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Research Article

QUALITY ASSURANCE IN HOSPITAL LINEN AND LAUNDRY SERVICES

Punit Yadav[1]., Awasthi P C[2] and Shashikant Sharma[3]

[1,2]Department of Hospital Administration Armed Forces Medical College, Pune 411040 Maharashtra, India
[3]Hospital Administration, Armed Forces Medical College

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ABSTRACT

Linen and laundry services are one of the most important support services in the present day hospitals. The laundry services include a wide range of activities and services pertaining to procurement, washing, cleaning, disinfection and distribution of clean linen to hospital inpatient and outpatient areas. Hospital Laundry is very different from laundry services maintained in Hospitality Industry. The hospital laundry deals with linen which is soiled from various body fluids i.e. Blood, Urine, Feces, Blood etc. This type of linen requires to be disinfected and serviced before putting them into washing machines. There are items which require careful and delicate handling. The goal of linen and laundry is to provide regular and timely supply of clean linen to the satisfaction of patients and staff. Laundry should be able to provide adequate quantity of right quality linen to indoor patients, Operation Theatres, Out Patient Departments and other areas of the hospital for the medical and paramedical personnel engaged in providing health care. An efficient and effective Linen and Laundry services can enhance patient experience and reduce the risk of cross contamination. Laundry and its products should preserve the patients' dignity, promote the patient care and be appropriate to patient group, gender, clinical status, religion and beliefs.

INTRODUCTION

When most of the people think of hospitals, they usually think in terms of doctors and nurses because of their high visibility, the high profile service they render and the close relationship they have with patients and their relatives. [1] Linen and laundry services are one of the most important support services in the present day hospitals. The word laundry is derived from the word 'Launderer' and 'Laundress' meaning washer man and washer women. The laundry services include a wide range of activities and services pertaining to procurement, washing, cleaning, disinfection and distribution of clean linen to hospital inpatient and outpatient areas. Criticism of linen services is the frequently heard complaint in the hospital. This document aims to provide guidelines so that an adequate supply of clean linen for the comfort and safety of patients thus become imperative.

History

The importance of clean environment and linen was realized as early as third and fourth century BC. Hotel-Dieu Blanchisegge was the earliest to realize the importance of linen and laundry services in 12th century AD. During 13th to 19th century there was a decline in the standards of linen and laundry services. In 1854 Florence Nightingale organized the Linen and Laundry services. After World War 1, mechanized washing machines were invented and mainly used in Hospital as In house facilities and contract system in small hospitals. At the end of World War II, Laundry machines were developed led to commercialization of linen and laundry services. Then developed central laundry services which served five to ten hospitals.

Why Hospital Laundry is different?

Hospital Laundry is very different from laundry services maintained in Hospitality Industry. The hospital laundry deals with Linen which is soiled from various body fluids i.e. Blood, Urine, Feces, Blood etc. This type of linen requires to be disinfected and serviced before putting them into washing machines. There are items which require careful and delicate handling. There is a requirement for zoning of different area in the laundry for segregation of clean and dirty utilities. Hospital Laundry requires large washing, drying and calendering machines, as the hospitals have to deal with large amount of linen per day. At the planning stage, however the workload to

Corresponding author: **Punit Yadav*
Department of Hospital Administration Armed Forces Medical College, Pune 411040 Maharashtra, India

be laundered can be projected by using the following guidelines: [1]

1. American Standards: An average of 15 pounds(6.80 kg) per bed per day plus 25 pounds (11.33 kg) for each operation or delivery.
2. British Standards: 60 articles per bed per week at 0.39 kg per article.
3. Indian Standards: The rule of thumb is three to five kg per bed per day.

Aim of Hospital Laundry

The aim of Hospital Laundry is to provide adequate supply of clean Linen for the comfort and safety of the patient and personal appearance of the personnel. The goal of Linen and laundry is to provide regular and timely supply of clean Linen to the satisfaction of patients and staff. Laundry should be able to provide adequate quantity of right quality linen to indoor patients, Operation Theatres, Out Patient Departments and other areas of the hospital for the medical and paramedical personnel engaged in providing health care.

