



Road Map to a Comprehensive Surgical Site Infection (SSI) Prevention Program

The **Safe CUTS road map** provides evidence-based recommendations/standards for Minnesota hospitals in the development of comprehensive surgical site infection (SSI) prevention programs. The road map and accompanying tool kit were developed as part of the Minnesota SSI Prevention Collaborative which was made possible with funding through the Centers for Disease Control and Prevention (CDC) Epidemiology and Laboratory Capacity Program (ELC) American Reinvestment and Recovery Act (ARRA).

The road map was written with elective, inpatient surgery in mind, and can be adapted for use in other settings such as ambulatory or emergency surgery. However, some of the recommendations clearly will not apply to those situations (e.g., providing smoking cessation services prior to emergency surgery). The road map reflects published literature and guidelines by relevant professional organizations and regulatory agencies (October 2011) as well as best practices identified by the SSI Prevention Collaborative. The road map and tool kit will be reviewed regularly and updated as indicated through published literature.

We would like to thank the following organizations and individuals for sharing their time, expertise and stories which made the road map and tool kit possible.

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| S | SSI Prevention Teams | <ol style="list-style-type: none"> 1) Provide support and expectations for SSI prevention champions. 2) Adopt an inter-disciplinary team approach to SSI prevention with a designated coordinator to oversee implementation. | <ol style="list-style-type: none"> 1a) A physician champion(s) has been identified (recommend surgeon and/or infectious disease specialist if possible) for SSI prevention. 1b) An operational champion(s) has been identified for SSI prevention (e.g., OR director, infection preventionist). 1c) The facility has a process in place to partner the physician and operational champions. 1d) The facility has defined roles, set expectations and provides support for the champion(s). 2a) The facility adopts a team approach with an interdisciplinary team to oversee and support SSI prevention work. 2b) The facility has a designated coordinator to oversee SSI prevention implementation (e.g., schedule team meetings, plan staff education). 2c) The designated SSI prevention coordinator has dedicated time to serve in this role. 2d) Individual roles in the SSI prevention steps ('CUTS') are clearly defined and documented. |
| A | Access to Information | <ol style="list-style-type: none"> 1) Verify the completion of the SSI prevention steps. 2) Audit the completion of the SSI prevention steps. 3) Measure the outcomes of the SSI prevention efforts (surveillance). 4) Evaluate the SSI prevention efforts for learning opportunities. | <p>Data Collection The facility has in place:</p> <ol style="list-style-type: none"> 1a) Documentation of the completion of each SSI prevention step for all interdisciplinary team members involved in the procedure (e.g., a pre-procedure, intra-procedure, and post-procedure checklist). <p><u>Pre-, Intra- & Post-Operative (OP):</u></p> <ol style="list-style-type: none"> 2a) Chart audits of the completion of SSI prevention steps. 2b) Observational audits of the completion of SSI prevention steps. 2c) Standard criteria for auditors. 3a) Standardized collection of SSI data using the National Healthcare Safety Network (NHSN) definitions. 3b) SSI data includes information beyond rates to use in determining possible factors contributing to and/or causing the infection. 3c) SSI data is submitted to NHSN. <p>Data Analysis The facility has a process in place to:</p> <ol style="list-style-type: none"> 4a) Routinely review and analyze SSI data. 4b) Carry out additional analysis (e.g. case review) for learning and improvement opportunities when rates suggest trends or clusters. <p>On at least a quarterly basis:</p> <ol style="list-style-type: none"> 4c) Share data within and across teams. 4d) Share data with senior leadership. 4e) Share data with medical staff. |

