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# " Implementation of Quality Tools to improve infection- control In El-Nasr specialized hospital for children"

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## **Abstract:**

This descriptive analytic study is a part of a nation-wide project aiming at assessment the pattern of current clinical practice in Increased incidence of surgical site infections in the inpatient ward at El-Nasr hospital in Port Said Governorate and to compare this pattern with standard international guidelines and Core components for infection prevention and control programmes fever, chills, pus from the wound site, Signs of infection at the wound site (pain, redness, delayed healing, redness, or tenderness) etc. The study included 300 clinically of patients with increasing of infection, that lead to your healthcare provider will prescribe antibiotics to fight the infection in Port Said Governorate. Data was collected between September 2020 and December 2020. We concluded that further work is needed to optimize and prevention of infection patients according to evidence-based clinical practice guidelines.

## **Keywords**

Infection, control, prevention, safety and health.

## **Introduction**

El Nasr Children's Specialized Hospital in Port Said joined the new comprehensive health insurance system within 7 hospitals in the governorate, after it had been renovated and developed its medical equipment and staff.

The hospital is a gigantic medical edifice that serves the governorates and cities of the Canal, and it was currently established on the land of Al-Nasr Hospital, whose buildings have been deserted for more than 18 years. The best medical services for beneficiaries within the comprehensive health insurance system, in accordance with the approved Egyptian standards (Elwatan news 2021)

The hospital is a three-floor building that has a total of 68 beds. It has an emergency department (ED), a cardiothoracic intensive care unit(ICU) for adult patients, a cardiac care unit , a neonatal intensivecare unit , a pediatric intensive care unit, an operation rooms (OR) , a cardiac catheterization unit , a pediatric chemotherapy unit, a pediatric hemodialysis unit, an inpatient department , and an outpatient clinic complex. The human power consists of 180 physicians, 89 pharmacists, 200 nurses, 19 chemists, 13 assistants, 119 administrativeclerks and 30 laborers. According to the mission statement of the hospital, the hospital aspires to be one of the leading medical centers in the field of specialized healthcare in Egypt and the Middle East. The message of the hospital is to provide distinguished, advanced and safe medical services of high quality in accordance with national standards through continuous medical education and training for workers to obtain the satisfaction of the service users.

The aims of this project are to:

1. Apply validated quality tools to assess the problems in the El- Nasr hospital's workflow that can lead to the provision of sub-optimal service.
2. Prioritize the healthcare problems based on severity and frequency, according to validated tools .
3. Apply quality improvement tools in the alleviation of detected healthcare problems.

## **Methodology**

### **Target Population**

This quality improvement program was done at el-Nasr Hospital. It involved all the hospital departments, in the period between September and December 2020. Initially, the workgroup held a brainstorming session to reach a list of the problems that face the hospital's workflow

## **Formulation of multidisciplinary team**

1. The medical Director (team leader)
2. Head of ICU department
3. Head of infectious control department
4. Quality coordinator
5. Head of nurses
6. ICU head nurse.
7. Medical secretary as team secretary
8. Administrative and financial manager
9. Head of quality

## **The resulting list included:**

1. Hand washing.
2. Failure to comply with infection control standards.
3. Preparation of the patient before the operation.
4. The patient past history.
5. Lack of awareness of policies.
6. Lack of nursing in the central sterilization department.
7. The patient connections.
8. Reprocessing machines and consumables.

