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Current Nursing Practice to Prevent Surgical Site Infections in Patients Who Have Had Abdominal Surgery

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Abstract

Abdominal surgical site infections are among the leading causes of hospital acquired infections; this is primarily due to endogenous body flora inhabiting the bowel, rendering the abdomen highly susceptible to infection with surgical incision. Appropriate nursing care for the patient who has undergone an abdominal surgery is crucial in reducing the likelihood that the patient will contract a hospital acquired surgical site infection. There are nationally recognized and government funded agencies, such as the Center for Disease Control and Prevention, who have formulated core measures for healthcare personnel to serve as the key guiding principles for the prevention of surgical site infections. The purpose of this research study was to ascertain the incidence and burden of abdominal surgical site infections; identify which patients, who have abdominal surgery, are at risk for contracting a hospital acquired surgical site infection and to associate core prevention strategies for surgical site infections with actual practice. In addition, identified current infection control practices in Alabama hospitals.

Key words abdominal surgery, prevention measures, hospital acquired surgical site infections, incidence, CDC, endogenous flora.

Introduction

What is the importance of examining hospital acquired surgical site infections that originate from abdominal surgery? A hospital acquired infections (HAIs) is defined as a "localized or systemic condition that results from an adverse reaction to the presence of an infectious agent(s) or its toxin(s) that occurs during a hospital admission, for which there is no evidence the infection was present or incubating at admission, and meets body specific-criteria" within 48 hours of admission (Klevens, et al., 2007). When the infection occurs as the result of a surgical incision, the incidents is deemed a *hospital acquired surgical site infection.* There are approximately 300,000 reported incidents of hospital acquired surgical site infections (SSI), in the United States, per year, ranking SSIs second to urinary tract infections among national HAI incidents. Therefore, SSIs are a grave burden to both the patient and health care system. Among SSIs, abdominal surgical site infections are the most commonly occurring type of SSI, due to the volatile symbiotic nature of the microbes in the environment of the abdomen, which can become antagonistic to their host given the appropriate condition. Furthermore, nurses play an across-the-board role in the transmission, detection, and diminution of abdominal surgical site infections. Thus, knowledge regarding the best way to prevent hospital acquired abdominal SSIs, among nurses, is pertinent to prevention of SSIs. Subsequently, nurses will lessen the burden to the at risk patient via knowledge of risk factors, infection control, and awareness of the specific guidelines pertinent to the reduction of abdominal SSIs. Therefore, it is important to question Current Hospital Nursing Practice to Prevent Surgical Site Infections in Patients Who Have Had Abdominal Surgery.

Review of Literature

Seventy-five percent of deaths in the United States stemming from patients with SSIs, are directly attributable to SSI (M.D. Torres-Berrios, 2009). The incidences of SSIs with regard to abdominal surgical procedures are as follows:

Abdominal Procedure	Incidence of SSI (%)
Laproscopy	10%
Umbilical hernia repair	2-5%
Colon Cancer resection w/o abx W/ prophylactic Abx	30-60% 10%
Colostomy	**<50%**
Colon perforation	20%
Stomach cancer and surgery	20%
Hernionite (hernia surgery)	**50%**
Adult appendectomy	10-20%
Children's appendectomy	2-5%
Appendectomy in AIDS victims	**<50%**
Liver abscess	20%
Hydatid cyst (parasitic infestation)	2-5%
Acute and Chronic choleocystectomy	10%

Acute septic cholangitis	10-20%
Laproscopic cholechystectomy	2-5%
Splenectomy	2-5%

In accordance with the Center for Disease Control and Prevention, if the abdominal incisions are clean wounds the incidence of SSI is (1.5–3.7%); clean-contaminated wounds (3–4%); contaminated wounds (8.5%); and dirty-infected wounds (28–40%). Clean-contaminated wounds are defined as, operative wounds involving areas such as the gastrointestinal tract, which are entered under controlled conditions, without unusual contamination and are inhabited by normal microorganisms that assist in the function of that body system. Contaminated wounds are identified as "open, fresh, accidental wounds. In addition, operations with major breaks in sterile technique or gross spillage from the gastrointestinal tract, and incision in which acute, nonpurulent inflammation is encountered (Osborn, Wraa, & Watson, 2010)". Dirty or infected wounds include old traumatic wounds with retained or devitalized tissue and those that involve existing clinical infection or perforated viscera (Osborn, Wraa, & Watson, 2010). The Center for Disease Control and Prevention issues published regulations regarding SSI events, based on evidence based corroboration, including surgical incision classification as the aforesaid. SSIs can be anticipated based on these surgical wound classifications, particularly contaminated and dirty infected wound classifications. A vast majority of abdominal surgical incisions range from contaminated wounds to dirty infected wounds, which comprise the majority of the incisions that involve contraction of SSI. Clearly, surgical site infections occur most commonly with abdominal surgeries, that is why it is

