall in the patient's room. The goal for positioning the alcohol-rub is to place it strategically so that it is in the HCW's line of sight and the HCW does not have to hunt for it.
- **Hand hygiene:** A general term that applies to hand washing, antiseptic hand wash, antiseptic hand rub, or surgical hand antisepsis.
- **Optimal Height:** As described above for "Easily Visible" the alcohol-based hand rub should be positioned at a height where 95% of all HCW can reach the dispenser and activate the mechanism for delivering an adequate amount of product while standing.
- **Mechanically activate:** The pump mechanism is easy to start (activate) and produces an adequate supply of Alcohol-based Rub or liquid foam.
- **Within easy reach from the Point of Care:** As described above for "Easily Visible" and "Optimal Height" the alcohol-based hand rub should be positioned close to the point-of-care e.g., attached to the patient's bed, on the patient's bedside table or suspended on the wall in the patient's room.

Calculate as: Number of observations of Hand Hygiene Products within bed spaces, patient areas, or at points of care in the monthly sample where BOTH of the two elements were in place at the time of the audit / Number of observations x 100.

Comments: None

COLLECTION STRATEGY:**Data Collection Approach:**

- Bundle compliance should be monitored in the same patient areas as Hand Hygiene technique is also being measured.
- Baseline data may be obtained from 10 to 20 direct observations made throughout the month on different shifts and days of the week. Observations should be performed by a designated and trained individual. Ten to twenty observations at any given point would serve as adequate baseline data to start implementing any Hand Hygiene quality improvement strategies
- Continue to track the measure monthly. Using the *SHN* worksheet, record your data and monitor your improvement on the run chart included in the measurement workbook. Annotate the run chart, with notes reflecting any interventions you made to improve.

Data Accuracy: Data accuracy is enhanced when all definitions are used without modification.

Sampling: 10 to 20 direct observations made each month on different shifts and days of the week. Observations should be performed by a designated and trained individual.

Appendix A2 - Technical Description for Measurement - New Approach to Controlling Superbugs

Technical Description of the Measurement Worksheets:

Implementation Stages - Definitions apply to all interventions and measures

Baseline Stage (Pre-intervention) - Data collected for Baseline should be collected prior to implementing small tests of change and reflect the current process.

Early (Partial) Implementation Stage - The team has set a clear aim(s) for the New Approach to Controlling Superbugs intervention, identified which measures will indicate if the changes will lead to improvement, and started to implement small tests of change (PDSA) to identify and refine processes, procedures and practices which will lead to improvement and achieving the aim. When the team is close to goal they are ready to move to Full Implementation.

Full Implementation Stage (At Goal) - The processes, procedures and practices are finalized and have lead to significant improvement. These practices on the selected unit are being consistently applied and monitored, showing a sustained performance at or close to goal. The team has achieved their aim(s) and is ready to spread to other areas.

The measurement methodology and recommendations regarding sampling size referenced in this GSK, is based on The Model for Improvement and is designed to accelerate the pace of improvement using the PDSA cycle; a "trial and learn" approach to improvement based on the scientific method.³

It is not intended to provide the same rigor that might be applied in a research study, but rather offers an efficient way to help a team understand how a system is performing. When choosing a sample size for your intervention, it is important to consider the purposes and uses of the data and to acknowledge when reporting that the findings are based on an "x" sample as determined by the team.

The scope or scale⁴ (amount of sampling, testing, or time required) of a test should be decided according to:

1. The team's degree of belief that the change will result in improvement
2. The risks from a failed test
3. Readiness of those who will have to make the change

Please refer to the [Improvement Frameworks GSK \(2015\)](#) for additional information.

³ Langley, G., Nolan, K., Nolan, T., Norman, C., Provost, L. The Improvement Guide: A Practical Approach to Enhancing Organizational Performance. San Francisco, Second Edition, CA. Jossey-Bass Publishers. 2009

⁴ Provost, Lloyd P; Murray, Sandra (2011-08-26). The Health Care Data Guide: Learning from Data for Improvement (Kindle Locations 1906-1909). Wiley. Kindle Edition

NACS 1 - Number of Gowns Used for the Area being Monitored - Measurement Worksheet																																																			
Intervention: New Approach to Controlling Superbugs (NACS)																																																			
Definition The number of gowns used for the area being monitored per month is an indirect measurement of compliance with contact precautions. This could be the number of gowns used on a ward or for your facility, however the count will likely not be for those used in contact precautions only. Although we recommend you obtain this data on a monthly basis you may have to rely on the measurement schedule established in your institution. In many cases this information will be available through the finance department.																																																			
Goal	Annual increase of 50% in number of Gowns used.																																																		
Data Collection Details																																																			
Hospital Name	Team #																																																		
Health Region	Hospital Type																																																		
Patient Sample	Describe the area being monitored and for which this data is being collected e.g. entire healthcare facility or patient ward/unit/clinic																																																		
<table border="1"> <thead> <tr> <th colspan="5">2007</th> <th colspan="5">2008</th> <th colspan="3">2009</th> </tr> <tr> <th>Nov</th><th>Dec</th><th>Jan</th><th>Feb</th><th>Mar</th> <th>Apr</th><th>May</th><th>Jun</th><th>Jul</th><th>Aug</th> <th>Sep</th><th>Oct</th><th>Nov</th> <th>Dec</th><th>Jan</th><th>Feb</th><th>Mar</th><th>Apr</th><th>May</th><th>Jun</th><th>Jul</th><th>Aug</th><th>Sep</th><th>Oct</th><th>Nov</th><th>Dec</th> </tr> </thead> </table>													2007					2008					2009			Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2007					2008					2009																																									
Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec																										
Calculation of Denominator																																																			
Frequency of Measurement																																																			
Final Count																																																			
1.1 Enter the total number of gowns used for the area being monitored.																																																			
GOAL*																																																			
*The primary goal for this measure is to increase the number of Gowns used by 50% in one year. Using your baseline (generally, this will be your first entry in row 17 above), calculate the goal for the area being monitored. Enter this goal rate in every monthly cell in row 17 above. (Please refer to the "SHN Instructions for Data Entry and Submission" for further information on how to calculate your baseline and goal rates).																																																			
Comments																																																			

1.0 Number of Gowns Used for the Area being Monitored- Technical Description

Intervention(s): New Approach to Controlling Superbugs

Definition: The number of gowns used for the area being monitored per month is an indirect measurement of compliance with contact precautions. This could be the number of gowns used on a ward or for your entire facility; however the count will likely not be for those used in contact precautions only.

Goal: Annual increase of 50% in number of Gowns used

CALCULATION DETAILS:

Numerator Definition: Does not apply to this measure

Denominator Definition: Does not apply to this measure

Final Count: Enter the total number of gowns used for the area being monitored for the measurement reporting period.

Measurement Period Length: Measure monthly. Although we recommend you obtain this data on a monthly basis you may have to rely on the measurement schedule established in your institution.

Definition of Terms:

- **Gowns:** garments used to cover the work clothes of the person entering the room of a patient on Contact Precautions.

Calculate as: No calculation required

Comments: Gowns are an indirect measure of compliance with contact precautions as they are used in settings other than caring for patients in contact precautions. For example, staff frequently use them for warmth or when following routine practices such as when changing a large wound dressing. As a result the gown count will not be a pure reflection of improved application of contact precautions.

COLLECTION STRATEGY:

Data Collection Approach:

- In many cases this information will be available through the finance department on a monthly or quarterly basis.
- Baseline data should be collected prior to implementing the Superbugs intervention and may be the number of Gowns used in the quarter prior to implementation.

NACS 2 - Number of Boxes of Gloves Used for the Area being Monitored - Measurement Worksheet												
Intervention: New Approach to Controlling Superbugs (NACS)												
Definition		The number of boxes of gloves used for the area being monitored per month is an indirect measurement of compliance with contact precautions. This could be the number of boxes of gloves used on a ward or for your facility, however the count will likely not be for those used in contact precautions only. Although we recommend you obtain this data on a monthly basis you may have to rely on the measurement schedule established in your institution. In many cases this information will be available through the finance department.										
Goal		Annual Increase of 50% in number of Boxes of Gloves used.										
Data Collection Details												
Hospital Name		Team #										
Health Region		Hospital Type										
Patient Sample		Describe the area being monitored and for which this data is being collected e.g. entire healthcare facility or patient ward/unit/clinic										
Calculation of Denominator		<div> <div>2007</div> <div>2008</div> <div>2009</div> </div> <div> <div>Nov</div><div>Dec</div><div>Jan</div><div>Feb</div><div>Mar</div><div>Apr</div><div>May</div><div>Jun</div><div>Jul</div><div>Aug</div><div>Sep</div><div>Oct</div><div>Nov</div><div>Dec</div> </div>										
Frequency of Measurement												
Final Count												
2.1 Enter the total number of Boxes of Gloves used for the area being monitored.												
GOAL:												
*The primary goal for this measure is to increase the number of Boxes of Gloves used by 50% in one year. Using your baseline (generally, this will be your first entry in row 17 above), calculate the goal for the area being monitored.												
Boxes of Gloves used per month. Enter this goal rate in every monthly cell in row 17 above. (Please refer to the "SHN Instructions for Data Entry and Submission" for further information on how to calculate your baseline goal rate.)												
Comments												

2.0 Number of Boxes of Gloves Used for the Area being Monitored- Technical Description

Intervention(s): New Approach to Controlling Superbugs

Definition: The number of boxes of gloves used for the area being monitored per month is an indirect measurement of compliance with contact precautions. This could be the number of boxes of gloves used on a ward or for your entire facility; however the count will likely not be for those used in contact precautions only.

Goal: Annual increase of 50% in number of boxes of Gloves used

CALCULATION DETAILS:

Numerator Definition: Does not apply to this measure

Denominator Definition: Does not apply to this measure

Final Count: Enter the total number of boxes of gloves used for the area being monitored for the measurement reporting period.

Measurement Period Length: Measure monthly. Although we recommend you obtain this data on a monthly basis you may have to rely on the measurement schedule established in your institution.

Definition of Terms:

- **Gloves:** boxes of single disposable gloves by the person entering or within the room of a patient on Contact Precautions.

Calculate as: No calculation required

Comments: Gloves are not always used for protection in contact precaution patient rooms only as they will also be used as part of personal protective equipment for routine practices such as changing a wound dressing. As a result the glove count will not be a pure reflection of improved application of contact precautions.

COLLECTION STRATEGY:

Data Collection Approach:

- In many cases this information will be available through the finance department on a monthly or quarterly basis.
- Baseline data should be collected prior to implementing the Superbugs intervention and may be the number of boxes of Gloves used in the quarter prior to implementation.

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3.0 Percentage of Eligible Patient Admissions Screened for MRSA per Month - Technical Description

Intervention(s): New Approach to Controlling Superbugs

Definition: The percentage of people that are screened for MRSA when they are admitted to the hospital. Eligibility for screening is based on the criteria established by the healthcare facility. For example, it may be universal screening or only high risk patients. Missed screens can lead to unidentified people with MRSA and potential for spread.