## **Using the quality tools:**

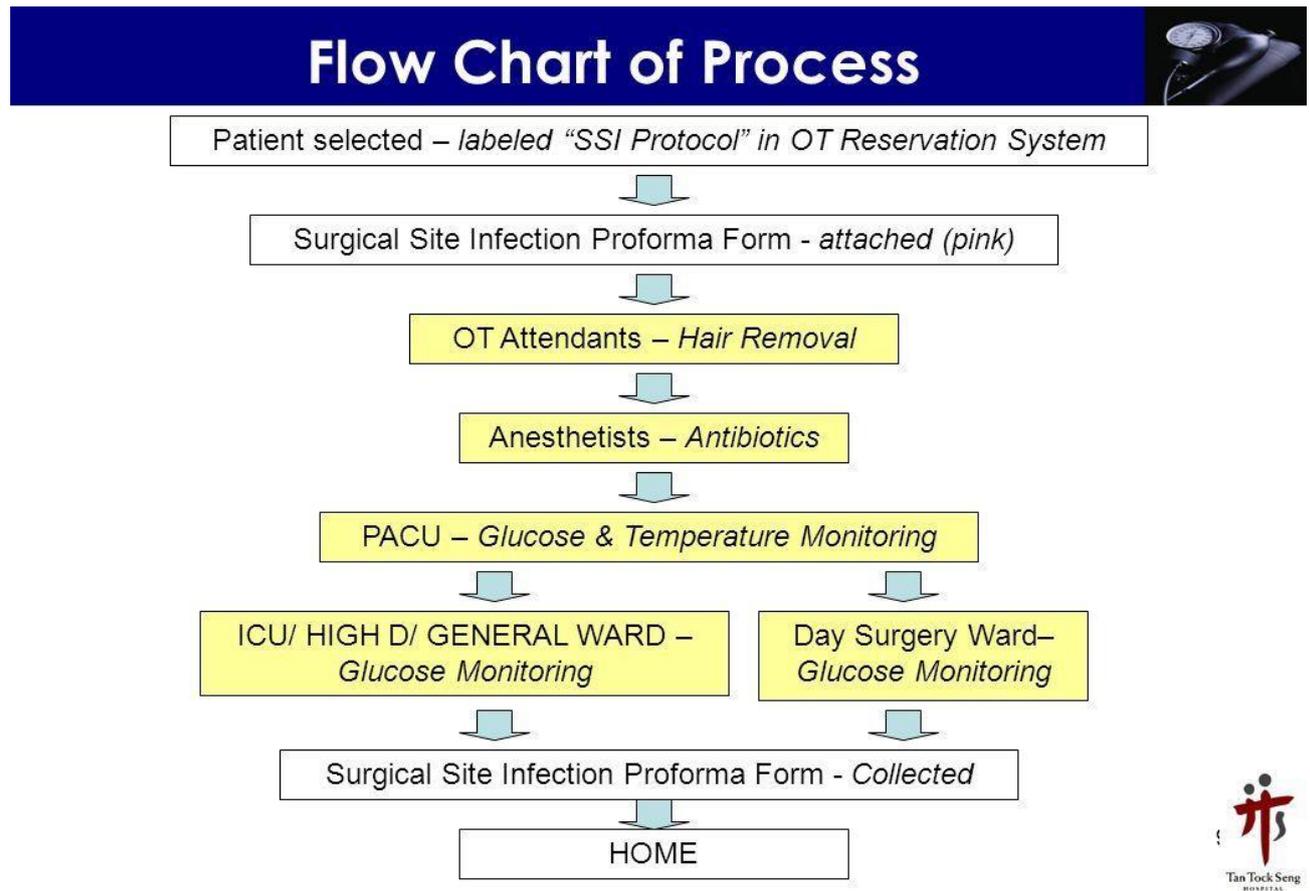
### **1-Identify the problem**

Increased the incidence rate of SSI in the inpatient department and intensive care unit (ICU) between September and October 2020.

**Mission**

Decreasing the incidence rate of SSI in the inpatient department and intensive care unit (ICU) between November and December 2020.

