# The Prevalent Hospital Infection Control System and Analysing the Gaps with the Actual NABH Standards

**Internship Training**
**at**
**District Hospital, Hoshiarpur, PHSC**
**Punjab**

**By**
**Mudita Puri**

**Under the guidance of**
**Dr. Seema Mehta**

**Post Graduate Diploma in Hospital & Health Management**
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**INSTITUTE OF HEALTH MANAGEMENT RESEARCH**
1, Prabhu Dayal Marg
Sanganer Airport, JAIPUR - 302 011, INDIA
Tel. : 3924700, 2791431-32
Fax : 91-141-3924738
E-mail : iihmr@iihmr.org
URL : http://www.iihmr.org
Gram : HEALTHINST

**TO WHOMSOEVER IT MAY CONCERN**

This is to certify that Dr. Mudita Puri student of Post Graduate Diploma in Hospital and Health Management (PGDHM) from Institute of Health Management Research, Jaipur has undergone internship training at District Hospital, Hoshiarpur, Punjab Health Systems Corporation, Punjab from 3rd February, 2014 to 30th April, 2014.

The Candidate has successfully carried out the study designated to her during internship training and her approach to the study has been sincere, scientific and analytical.

The internship is in fulfilment of the course requirements.

I wish her all success in all her future endeavours.

22 May 2014

**Dr. Ashok Kaushik**
Dean, Academics and Student Affairs
IIHMR, Jaipur

**Prof. Seema Mehta**
Professor
IIHMR, Jaipur

**PUNJAB HEALTH SYSTEMS CORPORATION**

State Institute of Health and Family Welfare Complex
Phase-VI, Near Civil Hospital, Sahibzada Ajit Singh Nagar, Punjab.
Phone : 0172-2262938, 2263938, Tele-Fax : 0172 - 2266938
Visit us at : punjabhealth.co.in : E-mail: phschd@yahoo.com

No. PHSC/NABH/'14/ 34 Dated 6.5.14

To whomsoever it may concern

Certificate of Dissertation Completion

This is to certify that Dr. Mridita Puri, student of Postgraduate Diploma in Hospital and Health Management of IIHMR Jaipur, has successfully completed three months dissertation under Punjab Health Systems Corporation, Punjab, from 03.02.2014 to 30.04.2014

During the dissertation the student's performance was found to be satisfactory.

We wish him/her success in all his/her future endeavors.

Hussan Lal I.A.S.
Managing Director
Punjab Health Systems Corporation
-Cum-Secretary Health and Family Welfare, Pb.

**INSTITUTE OF HEALTH MANAGEMENT RESEARCH**
1, Prabhu Dayal Marg
Sanganer Airport, JAIPUR - 302 011, INDIA
Tel. : 3924700, 2791431-32
Fax : 91-141-3924738
E-mail : iihmr@iihmr.org
URL : http://www.iihmr.org
Gram : HEALTHINST

## CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled **"The prevalent Hospital Infection Control system and analysing the gaps with the actual NABH standards"** and submitted by Dr.Mudita Puri, enrolment number IIHMR/PGDHM/2012-14/17-1340 under the supervision of Prof. Seema Mehta, for award of Postgraduate Diploma in Hospital Management of the Institute carried out during the period from 3rd February, 2014 to 30th April, 2014 embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other Institute or other similar institution of higher learning.

Mudita Puri
Signature 22/May/2014

## ABSTRACT

**Title:** "The prevalent Hospital Infection Control system and analysing the gaps with the actual NABH standards".

**Key words:** Infection Control, Biomedical waste management, NABH checklist analysis, hand hygiene guidelines, housekeeping guidelines.

**Background:** The study is based on knowing the prevalent hospital infection control system in the hospital. Hospital infection control program is dedicated to assisting the Public Health Services, State and Local Health Departments, Hospitals and other professional organisations in the prevention and control of nosocomial infections.

**Objectives:** To monitor the prevalent hospital infection control system and to find out the gaps between the standardised Hospital Infection control Standards and the prevalent standards in the hospital and suggest recommendations for the same.

**Methodology:**

A two phase study- descriptive method consisting of a comprehensive and observational study in the high risk areas of the hospital with the help of questionnaire, NABH checklist to check compliance and give score as 0,5,10 and studying the relevant record in District Hospital, Hoshiarpur, Punjab.

**Conclusion:**

After analysing the findings of the first and the second phase it was found that there was an evident increase in the average score of all the standards from 4.27 to 6.8. Standards like HIC.1 and HIC.9 showed no compliance in the first phase of the study which was observed to be 7.7 and 3.3 respectively in the second phase of the study. The number of objective elements showing full compliance was increased from 12 to 27. Most of the recommendations given were implemented for the standard dealing with Bio-Medical Waste management, therefore, HIC.8 showed the maximum average score in the second phase (9).

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**PART II**

**DISSERTATION REPORT**

## 2.1 INTRODUCTION TO THE PROJECT:

**Infection control** is the discipline concerned with preventing nosocomial or healthcare-associated infection. It is an essential, though often under recognized and under supported, part of the infrastructure of health care. Infection control and hospital epidemiology are akin to public health practice, practiced within the confines of a particular health-care delivery system rather than directed at society as a whole.

