

**A STUDY TO ASCERTAIN THE DIFFERENCE IN THE COST OF DISPOSABLE AND NON-DISPOSABLE SURGICAL DRAPE**

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**ABSTRACT**

A nosocomial infection — also called “hospital acquired infection” can be defined as, an infection acquired in hospital by a patient who was admitted for a reason other than that infection. It is an infection occurring in a patient in a hospital or other health care facility in whom the infection was not present or incubating at the time of admission. This includes infections acquired in the hospital but appearing after discharge and occupational infections among staff of the facility. The most frequent nosocomial infections are infections of surgical wounds, urinary tract infections and lower respiratory tract infections. The WHO study has also shown that the highest prevalence of nosocomial infections occur in Intensive Care units, in acute surgical and

orthopedic wards. Many factors promote infection among hospitalized patients. These can be decreased immunity among patients, the increasing variety of medical procedures and invasive techniques creating potential routes of infection, old age, underlying disease, the inconsistency in some of the standard methods and techniques followed by the hospital staff. There is a lot of scope in reducing the hospital acquired infections, by providing sterile supplies in the ICU, OT & wards.

**KEYWORDS:** Sterile supplies, Disposables, Hospital acquired infections, Cost reduction, Average length of stay.

## INTRODUCTION

A nosocomial infection — also called “hospital acquired infection” can be defined as, an infection acquired in hospital by a patient who was admitted for a reason other than that infection. It is an infection occurring in a patient in a hospital or other health care facility in whom the infection was not present or incubating at the time of admission.<sup>[1]</sup> Infection remains a complication of surgery despite the modern aseptic surgical techniques; other reason being the routine use of antibiotics. Infections that occur in the wound created by an invasive surgical procedure are generally referred to as Surgical Site Infections.<sup>[2]</sup> Surgical Site Infections are associated with considerable morbidity and it has been reported that over one-third of post-operative deaths are related, at least in part, to such infections.<sup>[3]</sup> There is a growing concern over the infection of healthcare workers by patients, particularly those with the hepatitis and human immunodeficiency virus.

**Cost:** An amount that has to be paid or given up in order to get something. **Institute of cost and work accounts** defines as ‘measurement in monetary terms of the amount of resources used for the purpose of production of goods or rendering services.’<sup>[4]</sup>

All expenses are costs, but not all costs are expenses (such as those incurred in acquisition of an income-generating asset).

Cost is a monetary evaluation of effort, material, resources, time, utilities, consumed, risks incurred and opportunity forgone. **An expense** is the cost of resources used to produce revenue. **Price** is the amount of money you pay to buy the equipment. Cost is the amount of money you pay to operate the equipment over the lifetime.

### Elements of the cost

Cost of production/manufacturing consists of various expenses incurred on production or manufacturing of goods or services. The elements of cost which can be divided into three groups: Material, Labor, Expenses.

### **Surgical drapes:** Surgical Drapes are *Medical Devices*

This is irrespective of whether the drapes are single use or reusable. Associated risk increases as the medical classification class increases.<sup>[5]</sup>

**Cost Savings is always an aim**

The objective of the present study was to carry out a cost/benefit analysis of surgical drapes to help hospital managers and surgical teams in comparing reusable, but non disposable and single-use surgical drapes.

**Utility and significance of this study**

Though the cost of non-disposable items costs more in the initial period, availability of a good CSSD & well-trained healthcare workers who are compliant with the execution of standard operating procedures (SOPs) of hospital related to sterile procedures, universal precautions and patient safety techniques can keep a check on the hospital expenses. One of the major concerns is the high cost of disposables. Factors which can prohibit use of disposable drapes are:

- Purchase price.
- Storage expenditure.
- Disposable expenditure after use.
- Inventory expiry cost.

A detailed case study was carried out to determine the net costs associated with the process of disposable and non-disposable surgical drape used in the operation theater of the hospital.

**AIM**

To carry out the comparative cost analysis of a disposable and non-disposable surgical drape.

**OBJECTIVES**

- a) To conduct the cost analysis of the process through which non-disposable and disposable surgical drape is used in the operation theaters.
- b) To study the process of use of the disposable and non-disposable surgical drape.

**METHODOLOGY**

**Type of study:** Cross sectional, Observational and Analytical.

**Place of study:** Multispecialty Hospital in Pune. (Bed strength – 450 beds).

**Economic evaluation:** Costing of single disposable and non-disposable surgical drape.

**Retrospective:** Record based. Records of the Workforce salary, Cost of the equipment's, maintenance cost, furniture, electricity consumption cost, water consumption cost, cost of

material consumption, stationary cost, housekeeping cost, waste disposal cost of respective departments were studied.

