

## **Back to Bessic (Bendan Surgical Site Infection Control) for Surgical Site Infection Prevention with Pip-Ed (Pre, Intra, and Post Operative Education) Guideline: New Innovation Idea**

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### **ABSTRACT**

Hospital as a health service unit that provides services in general and special fields, one of which is operating room services. The biggest issue in this installation is surgical wound infection, where many factors influence this condition. Education to patients and families regarding information on surgical wound infections can be given starting from before rehabilitation, during surgery and after the rehabilitation process. Education can provide an overview of surgical wound infections so that patients or families can do things according to existing guidelines so that surgical wound infections can be prevented. A new innovation regarding guidelines in patient education in preventing surgical wound infections called BeSSIC (Bendan Surgical Site Infection Control) with the PIP-ED (Pre, Intra, and Post- Operative Education) guideline provides an overview of educational checklists that must be given before, when and after the operation took place.

**KEYWORDS:** Surgical Site Infection, Bendan Surgical Site Infection Control, Pre- operation, Intra operation, Post Operation

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### **INTRODUCTION**

Hospital as a health service unit that provides outpatient and inpatient services, as well as services in special fields, one of which is the operating room. The issue that is currently being debated is infection in the surgical wound. Surgical wound infection occurs due to the entry of bacteria into the body.<sup>1</sup>

Surgical Site Infection (SSI) is an infection of the surgical wound which is one of the postoperative complications that can increase the morbidity and cost of treating patients in hospital, even increasing the risk of mortality in patients. The incidence of SSI in an institution providing health services reflects the quality of service for that institution. SSI in the United States is the main cause of patient morbidity after undergoing surgery. SSI is the most common occurrence of nosocomial infections, covering 38% of all nosocomial infections. According to a report from the National Nosocomial Infection Surveillance (NNIS), in 1986–1996 SSI data was found to be 2.6% of all surgical processes reported by various hospitals. A survey by WHO shows that the international rate of SSI ranges from 5 to

34%.<sup>2,3</sup>

According to the Infection Prevention and Control Committee (PPI) surveillance report at our hospital in Pekalongan City from 2021 to early 2023, it shows that the incidence of SSI has increased by 1.03%, this shows an alarming condition. Lack of information and education about management before, during and after surgery is one of the causes of surgical wound infections / SSI in our hospital.<sup>4</sup>

### **SURGICAL SITE INFECTION**

The term "surgical site infection" (SSI) was introduced in 1992 to replace the earlier term "surgical wound infection". SSI is defined as an infection occurring within 30 days after surgery (he within 1 year if the implant was placed after surgery) and involving an incision or deep tissue at the surgical site. These infections may be superficial or deep scar infections, or infections of organs or body spaces. Despite improvements in infection control techniques and surgical procedures, SSIs remain a major cause of morbidity and mortality and place enormous demands on healthcare

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resources. Continuous vigilance is therefore required to minimize the occurrence of such infections. This requires a systematic approach that considers multiple risk factors related to patients, procedures and hospital settings.<sup>5,6</sup>

Univariate and multivariate analyzes have shown that many patient- and procedure-related factors influence the risk of SSI. Possible patient-related factors include older age, pre-existing infections, colonization with *S. aureus* and other potential pathogens, diabetes, and smoking. Surgical factors include poor surgical technique, surgical time, quality of preoperative skin preparation, and inadequate sterilization of surgical instruments. A recent analysis identified age and low serum albumin levels as the most important patient-related factors, and quality of surgical technique as an important treatment factor. The analysis also concluded that most SSIs were due to patient-related rather than treatment-related factors. Approximately 0.5% to 3% of patients undergoing surgery will develop an infection at or adjacent to the surgical incision, which will extend the duration of treatment by approximately 7 to 11 days longer.<sup>7-9</sup>

In most SSIs, the causative agent originates from the patient's endogenous flora. The most commonly isolated organisms are *Staphylococcus aureus*, coagulase-negative staphylococci, and Enterococci. and *E. coli*. However, the pathogens isolated vary by procedure. The number of SSIs is methicillin-resistant *S. Staphylococcus aureus* (MRSA) or *Candida albicans*. This development is likely due to the increasing number of severely or immunocompromised surgical patients and the widespread use of broad-spectrum antibiotics. Pathogens can also arise from preoperative infections at sites distant from the surgical site, especially in patients receiving prostheses or other implants. In addition to the patient's endogenous flora, SSI pathogens can also arise from exogenous sources such as surgical team members, the operating room environment, and instruments and materials brought into the sterile field during surgery.<sup>10,11</sup> These pathogens are mainly aerobes, especially Gram-positive bacteria such as staphylococci and streptococci. Contamination levels above 10<sup>5</sup> cells per gram of tissue appear to increase the risk of SSI, although lower doses may be required in the presence of foreign material such as sutures. Microbial toxicity relates to their ability to produce toxins and other factors that enhance their ability to penetrate and damage tissue. Patients infected with highly virulent pathogens such as MRSA have mortality rates as high as