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| F | Facility Expectations | <ol style="list-style-type: none"> 1) Set expectations for implementation of the SSI prevention steps for any OR procedure. 2) The facility has a clearly defined process for speaking up and “stopping the line” if a potential safety issue has been identified by staff. 3) Set expectations that the patient is optimally physically prepared pre-operatively. | <ol style="list-style-type: none"> 1a) The facility’s policies address SSI prevention steps (i.e. “CUTS”) and include expectations for following these steps. <p>The process clearly outlines:</p> <ol style="list-style-type: none"> 2a) When to stop the line. 2b) How to stop the line (e.g., “I need clarity”). 2c) The chain of command to follow if not supported in stopping the line. 2d) Clear communication to staff from managers and leadership that staff will be supported if they speak up. <p>The facility has clearly communicated to providers that they are expected to address the following:</p> <ol style="list-style-type: none"> 3a) Pre-op planning includes assessment of modifiable risk factors and offering education and services for risk reduction (e.g., smoking cessation, weight loss, glucose management). 3b) The facility pre-op physical is in the patient medical record and reviewed by pre-op team prior to surgery. 3c) Pre-op physical includes evaluation for existing infections including, but not limited to, skin, urinary tract, sinus and periodontal. 3d) If identified, infections are treated before elective surgery and surgery is postponed until resolution of infection (excluding emergency surgery). |
| E | Educate Staff and Patients | <ol style="list-style-type: none"> 1) Provide SSI prevention education for all clinical staff involved in surgical procedures or caring for surgical patients. 2) Educate patients, families, and caregivers on their role in SSI prevention. | <p>SSI prevention education and competencies have been incorporated into new employee orientation:</p> <ol style="list-style-type: none"> 1a) For all surgical staff. 1b) For all health care personnel caring for surgical patients. 1c) For surgeons and other providers. 1d) Ongoing SSI prevention education is incorporated into training at least annually for all health care personnel involved in care of surgical patients. <ol style="list-style-type: none"> 2a) Pre-op SSI prevention education is provided to patients and families that includes identifying modifiable risk factors (e.g., smoking, obesity, diabetes management), not self-shaving, and instructions on hygiene (e.g., showering, hand hygiene, and pre-op surgical site preparation) prior to the procedure. 2b) Post-op SSI prevention education is provided to patients and families prior to discharge including hygiene (e.g., when to resume showering/bathing, hand hygiene, laundry), wound care, and signs and symptoms of infection to report to provider. |

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Patient Care Bundle

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| <p>C</p> | <p>Cleaning Surgical Equipment/Environment</p> | <ol style="list-style-type: none"> 1) Appropriate use of immediate use sterilization. 2) Appropriate cleaning, disinfection and sterilization of surgical instruments and equipment. 3) Appropriate cleaning and disinfection of the surgical environment. | <p>A standardized process is in place to:</p> <ol style="list-style-type: none"> 1a) Limit immediate use sterilization to instances when there are not other viable options (i.e., do not use for convenience, preference or when adequate inventory could eliminate the need for it). 1b) Audit immediate sterilization. 1c) Review audit data on a quarterly basis. 1d) Follow appropriate preparation methods for immediate use sterilization. 2a) Follow manufacturer’s instructions for cleaning, disinfection and sterilization. 2b) Follow AAMI guidelines and use Spaulding scale definitions in determining appropriate cleaning, disinfection and sterilization. 3a) The hospital has and adheres to a policy for complete and thorough cleaning of the surgical environment that is based on a guideline or guidelines by nationally recognized organizations such as The Joint Commission, AORN and/or HICPAC and incorporates AAMI standards using Spaulding scale definitions. 3b) Responsibility for cleaning and disinfecting each type of equipment and area is clearly defined. 3c) The cleaning and disinfection process is routinely audited and evaluated. |
| <p>U</p> | <p>Undergoing Surgery</p> <p><i>Pre-procedure</i></p> | <ol style="list-style-type: none"> 1) Administer antimicrobial prophylaxis. 2) Prep Skin/Site. | <ol style="list-style-type: none"> 1a) An evidence-based standardized protocol is in place for the use of prophylactic antibiotics. 1b) Surgeons, pharmacy, infection prevention, infectious disease and anesthesia staff are involved in the protocol development to ensure appropriate timing, selection and duration of antibiotics. 1c) Pre-printed or computerized standard orders are in place specifying antibiotic, timing, dose and discontinuation. Instructions for re-dosing (e.g., related to duration of surgery and blood loss) or special weight considerations, especially for obese patients (body mass index >30) are included. 1d) Roles are clearly assigned for ensuring that antibiotics are administered within one hour prior to surgical incision (2 hours for vancomycin and fluoroquinolones) and for re-dosing if needed. 1e) Verify administration timing (including re-dosing) during “time-out” period or pre-procedural briefing. <p>A standardized process is in place to prepare the patient’s skin and operative site, which includes:</p> <ol style="list-style-type: none"> 2a) Leaving surgical site hair in place. If hair removal is necessary, razors or depilatory creams that may irritate skin are not used. 2b) The skin around the surgical site is free of soil, debris, exudates, and transient organisms before application of the antiseptic skin preparation. 2c) Selection of the pre-op skin antiseptic agent is based on FDA approval or clearance. 2d) The pre-op antiseptic agent significantly reduces microorganisms and is broad spectrum, fast-acting and has a persistent effect. Consider use of 2% chlorhexidine gluconate (CHG) with isopropyl alcohol or iodine povacrylex with alcohol (70%) unless contraindicated. 2e) Assess patient for allergies or sensitivities to skin preparation agents. 2f) Any jewelry at or near the surgical site is removed before cleaning the skin. |