**1-flow chart:**

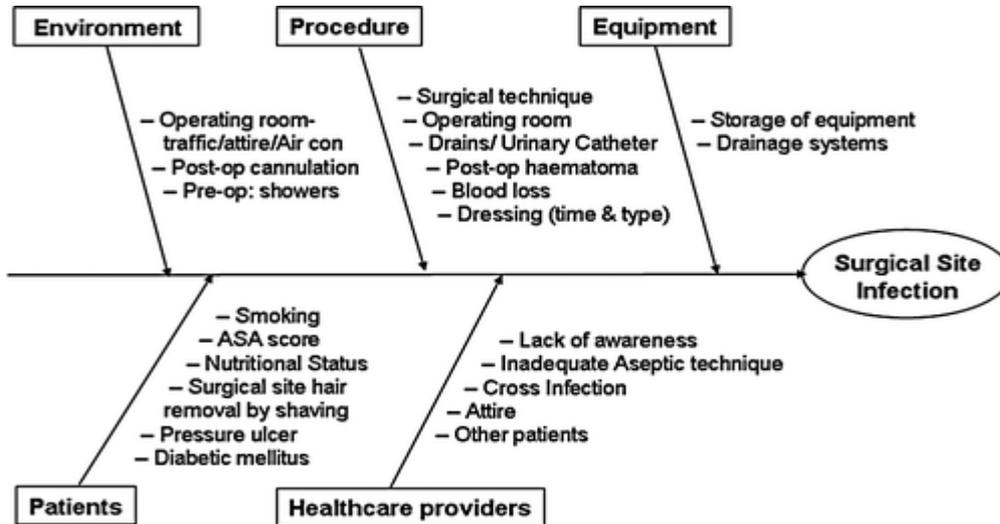
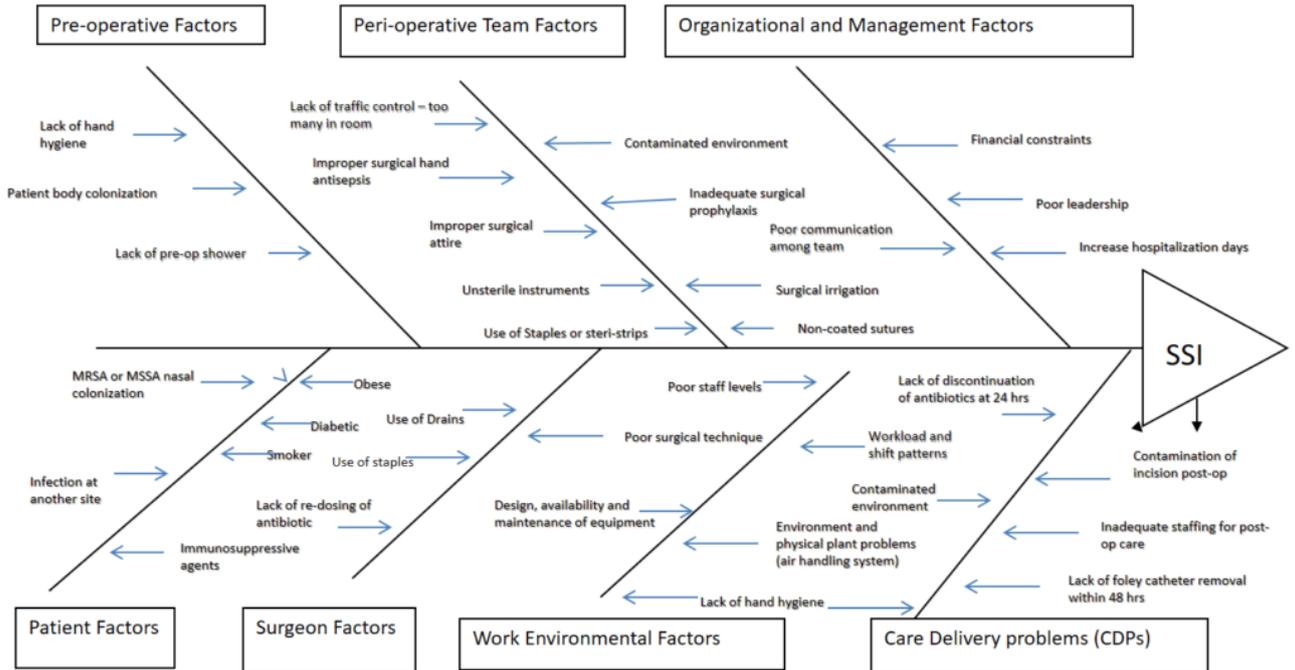


**2- Fishbone diagram:**

**The working team held a meeting in the form of a brainstorming session, in order to numerate the potential causes of the increased incidence of SSI in inpatient department and ICU. The following chart was done:**