Goal: 90%

CALCULATION DETAILS:

Numerator Definition: The total number of patients admitted to your healthcare facility or department who were screened for MRSA for this reporting period.

Numerator Exclusions: None

Denominator Definition: The total number of patients admitted to your healthcare facility or department who were eligible for MRSA screening according to your local policy for this reporting period.

Denominator Exclusions:

- As defined by patient sample parameters e.g., healthcare facility, department, unit.

Measurement Period Length: Measure monthly.

Definition of Terms:

- **Admission screening:** Screening performed at the time of hospital admission on all or a pre-defined target group of patients from whom specimens are recovered from body sites that may include the nose, perianal, perineal, groin, axillary, or others and analyzed in the facility's microbiology laboratory for evidence of MRSA. Some healthcare facilities have a pre-printed doctor's order record directing that "Admission Screening for Antibiotic Resistant Organisms" is to be completed on all patients requiring an overnight hospital stay.
- **Hospital Admission:** Hospital admission refers to the time when the patient is registered as an inpatient by the admitting department. This is often electronically recorded on the patient hospital admission form in a patient's record. The team should agree on a standardized time.

Calculate as: The total number of patients eligible for MRSA screening who were admitted to the healthcare facility, department or unit and underwent routine admission screening for MRSA in the monthly sample_ / Total number of patients eligible for MRSA screening admitted to the healthcare facility, department or unit in the monthly sample x 100.

Comments: None

COLLECTION STRATEGY:**Data Collection Approach:**

- If your institution has been conducting surveillance on this measure prior to joining the *SHN-SB intervention*, you may use previously collected data as baseline. If your organization has not been following these measures prior to *SHN*, start collecting this data prospectively. As this measure takes time to affect change, you may start testing your change ideas immediately.
- Continue to track the measure on a monthly basis. Using the *SHN* worksheet record your data and monitor your improvement on the run chart included in the measurement workbook. Annotate the run chart, with notes reflecting any interventions you made to improve.

Data Accuracy: Data accuracy is enhanced when all definitions are used without modification.

Sampling: Data may be obtained concurrently from 10 to 20 patients per month on a specific unit or the entire healthcare facility.

NACS 4 - Percentage of Eligible Patient Admissions Screened for VRE per Month - Measurement Worksheet																																																							
Increase in Percentage of Eligible Admissions Screened for VRE per Month																																																							
The percentage of people that are screened for Vancomycin-resistant enterococcus (VRE) when they are admitted to the hospital. Eligibility for screening is based on the criteria established by the healthcare facility. For example, it may be universal screening or only high risk patients. Missed screens can lead to unidentified people with VRE and potential for spread.																																																							
Goal	90%																																																						
Data Collection Details																																																							
Hospital Name											Team #																																												
Health Region											Hospital Type																																												
Patient Sample	Specify the sample of patients/VACS being included in this audit. If it is other than all patients admitted to the facility.																																																						
<table border="1"> <thead> <tr> <th></th> <th colspan="5">2007</th> <th colspan="5">2008</th> <th colspan="5">2009</th> </tr> <tr> <th></th> <th>Nov</th> <th>Dec</th> <th>Jan</th> <th>Feb</th> <th>Mar</th> <th>Apr</th> <th>May</th> <th>Jun</th> <th>Jul</th> <th>Aug</th> <th>Sep</th> <th>Oct</th> <th>Nov</th> <th>Dec</th> <th>Jan</th> <th>Feb</th> <th>Mar</th> <th>Apr</th> <th>May</th> <th>Jun</th> <th>Jul</th> <th>Aug</th> <th>Sep</th> <th>Oct</th> <th>Nov</th> <th>Dec</th> </tr> </thead> </table>														2007					2008					2009						Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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Calculation of Denominator																																																							
Implementation Stage																																																							
Collection Method																																																							
4.1 What is the total number of patients admitted to your healthcare facility or department who were eligible for VRE screening according to your local policy for this reporting period?																																																							
Calculation of Numerator																																																							
4.2 What is the total number of patients in # 4.1 who were screened for VRE for this reporting period?																																																							
Final Calculation																																																							
4.3 Percentage of eligible admissions screened for VRE for this reporting period. Divide # 4.2 by # 4.1. Multiply by 100.																																																							
GOAL -	90%																																																						
Comments																																																							

4.0 Percentage of Eligible Patient Admissions Screened for VRE per Month - Technical Description

Intervention(s): New Approach to Controlling Superbugs

Definition: The percentage of people that are screened for Vancomycin-resistant enterococcus (VRE) when they are admitted to the hospital. Eligibility for screening is based on the criteria established by the healthcare facility. For example, it may be universal screening or only high risk patients. Missed screens can lead to unidentified people with VRE and potential for spread.

Goal: 90%

CALCULATION DETAILS:

Numerator Definition: The total number of patients admitted to your healthcare facility or department who were screened for VRE for this reporting period.

Numerator Exclusions: None

Denominator Definition: The total number of patients admitted to your healthcare facility or department who were eligible for VRE screening according to your local policy for this reporting period.

Denominator Exclusions:

- As defined by patient sample parameters e.g. healthcare facility, department, unit.

Measurement Period Length: Measure monthly

Definition of Terms:

- **Admission screening:** Screening performed at the time of hospital admission on all or a pre-defined target group of patients from whom specimens are recovered from the perirectal or rectal area and analyzed in the facility's microbiology laboratory for evidence of VRE. Some healthcare facilities have a pre-printed doctor's order record directing that "Admission Screening for Antibiotic Resistant Organisms" is to be completed on all patients requiring an overnight hospital stay.
- **Hospital Admission:** Hospital admission refers to the time when the patient is registered as an inpatient by the admitting department. This is often electronically recorded on the patient hospital admission form in a patient's record. The team should agree on a standardized time.

Calculate as: The total number of patients eligible for VRE screening who were admitted to the healthcare facility, department or unit and underwent routine admission screening for MRSA in the monthly sample / Total number of patients eligible for VRE screening admitted to the healthcare facility, department or unit in the monthly sample x 100.

Comments: None

COLLECTION STRATEGY:

- If your institution has been conducting surveillance on this measure prior to joining the *SHN-SB intervention*, you may use previously collected data as baseline. If your organization has not been following these measures prior to *SHN*, start collecting this data prospectively. As this measure takes time to affect change, you may start testing your change ideas immediately.
- Continue to track the measure on a monthly basis. Using the *SHN* worksheet record your data and monitor your improvement on the run chart included in the measurement workbook. Annotate the run chart, with notes reflecting any interventions you made to improve.

Data Accuracy: Data accuracy is enhanced when all definitions are used without modification.

Sampling: Data may be obtained concurrently from 10 to 20 patients per month on a specific unit or the entire healthcare facility.

NACS 5 - Percent Appropriate Environmental Cleaning Practice Using Fluorescent Marker - Measurement Worksheet														
Intervention: New Approach to Controlling Superbugs (NACS)														
Definition: The percentage of "High Touch Areas" in the patient environment where there was appropriate environmental cleaning as demonstrated by the complete removal of the Fluorescent Marker. Compliance by individual HIGH TOUCH AREA is also monitored. It is recommended that FIVE environmental markers be placed per patient room. Environmental markers should be placed on all High Touch Surfaces.														
Goal	100% removal of Fluorescent marker on all High Touch surfaces													
Data Collection Details														
Hospital Name														
Health Region														
Patient Sample	Describe the source of the patient population e.g., Intensive Care Unit, General Medicine Unit, Healthcare Facility etc.													
	2007													
	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Implementation Stage														
Collection Method														
Calculation of Denominator														
5.01 What is the total number of observations of Environmental Cleaning Practice of BED RAILS included in this monthly sample?														
5.02 What is the total number of observations of Environmental Cleaning Practice of BEDSIDE TABLES included in this monthly sample?														
5.03 What is the total number of observations of Environmental Cleaning Practice of CALL BELLS included in this monthly sample?														
5.04 What is the total number of observations of Environmental Cleaning Practice of BEDSIDE LIGHT SWITCHES included in this monthly sample?														
5.05 What is the total number of observations of Environmental Cleaning Practice of BEDSIDE TELEPHONES included in this monthly sample?														
5.06 What is the total number of observations of Environmental Cleaning Practice of BED ADJUSTMENT BUTTONS included in this monthly sample?														
5.07 What is the total number of observations of Environmental Cleaning Practice of CHAIRS included in this monthly sample?														
5.08 What is the total number of observations of Environmental Cleaning Practice of OVERBED TABLES included in this monthly sample?														
5.09 What is the total number of observations of Environmental Cleaning Practice of WASHROOM TOILET SEATS included in this monthly sample?														
5.10 What is the total number of observations of Environmental Cleaning Practice of WASHROOM PAPER TOWEL DISPENSER included in this monthly sample?														
5.11 What is the total of ALL observations for Environmental Cleaning Practice on High Touch Surfaces in this monthly sample? (#5.01 + #5.02 + ... #5.10)														
5.12 What is the total number of "Cleaned" (Clean=1 or all fluorescent marker removed) BED RAILS included # 5.01?														
5.13 What is the total number of "Cleaned" (Clean=1 or all fluorescent marker removed) BEDSIDE TABLES included # 5.02?														
5.14 What is the total number of "Cleaned" (Clean=1 or all fluorescent marker removed) CALL BELLS included # 5.03?														
5.15 What is the total number of "Cleaned" (Clean=1 or all fluorescent marker removed) BEDSIDE LIGHT SWITCHES included # 5.04?														
Numerator for INDIVIDUAL "HIGH TOUCH" AREAS AND OVERALL ENVIRONMENTAL CLEANING COMPLIANCE 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0														

5.0 Percent Appropriate Environmental Cleaning Practice Using Fluorescent Marker-technical description to be developed

Intervention(s): New Approach to Controlling Superbugs (SB)

Definition: The percentage of "High Touch Areas"* in the patient environment where there was appropriate environmental cleaning as demonstrated by the complete removal of the Fluorescent Marker. Compliance by individual HIGH TOUCH AREA is also monitored. It is recommended that FIVE audits of the patient environment be conducted per week.

Goal: 100% removal of Fluorescent marker on all High Touch surfaces

CALCULATION DETAILS:

Numerator Definition: The total number of "Cleaned" for all High Touch Areas by:

1. Overall for all High Touch Areas where observations were made;
2. Individual High Touch Area (see photo) where observations were made including:
 - a. Bed Rails
 - b. Bedside Tables
 - c. Call Bells
 - d. Bedside Light Switches
 - e. Bedside Telephones
 - f. Bed Adjustment Buttons
 - g. Chairs
 - h. Overbed Tables
 - i. Washroom: Toilet Seat
 - j. Washroom: Towel Dispenser
(see photo on page 68)

Numerator Exclusions: None

Denominator Definition: The total number of ALL observations for Environmental Cleaning Practice on High Touch Surfaces in the monthly sample for overall and individual High Touch Areas as listed above.