74%.<sup>12</sup>

Currently, there are many published guidelines on wound infection control, but many experts only agree on 6 general strategies to be used. Infection control can be accomplished by several interventions that are associated with lower infection rates such as avoiding razors for hair removal, decolonization with intranasal anti-staphylococcal agents and anti-staphylococcal skin antiseptics in high-risk procedures, use of chlorhexidine gluconate solutions and alcohol-based skin preparations, maintaining temperature normal body function with active warming to maintain a body temperature warmer than 36°C, evaluate perioperative blood sugar levels, and use negative pressure wound care.<sup>13</sup>

SSI place a significant burden on mortality and morbidity, and by lengthening hospital stays, place a significant strain on healthcare resources. In addition to the increased healthcare costs associated with SSI, there are also indirect costs of reduced productivity for patients and their families. It is important to recognize that much of the morbidity and mortality burden associated with SSIs is preventable. There is ample evidence that addressing multiple patient- and procedure-related risk factors in various clinical settings reduces the risk of SSI.<sup>14,15</sup>

### NEW INNOVATION

In reducing the incidence of infection in hospitals, we offer an idea called BeSSIC (Bendan Surgical Site Infection Control). BeSSIC is a surgical wound infection control guide offered, this campaign consists of PIP-ED (Pre, Intra, Post Operation Education) guidelines.

The PIP-ED guide consists of pre-operative preparation which includes washing your hair before surgery, not shaving your own hair with a razor or shaving using a clipper, and washing your hands properly with WHO's five moment Hand Hygiene. Education during surgery is given in the form of education on asepsis and antisepsis behavior when in the operating room carried out by operating room staff. While postoperative education is divided into two, namely education given to patients and to nurses. Education for patients consists of postoperative diet education, wound care education, and return visits according to schedule, for nurses to be given education about wound care methods and education if they encounter early signs of surgical wound infection and report it to the doctor. (See table 1)

**Table 1. BeSSIC consists of PIP-ED Checklist**

No.	Education point	Understand	Don't Understand
<b>Pre- operative Checklist</b>			
1	Education about washing your hair before surgery		
2	Education is not shaving the hair in the surgical area		
3	Education on how to wash hands?		
4	If the answer is yes, try to practice how to wash your hands		

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<b>Intra- operative Checklist</b>			
1	Wash your hair before surgery		
2	The process of shaving hair by officers before surgery with a clipper in the preparation room		
3	Prophylactic antibiotics have been given 30 minutes before the incision		
<b>Post- operative Checklist</b>			
1	Eat foods that are high in protein/albumin		
2	Routinely control blood sugar levels and take medication (if there is comorbid DM)		
3	Always maintain hand hygiene and postoperative wounds		
4	Always follow the recommendations for taking medication and treating surgical wounds at home		
5	Repeat visits according to the schedule set by the doctor		

**NB:** If there is an answer that you don't understand, the inpatient staff will educate you about preparing for surgery during the handover process for inpatients

The details of each step are described below. Preoperative education contains education that is carried out when the patient has planned elective surgery in the outpatient consultation room. The material provided regarding hand washing and preparation for surgery (in the form of a video), the material is delivered using a computer screen/monitor and the patient or family is given the opportunity to ask questions. When the patient has been admitted to the hospital, the inpatient nurse re-checks the patient's pre-operative preparation using the BeSSiC checklist, which consists of whether the patient has received information from the outpatient department about preparation for surgery? if it has not been done then do the education again.

Intraoperative education consists of the operating room nurse conducting a pre-conference to prepare in the morning, the division of the operating room and the crew on duty at each OK based on the level of sterility/type of operation. Always ensure that every elective patient who

comes to the operating room is complete regarding preoperative preparation requirements with the BeSSiC Checklist. In preparing students or apprentices to enter the operating room it is carried out on the first day of practice students, contains aseptic work culture (in video form), and safety education in the operating room

Postoperative education given to patients consists of consuming foods high in protein/albumin, controlling blood sugar (if there is comorbid DM), maintaining hand hygiene and postoperative wounds, taking medication as directed by the doctor, revisiting according to the schedule determined by the doctor, education What is given to nurses is the method of treating postoperative wounds according to the type/degree of contamination of the operation and conducting screening and initial management if early signs of surgical wound infection are found and immediately reporting to the doctor and/or hospital infection control officer.



**Figure 1. BeSSiC logo on our hospital**

As a form of our hospital's seriousness in reducing SSI rates,

our hospital has formed a separate commitment by creating a

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logo (see figure 1). The hand symbol forming a heart on the logo shows that our hospital really cares about preventing SSI, while the red stitched wound symbol indicates that SSI is handled comprehensively. The symbol of a black stitch wound gives an understanding that every surgical wound in our hospital gives good results. With this logo, it is hoped that every community member in our hospital will be more serious and committed in fighting SSI.

### CONCLUSION

Prevention of Surgical Site Infection (SSI) does not have to be expensive and not always with sophisticated facilities. With the application of the "Back to BeSSIC" method with the PIP-ED Guideline, it is hoped that it will be able to effectively and efficiently reduce the incidence of SSI in hospitals.

Vigilance is needed in all lines of service by campaigning for an asepsis work culture and providing education to every patient who will undergo surgery.

With the application of the "Back to BeSSIC with PIP-ED Guideline" method, it is hoped that it will be able to reduce the cost of treating patients in the hospital and reduce the risk of postoperative morbidity and mortality in the hospital. However, these guidelines require further development, and more extensive testing is required in their application to patients

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