important to initiate improvements to what is currently being done to curtail abdominal SSIs in hospitals, nationwide. Individuals who contract hospital acquired SSIs are at 2-11 times higher risk of death, and those who survive typically experience 7-10 additional hospital days; and are likely to face long-term disabilities (Torres-Berrios, 2009). The cost of SSIs to the healthcare system is $3000-$29,000 [up to 10 billion annually] per surgical site infection (Torres-Berrios, 2009); however, more research must be conducted to estimate what portion of this figure is attributed to abdominal surgeries.

Pathogenesis

Abdominal surgical site incisions range from contaminated to dirty infected, because the abdomen is alive with endogenous flora. Endogenous flora is defined as bacteria that naturally occur within the body, and have a symbiotic relationship with the organs that they inhabit. When this relationship is interrupted, the endogenous flora become opportunistic bacteria (due to surgery, abdominal trauma, antibiotics), rendering the bacteria hostile and destructive to their host. Endogenous flora exists on all patients' skin, mucous membranes, and GI tract (Torres-Berrios, 2009). A study conducted in Lagos, Nigeria found that identifying the organisms of abdominal wound infections, and instituting proper procedures, aids in reducing SSIs. Furthermore, the most frequently occurring organisms in the study were found to be: "pseudomonas aeruginosa (7/25patients) followed by Enterobacter spp (5/25 patients), and Proteus mirabilis (4/25 patients) (Mofikoya, Mi, Ft, & Atoyabei, 2009)".

Epidemiology

Several epidemiological problems surround abdominal surgical site infections, which involve lack of a uniform identification of SSIs, increased number of outpatient surgeries, and shorter postoperative inpatient stays (Torres-Berrios, 2009).

Nationally, lack of enhanced identification of surgical site infections is a problem that plagues the infection control quality in most hospitals. "Although nearly all hospitals monitor their SSIs rates, not all generally accepted active surveillance methods are both reproducible and widely used" (Yokoe, et al., 2004). One study proposes a cluster of resolutions intended to be used jointly: Surveillance in hospital with feedback of data to surgeons; nationally standardizing what defines an SSI, with a single definition; and direct inspection of patients by infection control practitioners or specially trained nurse surveyors, for instance, patients are followed up with a thorough investigative phone call by the surgical nurse (SHEA, APIC, CDC, SIS , 1992).

Moreover, outpatient surgical procedures that range from clean contaminated to dirty contaminated, such as the common outpatient procedures laparotomy or laparoscopic surgery, comprise 25% of abdominal surgical site infections (Mofikoya, Mi, Ft, & Atoyabei, 2009). One article states, "Healthcare personnel may become lax in aseptic technique in the outpatient setting, as shown by a recent review of infections in outpatient settings". It is for the same reason that shorter postoperative stay is implicated in abdominal SSIs. Nevertheless, there are several research studies and guidelines backed by the Center for Disease Control and Prevention (CDC) that outline the most proper and current methods of preventing surgical site infections, including abdominal surgical procedures; the most highly implicated procedure among surgical site infections.

Prevention Strategies:

Core measures for the prevention of abdominal surgical site infections have been created and revised for decades, by chief health organizations such as the Center for Disease Control and Prevention (CDC), since its founding during World War II. These core measures are key guiding principles for healthcare teams involved in the care of an abdominal surgery patient. Risk factors involved in the development of abdominal surgical site infections, included operation type, duration of surgical procedure, age of patient, gender of patient, immune status of patient, patient nutrition, prophylactic antibiotics, type of shaving, secondary infections, and existing disease states. Correspondingly, the CDC has funded and instituted national recommendations in favor of preventative strategies and guidelines for preoperative, intraoperative, and postoperative surgical site infections. Preoperative measures include, but are not limited to: encourage tobacco cessation, and educate and encourage surgical personnel who have signs and symptoms of a transmissible infectious illness to report conditions promptly to their supervisory and occupational health service personnel. Additionally, some intraoperative guidelines involve filtering all air, recirculated and fresh, through the appropriate filters per the American Institute of Architects' recommendations, and limit the number of personnel entering the operating room to necessary personnel. Postoperative measures include: protect surgical site with a sterile dressing for 24 to 48 hours postoperatively (*see appendix A).*