Denominator Exclusions: None

Measurement Period Length: Measure monthly

Definition of Terms:

- **High Touch Areas:** surfaces that are easily and frequently touched by healthcare workers and patients and are known from medical literature to be typically contaminated when a patient with a superbug is occupying that bed.
- **Fluorescent Marker:** product (lotion or powder) that is visible under UV light and used as a surrogate marker for bacteria to determine the effectiveness of environmental cleaning procedures. Sold under the product name "GlitterBug" or "GlowGerm".

Calculate as: The sum of the number of "Cleaned" observed on High Touch Surfaces listed above monthly / Number of observations x 100.

Comments: None

COLLECTION STRATEGY:

- Prior to implementing this measure we recommend you discuss the process with your department of Environmental Services (Housekeeping) and include a representative on your team.
- Choose the area to audit. It could be a particular floor or unit, program, or facility where you are focusing other superbug interventions. Five audits of patient environments should be performed weekly. A patient's environment encompasses the surfaces and equipment in a patient's immediate vicinity such as their bed, bedside tables and chairs, and their washroom. Thus, a single room would be counted as one patient environment whereas a four bedded room would have 4 distinct environments plus typically one washroom shared amongst all 4 patients.

Create a template using a piece of plastic with a dime-sized cutout. This will be used to allow you to put a standard amount of Fluorescent marker on each of the high touch areas to be audited. Dab a small amount of Fluorescent marker on a cotton swab and rub the surface using the template, making sure that the amount of remaining material is not easy to see without the aid of the fluorescent lamp.

Following placement of the Fluorescent marker, the room should then be cleaned using your standard housekeeping protocol. It does not matter what type of cleaning is being performed (routine daily cleaning versus terminal or discharge cleaning) as it is assumed these high touch surfaces would be cleaned regardless. As soon as possible after cleaning, view each of the marker areas using a fluorescent lamp and score the amount of remaining marker at each site using the following scale:

0. Not removed (all or some of the product is visible)
1. Removed (no product is visible)

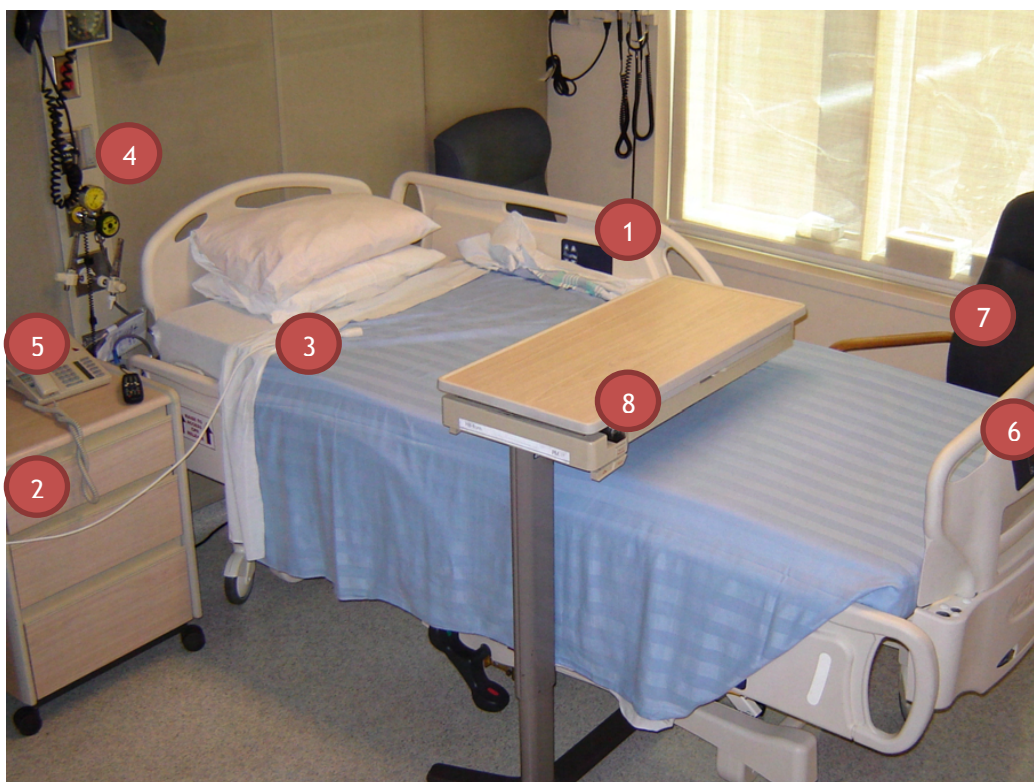
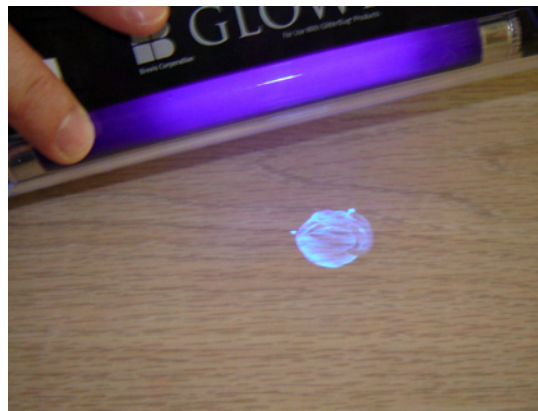
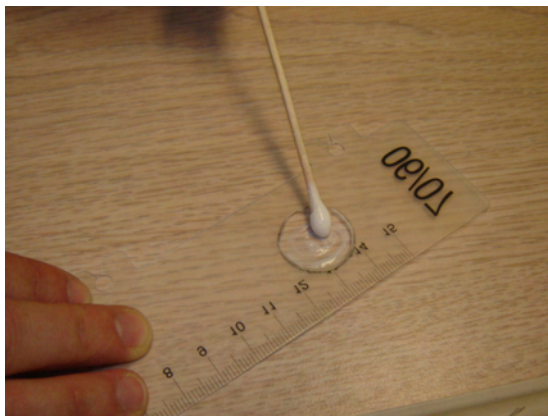
Adding up the numeric values for each site will give an overall score for that room (maximum score is 10). The higher the number, the better the score.

Please note that more porous or textured surfaces may require additional friction for the Fluorescent marker to be removed. It is recommended that a sample room be completed using the protocol to be used as baseline before data collection begins. Also, the longer the time interval between cleaning and viewing the audit sites the more likely that some product will be removed by staff or patients touching the surfaces. This may give a falsely high score.

Data Collection Approach:

- **Data Accuracy:** Data accuracy is enhanced when all definitions are used without modification.

Sampling: Data may be obtained concurrently from 10 to 20 patients per month on a specific unit or the entire healthcare facility.



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6.0 Reduction in Mean Time to Placement on Contact Precautions for Patients with Known or Probable MRSA, VRE, or *C. difficile* at Time of Hospital Arrival - Technical Description

Intervention(s): New Approach to Controlling Superbugs (SB)

Definition: The reduction of the mean elapsed time to being placed on contact precautions (CP) for patients with known or probable MRSA or VRE colonization or infection or *C. difficile* at the time of hospital arrival. The recommended industry standard for the time from hospital arrival to placement on CP for this patient population is within 2 hours of hospital arrival. Hospital arrival is measured from the point of initial clinical care following triage. These are patients who have already been identified as MRSA, VRE or *C. difficile* positive.

Goal: Decrease the mean time to placement on CP by 50% in one year.

CALCULATION DETAILS:

Numerator Definition: The total number of hours required for the patients presenting on arrival with known or probable MRSA or VRE colonization or infection or *C. difficile* to be placed on Contact Precautions from the time of initial clinical care following hospital arrival i.e. brought into the clinical area following triage..

Numerator Exclusions: None

Denominator Definition: The total number of patients presenting with known or probable MRSA or VRE colonization or infection or *C. difficile* at the time of hospital admission in the monthly sample.

Denominator Exclusions: None

Measurement Period Length: Measure monthly

Definition of Terms:

- **Colonization vs Infection:** Colonization occurs when a patient has MRSA or VRE in or on a body site but has no clinical signs or symptoms of disease. A colonized person may be a temporary or a longer term carrier of MRSA or VRE.

Certain MRSA carriers may be heavy shedders [e.g., patients with dermatitis or burns).

Infection occurs when MRSA or VRE enters a body site and multiplies in tissue causing clinical manifestations of disease. This is usually evident by fever, a rise in the white blood cell count, or purulent drainage from a wound or body cavity. The distinction between colonization and infection is a clinical one. Such a distinction should be determined by the clinician, not by culture results alone.

Colonized and infected patients are the major reservoirs of MRSA. MRSA colonization often occurs in the nares (nose), axillae (arm pits), chronic wounds, perineum or around gastrostomy and/or tracheostomy sites.

Patients at risk for MRSA or VRE colonization are generally debilitated patients who may have prolonged hospitalizations, chronic wounds, or received treatment with multiple antibiotics.

Although asymptomatic colonization with *C. difficile* is known to occur, it is difficult to determine this and typically only patients who are symptomatic from *C. difficile* are detected and counted.

- **Hospital Arrival:** Hospital arrival refers to the time of the first point-of-contact between the patient and a healthcare worker after the patient first enters the hospital. For this measure it is measured from the time of initial clinical care following triage.. The team should agree on a standardized time. Example Patient arrives in ED, is registered and triaged however is asked to remain in the waiting room. The triage nurse recognizes the patient is flagged as an MRSA patient. One hour later the patient is moved into the clinical assessment area in the ED. This is the point at which the timing begins for calculating the elapsed time to CP.
- **Hospital Admission:** Hospital admission refers to the date and time when the patient was registered as an inpatient. This is often electronically recorded on the admission form in patient's record. The team should agree on a standardized time.

Calculate as: The sum of the elapsed times from the time of admission to hospital to placement on CP for all patients in the monthly sample with known or probable MRSA or VRE colonization or infection or *C. difficile* at the time of hospital admission / Total number of patients with known or probable MRSA or VRE colonization or infection or *C. difficile* at the time of hospital admission. Add the time in hours (with 1 decimal eg 1.5) for each patient to be placed on CP.

Comments: None

COLLECTION STRATEGY:

Data Collection Approach:

- The team should standardize the “hospital admission” time.
- Baseline data may be obtained concurrently from a monthly sample of 10 to 20 patients.
- Continue to track the measure monthly. Using the *SHN* worksheet record your data and monitor your improvement on the run chart included in the measurement workbook. Annotate the run chart, with notes reflecting any interventions you made to improve.

Data Accuracy: Data accuracy is enhanced when all definitions are used without modification.

Sampling: Data may be obtained concurrently from 10 to 20 patients per month on a specific unit or the entire healthcare facility.