Infection control addresses factors related to the spread of infections within the health-care setting (whether patient-to-patient, from patients to staff and from staff to patients, or among-staff), including prevention (via hand hygiene/hand washing, cleaning/disinfection/sterilization, vaccination, surveillance), monitoring/investigation of demonstrated or suspected spread of infection within a particular health-care setting (surveillance and outbreak investigation), and management (interruption of outbreaks). It is on this basis that the common title being adopted within health care is "Infection Prevention & Control."

Patient safety and infection control are the two key areas for the smooth functioning of the hospital. Medical errors and hospital infection have always been a challenge for the hospital.

Hospital infection is contributed by large number of factors such as:

1. Advancing age of the patients, as they are more prone to infections
2. Use of sophisticated and complicated equipment which is not easy to clean, disinfect or sterilize. Increasing specialization bringing together patients susceptible to some type of infection.
3. Effective sterilization system as yet not fully understood by all concerned.

Major concerns of the Hospital Infection Control include the following aspects:

a) Segregation of Bio Medical Waste at source;
b) Hand Hygiene;
c) Needle Stick Injury;
d) Adherence to standard universal precautions;
e) Cleaning, sterilization and disinfection;
f) Isolation.

### 2.1.1 HAND HYGIENE:

As the hands of health-care workers are the most frequent vehicle of nosocomial infections, hand hygiene including both hand washing and hand disinfection is the primary preventive measure. Thorough hand washing with adequate quantities of water and soap remove more than 90% of the transient, i.e. superficial, flora including all or most contaminants. An antimicrobial soap will further reduce the transient flora, but only if used for several minutes. Hand washing with (non-medicated) soap is essential when hands are dirty and should be routine after physical contact with a patient. Killing all transient flora with all contaminants within a short time (a few seconds) necessitates hygienic hand disinfection: only alcohol or alcoholic preparations act sufficiently fast. Hands should be disinfected with alcohol when an infected tissue or body fluid is touched without gloves.

WASH HANDS WHEN VISIBLY SOILED! OTHERWISE, USE HANDRUB

Duration of the entire procedure: 40-60 seconds.

RUB HANDS FOR HAND HYGIENE! WASH HANDS WHEN VISIBLY SOILED

Duration of the entire procedure: 20-30 seconds.

**Hand washing Instructions**

- To wash hands properly, always running water should be used.
- Rub all parts of the hands and wrists with soap and water or an alcohol-based hand rub.
- Wash hands for at least 15 seconds or more.
- Pay special attention to fingertips, between fingers, backs of hands and base of the thumbs.
- Keep nails short
- Wash wrists and forearms if they are likely to have
- Remove watches, rings and bracelets been contaminated
- Do not use artificial nails
- Make sure that sleeves are rolled up and do not get
- Use of a clean towel is important part of effective hand washing.

**2.1.2 BIOMEDICAL WASTE MANAGEMENT:**

It is the waste that is potentially infectious. Biomedical waste may also include waste associated with the generation of biomedical waste that visually appears to be of medical or laboratory origin (e.g., packaging, unused bandages, infusion kits, etc.), as well research laboratory waste containing bio-molecules or organisms that are restricted from environmental release. Discarded sharps are considered biomedical waste whether they are contaminated or not, due to the possibility of being contaminated with blood and their propensity to cause injury when not properly contained and disposed.

Biomedical waste may be solid or liquid. Examples of infectious waste include discarded blood, sharps, unwanted microbiological cultures and stocks, identifiable body parts, other human or animal tissue, used bandages and dressings, discarded gloves, other

medical supplies that may have been in contact with blood and body fluids, and laboratory waste that exhibits the characteristics described above. Waste sharps include potentially contaminated used (and unused discarded) needles, scalpels, lancets and other devices capable of penetrating skin. Biomedical waste is generated from biological and medical sources and activities, such as the diagnosis, prevention, or treatment of diseases. Common generators (or producers) of biomedical waste include hospitals, health clinics, nursing homes, medical research laboratories, offices of physicians, dentists, and veterinarians, home health care, and funeral homes. In healthcare facilities (i.e., hospitals, clinics, doctors offices, veterinary hospitals and clinical laboratories), waste with these characteristics may alternatively be called medical or clinical waste. Biomedical waste is distinct from normal trash or general waste, and differs from other types of hazardous waste, such as chemical, radioactive, universal or industrial waste. Medical facilities generate waste hazardous chemicals and radioactive materials.