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| | | <ul style="list-style-type: none"> 3) Check pre-op blood glucose levels on all diabetic patients. 4) Pre-warming of patients. | <ul style="list-style-type: none"> 2g) Sterile gloves are worn unless the antiseptic prep applicator is of sufficient length to prevent hand contamination. 2h) Any skin preparation containing alcohol must be allowed to dry before beginning surgery due to flammability of the product. 3a) A standardized glucose management protocol is in place for all known diabetic patients. 3b) A baseline blood sugar is established for all patients with known diabetes on the day of surgery. 4a) A process is in place to pre-warm the patient's body temperature so that it can be maintained at >96.8° F/ 36° C during surgery. |
| | <i>During the procedure</i> | <ul style="list-style-type: none"> 1. Keep OR door closed during surgery except as needed for passage of equipment, personnel and the patient. 2. Maintain patient normothermia. 3. Control blood glucose for at-risk patients. 4. Antibiotic re-dosing occurs during surgery as indicated. | <p>Expectations are in place to:</p> <ul style="list-style-type: none"> 1a) Keep the OR door closed during surgery except for essential passage of equipment, personnel and patient. 1b) Discuss equipment/supply needs during pre-operative communication prior to the procedure to minimize the need to bring additional equipment/supplies in during the procedure. 1c) Responsibility is assigned to monitor the room once sterile supplies are opened. 2a) A standardized process is in place to maintain patient's body temperature at >96.8° F/ 36° C during surgery. 2b) Patient's temperature will be measured just prior to or shortly after anesthesia has ended. 3a) Clear expectations are in place for ongoing monitoring and management of blood glucose for diabetic patients during surgery. 4a) If necessary, antibiotic dose is repeated during surgery at the appropriate time. |
| | <i>Post-procedure</i> | <ul style="list-style-type: none"> 1) Apply sterile surgical wound dressings as appropriate. 2) Maintain normothermia during the immediate post-operative period. 3) Control blood glucose during the post-operative period. | <p>A standardized process is in place to:</p> <ul style="list-style-type: none"> 1a) Maintain sterility of surgical environment until sterile dressings have been applied and are secure. 1b) Protect primary closure incisions with sterile dressings as appropriate for 24-48 hours. 2a) Maintain normothermia in the post-anesthesia care unit (PACU). 3a) Baseline and intra-op glucose levels are communicated during post-op hand-offs. 3b) Have protocol in place to maintain post-operative glucose level at <200 mg/dl for 72 hours post-operatively while an inpatient. |