NACS 7 - Reduction in Mean Time from Notification by Lab of MRSA, VRE or C.difficile Status to Placement on Contact Precautions for Patients Identified as Positive (Colonized or Infected) - Measurement Worksheet																																																																																																																																																																																																																																																																																									
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7.0 Reduction in Mean Time from Notification by Lab of MRSA, VRE or *C. difficile* Status to Placement on Contact Precautions for Patients identified as Positive (Colonized or Infected) - Technical Description

Intervention(s): New Approach to Controlling Superbugs (SB)

Definition: The reduction of the mean time from the time of notification by the laboratory (microbiology) to the time of the patient being placed on contact precautions (CP) for patients identified as positive for MRSA, VRE or *C. difficile* colonization or infection. The recommended industry standard for the period from lab notification to placement on Contact Precautions is within 2 hours. We recommend you identify the time of lab notification from either the time stamp on the lab report or the time the lab calls the unit to notify them of the patient's probable or definite MRSA, VRE or *C. difficile* status. The time of being placed on contact precautions may be obtained from the patient record.

Goal: Decrease the mean time from Lab notification to placement on CP by 50% in one year.

CALCULATION DETAILS:

Numerator Definition: The total number of hours required for the patients identified as positive for MRSA or VRE colonization or infection or *C. difficile* positive to be placed on Contact Precautions from the time of laboratory notification of positive MRSA, VRE or *C. difficile* status.

Numerator Exclusions:

- None

Denominator Definition: The total number of patients identified as positive for MRSA or VRE colonization or infection or *C. difficile* positive on the unit in the monthly sample.

Denominator Exclusions:

- None

Measurement Period Length: Measure monthly

Definition of Terms:

- **Admission screening:** Screening performed at the time of hospital admission on all or a pre-defined target group of patients from whom specimens are recovered from nose, perianal, perineal, groin, axillary, or other sites and analyzed in the facility's microbiology laboratory for evidence of MRSA, or from rectal or perirectal sites for evidence of VRE. Some healthcare facilities have a pre-printed doctor's order record directing that "Admission Screening for Antibiotic Resistant Organisms" is to be completed on all patients requiring an overnight hospital stay.
- **Colonization vs Infection:** Colonization occurs when a patient has MRSA or VRE in or on a body site but has no clinical signs or symptoms of disease. A colonized person may be a temporary or a longer term carrier of MRSA or VRE.

Certain MRSA carriers may be heavy shedders [e.g., patients with dermatitis or burns).

Infection occurs when MRSA or VRE enters a body site and multiplies in tissue causing clinical manifestations of disease. This is usually evident by fever, a rise in the white blood cell count, or purulent drainage from a wound or body cavity. The distinction between colonization and infection is a clinical one. Such a distinction should be determined by the clinician, not by culture results alone.

Colonized and infected patients are the major reservoirs of MRSA. MRSA colonization often occurs in the nares (nose), axillae (arm pits), chronic wounds, perineum or around gastrostomy and/or tracheostomy sites.

Similarly, patients colonized or infected with VRE are major reservoirs of VRE. VRE colonization typically occurs in the GI or urinary tract, but can also involve sites with artificial devices such as intravenous catheters.

Patients at risk for MRSA or VRE colonization are generally debilitated patients who may have prolonged hospitalizations, chronic wounds, or received treatment with multiple antibiotics.

Although asymptomatic colonization with *C. difficile* is known to occur, it is difficult to determine this and typically only patients who are symptomatic from *C. difficile* are detected and counted.

- **Hospital Admission:** Hospital admission refers to the time when the patient is registered as an inpatient by the admitting department. This is often electronically recorded on the patient hospital admission form in a patient's record. The team should agree on a standardized time.

Calculate as: The sum of the elapsed times from the time of notification by laboratory to placement on CP for all patients identified as positive for MRSA or VRE colonization or infection or *C. difficile* through routine admission screening or clinical testing in the monthly sample / Total number of patients identified as positive for MRSA or VRE colonization or infection or *C. difficile*.

Comments: None.

COLLECTION STRATEGY:

Data Collection Approach:

- The team should standardize the "hospital admission" time.
- Continue to track the measure monthly. Using the *SHN* worksheet record your data and monitor your improvement on the run chart included in the measurement workbook. Annotate the run chart, with notes reflecting any interventions you made to improve.

Data Accuracy: Data accuracy is enhanced when all definitions are used without modification.

Sampling: Data may be obtained concurrently from all patients per month on a specific unit or the entire healthcare facility.

NACS 8 - Incidence of Healthcare-Associated Methicillin-Resistant Staphylococcus aureus (HAI-MRSA) Clinical Isolates (one per patient) per 1000 *Patient Days - Measurement Worksheet													
Intervention: New Approach to Controlling Superbugs (NACS)													
Definition													
<p>An MRSA clinical isolate is defined as the isolation of Staphylococcus aureus resistant to oxacillin (e.g. methicillin, amoxicillin, penicillin) from any body site in a clinical isolate (non-screening, specimens) obtained from an patient meets the definition of HAI-MRSA; no knowledge of previous MRSA status or history of admission to a healthcare institution in last 12 months.</p> <p>Case Definition:</p> <ul style="list-style-type: none"> Any acute care inpatient that has had Staphylococcus aureus isolated from a clinical specimen (excluding cultures taken for the purposes of MRSA screening); AND Resistance of isolate to oxacillin; AND Patient must be admitted to the hospital; AND Is a new hospital-associated case <p>Note: When using clinical isolates exclude all screening culture results as well as duplicate or additional specimens from the same patient (i.e., a patient with 3 swabs from a wound that all grow MRSA would be counted once – you need one clinical isolate from each infection event)</p>													
Goal													
Annual reduction of 50% in rate of HAI-MRSA clinical isolates													
Data Collection Details													
Hospital Name	Team #												
Health Region	Hospital Type												
Patient Sample	Describe the source of the patient population e.g. entire healthcare facility or per unit												
<div> <div>2007</div> <div>2008</div> <div>2009</div> </div> <div> <div>Nov</div> <div>Dec</div> <div>Jan</div> <div>Feb</div> <div>Mar</div> <div>Apr</div> <div>May</div> <div>Jun</div> <div>Jul</div> <div>Aug</div> <div>Sep</div> <div>Oct</div> <div>Nov</div> <div>Dec</div> <div>Jan</div> <div>Feb</div> <div>Mar</div> <div>Apr</div> <div>May</div> <div>Jun</div> <div>Jul</div> <div>Aug</div> <div>Sep</div> <div>Oct</div> <div>Nov</div> <div>Dec</div> </div>													
Calculation of Denominator													
Implementation Stage													
Collection Method													
8.1 What is the total number of patient days for the healthcare facility or department or unit this month? (Monthly measure of "Patient days" for a healthcare facility may be obtained from the Admitting Department of the facility).													
Calculation of Numerator													
8.2 What is the total number of patients in # 8.1 newly identified as having a HEALTHCARE-ACQUIRED MRSA CLINICAL ISOLATE according to the criteria listed below. *Hospital-acquired MRSA Infection is defined according to the best judgement of the ICP.													
Final Calculation													
8.3 MRSA Healthcare Associated Clinical Isolates (one per patient) per 1000 patient days. Divide # 8.2 by # 8.1. Multiply by 1000.													
GOAL:													
*The primary goal for this measure is to decrease the HAI-MRSA rate by 50% in one year. Using your baseline (generally, this will be your first entry in row 21 above), calculate the goal for your patient population. Enter this goal rate in every monthly cell in row 22 above. (Please refer to the "SHN Instructions for Data Entry and Submission" for further information on how to calculate your baseline and goal rates).													
Comments													

8.0 Incidence of Healthcare-Associated Methicillin-Resistant *Staphylococcus aureus* (MRSA) Clinical Isolates (one per patient) per 1000 *Patient Days - Technical Description

Intervention(s): New Approach to Controlling Superbugs (SB)

Definition: The number of patients with laboratory-confirmed MRSA healthcare-associated clinical isolates per 1,000 patient days. This measure reflects the number of patients who were not colonized or infected with MRSA prior to admission however, became infected or colonized with MRSA during their hospital stay.

Goal: Annual reduction of 50% in rate of MRSA clinical isolates

CALCULATION DETAILS:

Numerator Definition: The total number of patients newly identified as having a healthcare associated MRSA clinical isolate according to the criteria listed below.

Numerator Inclusions:

Count as one new clinical isolate per patient per month.

Criteria for Identifying a Patient as a "Healthcare-Associated" MRSA Case

1. *Staphylococcus aureus* from any body site.
2. Isolate resistant to oxacillin

Once the patient has been identified with MRSA, they will be classified as healthcare-associated based on the "best judgment" of the practitioner. This judgment should include review of:

- a. Length of time in hospital prior to MRSA identification (generally >72 hours);
- b. Knowledge of previous MRSA status
- c. Length of stay in hospital
- d. Prior hospitalization or other healthcare facility history (previously admitted in past 12 months)
- e. Where patient was admitted from (e.g., long-term care)

Denominator Definition: The total number of patient days for the healthcare facility, department or unit in the monthly sample.

- New infection with onset >48 hours after admission or the infection was present on admission but related to a previous admission to the same facility within the last 12 months.

Denominator Exclusions:

- MRSA infection present on admission
- Onset of symptoms of MRSA infection occur ≤ 48 hours following admission to the healthcare facility
- MRSA colonization i.e., the sample is from a colonization surveillance site rather than from a clinical culture.
- As defined by patient sample parameters e.g., healthcare facility, department, unit.

Measurement Period Length: Measure monthly**Definition of Terms:**

- **Infection:** Infection occurs when MRSA enters a body site and multiplies in tissue causing clinical manifestations of disease. This is usually evident by fever, a rise in the white blood cell count, or purulent drainage from a wound or body cavity. The distinction between colonization and infection is a clinical one. Such a distinction should be determined by the clinician, not by culture results alone; however you are not being asked to differentiate between the two states in this measure. Colonized and infected patients are the major reservoirs of MRSA.
- **MRSA case:** The isolation of *Staphylococcus aureus* resistant to oxacillin (e.g. methicillin) from any body site in a clinical isolate (non-screening specimens) obtained from a patient who meets the definition of HA-MRSA: the isolate is obtained from the patient a minimum of 72 hours after admission to hospital coupled with knowledge of the patient's previous MRSA status, date of admission, length of stay in hospital, prior hospitalization or other healthcare facility history (previously admitted in past 12 months) from where patient is admitted i.e. Long-term Care.

Since the measure is of clinical isolates, all screening culture results are to be excluded. Exclude duplicate or additional specimens from the same patient obtained at the same time i.e., a patient with 3 swabs from a wound that all grow MRSA would be counted once - you need one clinical isolate from each infection event per patient.

We are counting one clinical isolate per infection event per patient per month. Should a patient have a new clinical isolate in a subsequent month, it will be up to the judgement of the ICP determine whether the new isolate is related to the prior clinical event or a new event. If it is new, then it should be counted. **For example**, if a patient has MRSA obtained from an abscess in the first month, and a repeat tap of that abscess also shows MRSA, it would not be counted again. If on the other hand, a patient has an MRSA bacteremia that is treated in the first month, and then develops MRSA pneumonia in the second month, it would be counted.

- **Patient days:** A measure of a multiple of patient or bed days for a healthcare facility or unit used to standardize the results of the indicator. For this measure the multiple is 1,000 patient days. It is calculated by multiplying by 1,000 the count of patient days for a specific area and month which may be obtained from the Admitting Department of the facility.