Table 2.1: **Categories of Bio-Medical Waste**

| **Category** | **Description** | **Treatment** |
|---|---|---|
| 1 | Human anatomical waste<br>(Human tissue, organ, body parts, body fluids, foetuses) | Incineration/ deep burial |
| 2 | Animal anatomical waste<br>(Animal tissue, organ, body parts, fluid, animals used in research, waste from veterinary hospitals, colleges and animal houses) | Incineration/deep burial |
| 3 | Microbiological and biotechnological waste<br>(Lab cultures, microbiological stocks) | Autoclaving/microwaving/incineration |
| 4 | Sharp waste<br>(Intravenous or other needles, auto-disable needles, syringes with attached needles, scalpels, pipettes, blades, broken glass) | Chemical disinfection/microwaving/autoclaving/shredding |
| 5 | Discarded waste and cytotoxic waste<br>(Outdated, contaminated and discarded medicines) | Incineration/drug disposal in secured landfill |
| 6 | Soiled waste<br>(Waste contaminated with blood and other body fluids | Autoclaving/microwaving/incineration |

| | | |
|---|---|---|
| | like cotton dressings, soiled plaster casts, linen) | |
| 7 | Solid waste<br>(Waste such as tubing, catheters, intravenous sets) | Chemical disinfection/microwaving/autoclaving/shredding |
| 8 | Chemical waste<br>(Chemicals used in the production of biological, used for disinfection) | Chemical treatment and drain for liquids and landfill for solids |

### Staff responsibility for BMW

- All the staff follow the colour coding systems for different wastes, ensure before discarding anything that you are using the right bin.
- The syringes should be cut and the needle should be burned before discarding.
- Training of a new staff will be responsibility of the incharge sister.
- The biomedical waste management chart should always be displayed on the wall of every nursing station.
- There should be a display on the bin also.
- The infection control nurse will supervise all the staff for following biomedical waste management policy.
- Guiding the patient and the relatives will be duty of the ward staff.

**2.1.3 STANDARD UNIVERSAL PRECAUTIONS**:

A. **Hand washing**

• Wash hands after touching blood, secretions, excretions and contaminated items, whether or not gloves are worn. Wash hands immediately after gloves are removed, between patient contacts.

• Use a plain soap for routine hand washing.

• Use an antimicrobial agent for specific circumstances.

B. **Gloves**

• Wear gloves when touching blood, body fluids, secretions, excretions, and contaminated items. Put on clean gloves just before touching mucous membranes and non-intact skin.

C. **Mask, eye protection, face shield**

• Wear a mask and eye protection or a face shield during procedures and patient care activities that are likely to generate splashes or sprays of blood, body fluids, secretions, and excretions.

D. **Gown**

• Wear a gown during procedures and patient-care activities that are likely to generate splashes or sprays of blood, body fluids, secretions, or excretions.

E. **Patient-care equipment**

• Ensure that reusable equipment is not used for the care of another patient until it has been cleaned and reprocessed appropriately.

F. **Environmental control**

• Ensure that the hospital has adequate procedures for the routine care, cleaning and disinfection of environmental surfaces.

G. **Linen**

• Handle used linen, soiled with blood, body fluids, secretions, and excretions in a manner that prevents skin and mucous membrane exposures, and that avoids transfer of microorganisms to other patients and environments.

H. **Occupational health and blood borne pathogens**

• Take care to prevent injuries when using needles, scalpels, and other sharp instruments or devices.

• Use ventilation devices as an alternative to mouth-to-mouth resuscitation methods.

I. **Place of care of the patient**

• Place a patient who contaminates the environment or who does not assist in maintaining appropriate hygiene in an isolated (or separate) room.

### 2.1.4 DISINFECTION OF EQUIPMENT

Re-use instruments, tubingsetc, only after decontamination and sterilization of decontamination, as appropriate. Do not touch equipment with soiled gloves or gloves used for patient care.

**Spill cleanup**: Cover spills of blood or body fluids with 1% of freshly prepared sodium hypochlorite for 10 minutes. Then mop dry. A second decontamination may be done, if required. Wash the area with detergent and water. Gloves must be worn during clean up and decontamination process.

### 2.1.5 PRECAUTIONS AGAINST BLOOD BORNE TRANSMISSION:

**Admission**:

Patients with HIV/HBV/HCV disease but presenting with unrelated illnesses may be admitted in any ward .Confidentially shall be maintained with appropriate precautions to prevent nosocomial transmission

**Preparation of patients**:

In case of patient testing positive, attending physician should ensure that patient and/or significant others are informed about result and receive counselling. The nursing staff will explain to patients, attendants and visitors (when necessary), the purpose and methods of hand washing, body substance precautions, etc.

**Specimens**:

Adequate precautions are to be taken while collecting specimens. The specimens are to be transported in leak-proof containers. Attach a bio hazard label.

### 2.1.6 PRECAUTIONS AGAINST AIRBORNE TRANSMISSION:

These precautions are designed to reduce the risk of airborne and droplet transmission of infectious agents, and apply to patients known or suspected to be infected.

**Components of respiratory isolation**:

- Place the patient in a single\private room with closed doors .Patients with same illness (but no other infection) can be cohorted in one room.
- Masks to be worn by those who enter the patient's room.
- Gloves are necessary when handling the patient.
- Hands must be washed after touching the patient or potentially contaminated articles and before taking care of another patient.
- Articles contaminated with infective material must be discarded or bagged and labelled before being sent for decontamination.

### 2.1.7 PRECAUTIONS AGAINST CONTACT TRANSMISSION

Contact isolation precautions are recommended for specified patients known or suspected to be infected with microraganisms that can be transmitted by direct contact with the patient (hand or skin-to-skin contact that occurs when performing patient care) or indirect contact (touching) with contaminated surfaces or patient-care items.