Complementary and Alternative Measures:

Per several research studies conducted, chewing gum, following abdominal surgery, is a complementary and alternative approach that has been found to aid in reducing the postoperative ileus phase, and aids in return of bowels sounds, as well as a decrease in recovery time (Edward, Fitzgerald, & Ahmed, 2009). The National Center for Complementary and Alternative Medicine defines complementary and alternative medicine (CAM) as a group of diverse medical and health care systems, practices, and products that are not generally considered part of conventional medicine as practiced by holders of M.D. (medical doctor) or D.O. (doctor of osteopathy) degrees and by their allied health professionals such as physical therapists, psychologists, and registered nurses.

As soon as a postoperative patient is stabilized, and completely alert and oriented, that patient can be given chewing gum, which stimulates gastric secretions and functioning. Additionally, a study of reflexology and massage found postoperative foot massage, after abdominal surgery facilitates earlier recovery, theoretically due to proximate dermatome stimulation.

Methods:

To investigate Current Hospital Nursing Practice to Prevent Surgical Site Infections in Patients Who Have Had Abdominal Surgery, eight to ten Infection Control Specialist, at different Alabama hospitals were contacted and interviewed via phone or in-person, and asked 10 questions pertaining to this study *(see appendix for full list of questions)*. In order to schedule an interview, and obtain contact information on each

infection control specialist the main web page of each hospital was consulted for direct contact information. If that information cannot be acquired a direct call to the hospital's directory assistance was executed. Determination of what questions was asked is based on incidence of abdominal SSIs, surveillance of abdominal SSI incidents, preventative measures, current hospital guidelines implemented in comparison to the CDC national preventative guidelines, and the financial burden to hospital. The desired hospital for this study was ten of the most recognized hospitals in Alabama metropolises, yet will remain anonymous. Once the Infection Control Specialist of each hospital has been contacted a date for interview was scheduled. Before the scheduled interview a list of the questions to be posed was emailed to each Infection Control Specialist who desires, or sent via United Stated Postal Service to a confirmed address in preparation for question that may require advanced preparation.

Results:

The ten Alabama hospitals contacted, four of their infection control specialist responded. The infection control specialists were kept confidential in order to facilitate full disclosure, and were therefore labeled hospital infection control specialist A, B, C, and D. Hospital infection control specialist *A* participated via phone, while B, C, and D replied via e-mail. The responses were labeled questions one through ten, corresponding directly in order with the hospital infection control specialist interview questions (see Appendix B). Detailed answers were:

	Hospital A	**Hospital** B	**Hospital** C	**Hospital** D
Question 1	They have decreased 40-50%.	Approximately 447 incidents per year.	0.5%	About 20 % of our nosocomial infections are related to surgical site infections.
Question 2	The majority but I don't have the exact numbers.	Approximately 300.	We do not calculate rates by procedure type.	Almost all of them; about 90%.
Question 3	Per CDC guidelines for identifying SSI, we then follow patient. for up to 6 months; for a patient who developed SSI resulting from implanted devices (staples, drains, etc) for up to a year.	Infection control team uses investigative protocol.	Look at surgical team, length of surgery, timing of preop antibiotic, skin prep, and whether or not an implant was used.	We look at the nursing staff's care plan for inconsistencies if it is not inpatient surgery, we investigate what the client was taught before they left, and if they actually followed through on teaching instructions
Question 4	Pretesting for MRSA, CHG washes preoperative, intraoperative CHG, aseptic technique; evidence based research- CDC and AORN.	Preop and post op antibiotics, proper removal of hair, aseptic cleansing of surgical site.	Look at surgical team, length of surgery, timing of preop antibiotic, skin prep, and whether or not an implant was used	We use CDC protocols, and general standards of practice for abdominal surgeries
Question 5	Approximately 2009, but for several years.	2001	unsure	Not sure but they are updated often; about every other year some things are added or taken away based on the literature.
Question 6	Decreased by 40-50%	The incidence has decreased in the last 6 years, but initially remained stagnant.	Do not calculate rates by procedure type	They've remained pretty consistent since I've been here; about 2 years.
Question 7	CDC recommended guidelines, nationally recognized organizations.	Certified and Evidence based research via our infection control board. A board with is headed primarily of physicians and MSNs.	SCIP, AORN, CDC	CDC, Medline, research journals.
Question 8	Other healthcare facilities have validation that they have worked.	We review the latest evidence based research that has been successfully replicated.	Varies according to who issues the measure	They have to be obtained from a credible source such as the CDC.