# Risk is a Myriad Event

## SSI Fishbone Diagram



## **Results**

After root cause analysis, the team held a meeting, and a solution was suggested for the first 4 problems in a brainstorming session. The results were as follows:

**Table (1): Lack of nurse training on SSI policies and protocols**

<b>Lack of nurse training on SSI policies and protocols</b>			
	Distributing infection control policies and procedures within ICU and inpatient ward	Implementing a nursing training program about infection control policies and procedures	Holding on-site tests to assess the implementation of policies and procedures
<b>Cost</b>	10	8	8
<b>Time</b>	9	8	7
<b>Impact on problem</b>	7	10	7
<b>Resistance</b>	8	9	8
<b>Risk</b>	7	7	7
<b>Total</b>	41	42	37

The problem: Lack of nurse training on SSI policies and protocols.

Solution: Implementing a nursing training program about infection control policies and procedures.

**Table (2): Lack of implementation of SSI protocols and policies**

<b>Lack of implementation of SSI protocols and policies</b>			
	Distributing SSI policies and procedures within ICU and inpatient department	Implementing a physician and nursing training program about SSI policies and procedures	Preparation of printed material prepared by ICU to raise awareness about SSI policies and procedures
<b>Cost</b>	8	7	8
<b>Time</b>	7	7	7
<b>Impact on problem</b>	9	8	8
<b>Resistance</b>	8	7	7
<b>Risk</b>	7	8	8
<b>Total</b>	39	37	38

The problem: Lack of implementation of SSI protocols and policies

Solution: Distributing SSI policies and procedures within ICU and inpatient department.

A project assessment meeting was held. The Statistics were reviewed in cooperation with infection control team.

**The statistics were as follows:**

Infection prevalence rates of SSI from September 2020 to December 2020 have decreased from 6% to 0%.

## **Discussion**

Causes of surgical site infections in hospitals depend on type of surgery. Signs and symptoms appear 5-7 days after surgery and include erythema, local pain, pus / discharge from the wound, or persistent fever. Primary prevention is the ideal way to reduce surgical site infections, with many evidence-based interventions possible. Any infection at the surgical site should be monitored regularly, with any sutures removed where possible, any pus drained appropriately, and experimental antibiotics prescribed.

### **Introduction:**

A Surgical site infection (SSI) is an infection that occurs in the incision resulting from an invasive surgical procedure. SSI is a leading cause of hospital morbidity, increasing ICU admission rates and increasing mortality rates. Primary management is prevention through good surgical technique and improvement of the patient's condition.

### **Definition of SSI:**

Surgical site infections are defined as infections that occur 30 days after surgery and infection appears to be related to surgery.

### **Surgical site infection pathogenesis**

<b>Endogenous</b>	<b>Exogenous</b>
<ul style="list-style-type: none"><li>• Patient flora (skin, mucus membranes).</li></ul>	<ul style="list-style-type: none"><li>• Surgical team (breaks in aseptic technique, inadequate hand hygiene).</li><li>• OR environment and ventilation.</li><li>• Tools, equipment, materials in OR.</li></ul>

## **Incidence of surgical site infections**

- In the United States, the incidence of SSI is monitored by the National Nosocomial Infections Surveillance (NNIS) system and the National Hospital Discharge Survey, both sponsored by the CDC. A study by Klevens RM et al determined that 244,385 SSIs were reported in U.S. hospitals in 2020, accounting for 20% of all healthcare-associated infections and nearly 2% of all monitored surgical procedures.

## **Clinical Features**

- The signs and symptoms appear 5-7 days after surgery and can develop after 3 weeks and include: local pain, discharge from the wound, tenderness, fever, swelling and redness.

## **Classification of SSI**

1. Superficial incisional surgical site infection: it occurs within the skin or subcutaneous tissue; it observed at least one sign or symptom of clinical infection: localized pain, edema, erythema and warmth.
2. Deep incisional surgical site infection: it involves deep soft tissues such as muscle within incision and it must fulfill one of the following criteria: fever greater than 38°C, edema, localized pain, abscess or other evidence of infection

## **Risk factors for developing SSI**

- **Patient Factors;**

1-Extreme of ages. 2-

Diabetic patients.3-

Smoking.

