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Building a Team to Reduce Surgical Site Infections

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Building a Team to Reduce Surgical Site Infections

Purpose of the Toolkit

The purpose of this toolkit is to lead hospitals through the key elements that are essential in building a successful team to reduce surgical site infections (SSI). The toolkit will provide information regarding how to develop a team, assess work practices, identify gaps, develop an action plan, implement changes, and evaluate success.

Team Development

There should be at least two staff members to lead the team. Staff to consider:

- Nurses from preadmission testing
- Nurses from the pre-op holding area
- OR nurses
- PACU nurses
- Infection preventionists
- Nurse educator
- Physician or mid-level provider champion

Once the team is formed, a meeting should be scheduled to decide:

- Frequency of meetings
- Team communication (e.g. email, text message, staff lounge bulletin board)
- Data review (SSI), and completion of the self-assessment
- How to identify gaps and develop a plan to move forward

To keep everyone engaged, it is important to connect **what** you are doing to the **why** you are doing it. Do team members have a personal experience with a hospital-associated infection? Do team members remember a patient's experience that can be shared? No one wants to intentionally cause a patient harm, so having a patient story can energize the team to improve practices.

To work effectively as a team, you will need to have shared knowledge and shared attitudes. The more engaged your team is, the greater the likelihood of success. Teams are driven by "what's in it for me?" and "how will the change in practice improve patient care?"

Everyone's voice is important, but don't get stuck trying to "fix" everything. Hospitals need to identify problems or gaps in practices, decide on the actions to address them, and implement a plan.

Gap Analysis

The gap analysis can be done by taking a [quick survey](#).



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The survey may be taken as a team, or if time is limited, by a senior staff member that is familiar with the practices of the perioperative area. The results will summarize your current SSI practices related to decolonization for Class I elective surgeries and for practices related to prevention of colon SSI. The team will also learn about the culture and attitudes in the organization.

The team should now have a good idea of the gaps in practice and attitudes that need improvement.



Action Plan & Implementation



Now that the team has identified gaps in practice, it's important to narrow down the ones you want to work on. This can be done by picking the easiest to accomplish, or by picking the one most likely to reduce infections. No matter what is chosen, it should be done with input from the entire team. One way to do this is to post "gaps" in a common area and ask staff to prioritize them. This will help get buy in with better engagement and success.

Once you know what the team will work on, develop a plan for implementation.

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- Brainstorm ideas of what will work to meet your goal. Remember, goals should be measureable, achievable, and realistic.
- Designate who will be responsible for disseminating the information/ interventions/data to the staff in various areas.
- Designate who will collect the audits.
- Decide how feedback will be collected from staff. What is working and what is not? What needs to be tweaked? Once you know what the team will work on, develop a plan for implementation.

Once you have implemented your plan, be sure to let staff know how the action plan is progressing. What data can you share?

- Infection rates and SIRs
- Compliance with parts of the SSI bundle

There should be a place on the unit that is dedicated to this collaborative where feedback and results may be posted. It is well known that data can drive change.

Have your team develop a name for the project and a creative way to display the data.

Remember, not everyone changes at the same rate. Some will adopt new practices earlier than others. It's important to know that everyone has the ability to change but it may take some longer than others. The aim is to ingrain best practices so that when the collaborative is over, these practices are part of routine patient care.

Education and Interactions

Was lack of education one of the gaps identified?

There is an eLearn module available for use on [SSI prevention](#).

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Let's look at what are best practices for the reduction/prevention surgical site infections.

Decolonization Best Practices

In order to reduce Class I surgical site infections, many departments must work together. Below are the elements each department must perform to make the overall collaborative successful.

Pre-admission testing (PAT)

- Perform pre-operative screening using a nasal swab for Methicillin Sensitive *Staphylococcus aureus* (MSSA) and Methicillin Resistant *Staphylococcus aureus* (MRSA). Some hospitals chose to skip this step and use nasal iodine, or an alcohol-based nasal antiseptic on select or **all** patients before surgery
- Nasal decolonization for patients that are positive for MRSA or MSSA can occur in either of two ways:
 - Treatment with two percent mupirocin ointment which is applied by the patient twice a day for five days prior to surgery, or
 - Use five percent povidone-iodine nasal solution or an alcohol-based nasal antiseptic in the pre-operative area just before surgery
- Educate the patient about chlorhexidine gluconate (CHG) bathing the night before and morning of surgery. Remind patients about this when they are called with their surgery time
- Screen for malnutrition, diabetes, smoking, and infections
- Provide nutritional counseling and intervention before surgery if the patient's condition requires it (i.e. albumin less than 3.0 g/dl)

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- Refer patients to a smoking cessation program if necessary. Patients should ideally stop smoking 30 days before surgery

What is the protocol in your hospital?