Question 9	Sepsis after surgery $33,000, and a higher length of stay by at least 11 days. MRSA, E-coli, Yeast =common microbes	$21,000-28,000 per patient.	unknown	About 30,000
Question 10	CDC, NIOSH and Alabama health department division or NHSN.	Yes, each incident to the NHSN of the CDC.	No	Yes, to the CDC.

Discussion

The results of the study were inconclusive. A small sample size was obtained from the ten hospital infection control specialists that were contacted. A more sufficient sample size would have consisted of eight or more of the designated infection control specialist. However, only four of the Alabama hospital infection control specialist that were contacted, responded. The sample size obtained was not large enough to be considered a definitive representation of the sample of Alabama hospitals selected. Perhaps the lack of response was due to fear of hospitals being represented in a negative light (despite assurance of confidentiality). The common assumed sentiment when the ten Alabama hospital infection specialists were contacted was that an exposé was being structured. Therefore, the poverty of data is inconclusive, and indicates a need for further research. Implications for future studies include obtaining a larger sample size (not limited to major metropolises) with contracted assurance of confidentiality; identification of sequelae resulting from surgical site infections; legal implication of SSIs, including incidents of civil suits and/ or criminal prosecution; psychological impact of SSIs on patient, family, and involved healthcare team; and recurrent incidence of SSI infections occurring with particular surgeons and/ or nurses.

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Appendix A

Measures to prevent surgical sit e wound infections

Preoperative measures

a. Preparation of the patient

1. Whenever possible, identify and treat all infections remote to the surgical site before elective operation and postpone elective operations on patients with remote site infections until the infection has resolved. *Category IA*
2. Do not remove hair preoperatively unless the hair at or around the incision site will interfere with the operation.
3. If hair is removed, remove immediately before the operation, preferably with electric clippers. *Category IA*
4. Adequately control serum blood glucose levels in all diabetic patients and particularly avoid hyperglycemia
perioperatively.
5. Encourage tobacco cessation. At minimum, instruct patients to abstain for at least 30 days before elective operation from smoking cigarettes, cigars, pipes, or any other form of tobacco consumption (e.g., chewing/dipping).
6. Do not withhold necessary blood products from surgical patients as a means to prevent SSI.
7. Require patients to shower or bathe with an antiseptic
agent on at least the night before the operative day.
8. Thoroughly wash and clean at and around the incision site to remove gross contamination before performing
antiseptic skin preparation.
9. Use an appropriate antiseptic agent for skin preparation
10. Apply preoperative antiseptic skin preparation in concentric circles moving toward the periphery. The prepared
area must be large enough to extend the incision or create new incisions or drain sites, if necessary.
11. Keep preoperative hospital stay as short as possible while allowing for adequate preoperative preparation of
the patient.
12. No recommendation to taper or discontinue systemic steroid use (when medically permissible) before elective operation. *Unresolved issue*
13. No recommendation to enhance nutritional support for surgical patients solely as a means to prevent SSI.
Unresolved issue

14. No recommendation to preoperatively apply mupirocin to nares to prevent SSI.
15. No recommendation to provide measures that enhance wound space oxygenation to prevent SSI.
Unresolved issue

b. Hand/forearm antisepsis for surgical team members

1. Keep nails short and do not wear artificial nails.
2. Perform a preoperative surgical scrub for at least 2 to 5 minutes using an appropriate antiseptic (Table 6). Scrub the hands and forearms up to the elbows. *Category IB*
3. After performing the surgical scrub, keep hands up and away from the body (elbows in flexed position) so that water runs from the tips of the fingers toward the elbows. Dry hands with a sterile towel and don a sterile gown and gloves. *Category IB*
4. Clean underneath each fingernail prior to performing the first surgical scrub of the day. *Category II*
5. Do not wear hand or arm jewelry. *Category II*
6. No recommendation on wearing nail polish.
Unresolved Issue