Functions of Hospital Laundry

1. Collection and receipt of soiled and infected Linen
2. Sorting, Sluicing, Disinfecting, Washing and Ironing of Linen.
3. Repair of damaged Linen
4. Assembling and packaging of specialty Items and Linen pack for sterilization.
5. Distribution to user departments.

Planning Considerations

Provision of a new laundry or the major upgrading of an existing one entails considerable investment. Revenue expenditure over the life of the project will be in the order of 20 times the capital cost. [2] It is essential, therefore, that at an early stage in the planning the project team should consider rationalization of laundry services across a region, or the possibility of obtaining laundry services from an adjoining district. The following should also be considered while planning for a Hospital Linen and Laundry services

1. Size of the Hospital
2. Type of Hospital
3. Availability of Linen and Laundry services in adjacent areas
4. Weather Conditions
5. Type of Clientele

Location & Interdepartmental Relationship

The laundry will generally be sited within the curtilage of a hospital and should be located as near as possible to the boiler house to minimize distribution losses.[2] The linen and laundry services can be collocated with other facilities requiring services of boiler e.g. Central Sterile Supply Department , Dietary Services, Garage, Maintenance Shop The economic appraisal of alternative locations and design solutions should include the heat conversion and distribution losses to the point of use. There should be easy access to the principal hospital service roads and to public roads; and sufficient space to ensure that vehicles can manoeuvre, turn round and park easily at reception and dispatch bays. Where the laundry is an offsite facility, it should be sited with convenient access to the principal main and trunk routes which serve those hospitals sending articles to the laundry.

Physical Layout, Functional flow of activities carried out in Linen & Laundry Services

As followed in designing of other health care services, design should follow the functional flow. The laundry will only function effectively if the building is planned in strict accordance with the production sequence. One of the suggested layout of Linen & Laundry services is shown in Figure 1. There should be functional separation of areas that receive, store or process soiled textiles from areas that process, handle or store clean fabric. The following may be resorted to:

1. Physical Separation
2. Negative air pressure in soiled textile areas
3. Positive air flow from the clean textile area through the soiled textile area with venting directly to outside.

Figure 1 Functional Flow and Layout

Design of Linen and Laundry Services

The design of linen and laundry services may follow the local site considerations. The suggested layouts are shown in Figure 2. In case of high rise buildings the gravitational type of layout can be considered. However, the decision is being left to project planning teams.