If a hospital does not have a PAT department, education on the above items must be provided to the staff in the surgeons'/physicians' offices so they can competently provide this information to patients. Most facilities that have successfully implemented CHG bathing have given the patient the product and instructions for use. Preoperative [educational materials](#) should be standardized for surgery preparation and SSI prevention.

Provide teaching materials to physician clinics, pre-operative areas, and the hospital's PAT department.

The prep holding/pre-op area

- Initiate the paper data collection sheet or document in electronic medical record
- Ascertain if patient performed CHG bathing
- Ascertain if patient performed mupirocin decolonization if they were MRSA/MSSA positive and directed to do so
- Apply the nasal iodine swab or alcohol based nasal antiseptic if it is your hospital policy and meets approved criteria (e.g., correct procedure, positive screen, emergent, unknown, etc.)
- Cleanse patient's operative area with CHG
- Clip hair as close to OR time if needed, but perform outside the OR or use a clipper with a vacuum if done in the OR



Intra-op

- Prep patient with an alcohol-based CHG or iodine product
- Give weight-based prophylactic antibiotics within one hour of cut time unless it is vancomycin or fluoroquinolones

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- Re-dose with antibiotics every three to four hours, depending on the antibiotic given

Surgical team

- Apply a standard occlusive sterile dressing to the post-op wound. Surgeons might decide to consider an antiseptic impregnated dressing or silver dressings if SSIs are frequent
- Keep OR traffic to a minimum

Post-surgery patient

- Educate the patient to wash their hands and not touch their post-op dressing
- Keep site covered with a sterile dressing which is maintained for at least 24 to 48 hours or changed aseptically if there is a need to disturb it
- Discontinue Foley catheter as soon as possible if one was inserted
- Educate patient on wound care and signs and symptoms of infection
- Address the patient's pain

Bundle to prevent colon SSI

Like best practices to prevent Class I SSI, the prevention of colon SSI involves the cooperation of many departments. There is overlap in practices such as skin decolonization and prep, both pre-op and intra-op, and how the patient is processed in pre-admission testing.

Pre-admission testing will need to

- Educate the patient about chlorhexidine gluconate (CHG) bathing the night before and morning of surgery. Remind the patient when they are called with their surgery time
- Screen for malnutrition, diabetes, smoking, and infections
- Provide nutritional counseling and intervention before surgery if the patient's condition requires it (i.e. albumin less than 3.0 g/dl)
- Refer patients to a smoking cessation program if necessary. Patients should ideally stop smoking 30 days before surgery
- Provide instructions for full bowel prep (pre-op oral antibiotics and mechanical bowel prep)

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For those facilities that do not have PAT departments, education must be provided to physician offices. Most facilities that have successfully implemented CHG bathing have given the patient the product as well as [instructions](#) for use



The prep holding/pre-op area

- Initiate pre-warming
- Check glucose level
- Cleanse patient's operative area with CHG
- Clip hair as close to OR time (if needed) but perform outside the OR. Use a clip vac if clipping inside the OR
- Initiate paper data collection sheet or document in electronic medical record (EMR)

Intra-operative

- Prep patient with an alcohol-based prep
- Give weight-based prophylactic antibiotics within one hour of cut time unless it is vancomycin or a fluoroquinolone
- Re-dose with antibiotics every three to four hours depending on the antibiotic given
- Warm patient to ≥ 36 degrees Celsius
- Maintain glucose level at less than 200 mg/dl
- Administer increased perioperative oxygen unless contraindicated

Surgical team

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- Use a wound protector to protect margins
- Change gown (if visibly soiled), gloves, and instruments prior to fascia closure
- Leak test anastomosis
- Increases oxygenation unless contraindicated
- Apply a standard occlusive sterile dressing to the post-op wound
- Keep OR traffic to a minimum



Post-operative

- Keep patient warmed to maintain normothermia
- Check glucose level and maintain at less than 200 mg/dl
- Have patient continue to receive increase inspired oxygenation for two hours or until discharge from PACU

Post-surgery

- Educate patient to wash their hands and not touch their post-op dressing
- Keep site covered with a sterile dressing and maintained for at least 24 to 48 hours or until changed

Measurement of Processes & Outcomes

Infection rates (outcome measures) are tracked to determine the level of improvement in a hospital's performance.

