

Original Research Article

## The Practice of Aseptic Techniques on Surgical Wound Dressing By Health Care Professionals

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### ABSTRACT

Asepsis is freedom from infection or prevention of contact with microorganisms. Aseptic technique is a set of practices and procedures performed under controlled conditions with the goal of reducing contamination by pathogens. Surgical aseptic procedures are used to keep the objects or areas sterile or completely free from microorganisms. The effectiveness of infection control practices depends on health care professionals conscientious and consistency in using effective aseptic technique. Objectives: 1. To assess the practice of aseptic techniques on surgical wound dressing among medical interns and staff nurses. 2. To identify the factors influencing the standard of practice followed in aseptic techniques on surgical wound dressing among medical interns and staff nurses. Descriptive design was used in this study. The study was conducted in the General surgical wards. Purposive sampling method was used to select the samples. Totally 15 medical interns and 15 staff nurses were included. Medical interns and staff nurses were observed using different checklist for aseptic techniques on surgical wound dressing. After completing the observation, study variables and influencing factors for aseptic techniques on surgical wound dressing were collected. According to the level of practice on surgical wound dressing by following aseptic techniques, 13 (87%) of the medical interns followed moderately adequate practice and among staff nurses nine (60%) of them followed moderately adequate and six (40%) of the participants followed adequate practice. By implementing surgical wound dressing checklist in respective wards the surgical wound infection can be prevented and also the health care professionals will have better practice related to surgical wound dressing.

**Key words:** aseptic techniques, surgical wound dressing, health care professionals, surgical wound infection.

### INTRODUCTION

The human skin is the outer covering of the body. In humans, the integumentary system is the largest organ. <sup>[1]</sup> Normal skin microflora includes Staphylococcus, Streptococcus, Acinetobacter, Peptococcus, and yeast. Intact skin may be contaminated with up to  $10^3$  microbes per gram of tissue without any effect on tissue healing. Contamination can also occur as a result of

the introduction of foreign objects to the wound's surface. Thus, wound contamination occurs endogenously through the patient's own flora, or exogenously whereby microbes are introduced through external sources, such as the health care professional hands. <sup>[2]</sup>

Patients with sepsis often require care in the intensive care unit, with broad spectrum intravenous antibiotic. Once the

infection is identified, antibiotics may be given according to the specific causative organism. Mortality associated with sepsis can be as high as 60% if there are other medical problems involved. Among the three forms of sepsis such as uncomplicated sepsis, severe sepsis and septic shock, severe sepsis carries a mortality of 30% to 35% and septic shock carries a mortality of 50%.<sup>[3]</sup>

Surgical site infections are the second most common nosocomial (hospital-acquired) infection and are responsible for longer hospital stays and increased costs to the patient and hospital. Approximately 80% of these wounds use some form of closure product: sutures, staples, and tapes. Many employ hemostasis products, and use fabric bandages and surgical dressings. A recent survey was conducted in India to estimate the prevalence rate of chronic wounds; it was 4.5 per 1000 population.<sup>[4]</sup>

Surgical wounds account for the vast majority of skin injuries. A Study estimated that over 234 million major surgical procedures are performed all over the world every year.<sup>[5]</sup> In the US each year 750,000 gall bladder surgeries, 20 million hernia surgeries, 100,000 to 120,000 radical prostatectomy surgeries, one million cholecystectomies, 150,000 gastric bypass surgeries were performed.<sup>[6]</sup> So it is considered that use of aseptic techniques is necessary for creating a healthy environment in health care setting.

### **Objectives**

1. To assess the practice of aseptic techniques on surgical wound dressing among medical interns and staff nurses.
2. To identify the factors influencing the standard of practice followed in aseptic techniques on surgical wound dressing among medical interns and staff nurses.
3. To find out the association between the level of practice on aseptic techniques with study variable of medical interns, staff nurses and their study clients.

## **MATERIALS AND METHODS**

Non-experimental descriptive study was conducted in the general surgical wards of a tertiary care teaching hospital at Pondicherry. This study was approved by the Institutional review board of College of Nursing, Pondicherry Institute of Medical Sciences. In this study the participants were the medical interns and staff nurses who perform surgical wound dressing in general surgical wards at Pondicherry Institute of Medical Sciences. In this study 30 health care professionals participated i.e. 15 medical interns and 15 staff nurses. Purposive sampling method was adopted. For this study the list of medical interns who are posted in the general surgical ward was obtained from the department of general surgical and for the staff nurse from nursing office.