Components of contact isolation. Gowns are indicated if soiling is likely.

Gloves are indicated for touching infected material/area.

Hands must be washed after touching the patient or potentially contaminated articles and before taking care of another patient.

Adequately clean and disinfect equipment and patient's articles.

## 2.2 REVIEW OF LITERATURE:

- There is a growing recognition of the relationship between the effective cleaning of hospitals and long-term care facilities and the health and safety of both patients and staff. The national Canadian Nosocomial Infection Surveillance Program (CNISP) in the past 5years has documented a significant increase in the number of patients colonized or infected with MRSA. A Welsh study evaluating hospital cleaning regimes and standards argues that there is "no doubt those environmental surfaces can act as a source of pathogens which can give rise to nosocomial [hospital-acquired] infections". This review of the literature focuses on the evidence of infection control nurses and doctors concerned that the trends in cost cutting are contributing to the decline in the provision of cleaning services and the accompanying rise in hospital-acquired infections. The research demonstrates that what we need is rigorous standards for cleaning, versus the steady cutbacks in service that is being observed.

- **Hand hygiene**

  Independent studies by Ignaz Semmelweis in 1847 in Vienna and Oliver Wendell Holmes in 1843 in Boston established a link between the hands of health care workers and the spread of hospital-acquired disease. The Centres for Disease Control and Prevention (CDC) has stated that "It is well documented that the most important measure for preventing the spread of pathogens is effective hand washing." In the United States, hand washing is mandatory in most health care settings and required by many different state and local regulations.

- In 2002, the Royal Australian College of General Practitioners published a revised standard for office-based infection control which covers the sections of managing immunisation, sterilisation and disease surveillance. However, the document on the

personal hygiene of health workers is only limited to hand hygiene, waste and linen management, which may not be sufficient since some of the pathogens are air-born and could be spread through air flow.

- Over the last 20 years, many studies have demonstrated that effective interventions exist to improve hand hygiene compliance among HCWs although measurement of hand hygiene compliance has varied in terms of the definition of a hand hygiene opportunity and the assessment of hand hygiene by means of direct observation or consumption of hand hygiene products, making comparisons difficult.
- In the United States, a study on the Efficacy of Nosocomial Infection Control Project (SENIC) by the CDC found that hospitals reduced their nosocomial infection rates by approximately 32 per cent by focusing on surveillance activities and prevention efforts.
- In 2002, the Royal Australian College of General Practitioners published a revised standard for office-based infection control which covers the sections of managing immunisation, sterilisation and disease surveillance. However, the document on the personal hygiene of health workers is only limited to hand hygiene, waste and linen management, which may not be sufficient since some of the pathogens are air-born and could be spread through air flow.
- Biomedical waste means any solid, fluid, or liquid waste including its containers and any intermediate product which is generated during the diagnosis, treatment, or immunization of human beings or animals or in research activities pertaining thereto or in the production or testing of biological and includes ten categories for same.[6] There are eight categories of waste according to the amendments made to Bio-medical Waste (Management and Handling) rules 1998 in 2011.

## 2.3 OBJECTIVES OF THE STUDY:

2.3.1 General Objectives:

1) To monitor the prevalent hospital infection control system.

2.3.2 Specific objectives:

1) To find out the gap between the standardised Hospital Infection control Standards and the prevalent standards in the hospital;
2) To find out the factors which cause the gaps;
3) To suggest measures to improve the compliance with the existing standards.

## 2.4 STUDY DESIGN AND METHODOLOGY:

### 2.4.1 TYPE OF STUDY:

A two phase- descriptive method consisting of a comprehensive observational study in the high risk areas of the hospital with the help of NABH checklist to check compliance, personal observation and studying the relevant record.

### 2.4.2 LOCATION OF STUDY:

District Hospital, Hoshiarpur, Punjab

### 2.4.3 DATA TO BE COLLECTED:

Primary data:

Data collected from the wards, OT and the OPD regarding the compliance with the NABH checklist for hospital infection control.

Process of hand hygiene practice, BMW segregation at source, were observed and filled in person in every ward so as to monitor and analyze the compliance rate.

All high risk areas (OT's) of the hospital were directly observed and target areas were individually studied by observing a set of activities performed by doctors, technicians, para-medical staff and other non-clinical staff.

Secondary Data:

The records in reference to HIC in hospital for last 3 months were checked and monitored.

### 2.4.4 DATA COLLECTION TOOL:

The NABH checklist on the chapter on Hospital Infection Control was used and various standards monitored. Hence forth, the compliance was checked with the various standards and given scores as 0,5,10 based on the existing standards in the hospital.

Also, a questionnaire was prepared to check the awareness level of the staff regarding the various hospital infection control measures which included questions on BMW management, hand hygiene protocols and needle stick injury.

## 2.5 DATA COMPILATION AND ANALYSIS:

The entire study was divided into two halves:

1) The first phase;
2) The second phase.

The checklist which was used to analyse the data consisted 9 standards on the Hospital Infection Control chapter. These standards had further objective elements which were checked for compliance.