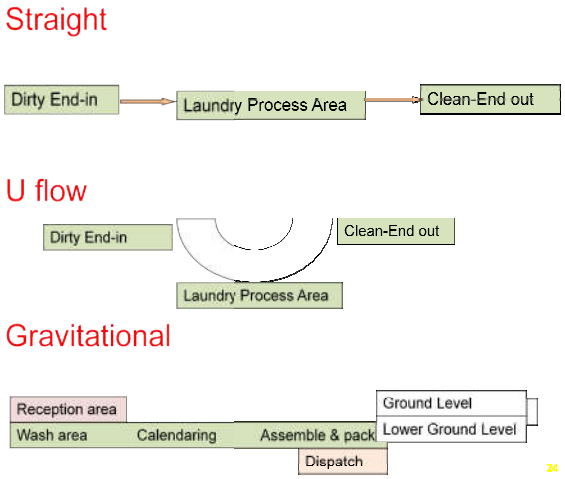

Figure 2 Design Considerations

Space, Structural and Engineering Requirements

The space requirements for establishing a Linen and Laundry Services for a hospital depends upon the parameters mentioned in the planning considerations. However, minimum space requirements are 10 sq ft per bed or 10 sq ft per 2.5kg of Linen. For a 300 bedded hospitals a minimum area of 3240 sq ft and for a 600 bedded 4068 sq ft is required. [3] The floor should be smooth, washable, non slippery and water impervious. Terrazo, Mosaic, Welded Sheet Vinyl are the suggested materials for floor finish. The walls should be hard, smooth, washable and light reflecting with no dust collecting projections. The ceiling height should not be less than 3.35 meters from finished floor level to incorporate the various ductings. A minimum of 10 air changes with maximum of 20 in hot weather period is suggested. Lighting of 300 lux in working area with painted surface reflecting values of 0.74 and 0.81 is required. Mechanical Laundry consumes a large quantities of water, 30 liters of hot water and 10 Liters of cold water should be catered for every kilogram of linen washed. As a thumb rule, 100 liters/bed/day is the requirement for smooth functioning of laundry services. A boiler supplying a steam at 170-180 degree Celsius at 100-125 Psi should be collocated to minimize distribution losses. A water softening plant according to local water supply is desirable. A 400 Volt, three phase connection with a standby backup supply with adequate provisioning of 15 Ampere Sockets should also be considered during initial planning stage.

Linen recognition systems

All items should be prominently marked for visual identification to discourage pilfering. The long-term development of the laundry service will include the use of bar-coding and/or transducers. This will enable the hospital to keep track of how linen moves around from one site to another. It is envisaged that this system will assist in linen control, stock levels, identifying where linen losses are taking place, management systems etc. It will not be cost effective to bar-code all items of linen and a guide will be the cost of the article and loss rate.

Rental system		Contractual system		In-plant system		Cooperative system	
Adv	Disadv	Adv	Disadv	Adv	Disadv	Adv	Disadv
Reduced capital outlay Fewer personal problems Lowered overall costs Low administrative responsibility Use 25 – 300 beds Distance	Higher cost compared to a hospital operated linen service	Saving on capital outlay No training cost Professional agency No Union problem Commitment Reputation	High linen inventory No control over wash formula Not absolutely dependable Delivery problems delaying scheduled services Hard on linen High caustic solutions High pH to make soap effective	Safe handling Better control Cost Washing formula Complete control of quality Emergent requirement High level of patient care Use Big size	High initial cost Maintenance and recurring expenditure Administrative problems	Unnecessary duplication avoided Improved planning Increased community support Operational efficiency Improved management Modernization Automation Cost effective purchase Improved quality	Loss of administrative control of hospitals Institution loss of prestige Concern over standardization Lack of response to needs of individual hospitals

Figure 3 Advantages (Adv) and Disadvantages (Disadv)

In House vs Outsourced

In general terms, the decision of In-house vs. outsourced services will be an executive decision and the cost benefits are related to the scale of laundering operations. Maximum efficiency will normally be achieved when machinery and equipment used for processing the bulk of flat-work are operating at their optimum production levels, which are determined by the workload capacity of calendering equipment (flat-work ironing machines) and by the type of linen. The advantages and disadvantages of various options are shown in Figure 3

Risk Management: Hazard Analysis and Critical Control Point (HACCP) system

Linen and Laundry services being equipment intensive poses a variable number of hazards to the facility and the personnel working in the facility. As a part of Quality Control Measure, the HACCP system, which is science based and systematic, identifies specific hazards and measures for their control to ensure the safety. HACCP is a tool to assess hazards and establish control systems that focus on prevention. Any HACCP system is capable of accommodating change, such as advances in equipment design, processing procedures or technological developments. The details of HACCP are outside the scope of the present document but to mention the HACCP system consists of the following seven principles:

PRINCIPLE 1: Conduct a hazard analysis.
PRINCIPLE 2: Determine the Critical Control Points (CCPs).
PRINCIPLE 3: Establish critical limit(s).
PRINCIPLE 4: Establish a system to monitor control of the CCP.
PRINCIPLE 5: Establish the corrective action to be taken when monitoring indicates that a particular CCP is not under control.
PRINCIPLE 6: Establish procedures for verification to confirm that the HACCP system is working effectively.
PRINCIPLE 7: Establish documentation concerning all procedures and records appropriate to these principles and their application.

CONCLUSION

An efficient and effective Linen and Laundry services can enhance patient experience and reduce the risk of cross contamination. Laundry and its products should preserve the patients' dignity, promote the patients' care and be appropriate to patient group, gender, clinical status, religion and beliefs. Quality inspectors may wish to understand how the laundry process impacts above and design a framework to identify necessary quality requirements within the organization.

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