Rates/100 procedures are obtained from NHSN after conferral of rights are granted. The HAI project managers will develop dashboards that graphically show how individual hospitals' infection rates and compliance with process measures are progressing.

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Processes audited will depend on the whether hospitals are striving to improve Class I SSI or colon SSI.

In the best practices section, recommended evidence-based practices for reducing SSIs were described.



Audits practices for Class I surgeries

- Number of procedures performed
- Number of patients screened for MSSA/MRSA before surgery
- Number of patients positive for MSSA/MRSA before surgery
- Number of patients decolonized with mupirocin for five days before surgery or decolonized with nasal iodine or an alcohol based nasal antiseptic before surgery
- Number of patients performing CHG bath before surgery (patient must have performed CHG wiping and/or bathing the night before and morning of surgery)
- Number of patients receiving CHG cleansing in pre-op area
- Number of patients treated with an alcohol based OR skin prep

Audit Tool for Decolonization Bundle

Patient Identifier	Screened for MSSA/MRSA	Positive for MSSA/MRSA	Decolonized with mupirocin or nasal iodine	CHG bathing at home	CHG cleanse pre-op	Alcohol based OR skin prep

Processes that should be audited for colon surgery

- Number of procedures performed
- Number of patients performing CHG bath before surgery

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- Number of patients receiving CHG bath pre-op
- Number of patients with pre-op glucose monitoring
- Number of patients with pre-op temp $\geq 35.5^{\circ}$
- Number of patients receiving alcohol based OR prep
- Number of patients with intra-op glucose monitoring
- Number of patients with intra-op temp of $\geq 35.5^{\circ}$
- Number of patients with increased oxygenation
- Number of patients given weight-based antibiotics given w/in one hour of incision time
- Number of times gloves changed before closing
- Number of patients with post-op glucose monitoring
- Number of patients with post-op temp of $\geq 35.5^{\circ}$

Identifier	Patient CHG shc	Pre-op CHG bai	Pre-op glucose	Pre-op temp ≥ 36	Alcohol based pi	Abx wt dosed w	Intra-op glucose	Intra-op temps \geq	Increased Oxyge	Gowns & gloves	PACU glucose	PACU temps

The data collection form for this project should be done concurrently and not retrospectively. The data sheet should be generated in pre-op/prep holding and finished in PACU where it can be collected.

Codes should be Y=yes, N=no and 0=not applicable (e.g. patient has abnormal pulmonary function and cannot tolerate increased oxygenation, or a patient did not perform CHG bathing at home because it was an emergent surgery).

Under "Identifier," hospitals may choose to populate if it would be helpful to trace back to a particular patient for education purposes. For example, hospitals may choose to use initials, or a number.

On the colon surveillance form, note that glucose levels not tested for non-diabetic patients should not be coded as 0, not applicable. Thirty percent of hyperglycemic episodes occur in non-diabetic patients undergoing surgery.

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Hospitals may have a number of “N”s (no) in the beginning of the project as they implement different parts of the bundle. We do not require hospitals to record blood sugar levels; only that they are checked. If hospitals later find an infection in that patient, they may want to check levels to determine if follow-up is necessary for untreated hyperglycemia. When intra-op temperatures are collected, as long as the majority (i.e. at least 75%) are greater than or equal to 35.5 degrees, hospitals may check “yes.” Hospitals wishing to collect this information electronically should check with their IT department. Since this is a short term collaborative, hospitals may want to collect audits manually until data can be gotten electronically.

Websites

- [AHRQ Patient Safety Network](#)
- [Institute for Healthcare Improvement How-to Guide: Prevent Surgical Site Infections](#)
- [World Health Organization Global Guidelines for the Prevention of Surgical Site Infection](#)
- [New York State Partnership for Patients Colon Bundle](#)
- Glucose Control Algorithm: [Randomized Study of Basal-Bolus Insulin Therapy in the Inpatient Management of Patients With Type 2 Diabetes Undergoing General Surgery \(RABBIT 2 Surgery\)](#)

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