**Prospective:** Various routes and the procedures for both the disposable and non-disposable surgical drapes were studied. Series of interactive sessions with the hospital staff were conducted.

**Workload calculation:** The total workload of respective departments, The workload for the respected type of surgical drapes in these departments were calculated.

**Target population:** Doctors, the heads of departments, professionals of various categories and Class IV workers working in respected departments of the hospital.

### Tools of data collection

The tools of data collection were:

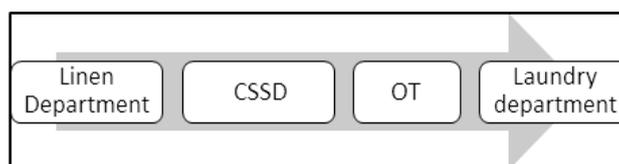
1. Daily Records of the various departments related to the surgical drapes,
2. Finance records,
3. Maintenance of records,
4. Workload records,
5. Interviews with the head of departments, staff, and multipurpose workers.

### Departments involved

**Table 1: Departments involved in sterile store supply.**

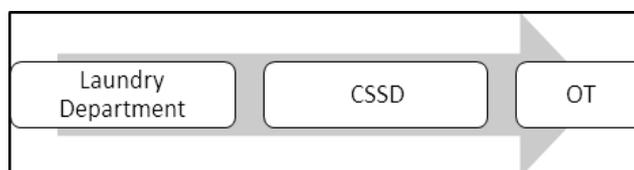
Linen	Laundry	C.S.S.D	Finance
O.T. store	Purchase	B.M.W	I.T
Laboratory	Water & Electricity	Purchase& store dept.	Accounts

The first cycle through which the non-disposable drapes is passed through:



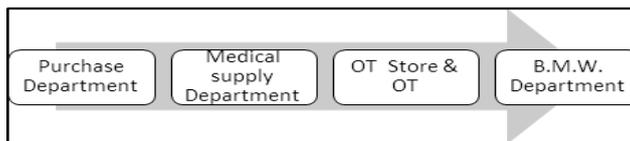
**Fig1: Flow chart of move of Non sterile supply.**

The second cycle is as follows:



**Fig2: Flow chart of move of sterile supply.**

The cycle for the disposable drapes is:



**Fig3: Flow chart of move of Disposables.**

**Findings & analysis:** The average no. of surgical drapes used in per case in these surgeries:

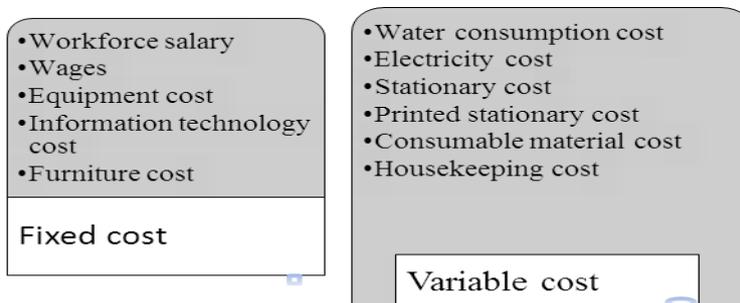
**Table 2: Average requirement of surgical drapes in OT**

Sr.no	Type of surgery	No of surgical drapes required	No of disposable drapes used (pcs)	No of non-disposable drapes used (pcs)
1	T.K.R.	21	3	17
2	T.H.R	22	4	18
3	Cardiac surgeries	26	3	24
4	Laparotomy	10	2	8
5	Gynecology cases	10	2	6
6	Neurological surgeries	15	2	13
7	Average	17.4	2.33	14.33

**Table 3: Total requirement of surgical drapes in a year.**

	Disposable	Non-disposable
Average no of drapes required for each surgery	2.6	14.6
No. of surgeries daily	40	40
No. of Surgical drapes required daily	104	584
No. of Surgical drapes required yearly	37,856	2,13,160

The basic methodology for cost each department was:



**Fig4: Break down of Fixed and Variable cost.**

The total cost for the non-disposable surgical drapes is given in table4:

**Table 4: Department-wise break down of costing.**

Sr.no.	Name of the dept	Total cost in dept.
1	Linen	Rs. 13,18,538.21
2	Laundry	Rs. 43,86,182.61
3	C.S.S.D	Rs.43,95,978.38
4	Opportunity forgone	Rs.44,51,001.664

The total cost, in a year for a respective single surgical drape in each department involved was:

**Table 5: Cost incurred on disposable drapes.**

1	Purchase, Medical supply & store	<b>Rs.39,68,421.82</b>
2	B.M.W	<b>Rs. 64,572</b>

The total workload of the surgical drapes for each department is calculated. As per the existing norms, the depreciation rate for equipment, information technology & furniture were taken. The cost of water, electricity consumption was calculated with respect to the workload of surgical drapes for the each department. The cost of both the types of drapes in the O.T. was calculated separately, as the time for the each surgery, the workforce required for it, cost associated with it varies from place to place and hospital to hospital. The land cost in this case is not considered as the land for this hospital belongs to a Trust.