Calculate as: The total number of patients newly identified as having a healthcare-associated MRSA clinical isolate according to the criteria listed in "numerator inclusions" in the monthly sample / Total number of patient days for the healthcare facility, department or unit in the monthly sample x 1000.

Comments: None

COLLECTION STRATEGY:**Data Collection Approach:**

- If your institution has been conducting surveillance on this measure prior to joining *SHN*, you may use previously collected data as baseline. If your organization has not been following these measures prior to *SHN*, start collecting this data prospectively. As this measure takes time to affect change, you may start testing your change ideas immediately.
- Continue to track the measure on a monthly basis. Using the *SHN* worksheet record your data and monitor your improvement on the run chart included in the measurement workbook. Annotate the run chart, with notes reflecting any interventions you made to improve.

Data Accuracy: Data accuracy is enhanced when all definitions are used without modification.

Sampling: Data may be obtained concurrently from all patients per month on a specific unit or the entire healthcare facility.

NACS 9 - Incidence of Healthcare-Associated Vancomycin Resistant Enterococci (HAI-VRE) Clinical Isolates (one per patient) per 1000 *Patient Days - Measurement Worksheet																																																																			
Intervention: New Approach to Controlling Superbugs (NACS)																																																																			
Definition (An VRE clinical isolate is defined as the isolation of Enterococci resistant to Vancomycin from any body site in a clinical isolate (non-screening specimens) obtained from a patient who meets the definition of HAI-VRE: no knowledge of previous VRE status or history of admission to a healthcare institution in last 12 months)																																																																			
Case Definition:																																																																			
<ul style="list-style-type: none"> Any acute care inpatient that has had Enterococcus isolated from a clinical specimen (excluding cultures taken for the purposes of VRE screening); AND Resistance of isolate to vancomycin; AND Patient must be admitted to the hospital; AND Is a new hospital-associated case 																																																																			
Note: When using clinical isolates exclude all screening culture results as well as duplicate or additional specimens from the same patient (i.e., a patient with 3 swabs from a wound that all grow VRE would be counted once – you need one clinical isolate from each infection event).																																																																			
Goal Annual reduction of 50% in rate of HAI/VRE clinical isolates																																																																			
Data Collection Details																																																																			
Hospital Name	Team #																																																																		
Health Region	Hospital Type																																																																		
Patient Sample	Describe the source of the patient population e.g. entire healthcare facility or per unit																																																																		
<table border="1"> <thead> <tr> <th colspan="2">2007</th> <th colspan="12">2008</th> <th colspan="12">2009</th> </tr> <tr> <th></th> <th>Nov</th> <th>Dec</th> <th>Jan</th> <th>Feb</th> <th>Mar</th> <th>Apr</th> <th>May</th> <th>Jun</th> <th>Jul</th> <th>Aug</th> <th>Sep</th> <th>Oct</th> <th>Nov</th> <th>Dec</th> <th>Jan</th> <th>Feb</th> <th>Mar</th> <th>Apr</th> <th>May</th> <th>Jun</th> <th>Jul</th> <th>Aug</th> <th>Sep</th> <th>Oct</th> <th>Nov</th> <th>Dec</th> </tr> </thead> </table>															2007		2008												2009													Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2007		2008												2009																																																					
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Calculation of Denominator																																																																			
Implementation Stage																																																																			
Collection Method																																																																			
9.1 What is the total number of patient days for the healthcare facility or department or unit this month? (Monthly measure of "Patient days" for a healthcare facility may be obtained from the Admitting Department of the facility).																																																																			
Calculation of Numerator																																																																			
9.2 What is the total number of patients in # 9.1 newly identified as having a HEALTHCARE-ACQUIRED VRE CLINICAL ISOLATE according to the criteria listed below. *Hospital-acquired VRE infection is defined according to the best judgement of the ICP.																																																																			
Final Calculation																																																																			
9.3 VRE Healthcare Associated Clinical Isolates (one per patient) per 1000 patient days. Divide # 9.2 by # 9.1. Multiply by 1000.																																																																			
GOAL:																																																																			
*The primary goal for this measure is to decrease the HAI-VRE rate by 50% in one year. Using your baseline (generally, this will be your first entry in row 20 above), calculate the goal for your patient population. For this goal rate in every monthly cell in row 21 above. (Please refer to the "SHN Instructions for Data Entry and Submission" for further information on how to calculate your baseline and goal rates).																																																																			
Comments																																																																			

9.0 Incidence of Healthcare-Associated Vancomycin-Resistant Enterococcus (VRE) Clinical Isolates (one per patient) per 1000 *Patient Days - Technical Description

Intervention(s): New Approach to Controlling Superbugs (SB)

Definition: The number of patients with laboratory-confirmed VRE healthcare-associated clinical isolates per 1,000 patient days. This measure reflects the number of patients who were not colonized or infected with VRE prior to admission however, became infected or colonized with VRE during their hospital stay.

Goal: Annual reduction of 50% in rate of VRE clinical isolates

CALCULATION DETAILS:

Numerator Definition: The total number of patients newly identified as having a healthcare associated VRE clinical isolate according to the criteria listed below.

Numerator Inclusions:

- Count as one new clinical isolate per patient per month.
- *Criteria for Identifying a Patient as a "Healthcare-Associated" VRE Case*
 3. *Enterococcus faecium* or *faecalis* from any body site
 4. Isolate high level resistant to vancomycin (vanA or vanB phenotype)
- *Once the patient has been identified with VRE, they will be classified as healthcare-associated based on the "best judgment" of the practitioner. This judgment should include review of:*
 - f. Length of time in hospital prior to VRE identification (generally >72 hours);
 - g. Knowledge of previous VRE status
 - h. Length of stay in hospital
 - i. Prior hospitalization or other healthcare facility history (previously admitted in past 12 months)
 - j. Where patient was admitted from (e.g., long-term care)

Denominator Definition: The total number of patient days for the healthcare facility, department or unit in the monthly sample.

- New infection with onset >48 hours after admission or the infection was present on admission but related to a previous admission to the same facility within the last 12 months.

Denominator Exclusions:

- VRE infection present on admission
- Onset of symptoms of MRSA infection occur ≤48 hours following admission to the healthcare facility
- VRE colonization i.e., the sample is from a colonization surveillance site rather than from a clinical culture.
- As defined by patient sample parameters e.g., healthcare facility, department, unit.

Measurement Period Length: Measure monthly**Definition of Terms:**

- **Infection:** Infection occurs when VRE enters a body site and multiplies in tissue causing clinical manifestations of disease. This is usually evident by fever, a rise in the white blood cell count, or purulent drainage from a wound or body cavity. The distinction between colonization and infection is a clinical one. Such a distinction should be determined by the clinician, not by culture results alone; however you are not being asked to differentiate between the two states in this measure.. Colonized and infected patients are the major reservoirs of VRE.
- **VRE case:** The isolation of *Enterococcus faecium* or *faecalis* exhibiting high-level resistance to vancomycin (vanA or vanB phenotype) from any body site in a clinical isolate (non-screening specimens) obtained from a patient who meets the definition of HA-VRE: the isolate is obtained from the patient a minimum of 72 hours after admission to hospital coupled with knowledge of the patient's previous VRE status, date of admission, length of stay in hospital, prior hospitalization or other healthcare facility history (previously admitted in past 12 months) from where patient is admitted i.e. Long-term Care.

Since the measure is of clinical isolates, all screening culture results are to be excluded. Exclude duplicate or additional specimens from the same patient obtained at the same time i.e., a patient with 3 swabs from a wound that all grow VRE would be counted once - you need one clinical isolate from each infection event per patient.

We are counting one clinical isolate per infection event per patient per month. Should a patient have a new clinical isolate in a subsequent month, it will be up to the judgement of the ICP determine whether the new isolate is related to the prior clinical event or a new event. If it is new, then it should be counted. **For example**, if a patient has VRE obtained from an abscess in the first month, and a repeat tap of that abscess also shows VRE, it would not be counted again. If on the other hand, a patient has an VRE bacteremia that is treated in the first month, and then develops VRE pneumonia in the second month, it would be counted.

- **Patient days:** A measure of a multiple of patient or bed days for a healthcare facility or unit used to standardize the results of the indicator. For this measure the multiple is 1,000 patient days. It is calculated by multiplying by 1,000 the count of patient days for a specific area and month which may be obtained from the Admitting Department of the facility.

Calculate as: The total number of patients newly identified as having a healthcare-associated VRE clinical isolate according to the criteria listed in “numerator inclusions” in the monthly sample_ / Total number of patient days for the healthcare facility, department or unit in the monthly sample x 1000.

Comments: None

COLLECTION STRATEGY:**Data Collection Approach:**

- If your institution has been conducting surveillance on this measure prior to joining *SHN*, you may use previously collected data as baseline. If your organization has not been following these measures prior to *SHN*, start collecting this data prospectively. As this measure takes time to affect change, you may start testing your change ideas immediately.
- Continue to track the measure on a monthly basis. Using the *SHN* worksheet record your data and monitor your improvement on the run chart included in the measurement workbook. Annotate the run chart, with notes reflecting any interventions you made to improve.

Data Accuracy: Data accuracy is enhanced when all definitions are used without modification.

Sampling: Data may be obtained concurrently from all patients per month on a specific unit or the entire healthcare facility

NACS 10 - Incidence of Healthcare-Associated C. difficile acquired disease (HAI-CDAD) Positive Toxin Assay (one per patient) per 1000 *Patient Days - Measurement Worksheet									
Intervention: New Approach to Controlling Superbugs (NACS)									
Definition A healthcare-acquired C. difficile infection is defined as a positive toxin assay 72 hours or more after admission or a positive toxin assay within 72 hours of admission if that patient had hospitalization at that same facility within the previous 4 weeks.									
Case definition: a) laboratory confirmation of a positive toxin assay for C. difficile together with diarrhea OR b) visualization of pseudomembranes on sigmoidoscopy or colonoscopy or histological/pathological diagnosis of pseudomembranous colitis									
Diarrhea is defined as: Three or more loose/watery bowel movements in a 24 hour period The bowel movements are unusual or different for the patient, and There is no other recognized etiology for the diarrhea (for example, laxative use, inflammatory bowel disease)									
Goal Decrease the incidence of CDAD positive toxin assays by 30% in one year									
Data Collection Details									
Hospital Name									
Health Region									
Patient Sample									
Team #									
Hospital Type									
Describe the source of the patient population e.g., entire healthcare facility or per unit									
2007									
2008									
2009									
Calculation of Denominator									
Implementation Stage									
Collection Method									
10.1 What is the total number of patient days for the healthcare facility or department or unit this month? (Monthly measure of "Patient days" for a healthcare facility may be obtained from the Admitting Department of the facility).									
Calculation of Numerator									
10.2 What is the total number of patients in # 10.1 newly identified as having a HOSPITAL-ACQUIRED CDAD positive toxin result according to the criteria listed below. *Hospital-acquired CDAD infection is defined according to the best judgement of the ICP.									
Final Calculation									
10.3 Healthcare Associated CDAD positive toxin result (one per patient) per 1000 patient days. Divide # 10.2 by # 10.1. Multiply by 1000. GOAL*:									
*The primary goal for this measure is to decrease the HAI-CDAD rate by 30% in one year. Using your baseline (generally, this will be your first entry in row 20 above), calculate the goal for your patient population. For Enter this goal rate in every monthly cell in row 21 above. (Please refer to the "SHN Instructions for Data Entry and Submission" for further information on how to calculate your baseline and goal rates).									
Comments									

10.0 Incidence of Healthcare-Associated *C. difficile* (HAI-CDAD) Positive Toxin Assay (one per patient) per 1000 *Patient Days - Technical Description

Intervention(s): New Approach to Controlling Superbugs (SB)

Definition: A healthcare-acquired *C. difficile* infection is defined as a positive toxin assay 72 hours or more after admission or a positive toxin assay within 72 hours of admission if that patient had hospitalization at that same facility within the previous 4 weeks. The number of patients with laboratory-confirmed CDAD healthcare-associated positive toxin assay per 1,000 patient days. This measure reflects the number of patients who were CDAD negative prior to admission however, became positive during their hospital stay.