4- Immune disease.5-

Obesity.

6- Malnutrition.

7-Length of preoperative stay.

### **Treatment of SSI**

1. Remove the sutures in the infected part.
2. Take wound swab for MCS.
3. Take broad spectrum antibiotics based on the MCS result.
4. Frequent wound dressing according to the infection degree.
5. Correct anemia.

### **Prevention of SSI**

#### **Preoperative:**

- Full body wash.
- Prepare surgical site immediately before incision.
- Decontaminate hands.
- Remove hair on table (with electric clippers if available).

#### **Perioperative:**

- Maintain saturation > 95%.
- Monitor and correct blood glucose.
- Maintain normothermia.

#### **Antibiotics:**

- Use prophylactically surgery.
- Select according guidelines based on operation and local resistance patterns.
- Administer IV within 60 minutes before incision.
- Repeat dose if needed.
- Don't routinely continue after 24 hours.

### **Conclusion**

Through the research, we concluded that infection prevalence rates decreased from 6% to 0% in the month of December 2020.

Training programs were made for doctors and nursing and familiarized them with the standards for fighting infection and the possibility of applying policies and protocols surgery site infection, and training continued on the correct methods of washing hands and how to

prepare the patient before the operation. The methods are correct and the entire patient history has been taken for the patient

The number of nurses in the central sterilization department has been increased and training on re-treatment policies for machines and disposables.

### **Recommendation**

1. Review of records to monitor SSI by infection control team, in cooperation with quality team.
2. Reviewing monthly statistics prepared by infection control department in the inpatient wards.
3. Monitoring the operational skills of ICU nursing staff, and distributing questionnaire to detect defects and training requirements.
4. Emphasizing the importance of infection control team in solving the problem.
5. The importance of cooperation with training team, and asking for their input and help in future projects
6. Discussing the application of the problem in other departments in the hospital, in order to raise the quality of nursing staff.

## **Summary**

After study and research, we have summarized the most important points mentioned in the research:

- The prevalence of surgical segment infection has decreased to 0%.
- Physicians and nurses have been trained on the basics and procedures for infection control and how to prepare the patient before the operation and take the patient's full history.
- The surgeries were performed based on scientific references and guidelines.
- Increasing awareness of infection control policies related to surgical section infection.
- The number of nurses in the central sterilization department has been increased and they have been trained on how to reprocess machines and tools.

### **References**

- Klevens RM, Edwards JR, Richards CL Jr, et al. Estimating health care-associated infections and deaths in U.S. hospitals, 2002. Public Health Rep. 2007 Mar-Apr;122:160-166. PUBMED:17357358.
- Scott RD. The Direct Medical Costs of Healthcare-Associated Infections in U.S. Hospitals and the Benefits of Prevention. March 2009. Centers for Disease Control and Prevention. [monograph – no PMID].
- Lee SY, Kuti JL, Nicolau DP. Antimicrobial management of complicated skin and skin structure infections in the era of

emerging resistance. *Surg Infect* 2005;6:283-295.

PUBMED:16201938.