### **Criteria for sample selection**

#### **Inclusion Criteria**

- Medical interns and staff nurses who are doing surgical wound dressing.
- Both male and female medical interns and staff nurses.

#### **Exclusion Criteria**

- Health care professionals who are doing dressing on infected surgical wound.

Total of 15 medical interns and 15 staff nurses were selected using purposive sampling method. Group consent was obtained from the participants and the observer's identity was not revealed throughout the study.

#### **Instruments used:**

There are 4 types of tools used in this study and they are as follows:

1. Tool I - Observational Checklist for aseptic techniques on surgical wound dressing by Medical Interns.
2. Tool II - Observational Checklist for aseptic techniques on surgical wound dressing by Staff Nurses.
3. Tool III – Self administered questionnaire for medical interns
4. Tool IV- Self administered questionnaire for staff nurses.

Formal administrative permission was obtained from Institutional Review

Board (IRB No. 1601 dated 03.05.2016), and concerned authorities. The nature and purpose of the study was explained to the medical interns by Dean UG medical college and head of general surgery department and for the staff nurses the study was explained by Nursing Superintendent in the group and the group consent (verbal consent) was obtained for the observation of practice on surgical wound dressing. 15 medical interns and 15 staff nurses were selected using purposive sampling technique.

The data collection was done in September and October 2016. Each medical intern was observed for 23 steps on practice of aseptic techniques on surgical wound dressing using observational checklist. Researcher used participative and non participative observational technique to observe the level of practice for aseptic techniques on surgical wound dressing by medical interns. If the step was correctly performed one score was given and zero score for the steps that were not followed. Each staff nurse was observed for 24 steps on practice of aseptic techniques on surgical wound dressing using observational checklist and same scoring procedure was followed. Researcher used non participative observational technique to observe the staff nurses practice on surgical wound dressing.

Participant information sheet was provided and written consent was obtained from medical interns and staff nurses before collecting information on self administered questionnaire. Study variables and contributing factors that hinder the practice of aseptic techniques on surgical wound dressing were obtained from medical interns and staff nurses using self administered questionnaires. The researcher identity was not revealed throughout the observation. The collected data was analyzed to find out the practice of aseptic techniques on surgical wound dressing among health care professionals.

## RESULTS

### Section A: Distribution of Medical Interns and staff nurses according to study variables.

Table – 1 : Distribution of medical interns according to study variables. n = 15

S. No.	Study variables	Frequency	Percentage
<b>I</b>	<b>Medical Interns</b>		
1.	<b>Age (in year)</b>		
	21 – 22	6	40
	23 – 24	9	60
2.	<b>Gender</b>		
	Male	8	53
	Female	7	47
3.	<b>Area of work</b>		
	Male surgical ward	9	60
	Female surgical ward	6	40

Table 1 revealed that **nine** (60%) of the medical interns were in the age group of 23-24 years, **six** (40%) of them were in the age group of 21-22 years. With regard to gender **eight** (53%) of them were males and **seven** (47%) of them were females. **Nine** (60%) of them performed surgical dressing in the male surgical ward and **six** (40%) in female surgical ward.

Table 2 : Distribution of staff nurses according to study variables n=15

S. No	Study Variables	Frequency	Percentage
<b>I</b>	<b>Staff Nurses</b>		
1.	<b>Age (in years)</b>		
	20 – 23	6	40
	24 – 26	9	60
2.	<b>Gender</b>		
	Male	1	7
	Female	14	93
3.	<b>Educational Qualification</b>		
	B.Sc nursing	14	93
	GNM	1	7
4.	<b>Experience</b>		
	< 1 yrs	1	7
	1- 3 yrs	10	67
	> 3- 5 yrs	4	27
5.	<b>Area of work</b>		
	Male surgical ward	11	73
	Female surgical ward	4	27
6.	<b>Formal In-service Training received</b>		
	Yes	2	13
	No	13	87

Table 2 revealed that **nine** (60%) of them were in the age group of 24 – 26 years. With regard to gender 14 (93%) of them were females, with regard to educational qualification 14 (93%) of them had completed B.Sc. nursing degree. Among 15 staff nurses 10 (67%) had clinical experience between 1-3 yrs, 11 (73%) were

working in male surgical ward. With regard to formal in service training on aseptic training or infection control measures 13 (87%) of them did not have any formal training on aseptic techniques or infection control measures.