Goal: Decrease the incidence of CDAD positive toxin assays by 30% in one year

CALCULATION DETAILS:

Numerator Definition: The total number of patients newly identified as having a hospital-acquired VRE clinical isolate according to the criteria listed below. The total number of patients newly identified as having a HOSPITAL-ACQUIRED CDAD positive toxin result according to the best judgement of the Infection Control Practitioner (ICP).

Numerator Inclusions:

- *Case definition:*
 - a) *laboratory confirmation of a positive toxin assay for *C. difficile* together with diarrhea*
 - OR
 - b) *visualization of pseudomembranes on sigmoidoscopy or colonoscopy or histological/pathological diagnosis of pseudomembranous colitis*

Diarrhea is defined as:

- *Three or more loose/watery bowel movements in a 24 hour period*
- *The bowel movements are unusual or different for the patient, and*
- *There is no other recognized etiology for the diarrhea (for example, laxative use, inflammatory bowel disease)*

Count each patient only once regardless of relapse status within the same hospital stay.

We recognize that some patients will be readmitted within a short period of time

Denominator Definition: The total number of patient days for the healthcare facility, department or unit in the monthly sample.

- New infection with onset >72 hours after admission or the infection was present on admission but related to a previous admission to the same facility within the last 4 weeks.

Denominator Exclusions:

- Infection present on admission
- Onset of symptoms of CDAD infection occur ≤ 72 hours following admission to the healthcare facility.
- As defined by patient sample parameters e.g., healthcare facility, department, unit.

Measurement Period Length: Measure monthly

Definition of Terms:

- **CDAD case:** see above
- **Patient days:** A measure of a multiple of patient or bed days for a healthcare facility or unit used to standardize the results of the indicator. For this measure the multiple is 1,000 patient days. It is calculated by multiplying by 1,000 the count of patient days for a specific area and month which may be obtained from the Admitting Department of the facility.

Calculate as: The total number of patients newly identified as a healthcare-associated CDAD positive toxin assay according to the criteria listed in “numerator inclusions” in the monthly sample_ / Total number of patient days for the healthcare facility, department or unit in the monthly sample x 1000.

Comments: None

COLLECTION STRATEGY:

Data Collection Approach:

- If your institution has been conducting surveillance on this measure prior to joining *SHN*, you may use previously collected data as baseline. If your organization has not been following these measures prior to *SHN*, start collecting this data prospectively. As this measure takes time to affect change, you may start testing your change ideas immediately.
- Continue to track the measure on a monthly basis. Using the *SHN* worksheet record your data and monitor your improvement on the run chart included in the measurement workbook. Annotate the run chart, with notes reflecting any interventions you made to improve.

Data Accuracy: Data accuracy is enhanced when all definitions are used without modification.

Sampling: Data may be obtained concurrently from 10 to 20 patients per month on a specific unit or the entire healthcare facility.

Appendix B - Environmental Cleaning

As we said in the GSK, well-done surface cleaning and disinfection is one of the most important ways to prevent and control healthcare-associated infections. Superbugs can survive and even thrive on inanimate surfaces for weeks to months (if only your houseplants needed so little attention). If they are allowed to live in the environment, patients can get colonized with superbugs either directly from room surfaces or via the contaminated hands of a healthcare worker who has just touched a dirty light switch or bedrail.

If you think about it, not all surfaces in the room likely have the same risk of transmitting to patients. For example, the floor in the corner of the room might have *C. difficile* spores on it, but how often would a patient or a healthcare worker touch the floor in the corner? Compare that with a contaminated bed rail, bedside table or privacy curtain: these are touched many times a day by lots of people, including the patient and their family. Some other high touch surfaces include sinks, chairs, call bells, telephones, intravenous lines and poles, blood pressure cuffs, door handles, wall panel controls, thermostats and keyboards. The list goes on. Basically, if people are going to touch the surface a lot it's a high touch surface (yup, infection control is sometimes pretty obvious)

So it should come as no surprise that researchers have shown that the quality of environmental hygiene in hospitals can make a significant impact on reducing the spread of superbugs.

So this supplement to the GSK is meant to help you look at the cleaning practices in your institution and help to improve practice.

“Fun” facts about cleaning and disinfection

Cleaning is the physical removal of foreign material (e.g., dust, soil, organic material such as blood, secretions, excretions and microorganisms). Cleaning physically removes rather than kills superbugs. The cleaning agent used is less important than the thoroughness of the cleaning activity i.e., Basically, elbow grease is more important than what soap you use.

Disinfection is the inactivation of disease-producing microorganisms, including superbugs. Equipment and surfaces must be cleaned thoroughly before effective disinfection can take place. If you think about it, this makes sense since the disinfectant can't come in contact with the bugs you want to kill if they are surrounded by dirt.

Wake up, this stuff is important!

Five steps to a cleaner, brighter facility

1. Begin with an assessment of your environment. Reduce clutter, keep minimal supplies in rooms (enough for an 8 hour shift) and remove unnecessary equipment. The more supplies that are kept in a room of a patient with a superbug, the more supplies will be contaminated by superbugs. Have you ever tried to clean a sterile dressing? Can't be done dude—all the supplies will need to be thrown out before the next patient arrives.
2. Look at your process for cleaning and disinfection to ensure that there is responsibility assigned for these processes. This sounds obvious at first glance, but in our experience, one can very quickly find lots of examples where this actually isn't clear. Do you have computers in patient rooms or in the hallways? Who cleans them? Are they cleaned before or after use?
3. Make sure you have a clear, routine cleaning schedule and that it follows best practice.
4. Once your schedule is established, your facility also needs to assign responsibility and accountability to both managers and staff for keeping to the schedule to ensure that all the stuff that needs to be cleaned is actually being cleaned. In our experience this is where many facilities run into trouble i.e. have you ever said: "yes we have a policy...but nobody follows it..."?
5. You need to track what is going on, identify where things are working well, and where they are not, learn and make changes, and track again. This is one of the areas in infection control where the traditional quality improvement strategy of PDSA cycles seems to work quite well, at least in some facilities (for more information on PDSA cycles, including what PDSA stands for, please see the GSK supplement on PDSA cycles). Please note though that nothing stops you from improving using another technique like Positive Deviance. Once again, you need to figure out what works best in your setting. Whatever technique you decide to use, it is absolutely critical that Environmental Services are a key player. Ideally, they should be the leader of the improvement process. If observations are completed by those doing the work it is more successful and leads to team building and cooperation. Front line workers are much more likely to pay attention to the findings of their own co-workers, staff nurses, nurse aides, and environmental services staff. Once you have agreed on the findings, the team can get together to find ways to build on the positive findings and eliminate any identified barriers that are getting in the way to a cleaner and safer environment.

Some examples of improvement strategies that have worked in facilities that are probably similar to yours:

- Assessing effectiveness of cleaning by using environmental “tracers” (Glo Germ™ or GlitterBug™) that can highlight surfaces that were skipped in the cleaning process when exposed to UV light. It has been our experience that people often like this strategy. Basically, choose 10 or so high touch surfaces, swab them with a tracer, clean the room as you normally would, and then see if the tracer is all gone. Feedback the results and try again (we have attached an audit tool from the previous GSK to get your started). You are making improvements and the stuff glows! It doesn’t get any better than that in the quality improvement world!
- Using checklists to document that all areas were cleaned as per the schedule, especially those that are “high touch”. This is similar to the tracer strategy above but without the tracer.
- Developing observational tools to measure if policies/checklists are being followed correctly. This involves directly auditing the performance of environmental staff. You can see how important it is that environmental staff be driving the improvement process, otherwise it could be pretty threatening.
- Verifying competence in cleaning and disinfection procedures using observational tools. Again, this involves direct auditing.
- Scheduling specific cleaning times for rooms of patients in isolation or on contact precautions.
- Using immediate feedback mechanisms to assess cleaning and reinforce proper technique.
- Developing educational materials that are tailored to the language and cultural needs of the staff;¹ and
- Including visitors and patients on the team. If motivated and given the resources (disinfectant wipes), they can help by wiping phones, computers, bed tables, TV remotes after use.

Sample Audit Process and Tool: Percent Appropriate Environmental Cleaning Practice Using Fluorescent Marker

Intervention(s): Reduction of superbugs

Definition: The percentage of “High Touch Areas”* in the patient environment where there was appropriate environmental cleaning as demonstrated by the complete removal of the Fluorescent Marker. Compliance by individual HIGH TOUCH AREA is also monitored. It is recommended that FIVE audits of the patient environment be conducted per week.

Goal: 100% removal of Fluorescent marker on all High Touch surfaces

CALCULATION DETAILS:

Numerator Definition: The total number of “Cleaned” for all High Touch Areas by:

3. Overall for all High Touch Areas where observations were made;
4. Individual High Touch Area where observations were made (see photo below):
 1. Bed Rails
 2. Bedside Tables
 3. Call Bells
 4. Bedside Light Switches
 5. Bedside Telephones
 6. Bed Adjustment Buttons
 7. Chairs
 8. Overbed Tables
 9. Washroom: Toilet Seat
 10. Washroom: Towel Dispenser



Numerator Exclusions:

- None

Denominator Definition: The total number of ALL observations for Environmental Cleaning Practice on High Touch Surfaces in the monthly sample.

Denominator Exclusions:

- None

Measurement Period Length: Measure monthly.

Definition of Terms:

- **High Touch Areas:** surfaces that are easily and frequently touched by healthcare workers and patients and are known from medical literature to be typically contaminated when a patient with MRSA is occupying that bed.
- **Fluorescent Marker:** product (lotion or powder) that is visible under UV light and used as a surrogate marker for bacteria to determine the effectiveness of environmental cleaning procedures. Sold under the product name “GlitterBug”.