The nine standards which were analysed are as follows:

- HIC.1: The organization has a well-designed, comprehensive and coordinated Hospital Infection Prevention and Control (HIC) programme aimed at reducing/ eliminating risks to patients, visitors and providers of care.
- HIC.2: The organization implements the policies and procedures laid down in the Infection Control Manual.
- HIC.3: The organization performs surveillance activities to capture and monitor infection prevention and control data.
- HIC.4: The organization takes actions to prevent and control Healthcare Associated Infections (HAI) in patients.
- HIC.5: The organization provides adequate and appropriate resources for prevention and control of Healthcare Associated Infections (HAI).
- HIC.6: The organization identifies and takes appropriate action to control outbreaks of infections.
- HIC.7: There are documented policies and procedures for sterilization activities in the organization.

- HIC.8: Biomedical waste (BMW) is handled in an appropriate and safe manner.
- HIC.9: The infection control programme is supported by the management and includes training of staff.

**2.5.1 FIRST PHASE OF THE STUDY**:

1) It was calculated in the initial period of the internship; i.e; in the month of February.
2) Various standards were analysed for the compliance and the scores were given according to those mentioned by NABH i.e 0, 5 or 10.
3) It was observed that the average score of all the standards of the Hospital Infection Control chapter came out to be 4.27, which was very low and signified no proper infection control measures being followed in the hospital.

**2.5.2 SECOND PHASE OF THE STUDY**:

1) It was calculated in the month of April, after giving some recommendations to the higher authorities in order to increase the compilation with the actual NABH standards.
2) The average score for this period came out to be 6.80, which was although less than 7 but showed a significant improvement than the previous scores recorded initially.
3) The recommendations were given to the management and certain things implemented thereafter.

## 2.6 STUDY FINDINGS:

After analysing the 9 standards with 50 subheadings under the Hospital Infection Control chapter given by NABH, the various study findings were noted as below.

### 2.6.1 FIRST PHASE OF THE STUDY:

A) The average score of all the standards came out to be **4.27**

SCORING PATTERN:

NABH has laid down the following pattern-

- Non- compliance=0
- Partial compliance=5
- Full compliance=10
- No standard can have more than one zero
- The average for a standard must exceed 5
- The overall average score must exceed 7
- No zeros in legal requirements

Therefore, on calculating compliance according to the score mentioned, the average score was calculated to be 4.27

B) Scores of the individual 9 standards was found out to be:

- HIC.1= **0**
- HIC.2= 5.4
- HIC.3= **4.3**
- HIC.4= 5

- HIC.5=5
- HIC.6= 5
- HIC.7=5
- HIC.8=6
- HIC.9=**0**

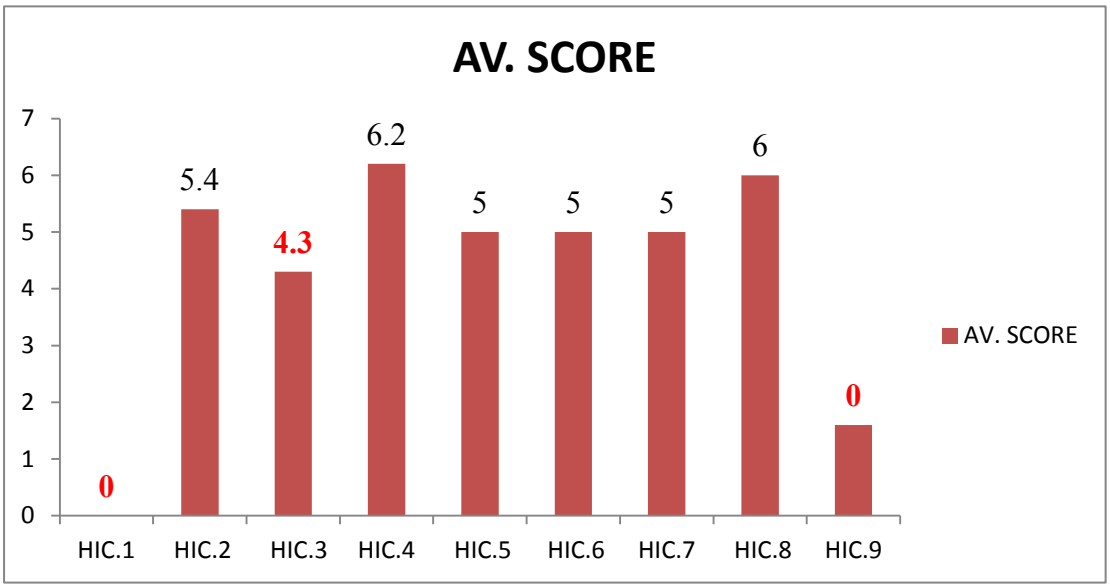


**Figure 2.1 shows the average score of each standard in the first phase of the study**

**INTERPRETATION**:

The above graph shows that the average score for the individual standards was very less as compared to the actual requirement (7). The lowest scores were for the HIC.1 (0) and HIC.9 (0) which shows that there was nothing implemented with regards to this standard.

Following it, was the HIC.3 (4.3), which needed more focus as compared to the other standards, so focus was to be made on the above three standards in order to achieve an optimal score for the compliance.