**Section B: Level of practice by medical interns and staff nurses on surgical wound dressing**

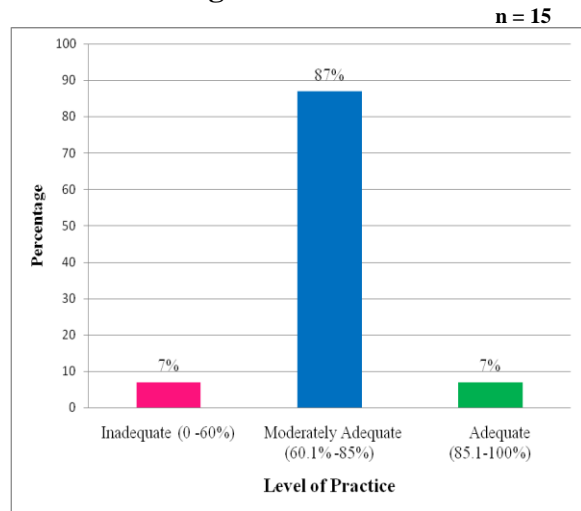


Fig. 1: Percentage distribution of medical interns according to the level of practice on surgical wound dressing.

Figure 1 shows the level of practice of aseptic techniques on surgical wound dressing by medical interns. Among 15

medical interns, **one** (7%) participant had inadequate practice, majority 13 (87%) of them had moderately adequate practice and **one** (7%) had adequate practice.

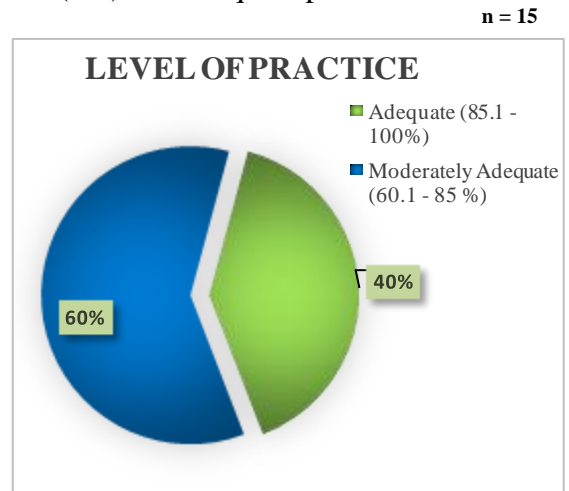


Fig. 2: Percentage distribution of staff nurses according to the level of practice on surgical wound dressing.

Figure 2 shows the level of practice of aseptic techniques on surgical wound dressing by staff nurses. Majority Nine (60%) of the staff nurses had moderately adequate practice and Six (40%) of them had adequate practice.

**Section C: Distribution of factors influencing the practice of aseptic techniques on surgical wound dressing by staff nurses.**

Table 3 (a): Frequency and percentage distribution of staff nurses according to the factors influencing the practice before the surgical wound dressing. n = 15

S. No	BEFORE THE PROCEDURE Steps	Yes		No		Influencing factor			
		(no.)	(%)	(no.)	(%)	A	B	C	D
1.	I explain the procedure to the patient.	15	100	-	-	-	-	-	-
2.	I provide privacy.	15	100	-	-	-	-	-	-
3.	Place the patient in a comfortable position that provides easy access to the wound.	13	87	2	13	-	2	-	-
4.	Arrange all the equipments such as dressing trolley with needed articles, waste bin near to the patient bed side	15	100	-	-	-	-	-	-
5.	Checked the expiry date on the sterile dressing pack and solutions used for cleaning the wound.	14	93	1	7	-	1	-	-
6.	Placed the unsterile objects separate from the sterile field.	11	73	4	27	-	1	-	3
7.	Place sterile dressing tray on a clean and dry trolley.	14	93	1	7	-	1	-	-
8.	Place waterproof pad under the wound site.	14	93	1	7	-	-	-	1
9.	Switch off the fan near the patient bed side.	-	-	15	100	6	4	5	-
10.	Remove rings/ bracelets/ wrist watch before hand washing.	10	67	5	33	-	2	3	-
11.	Wash hands with soap and water for 40-60 seconds and dried the hands / hand rubbed with alcohol based solution for 20-30 seconds before the procedure.	10	67	5	33	-	2	3	-
12.	Wear face mask throughout the procedure.	13	87	2	13	-	-	2	-

A- Patient/Physician request, B - No time, C- Negligence, D- Inadequate materials

Table 3 (a) revealed the influencing factors listed by staff nurses such as the patients/physician requested not to switch off the fan, forgot and no time, unavailability of equipments, not necessary to follow few steps.