- Florman S, Nichols RL. Current approaches for the prevention of surgical site infections. *Am J Infect Dis* 2007;3:51-61. [no PMID].
- Engemann JJ, Carmeli Y, Cosgrove SE, et al. Adverse clinical and economic outcomes attributable to methicillin resistance among patients with *Staphylococcus aureus* surgical site infection. *Clin Infect Dis*. 2003;36:592-598. PUBMED:12594640.
- National Institutes of Health, Division of Safety. Biological decontamination: methods of disinfection. [www.nih.gov/od/ors/ds/pubs/biodecontamination/biodecon1.htm](http://www.nih.gov/od/ors/ds/pubs/biodecontamination/biodecon1.htm). 08/07/02.
- Crawford L, Yu Z, Keegan L, Yu T. A comparison of commonly used surface disinfectants. *Infection Control Today*. November 2000, 1-9.
- OSHA. Frequently Asked Questions: Bloodborne Pathogens. [www.osha-slc.gov/html/faq-bbp.html](http://www.osha-slc.gov/html/faq-bbp.html). 08/07/02.
- Centers for Disease Control and Prevention. Sterilization or disinfection of patient-care equipment: HIV related. [www.cdc.gov/ncidod/hip/Sterile/hivsteri.htm](http://www.cdc.gov/ncidod/hip/Sterile/hivsteri.htm). 08/07/02.
- Rutala WA. APIC guideline for selection and use of disinfectants. *Am J Infect Control*. 1996;24:313-342.
- Rutala WA, Weber DJ. New disinfection and sterilization methods. *Emerging Infect Diseases*. 2001; 7(2): 348-53.
- [www.surfacine.com](http://www.surfacine.com). 08/06/02.
- "Battling Biofilm: Surface Science, Antimicrobials Help Combat Medical Device-Related Infections," by Kelly M. Pyrek, page 32.

- Katz J. Coating and surface treatment technology. [www.devicelink.com/mddi/archive/97/04/019.html](http://www.devicelink.com/mddi/archive/97/04/019.html).
- Lin TL, et al. Antimicrobial coatings: a remedy for medical device-related infections. [www.medicaldevicesonline.com/features/story.epml?/features.REF=47](http://www.medicaldevicesonline.com/features/story.epml?/features.REF=47).
- Donlan RM. Biofilms and device-related infections. [www.cdc.gov/ncidod/eid/vol7no2/donlan.htm](http://www.cdc.gov/ncidod/eid/vol7no2/donlan.htm).
- Ibid.
- Katz J. Coating and surface treatment technology. [www.devicelink.com/mddi/archive/97/04/019.html](http://www.devicelink.com/mddi/archive/97/04/019.html).
- Lin TL, et al. Antimicrobial coatings: a remedy for medical device-related infections. [www.medicaldevicesonline.com/features/story.epml?/features.REF=47](http://www.medicaldevicesonline.com/features/story.epml?/features.REF=47).
- Maki DG. Infections due to infusion therapy. In: Bennett JV, Brachman PS, eds. Hospital Infections. 3rd ed. Boston: Little, Brown; 1992.
- Plott R, Polk B, Murdock B, et al. Mortality associated with nosocomial urinary tract infection. *New Engl J Med.* 30(11):637-642, 1982.
- Watson SK, Lichtenberg DA, Wainwright H. Technology vs. the most common nosocomial infection. *Infection Control Today.* [www.infectioncontrolday.com/articles/081topics.html](http://www.infectioncontrolday.com/articles/081topics.html).
- Maki DG, Stolz SM, Wheeler S, Mermel LA. Prevention of central venous catheter-related bloodstream infection by use of an antiseptic-impregnated catheter. *Ann Intern Med.* 1997;127:267-74.
- Raad I, Darouiche R, Dupuis J, Abi-Said D, Gabrielli A, Hachem R, et al. Central venous catheters coated with minocycline and rifampin for the prevention of catheter-related colonization and bloodstream

infections. *Ann Intern Med.*1997;127:267-74.

- [www.acponline.org/journals/annals/15aug97/cathedit.htm](http://www.acponline.org/journals/annals/15aug97/cathedit.htm).
- Davis RL and Etris SF. The development and functions of silver in waterpurification and disease control. The Silver Institute, Washington, D.C. [www.silverfacts.org/pages/davies.html](http://www.silverfacts.org/pages/davies.html).

- Silver-coated catheters cut

infection. [www.silverinstitute.org/silnews/1998/4b1998.htm](http://www.silverinstitute.org/silnews/1998/4b1998.htm).

- Katz J. Coating and surface treatment

technology. [www.devicelink.com/mddi/archive/97/04/019.html](http://www.devicelink.com/mddi/archive/97/04/019.html)

- Biofilm and Infected Wounds by Samantha Kuplicki, MSN, APRN-CNS,AGCNS-BC, CWS, CWCN, CFCN <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2811111/>