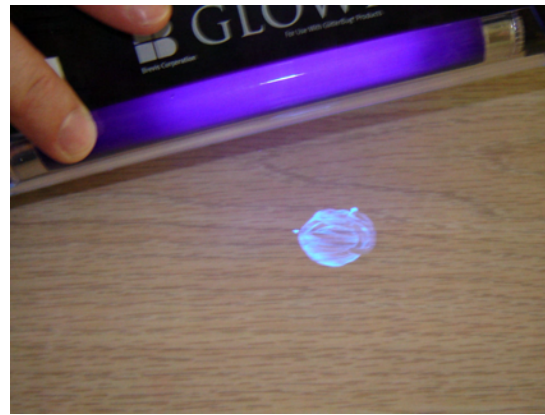
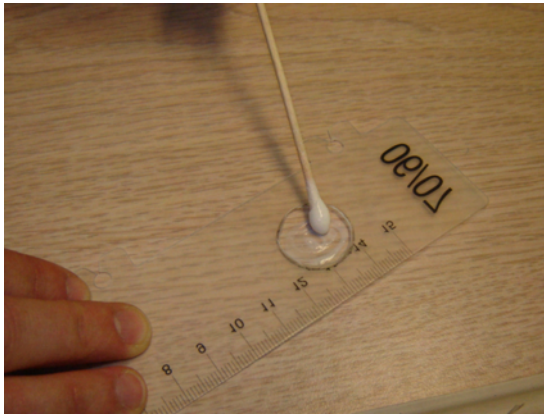
Calculate as: The sum of the number of “Cleaned” observed on High Touch Surfaces listed above monthly sample appropriate Hand Hygiene / Number of observations x 100.

Comments: None.

COLLECTION STRATEGY:

- Prior to implementing this measure we recommend you discuss the process with your department of Environmental Services (Housekeeping) and include a representative on your team.
- Choose the area to audit. It could be a particular floor or unit, program, or facility where you are focusing other MRSA interventions. Five audits of patient environments should be performed weekly. A patient’s environment encompasses the surfaces and equipment in a patient’s immediate vicinity such as their bed, bedside tables and chairs, and their washroom. Thus, a single room would be counted as one patient environment whereas a four bedded room would have 4 distinct environments plus typically one washroom shared amongst all 4 patients.

Create a template using a piece of plastic with a dime-sized cutout. This will be used to allow you to put a standard amount of GlitterBug[™] on each of the high touch areas to be audited. Dab a small amount of GlitterBug[™] on a cotton swab and rub the surface using the template, making sure that the amount of remaining material is not easy to see without the aid of the fluorescent lamp.



Following placement of the GlitterBug[™], the room should then be cleaned using your standard housekeeping protocol. It does not matter what type of cleaning is being performed (routine daily cleaning versus terminal or discharge cleaning) as it is assumed these high touch surfaces would be cleaned regardless. As soon as possible after cleaning, view each of the marker areas using a fluorescent lamp and score the amount of remaining marker at each site using the following scale:

0 - Not removed (all or some of the product is visible)

1 - Removed (no product is visible)

Adding up the numeric values for each site will give an overall score for that room (maximum score is 10). The higher the number the better the score.

Please note that more porous or textured surfaces may require additional friction for the GlitterBug[™] marker to be removed. It is recommended that a sample room be completed using the protocol to be used as baseline before data collection begins. Also, the longer the time interval between cleaning and viewing the audit sites the more likely that some product will be removed by staff or patients touching the surfaces. This may give a falsely high score.

DATA COLLECTION APPROACH:

Data Accuracy: Data accuracy is enhanced when all definitions are used without modification.

Sampling: Data may be obtained concurrently from 10 to 20 patients per month on a specific unit or the entire healthcare facility.

4.0 Reduction in Mean Time to Placement on Contact Precautions for Patients with Known or Probable MRSA at Time of Admission - Measurement Worksheet		2008													
		Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Reduction of Methicillin-Resistant <i>Staphylococcus aureus</i> (MRSA) Intervention Reduction of Methicillin-Resistant <i>Staphylococcus aureus</i> (MRSA) Definition The reduction of the mean elapsed time to being placed on contact precautions (CP) for patients with known or probable MRSA colonization or infection at the time of hospital arrival. The recommended industry standard for the time from hospital arrival to placement on CP for this patient population is within 2 hours of hospital arrival. These are patients who have already been identified as MRSA Positive. Goal Decrease the mean time to placement on CP by 50% in one year Data Collection Details Hospital Name Health Region Patient Sample <i>Describe the source of the patient population e.g. ICU, Burn Unit, General Medicine Unit, Healthcare Facility</i>															
Calculation of Denominator															
Implementation Stage															
Collection Method															
4.1 What is the total number of patients with known or probable MRSA colonization or infection at the time of hospital arrival in this month's sample?															
Calculation of Numerator															
4.2 What is the total number of hours required for the patients in # 4.1 to be placed on Contact Precautions from the time of hospital admission? (add the time in hours with 1 decimal eg 1.5) for each patient to be placed on CP and enter the total in this box															
Final Calculation															
4.3 Mean time to placement on CP. Divide # 4.2 by # 4.1 GOAL:		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
The goal for this measure is to decrease the mean time to being placed on Contact Precautions by 50% in one year. Using your baseline rate, calculate the Goal for your patient population. For example, if the baseline mean rate for your patient sample is 8.6 hours, your goal rate would be 18.6. $(8.6 \times 1.5) = 12.9$ hours. Enter your goal rate in each of the monthly cells in row 22 above.															
Comments															

Data Entry Sheet

Submitted By

Appendix C - Plan-Do-Study-Act Cycle

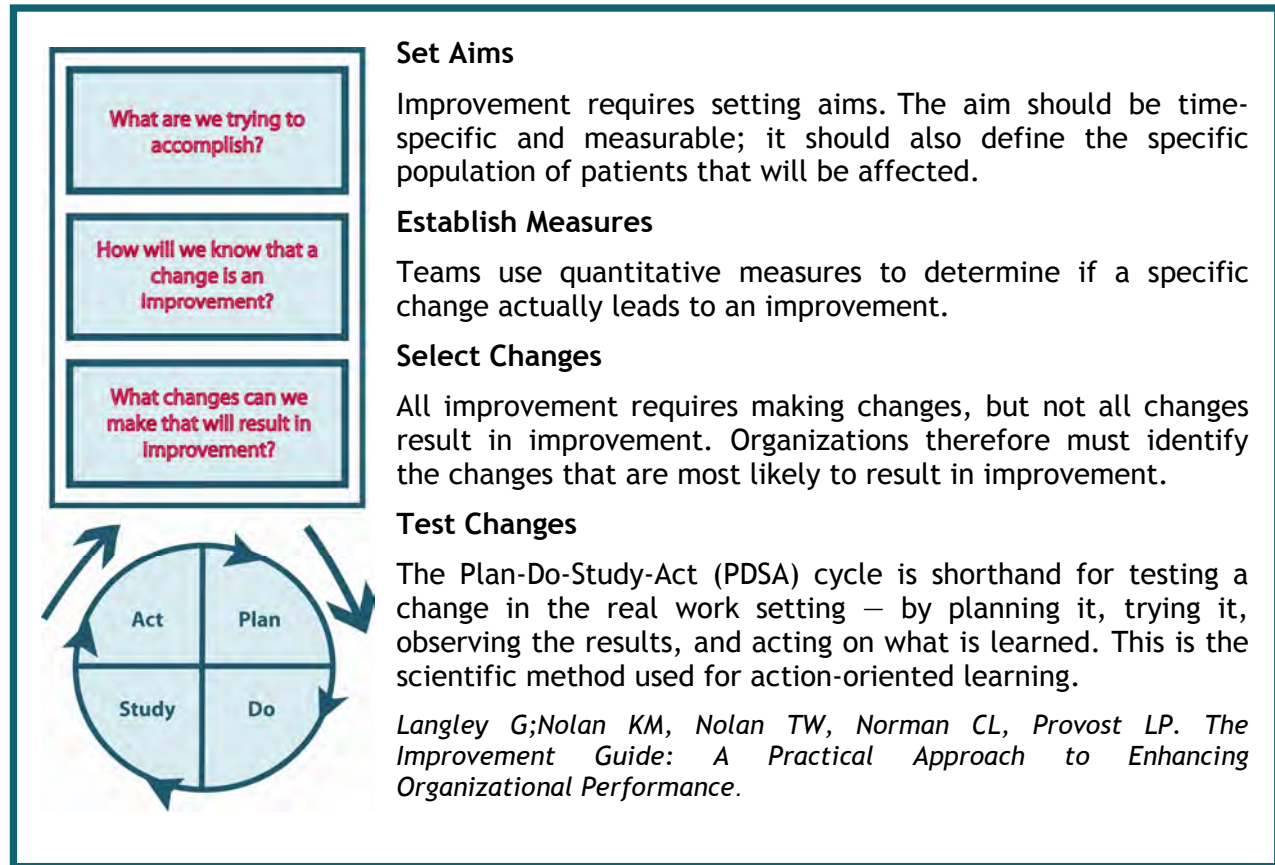
Using the Model for Improvement to Accelerate Change

The **Model for Improvement**, developed by Associates in Process Improvement, is a simple yet effective tool not meant to replace change models that organizations may already be using, but rather to accelerate improvement. As we discussed in the GSK, the Plan-Do-Study-Act (PDSA) cycle, which is a big part of this model, has been used to bring about many quality improvements in healthcare. In the original GSK for reducing MRSA infections, it was the main quality improvement strategy discussed. We agree that there are many issues where the PDSA cycle can be used to bring about improvements. We have also found that when it comes to infection control issues that are rooted in healthcare worker culture or behaviour, it may not be as effective. For example, the PDSA cycle may work well at ensuring that the appropriate personal protective equipment (PPE) is always available for staff to wear but may be less helpful at actually improving physician compliance with wearing PPE.

We can't tell you whether the PDSA cycle is the right tool to help you solve an infection control problem; this is something you need to figure out taking into consideration the culture of your organization and the nature of the problem. If the problem you are facing has been around a long time and has been resistant to previous improvement attempts, it may be that a technique like positive deviance (PD) is a more appropriate tool. Also, nothing stops you from combining the PDSA cycle with other techniques like PD.

The Improvement Model has two parts:

- Three fundamental questions, which can be addressed in any order.
 1. What are we trying to accomplish?
 2. How will we know that a change is an improvement?
 3. What changes can we make that will result in improvement?
- The PDSA cycle guides the test of a change to determine if the change is an improvement.



A. Set Aims (Goals and Objectives)

Improvement requires setting aims. An organization will not improve without a clear and firm intention to do so. The aim should be time-specific and measurable; it should also define the specific population of residents that will be affected. Agreeing on the aim is crucial; so is allocating the people and resources necessary to accomplish the aim.

Setting an aim can assist teams to focus on what they are hoping to achieve when implementing MRSA reduction strategies. The aim should be time-specific, measurable and define the specific population who will be affected.