c. Management of infected or colonized surgical personnel

1. Educate and encourage surgical personnel who have signs and symptoms of a transmissible infectious illness to report conditions promptly to their supervisory and occupational health service personnel. *Category IB*
2. Develop well-defined policies concerning patientcare responsibilities when personnel have potentially transmissible infectious conditions. These policies should govern (a) personnel responsibility in using the health service and reporting illness, (b) work restrictions, and (c) clearance to resume work after an illness that required work restriction. The policies also should identify persons who have the authority to remove personnel from duty. *Category IB*
3. Obtain appropriate cultures from, and exclude from duty, surgical personnel who have draining skin lesions until infection has been ruled out or personnel have received adequate therapy and infection has resolved.
Category IB
4. Do not routinely exclude surgical personnel who are colonized with organisms such as *S. aureus* (nose, hands, or other body site) or group A *Streptococcus,* unless such personnel have been linked epidemiologically to dissemination of the organism in the healthcare setting.
Category IB

d. Antimicrobial prophylaxis

1. Administer a prophylactic antimicrobial agent only when indicated, and select it based on its efficacy against the most common pathogens causing SSI for a specific operation (Table 4) and published recommendations.
266,268,269,282-284 *Category IA*
2. Administer by the intravenous route the initial dose of prophylactic antimicrobial agent, timed such that a bactericidal concentration of the drug is established in serum and

tissues when the incision is made. Maintain therapeutic levels of the agent in serum and tissues throughout the operation and until, at most, a few hours
after the incision is closed in the operating room. *Category I*
3. Before elective colorectal operations in addition to d2 above, mechanically prepare the colon by use of enemas
and cathartic agents. Administer nonabsorbable oral antimicrobial agents in divided doses on the day before the
operation. *Category IA*
4. For high-risk cesarean section, administer the prophylactic antimicrobial agent immediately after the umbilical cord is clamped. *Category IA*
5. Do not routinely use vancomycin for antimicrobial prophylaxis. *Category IB*

Intraoperative

Ventilation
1. Maintain positive-pressure ventilation in the operating room with respect to the corridors and adjacent areas. *Category IB*
2. Maintain a minimum of 15 air changes per hour, of which at least 3 should be fresh air. *Category IB*
3. Filter all air, recirculated and fresh, through the appropriate filters per the American Institute of Architects' recommendations.299 *Category IB*
4. Introduce all air at the ceiling, and exhaust near the floor. *Category IB*
5. Do not use UV radiation in the operating room to prevent SSI. *Category IB*
6. Keep operating room doors closed except as needed for passage of equipment, personnel, and the patient.
Category IB
7. Consider performing orthopedic implant operations in operating rooms supplied with ultraclean air.
Category II
8. Limit the number of personnel entering the operating room to necessary personnel.
Category II

b. Cleaning and disinfection of environmental surface

1. When visible soiling or contamination with blood or other body fluids of surfaces or

equipment occurs during an operation, use an EPA-approved hospital disinfectant to

clean the affected areas before the next operation.

2. Do not perform special cleaning or closing of operating rooms after contaminated or dirty operations.
Category IB

3. Do not use tacky mats at the entrance to the operating room suite or individual operating rooms for infection control. *Category IB*
4. Wet vacuum the operating room floor after the last operation of the day or night with an EPA-approved hospital disinfectant. *Category II*
5. No recommendation on disinfecting environmental\ surfaces or equipment used in operating rooms between operations in the absence of visible soiling. *Unresolved issue*

c. Microbiologic sampling

1. Do not perform routine environmental sampling of the operating room. Perform microbiologic sampling of operating room environmental surfaces or air only as part of an epidemiologic investigation. *Category IB*

d. Sterilization of surgical instruments

1. Sterilize all surgical instruments according to published guidelines.212,299,314,321 *Category IB*
2. Perform flash sterilization only for patient care items that will be used immediately (e.g., to reprocess an inadvertently dropped instrument). Do not use flash sterilization for reasons of convenience, as an alternative to purchasing additional instrument sets, or to save time.
Category IB