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| | | <p>4) Discontinue antibiotics within 24 hours after end of surgery unless otherwise indicated.</p> <p>5) Provide post-procedure education to patient/family.</p> | <p>4a) Discontinue antibiotics within 24 hours after end of surgery unless otherwise indicated. (Exceptions: CABG and other cardiac surgery.)</p> <p>5a) Post-op SSI prevention education is provided to patients and families prior to discharge. {Refer back to "Education"}</p> |
| T | Team Accountability/Communication | <p>1) Communicate using standardized process.</p> | <p>1a) A pre-op team communication process, such as a pre-op briefing, is in place in the OR prior to incision that includes discussion on antibiotic, timing, need for re-dosing; and any special considerations.</p> <p>1b) A standardized process is in place to track completion of SSI prevention steps (i.e. incorporate into surgical checklist).</p> |
| S | Staff | <p>1) Set expectations for hand hygiene.</p> <p>2) Set expectations for staff illness.</p> <p>3) Set expectations for surgical attire.</p> | <p>Clear expectations are in place for hand hygiene, illness, and attire for all health care providers including:</p> <p>1a) Hand hygiene education is provided for all new employees.</p> <p>1b) Standardized procedures for hand hygiene are followed by all health care personnel.</p> <p>In the perioperative setting, hand hygiene practices for maintaining healthy skin and fingernail conditions as outlined by AORN guidelines are followed including:</p> <p>1c) Fingernails are short, clean, and without chipped nail polish.</p> <p>1d) Artificial nails (any enhancement or resin bonding product including gel and shellac) are not worn.</p> <p>1e) Rings, watches, and bracelets are removed prior to hand hygiene.</p> <p>1f) Cuticles, hands and exposed skin are free of cuts, abrasions, open lesions, and new tattoos.</p> <p>1g) A surgical hand scrub is performed by health care personnel before donning sterile gloves for surgical or other invasive procedures.</p> <p>Hospital-wide:</p> <p>1h) Hand hygiene and surgical hand scrub products are FDA-approved.</p> <p>1i) AORN, CDC, and/or WHO guidelines as well as manufacturer's directions are followed when using hand hygiene and surgical hand scrub products.</p> <p>1j) Hand hygiene audits are conducted for all health care personnel.</p> <p>1k) The "Just Culture" model will be applied when health care personnel are observed not following facility expectation for appropriate hand hygiene.</p> <p>2a) Staff who are acutely ill with a communicable infectious disease should be excluded from direct patient care.</p> <p>For staff in restricted and semi-restricted areas:</p> <p>3a) Fresh, hospital-laundered surgical attire donned upon arrival before entering the restricted and semi-restricted areas each day.</p> <p>3b) Surgical attire is changed if it becomes visibly soiled.</p> <p>3c) Scrubs are not to be worn outside the hospital. This applies to all health care personnel and vendors.</p> <p>3d) Personal attire is covered by hospital-provided attire.</p> |

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| | | | <p>3e) Jewelry that is not covered by surgical attire is removed prior to entering restricted and semi-restricted area.</p> <p>3f) Scalp and hair is completely covered by disposable caps or caps that are hospital-laundered and changed daily.</p> <p>3g) Non-scrubbed health care personnel in the OR wear hospital-laundered long-sleeved cover jackets.</p> <p>3h) The “Just Culture” model will be applied when staff are observed not following facility expectation for appropriate surgical attire.</p> |

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In addition to SSI, surgical patients are vulnerable to other health care-associated infections. Refer to guides for prevention of catheter-associated urinary tract infections, ventilator-associated pneumonia, central line-associated bloodstream infections, *Clostridium difficile* infection, pressure ulcers, and guidance on judicious antibiotic use for measures to prevent other infections.

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