It is clear from the above graph that the HIC system prevalent in the hospital was not in accordance to the NABH guidelines in many respects.

C)Out of 50 points in the 9 standards, the number of checklist points showing partial compliance was 17, full compliance were 12 and no compliance were 21.

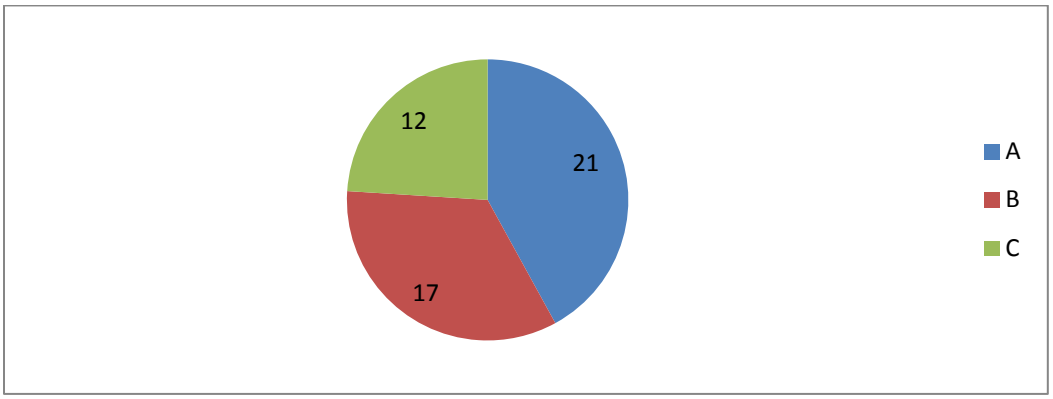


**Figure2.2 shows Scoring Where A= Score 0; B= Score 5; C=Score 10**

D)HIC.1: *The organization has a well-designed, comprehensive and coordinated Hospital Infection Prevention and Control (HIC) programme aimed at reducing/ eliminating risks to patients, visitors and providers of care* showed the least compliance (0) as there was no documentation of the infection control programme and the hospital had no committee for the same.

E) HIC.3: *The organization performs surveillance activities to capture and monitor infection prevention and control data.*

This standard showed an average score of 4.3

The graphical representation of all the objective elements under the standard of surveillance is given as follows, which represents the areas of concern which needed attention to be improved in order to be in accordance with the NABH guidelines on the HIC chapter.