e. Surgical attire and drapes

1. Wear a surgical mask that fully covers the mouth and nose when entering the operating room if an operation is about to begin or already under way, or if sterile instruments are exposed. Wear the mask throughout the operation.
*Category IB**
2. Wear a cap or hood to fully cover hair on the head and face when entering the operating room. *Category IB**
3. Do not wear shoe covers for the prevention of SSI.
*Category IB**
4. Wear sterile gloves if a scrubbed surgical team member. Put on gloves after donning a sterile gown.
*Category IB**
5. Use surgical gowns and drapes that are effective barriers when wet (i.e., materials that resist liquid penetration).
Category IB
6. Change scrub suits that are visibly soiled, contaminated, and/or penetrated by blood or other potentially infectious materials. *Category IB**
7. No recommendations on how or where to launder scrub suits, on restricting use of scrub suits to the operating suite, or for covering scrub suits when out of the operating suite. *Unresolved issue*

f. Asepsis and surgical technique

1. Adhere to principles of asepsis when placing intravascular devices (e.g., central venous catheters), spinal or epidural anesthesia catheters, or when dispensing and administering intravenous drugs. *Category IA*
2. Assemble sterile equipment and solutions immediately prior to use. *Category II*
3. Handle tissue gently, maintain effective hemostasis, minimize devitalized tissue and foreign bodies (i.e., sutures, charred tissues, necrotic debris), and eradicate dead space at the surgical site. *Category IB*

4. Use delayed primary skin closure or leave an incision open to heal by second intention if the surgeon considers the surgical site to be heavily contaminated (e.g.,
Class III and Class IV). *Category IB*
5. If drainage is necessary, use a closed suction drain. Place a drain through a separate incision distant from the operative incision. Remove the drain as soon as possible. *Category IB*

Postoperative incision care

a. Protect with a sterile dressing for 24 to 48 hours postoperatively an incision that has been closed primarily.
Category IB
b. Wash hands before and after dressing changes and any contact with the surgical site. *Category IB*
c. When an incision dressing must be changed, use sterile technique. *Category II*
d. Educate the patient and family regarding proper incision care, symptoms of SSI, and the need to report such symptoms. *Category II*
e. No recommendation to cover an incision closed primarily beyond 48 hours, nor on the appropriate time to shower or bathe with an uncovered incision. *Unresolved issue*

4. Surveillance

a. Use CDC definitions of SSI (Table 1) without modification for identifying SSI among surgical inpatients and outpatients. *Category IB*
b. For inpatient case-finding (including readmissions), use direct prospective observation, indirect prospective detection, or a combination of both direct and indirect methods for the duration of the patient's hospitalization.
Category IB
c. When post discharge surveillance is performed for detecting SSI following certain operations (e.g., coronary artery bypass graft), use a method that accommodates available resources and data needs. *Category II*
d. For outpatient case-finding, use a method that accommodates available resources and data needs.
Category IB
e. Assign the surgical wound classification upon completion of an operation. A surgical team member should make the assignment. *Category II*
f. For each patient undergoing an operation chosen for surveillance, record those variables shown to be associated with increased SSI risk (e.g., surgical wound class, ASA class, and duration of operation). *Category IB * Federal regulation: OSHA.* g. Periodically calculate operation-specific SSI rates
Vol. 20 No. 4 GUIDELINE FOR PREVENTION OF SSI 269 stratified by variables shown to be associated with increased SSI risk (e.g., NNIS risk index). *Category IB*
h. Report appropriately stratified, operation-specific SSI rates to surgical team members. The optimum frequency and format for such rate computations will be determined by stratified case-load sizes (denominators) and the objectives of local, continuous quality improvement initiatives.
Category IB

i. No recommendation to make available to the infection control committee coded surgeon-specific data

(Mangram A. , Horan, Pearson, Silver, & Jarvis, 1999)

Appendix B

Interview Questions for Hospital Inspection Control Specialist

1. What is the annual incidence of surgical site infections in you hospital?

2. How many of those surgical site infections are related to abdominal procedures?

3. Once a patient is identified as having a SSI what investigative measures are taken to determine the cause of and liability of that infection?

4. What preventative measures are currently being implemented to avoid abdominal surgical site infections in your hospital?

5. What year were these measures initiated?

6. Since the initiation of these preventative measures, have abdominal SSI increased or decreased, or stayed the same.

7. From what source did the hospital obtain their abdominal surgical site preventative measures?

8. What criteria do the measures have to meet before they are chosen to be implemented into hospital protocol/procedure?

9. What is the financial burden of abdominal surgical site infections to your hospital?

10. Does your hospital report their incidence of abdominal surgical site infection to the CDC National Health and Safety Network or the CDC HAI surveillance division?