After all the calculations, the cost for the non-disposable surgical drapes in each department is as follows:

**Table 6: Cost of Non disposable surgical drape/unit.**

Linen Department	Laundry Department	CSSD	OT	Opportunity cost
Rs.13.73	Rs.6.84	Rs.9.94		Rs.46.36

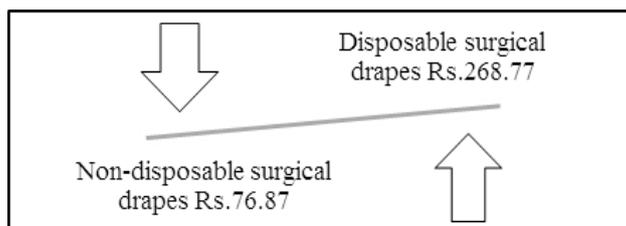
The total cost comes to **Rs.76.87**

The cost for the disposable surgical drapes is as follows:

**Table 7: Cost of Disposable surgical drape/unit.**

Cost of the disposable surgical drape	Purchase & Medical supply dept.	O.T. & O.T. Store	B.M.W. Department
Rs.272.11	Rs. 1.62		Rs.1.72

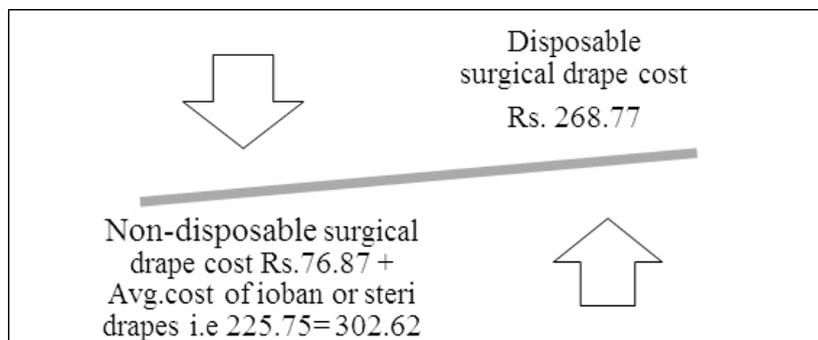
The total cost comes to Rs.268.77. So the study reveals the following:



**Fig12: Cost Variation in Disposable & Non-disposable surgical drapes.**

It has been observed that the use of Ioban incision drape or Steri drape is very high irrespective of the other surgical drapes used in the same surgery. The average cost of these Ioban incision drape and the Steri drape is about Rs. 225.75. So when the surgeon performs

the surgery with the non-woven surgical drape and uses either the Ioban incision drape or Steri drape the cost for the surgical drape for that surgery comes to Rs. 302.62(super specialty surgery). So when the surgeon performs surgery with Ioban incision drape or Steri drape it, costs more.



**Fig13: Cost of surgical drapes in super-specialty operation when both the drapes were used.**

Apart from this there are various factors which influence the decision to use non-disposable or disposable surgical drapes. These factors are Infection control, ease of handling, Cost effectiveness, Absorbency, Strikethrough, Regulations, Environmental cost, Health and safety of staff.

It also depends on the type of hospital it is, the surgeons who are attached to the hospital as with this will vary the type of surgeries performed. Example if the two leading cardiac surgeons are attached to the hospital, the number of cardiac surgeries may be more leading to change in the requirement of the surgical drapes and so the cost of it. It also depends on the policy of the hospital regarding the pricing of the surgeries, the policy on using the disposable drapes, whether the biomedical disposable waste facility is in-house or outsourced.

## CONCLUSION

Considering all these factors, still can the hospital take a decision to increase the use of the disposable drapes to some extent, if not fully? The overall cost for raising the purchase order for the disposable of surgical drapes is high. The hospital may have to bargain for more reduced price, from the companies who sell the disposable surgical drapes. May be the workload from the laundry, C.S.S.D, and also the time of the O.T. staff will be saved. But, the bulk (volume) of disposables require additional space in the hospital.

Study clearly showed, that if a good CSSD & Linen laundry services are available in the hospital & if there are no high end operations (transplant surgery, Orthopedic & Neuro surgery) are under taken and healthcare workers are patient safety conscious, there is a definite scope for minimal use of disposables in hospitals.

The study is not funded by any agency.

There is no conflict of interest.

The study was conducted by student of MBA (HHM) as a part of Summer Internship Project, on managerial issue of cost containment measures; no human / animal beings were used for experimental study and hence, no Ethical issues were involved.

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