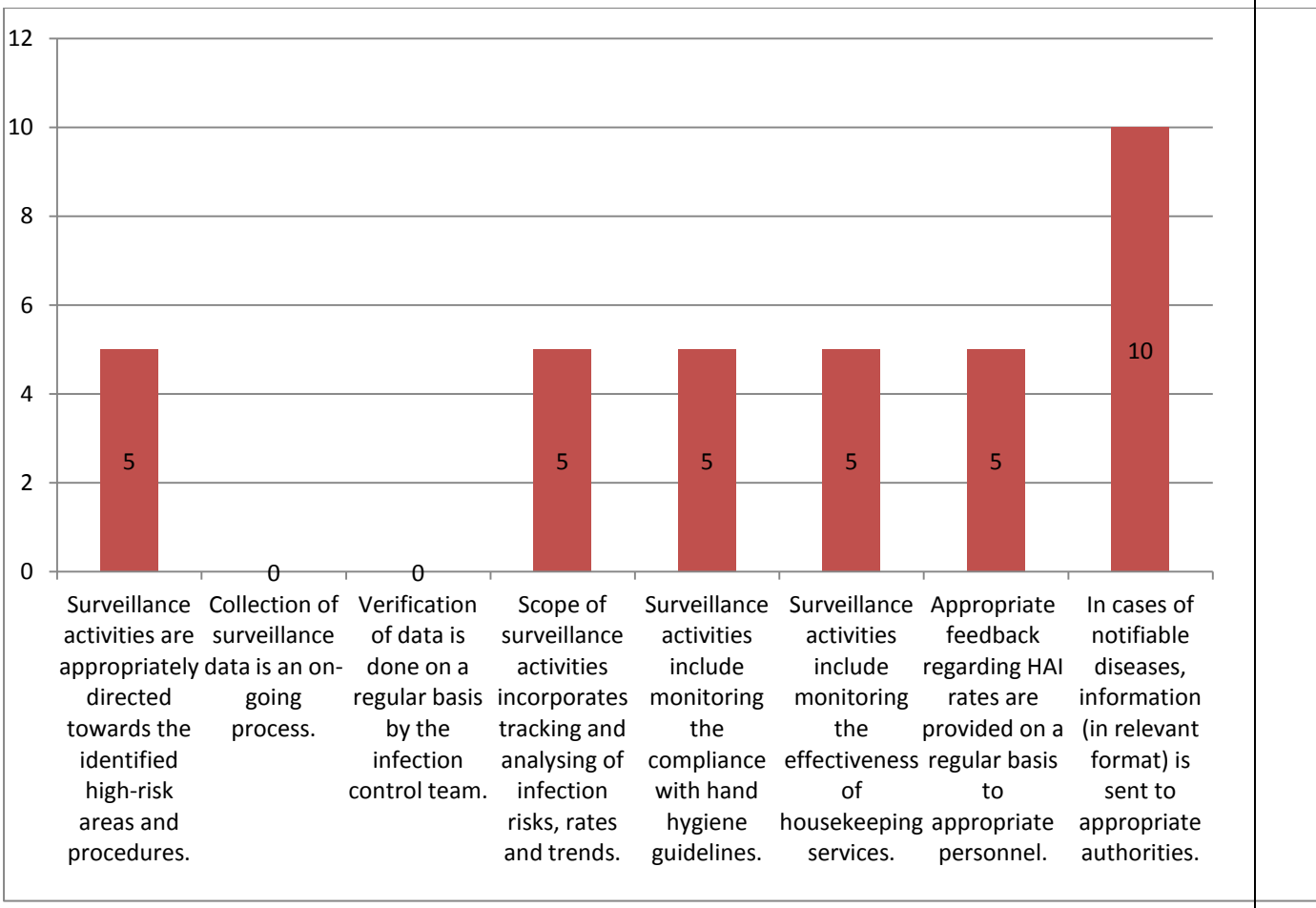


**Figure2.4 shows the Average Score Awarded to Each Objective Elements of HIC.3**

**INTERPRETATION**:

The above graph clearly shows that the surveillance activities in the hospital were not given much attention thereby the low score (4.3). It is evident that as there was no infection control team existing in the hospital, so verification of data on regular basis was not done (0).

The surveillance activities including the monitoring of compliance with hand hygiene guidelines was given a score 5, because there were no proper hand hygiene guidelines being followed in the hospital and similar was the case with housekeeping services (5). The housekeeping servants were although regularly supervised for their work but there were no measures adopted for keeping a supervision of the PPE material required by the staff. Also, there was a shortage of manpower noticed for the housekeeping staff.

## 2.7 RECOMMENDATIONS FOR THE FIRST PHASE:

It was observed that there was a large gap between the standards laid down by NABH and the standards prevalent in the hospital. In accordance to comply the existing system with the NABH standards for "Hospital Infection Control", there were certain recommendations given after taking the appropriate data in support of the need for certain implementations.

### 2.7.1 STANDARD WISE RECOMENDATIONS:

- **HIC.1**: In this, it was observed that the compliance came out to be zero because there were no measures adopted for the documentation of the Infection Control Programme being implemented in the hospital.

  Therefore, certain points were recommended in order to obtain compliance with the first standard of HIC. These were:

  i) Documentation of the hospital infection prevention and control programme which aims at preventing and reducing risk of healthcare associated infections.

  ii) The formation of a multi-disciplinary infection control committee which co-ordinates all infection prevention and control activities.

  iii) The hospital should have designated infection control officer as part of the infection control team.

  iv) The hospital should have designated infection control nurse(s) as part of the infection control team.

- **HIC.2:** For this standard, the compliance came out to be 5.4, which was less as per what is required (7 for each standard). So, certain measures were suggested for the compliance score to reach the required levels and to also implement the Infection Control Programme in the right way in the hospital. These were:

i) Implementation of the policies and procedures laid down in the Infection Control Manual**.**

ii) Adherence to hand hygiene guidelines.

iii) Adherence to cleaning, disinfection and sterilization practices.

iv) Establishment and implementation of an appropriate antibiotic policy.

v) Adherence to proper linen and laundry management.

vi) Proper adherence to housekeeping services, which includes the proper usage of cleaning aids and PPE for the workers.

- **HIC.3:** This standard is related with the surveillance activities in order to monitor the infection prevention and control. It was found that this standard has the low score (4.3) so there was a great focus needed on this area. The measures suggested for this were:

  i) Collection of data to be done on a regular basis.

  ii) The organisation must be able to provide evidence of conducting periodic surveillance activities in its high risk areas and procedures.

  iii) The infection control team should verify the data collected under surveillance and shall then be declared authentic.

  iv) The infection rates, risks and trends to be monitored monthly and also to be added in the annual report made.

  v) Proper hand hygiene guidelines to be implemented and monitored for compliance with the actual standards

  vi) Surveillance of the housekeeping services to monitor their effectiveness even if it is outsourced.

- **HIC.7:** Proper validation tests to be made available for the sterilization and need to be documented. This will ensure proper autoclaving of instruments and reprocessing if required.

- **HIC.8**: i) Segregation of bio-medical waste collected from various departments be supervised on regular basis by the staff on duty.

  ii) The vehicles which should be used to carry the waste from the departments to the collecting room should be wheeled thereby making it easy for the housekeeping staff to carry it.

  iii) Availability of proper PPE material to all the staff dealing with the handling and collection of bio-medical waste.

  iv) Fixing a time when the housekeeping staff of all the departments should collect, segregate and keep the waste in the collecting room.

**HIC.9:** i) The organization should conduct induction training for all staff.

ii) There should be separate provisions made for the resources to be made available to the team dealing with the infection control in the hospital.