**Table 3 (b): Frequency and percentage distribution of staff nurses according to the factors influencing the practice during the surgical wound dressing. n = 15**

S. No	DURING THE PROCEDURE Steps	Yes		No		Influencing factor			
		(no.)	(%)	(no.)	(%)	A	B	C	D
1.	Open the glove pack without touching the inside of the wrapper.	15	100	-	-	-	-	-	-
2.	Open the outer layer of the sterile dressing pack and ensure it didn't touch any surface other than trolley.	15	100	-	-	-	-	-	-
3.	Hold the cleaning solution bottle approximately 6 inches above sterile bowl while pouring the solution.	11	73	4	27	-	3	1	-
4.	Keep the sterile pack dry without becoming wet while pouring solution	13	87	2	13	-	1	1	-
5.	Drop the sterile articles gently to the sterile field without touching any articles.	14	93	1	7	-	-	1	-
6.	Do not touch the sterile dressing tray / articles using bare hands.	14	93	1	7	-	1	-	-

A- Patient/Physician request, B - No time, C- Negligence, D- Inadequate materials.

Table 3 (b) shows the influencing factors listed by staff nurses such as no time and not necessary to follow few steps.

**Table 3 (c): Frequency and percentage distribution of staff nurses according to the factors influencing the practice after the surgical wound dressing. n = 15**

S. No	AFTER THE PROCEDURE Steps	Yes		No		Influencing factor			
		(no.)	(%)	(no.)	(%)	A	B	C	D
1.	Place the patient in a comfortable position	15	100	-	-	-	-	-	-
2.	Remove used dressing tray and remaining equipments from patient side immediately after the dressing.	15	100	-	-	-	-	-	-
3.	Dispose soiled dressing in yellow bin and gloves and tubings in red bin	14	93	1	7	-	-	-	1
4.	Wash reusable articles to be sent for sterilization.	15	100	-	-	-	-	-	-
5.	Wash hands with soap and water for 40-60 seconds and dried the hands/ hand rubbed with alcohol based solution for 20-30 seconds after the procedure.	10	67	5	33	-	5	-	-
6.	Document the date and time of the procedure, nature of the wound and drainage, solutions used and patient condition.	14	93	1	7	-	1	-	-

A- Patient/Physician request, B - No time, C- Negligence, D- Inadequate materials

Table 3 (c) revealed the influencing factors listed by staff nurses such as no time to do hand wash and documentation after the procedure and no adequate bin to dispose the soiled dressing.

## SECTION D: ASSOCIATION BETWEEN THE LEVEL OF PRACTICE ON ASEPTIC TECHNIQUES WITH SELECTED STUDY VARIABLES.

### Section D (I): Association between the level of practice on aseptic techniques with study variable of medical interns and study clients.

**Table 4: Association between the level of practice on aseptic techniques with study variable of medical interns and their study clients. n = 15**

S.No	Study Variables	Level of Practice			Fisher's Exact Test
		Inadequate (0-60%)	Moderately adequate (60-85%)	Adequate (>85%)	
<b>I Medical Interns</b>					
1.	<b>Gender</b> a) Male b) Female	0 1	7 6	1 0	1.892 NS
<b>II Study Clients</b>					
2.	<b>Surgery</b> Minor Major	0 1	11 2	1 0	3.660 NS
3.	<b>Number of post operative days</b> a) 0 - 10 days b) 11 - 20 days	0 1	7 6	1 0	1.893 NS

NS – Not significant

Fisher's Exact test was used to find out the association between the level of practice on aseptic techniques with study variable of medical interns and study subjects. Table 4 revealed that there is no statistically significant association between the level of practice on aseptic techniques with gender of medical interns, surgery and number of post operative days of study clients.

**Section D (II): Association between the level of practice on aseptic techniques with selected study variables of staff nurses and study clients.**

Table 5: Association between the level of practice on aseptic techniques with selected study variables of staff nurses and study clients. n = 15

S. No	Study Variables	Level of Practice		Fisher's Exact Test
		Moderately adequate (60-85%)	Adequate (>85%)	
<b>I Staff Nurses</b>				
1.	<b>Age ( in years)</b> a) 20- 23 b) 24 - 26	5 4	1 5	0.287 NS
2.	<b>Experience ( in month)</b> a) 1- 24 months b) 25 - 48 months	5 4	1 5	0.287 NS
3.	<b>Area of work</b> a) Male surgical ward b) Female surgical ward	6 3	5 1	0.604 NS
<b>II Study Clients</b>				
4.	<b>Surgery</b> Minor Major	6 3	5 1	0.604 NS
5.	<b>Number of post operative days</b> a) 0 - 10 days b) 11 - 20 days	0 1	8 6	0.467 NS

NS – Not significant

Fisher's Exact test was used to find out the association between the level of practice on aseptic techniques with selected study variables and study subjects. Table 5 revealed that there is no statistically significant association between the practice on aseptic techniques with age, experience and area of work of staff nurses, surgery and number of post operative days of study clients.

