

## Assessment of Bed Linen in Surgical Sites and the Use of Nonwoven Materials in Hospitals: A Study on Surgical Site Infection Prevention and Sterility Standards

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### ABSTRACT

People take visits to Hospitals for various health issues. Hospitals are the place where patients get cured but hospital environment can be a cause of spreading illness. Environment of the Hospital plays a major role in spreading infections like Hospital acquired infections and surgical site infections. Hospital linen can be a major cause in conveying infections. Textiles contaminated with body substances can contain large numbers of microorganisms (106-108 cfu/100 cm<sup>2</sup> fabric).

At surgical sites, the risk of Surgical Site Infections is high and using Nonwoven instead of woven material can minimize the risk. Nonwovens are much better because of disposability and cost effectiveness. Cross-contamination has always been a problem for hospitals which is attributed largely to re-using of woven gowns, masks, bed linen etc. Nonwovens significantly reduce cross-contamination because it is disposability and cost effectiveness.

This study is conducted at some of the private hospitals of Bhopal city in India, to know the type of material being used as Bed Linen at surgical sites, any guidelines followed by hospitals for laundering Bed Linen, awareness about nonwoven materials, and scope of introducing Nonwoven as an option at surgical sites.

**Keywords:** *Nonwoven, Hospital Linen, Surgical Site, Cross-contamination, Hospital Acquired infections, Surgical Site Infections.*

## I. INTRODUCTION

Welcome Microorganisms and their side effects has always been a threat for the Hospitals. Many precautions are taken for prevention but the risk of cross contamination of surfaces and textiles to patients and staff is considerable. Any textile material in a hospital is a potential carrier of infectious agents such as bacteria, fungi, and yeast. Of all the surfaces in a hospital, a patient has the greatest degree of contact with his gown and the bed linens. The threat of Hospital acquired infections has brought third generation antibiotics into the market and prescribed intensively by the medical personnel. This has led to double the suffering of patient and increase in cost of treatment. Good cleaning practices and environmental sanitation procedures can lead a long way towards reducing hospital acquired infection and decreasing the cost of care.

A previously published study shows that 0.84% of the total expenditure of the hospital is spent on laundering (excluding salary and wages), and 0.42% on Linen. According to Indian government's guidelines for district hospitals, hospital having 30 bed capacities must have a 150 sq. feet space for washing machine, autoclave and dryer. Hospital linens ought to be laundered, transported, and stored in such a way that risk of exposure to environmental contaminant minimizes.

Nonwovens used in medical products are designed for two purposes: firstly, to be low cost to aid in one-time use scenarios; and secondly, to perform 100% of the time [2]. Nonwovens give a performance much better than woven in terms of cost-effectiveness, disposability etc. India is fast growing in its use of nonwovens [3].

## II. METHODOLOGY

The methodology for this research is Descriptive Research. This study is conducted at the private hospitals of Bhopal city. Closed ended Questions are asked in 5 categories: 1. Material used for Bed Linen, 2. Any Guidelines followed by Hospitals for laundering Surgical Site Linen, 3. Separation of Surgical Site linen from other Bed linen 4. Awareness of Hospital authorities about Nonwoven materials and their benefits, 5. Scope of using Non woven Material at Surgical site

**Study area**

This study is conducted at the private hospitals of Bhopal city. Sample size of 10% of the total population (Hospitals of Bhopal City) has been taken.

**Study tool**

Questionnaire is used as a research tool in the study. Closed ended Questions are asked in 5 categories: 1. Material used for Bed Linen, 2. Any Guidelines followed by Hospitals for laundering Surgical Site Linen, 3. Separation of Surgical Site linen from other Bed linen 4. Awareness of Hospital authorities about Nonwoven materials and their benefits, 5. Scope of using Nonwoven Material at Surgical site.

**Data analysis**

The data collected was analyzed and interpreted by taking out the percentage.

**III. RESULT**

The outcome of survey for the sample size of 10% (18 Private hospitals of Bhopal city) is: 80% Hospitals use woven Cotton Bed linen and rest use Cotton-Polyester woven Bed-Linen. 70% hospitals follow guidelines for laundering Bed Linen while others outsource the facility. 70% do separately launder the Surgical site linen and Other Bed Linen, 80% Hospital authorities are aware about Non-woven materials and their benefits and, 50% of them would like to introduce Non-woven materials as an option at surgical sites.

**IV. PRACTICAL SIGNIFICANCE**

Nonwovens are developed to impart special properties to product. The advantage of nonwovens is high economic efficiency of production and disposability. This study explores about awareness of hospitals about benefits of Nonwovens, threats of surgical site infections, cost effectiveness of Nonwovens, and an option for the hospitals to use nonwovens at surgical site to avoid surgical site infections. In the long run, it can be beneficial for both patients and hospitals.

**V. CONCLUSION**

This study concludes that: - Material used by hospitals of Bhopal is woven material of Cotton and Cotton Polyester Blend. -The outsourcing units do not follow the guidelines properly which can be a major cause of conveying infections. - Because of cost effective reasons, Hospitals avoid establishing their own laundry setup. - Since it is more risky to wash surgical site linens and general linens together when there is no assurance of proper laundering process and disinfection of Linen, taking in mind the cost-effectiveness and disposability etc, Nonwoven surgical site linen are the possible solution. - Nonwoven Bed Linen is easily available by leading manufacturers and suppliers from various parts of the country and buyers can easily contact them by email and phone. - Hospital authorities are aware about Non-woven materials but they are not sure about taking the initiative.

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