The following are examples of aims at the organizational level:

1. Improve hand hygiene of all healthcare workers on unit X from 30% to 90% by June 2010.
2. Improve compliance with all isolation precautions for MRSA patients to 100% by June 2010.

As teams work on different elements of the bundle, the aims should be specific to what it is they are hoping to achieve at that point.



B. Establish Measures

Measurement is a critical part of testing and implementing changes; measures tell a team whether the changes they are making actually lead to improvement. Measurement for improvement should not be confused with measurement for research. This difference is outlined in the chart below:

	Measurement for Research	Measurement for Learning and Process Improvement
Purpose	To discover new knowledge	To bring new knowledge into daily practice
Tests	One large “blind” test	Many sequential, observable tests
Biases	Control for as many biases as possible	Stabilize the biases from test to test
Data	Gather as much data as possible, “just in case”	Gather “just enough” data to learn and complete another cycle
Duration	Can take long periods of time to obtain results	“Small tests of significant changes” accelerates the rate of improvement

Three Types of Measures

Use a balanced set of measures for all improvement efforts:

1. **Outcome Measures (voice of the patients):**
How is the system performing? What is the result?
2. **Process Measures (the workings of the system):**
Are the parts/steps in the system performing as planned?
 - Percentage of healthcare workers washing their hands.
3. **Balancing Measures (looking at a system from different directions/dimensions):**
Are changes designed to improve one part of the system causing new problems in other parts of the system? This measure often addresses resident/staff satisfaction and workload issues.
 - Time to put patient on isolation precautions after test results received on unit.

Measuring for improvement starts with collecting baseline data to determine the seriousness of the problem to help motivate stakeholders. Then, collect data regularly to track the effectiveness of change over time.

C. Select Changes

While all changes do not lead to improvement, all improvement requires change. The ability to develop, test, and implement changes is essential for any individual, group, or organization that wants to continuously improve. There are many kinds of changes that will lead to improvement, but these specific changes are developed from a limited number of change concepts.

A change concept is a general notion or approach to change that has been found to be useful in developing specific ideas for changes that lead to improvement. Creatively combining these change concepts with knowledge about specific subjects can help generate ideas for tests of change. After generating ideas, run Plan-Do-Study-Act (PDSA) cycles to test a change or group of changes on a small scale to see if they result in improvement. If they do, expand the tests and gradually incorporate larger and larger samples until you are confident that the changes should be adopted more widely.

D. Test Changes

Once a team has set an aim, established its membership, and developed measures to determine whether a change leads to an improvement, the next step is to test a change in the real work setting. The Plan-Do-Study-Act (PDSA) cycle is shorthand for testing a change — by planning it, trying it, observing the results, and acting on what is learned. This is the scientific method used for action-oriented learning.

Reasons to Test Changes

- To increase your belief that the change will result in improvement.
- To decide which of several proposed changes will lead to the desired improvement.
- To evaluate how much improvement can be expected from the change.
- To decide whether the proposed change will work in the actual environment of interest.
- To decide which combinations of changes will have the desired effects on the important measures of quality.
- To evaluate costs, social impact, and side effects from a proposed change.
- To minimize resistance upon implementation.



Steps in the PDSA Cycle

Step 1: Plan

Plan the test or observation, including a plan for collecting data.

- State the objective of the test.
- Make predictions about what will happen and why.
- Develop a plan to test the change (Who? What? When? Where? What data need to be collected?).

Step 2: Do

Try out the test on a small scale.

- Carry out the test.
- Document problems and unexpected observations.
- Begin analysis of the data.

Step 3: Study

Set aside time to analyze the data and study the results.

- Complete the analysis of the data.
- Compare the data to your predictions.
- Summarize and reflect on what was learned.

Step 4: Act

Refine the change, based on what was learned from the test.

- Determine what modifications should be made.
- Prepare a plan for the next test.

Example of a Test of Change (Plan-Do-Study-Act Cycle)

Depending on the aim, teams choose promising changes and use Plan-Do-Study-Act (PDSA) cycles to test a change quickly on a small scale, see how it works, and refine the change as necessary before implementing it on a broader scale. The following example shows how a team started with a small-scale test.

Implementing Hand Hygiene Interventions

Plan:	Observation shows that the supplies at the entrance of an isolated patients room are often missing key items such as: different sizes of gloves
Do:	Ask the nursing aid on day shift to assess and stock patient care room twice a day
Study:	Nurse aid reports that it is easy to forget; and only got to it once during the shift
Act:	Suggestion for PDSA #2: to “tie” this step into medication rounds. A red card with isolation precautions written on it sits on the med cart as a reminder

Implement Changes

After testing a change on a small scale, learning from each test, and refining the change through several PDSA cycles, the change is ready for implementation on a broader scale—for example, for an entire pilot population or on an entire unit. Implementation is a permanent change to the way work is done and, as such, involves building the change into the organization. It may affect documentation, written policies, hiring, training, compensation, and aspects of the organization's infrastructure that are not heavily engaged in the testing phase. Implementation also requires the use of the PDSA cycle.

Example:

Testing a change:

Three environmental cleaning staff (one from each shift in a 24 hour period) use a new “checklist” for room cleaning to obtain feedback on ease of use, format of the form etc.

Implementing a change: All environmental staff on the unit use the new “checklist” for room cleaning.



Spread changes

Spread is the process of taking a successful implementation process from a pilot unit or pilot population and replicating that change or package of changes in other parts of the organization or other organizations. During implementation, teams learn valuable lessons necessary for successful spread, including key infrastructure issues, optimal sequencing of tasks, and working with people to help them adopt and adapt a change.

Spread efforts will benefit from the use of the PDSA cycle. Units adopting the change need to plan how best to adapt the change to their unit and to determine if the change resulted in the predicted improvement.

As experience develops and measurement of the success of your superbug reduction strategies process reflects sustained improvement the process can be implemented for more patients in more areas. Evaluate at each new step before adding more units to the process. Retest the pilot process on new units in order to identify any revisions that may be needed. The roll-out across an organization requires careful planning to move through each of the major implementation phases.



A key factor for closing the gap between *best* practice and *common* practice is the ability of healthcare providers and their organizations to spread innovations and new ideas. The IHI's 'A Framework of Spread: From Local Improvements to System-Wide Change' will assist teams to develop, test and implement a system for accelerating improvement by spreading change ideas within and between organizations. This paper will assist teams to "prepare for a spread; establish an aim for spread; and develop, execute, and refine a spread plan." Some issues to address in planning for spread include training and new skill development, supporting people in new behaviors that reinforce the new practices, problem solving, current culture regarding change, degree of buy-in by staff, and assignment of responsibility.

Further information on sustaining and spreading improvements can be accessed by using the following link: www.ihl.org/IHI/Results/WhitePapers/AFrameworkforSpreadWhitePaper.htm

Example:

If key change ideas such as increased access to alcohol based hand rub both on units, and painted symbols on the floor have contributed to improving hand hygiene, then spread would be sharing these successes to occur in all units in a step-wise fashion throughout the organization and assisting the units in adopting or adapting the change.

Communication

Infection Control Practitioners are skilled at collecting and reporting data on healthcare-associated infections. However, often the structures needed to give this information back to the healthcare workers in a meaningful way- front-line staff and leadership - are lacking. Unless the front-line healthcare workers feel "ownership" of the data; it will be difficult to expect change. Front-line healthcare workers need to be included in the discussion on how the surveillance data is tied to the interventions they are implementing on the unit. Teams will accelerate their improvement activity if they can see the numbers are improving. This data feedback loop is a critical component.

Successful superbug control strategies all include creating a systematic way to give feedback to all those involved in control efforts and a way to follow-up on this feedback. Figuring out how to do this can sometimes be more challenging than the intervention. However, finding a way to effectively give information to both frontline workers and leadership is crucial to success.^{1,2}

A successful MRSA reduction program in Toronto moved from standard infection control strategies to a program of "structured communication with frontline workers, senior administration and other stakeholders of quantitative data with respect to care outcome, practice standards, the role of the environment and economic impact on a regular basis." During the first year of the implementation of this strategy, they achieved a 60% hospital-wide drop in the incidence of healthcare-associated MRSA transmission.³

1 A Multidisciplinary Approach to Reducing Outbreaks and Nosocomial MRSA in a University-Affiliated Hospital Vol. 9 Special Issue | Patient Safety Papers Healthcare Quarterly, 9(Sp)2006:54-60 Maryam Salaripour, Pat McKernan, Roslyn Devlin and the Infection Prevention and Control Team

2 Gandhi, T.K., E. Graydon-Baker, C.N. Huber, A.D. Whittemore and M. Gustafson. 2005. "Closing the Loop: Follow Up and Feedback in a Patient Safety Program." Joint Commission Journal on Quality and Patient Safety 31(11): 614-21.

3 Curran, E.T., J.C. Benneyan and J. Hood. 2002. "Controlling Methicillin-Resistant Staphylococcus aureus: A Feedback Approach Using Annotated Statistical Process Control Charts." Infection Control and Hospital Epidemiology 23(1): 13-18.

Another hospital in the US study found that “the use of statistical control charts and monthly feedback to medical staff, ward managers, and senior managers resulted in a 50% reduction in the overall MRSA rate and an associated decrease in variability within departments.”⁴

A report from a successful program in Pittsburgh noted: “The whole process is bathed in information. Thanks to the surveillance system, data are generated on a regular basis and given to each unit. Staff analyzes the data and act accordingly.”⁵

Some communication examples:

- Include a review of data at weekly staff meetings;
- Provide charts showing cases of MRSA among new patients or any cases of transmission to patients in the last week. These may be displayed at nursing stations;
- Review hand hygiene, cleaning and precaution audit results jointly as a team. During the discussion focus and emphasize on what went well with the audit. Then, as a group, identify places for improvement; and
- If transmission is occurring or audit results are not meeting your goals:
 - a. Brainstorm to figure out why compliance is low or how transition happened.
 - b. Encourage everyone involved to identify what is working and what is not.
 - c. Use these findings to support staff to build on what is working and also support their efforts to create innovative new practices.

The most important point is that you want to develop individually tailored ideas for your unit, team and facility. Available resources, MRSA burden, patient population and many other variables are all going to be different around the country and therefore your solutions must be “home grown” to work.

Examples of audits:

- hand hygiene observations;
- hand hygiene resource availability;
- appropriate use of contact precautions;
- checklists of environmental cleaning;
- use of Glo Germ™ or GlitterBug™ to assess thoroughness of hand hygiene and environmental cleaning;
- percent of admission swabs done of those that were required; and/or
- length of time from sending MRSA cultures to the lab to receiving results and placing patients on precautions, if appropriate.

4 Curran, E.T., J.C. Benneyan and J. Hood. 2002. “Controlling Methicillin-Resistant Staphylococcus aureus: A Feedback Approach Using Annotated Statistical Process Control Charts.” *Infection Control and Hospital Epidemiology* 23(1): 13-18.

5 “Do What You Can, With What You Have, Where You Are.” Plexus Institute 2007 A Quest To Eliminate MRSA At the VA Pittsburgh Healthcare System. by A. Singh and Karen Greiner