**DISCUSSION**

Surgical site infections are caused by not following proper aseptic technique. A prospective study was conducted on Post Surgical Wound Infections in a Tertiary Care Hospital in Kanchipuram among 30 patients. All the pus swabs were processed and identified as per standard methods of identification. The rate of surgical site infections in this study was 8.3%. The rate of surgical site infections was higher (73.3%) in emergency surgeries than the elective surgeries. [7] In the present study Nine (60%) staff nurses had moderately

adequate practice and Six (40%) of them had adequate practice. Among 15 medical interns, one (7%) participant had inadequate practice, majority 13 (87%) of them had moderately adequate practice and one (7%) had adequate practice. Nurses and doctors who perform surgical dressing need to follow asepsis to prevent the surgical site infections. A study was conducted on prevention of post-operative wound infection in accordance with evidence based practice. The study includes staff nurses and facilitators from the female surgery ward. The skill of doing procedure systematically in the pre test was only 58.57% but the posttest shows improvement that is 100%. Therefore there was significant improvement in developing evidence based skill of doing procedure. [8]

In this present study the staff nurses reported that they do not have time to follow all the steps of the procedure in emergency, forgot to do some steps, unavailability of equipments and need not to follow few steps in the procedure. A descriptive study was

conducted to explore the Cypriots surgical-oncology nurse's perceptions on postoperative wound management and to identify factors involved in decision-making on this topic. The absence of nurse's up-to-date knowledge and the absence of wound care guidelines appear to negatively influence the postoperative wound care decision-making. Furthermore, the influencing role of the doctors in deciding how to manage postoperative wounds is one of the factors that nurses identified as a negative influence to their autonomy. Workload was identified as a major factor that influences the quality of postoperative wound care and maximizes the occupational risks in nurse's area of practice. [9] A descriptive study was conducted on Knowledge, Attitude and Practice regarding Universal Precautions among nursing personnel. The study was conducted in the Government Multi-Specialty Hospital Sector 16 Chandigarh in 2006 and 2007. In the practice score 38.7% of subjects reported the universal precautions to be time consuming whereas 26% of them did not take it as time consuming while at the same time 21.3% of the total subjects did not attempt the question. [10] A descriptive study was conducted to assess the knowledge and practices of aseptic techniques applied in nursing practice among staff nurse working in selected hospital, Ahmednagar. Finding revealed that overall knowledge mean score was  $11.56 \pm 2.37$  which is 57.80 % of the total score. It interprets that the staff nurses had good level of knowledge of aseptic techniques applied in nursing practice. It interprets that the staff nurses maintain very good practices of aseptic techniques applied in nursing practice. However overall practices mean score for no was  $4.97 \pm 3.12$  which is 24.60%. It is essential to raise awareness about aseptic techniques in providing nursing care to patients. [11]

A descriptive study was conducted to assess the effectiveness of self-instructional module on aseptic wound dressing practices for staff nurses at Sree Balaji College of Nursing, Bharath

University, Chennai. A total of 100 staff nurses have been taken from the selected hospital. A very highly significant ( $t=31.74$ ,  $p<0.05$ ) difference was observed between the pre-test and post-test knowledge scores of staff nurses in the areas of aseptic wound dressing practices. [12] A descriptive study was conducted to assess wound dressing performances among nursing personnel in three surgical wards of Olabisi On Shagamu Ogun State Nigeria. Nurses have a very good performance of concepts/principles of sterile technique in the performance of the procedure. Significant difference was found between length of clinical experience and practice of wound dressing. [13] So frequent training is needed for the nurses to follow the aseptic techniques and prevent the surgical site wound infections.

## CONCLUSION

The present study assessed the practice of aseptic techniques on surgical wound dressing by health care professionals in general surgical wards. The practice was observed by using observational checklist and self administered questionnaire. The current study revealed that majority of the medical interns and staff nurses had moderately adequate level of practice of aseptic techniques on surgical wound dressing. Therefore the study concluded that there is a need for continuous education and reinforcement of aseptic techniques on surgical wound dressing among health care professionals to improve their practice.

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