## 2.8 IMPLEMENTATIONS (FIRST HALF)

- Formation and implementation of Infection Control Committee.
- Formation of Infection Control Manual.
- Assigned the post of Infection Control Nurse to the matron as there was no other staff available which qualified for it.
- Proper hand hygiene guidelines according to WHO were suggested and were adapted by the staff. Posters were printed and placed in front of the hand washing areas.
- Antibiotic policy was made and implemented.
- Linen management was ensured by taking a note of the beds always covered with sheets. Surplus sheets were issued to the staff of the concerned departments, so that in case the wash gets delayed the staffs do not make an excuse of delayed delivery of sheets by the washing personnel.
- Housekeeping services were improved by taking measures to provide them with proper cleaning aids, that is, proper mops and buckets. Also, the housekeeping staffs were provided with proper disinfectants for cleaning the floors and the washrooms. Also, a checklist was made for the washrooms to monitor the regular and timely cleaning of the washrooms and toilets.
- Proper availability of PPE to the housekeeping staff was implemented on monthly basis and was supervised daily for proper use.
- The housekeeping staff was also made aware of the health hazards the infectious waste can cause them if not handled with gloves and proper masks and were also trained for proper colour coding and collection of Bio-medical waste.
- Daily supervision of the hospital, wards was initiated.

- Monitoring of the proper hand washing techniques and housekeeping services was done once a week by taking a random sample for questionnaire from the concerned staff.

## 2.9 STUDY FINDINGS FOR THE SECOND PHASE

After the process of implementing some of the recommendations given, the NABH checklist was again analysed for the compliance with the Hospital Infection Control standards and the findings noted down.

A) The average score of all the standards came out to be 6.6

This showed an improvement in the compliance rate and indicated a reduction in the gap that existed between the existing standards and the standards given by NABH. Although not all the recommendations were implemented yet there was seen a remarkable decrease in the gap that existed in some of the standards. Thus altering the total average score and increasing the overall compliance to the existing standards.

B) The scores of the individual standards came out to be:

- **HIC.1**: **7.5**
- **HIC.2**: **7.7**
- **HIC.3**: **6.2**
- HIC.4: 5
- **HIC.5**: **7.5**
- HIC.6: 5
- HIC.7: 5
- **HIC.8**: **9**
- **HIC.9**: 3.3

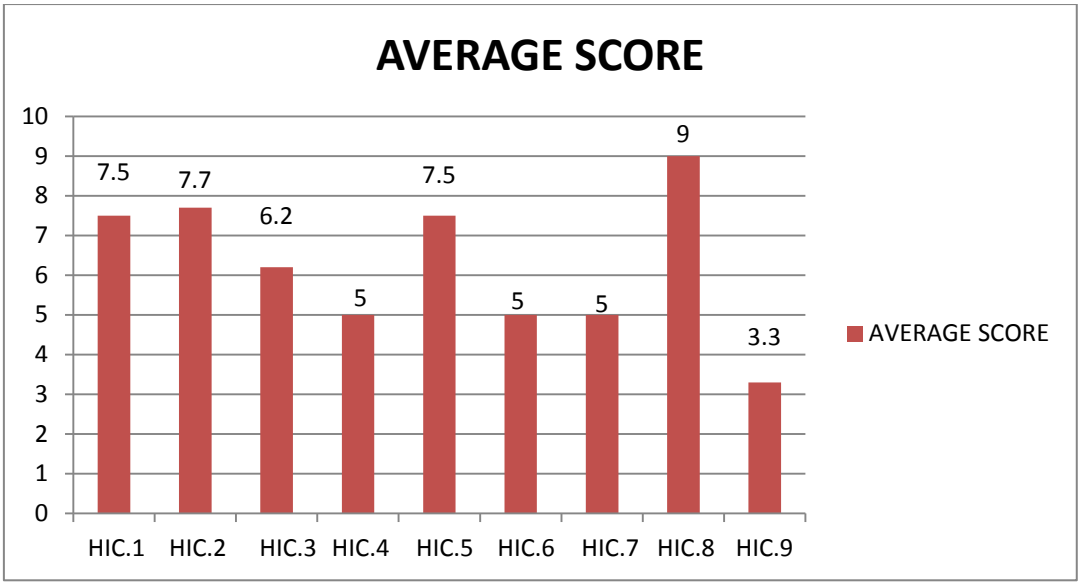


**Figure2.5 shows Average Score Of The Various Standards**

**INTERPRETATION:**

There was seen an evident increase in the average scores for the various standards namely, HIC.1 for which the score increased from 0 to 7.5.

Similarly, the score for HIC.2. changed from 5.4 to 7.7 and for HIC.3 from 4.3 to 6.2

The maximum increase in the scores was observed for the HIC.9 which is the one concerned with the bio-medical waste management.

The infection control committee was now formed in the hospital and infection control nurse appointed. The infection control manual was also made and implemented with the permission of the SMO in charge.

The hand hygiene guidelines were explained as in accordance with WHO. An appropriate antibiotic policy was also established. Also, the housekeeping services were monitored in terms of supplies of disinfectants and cleaning aids and PPE.

C) Out of 50 points in the 9 standards, the number of checklist points showing partial compliance was 12, full compliance were 27 and no compliance were 11.

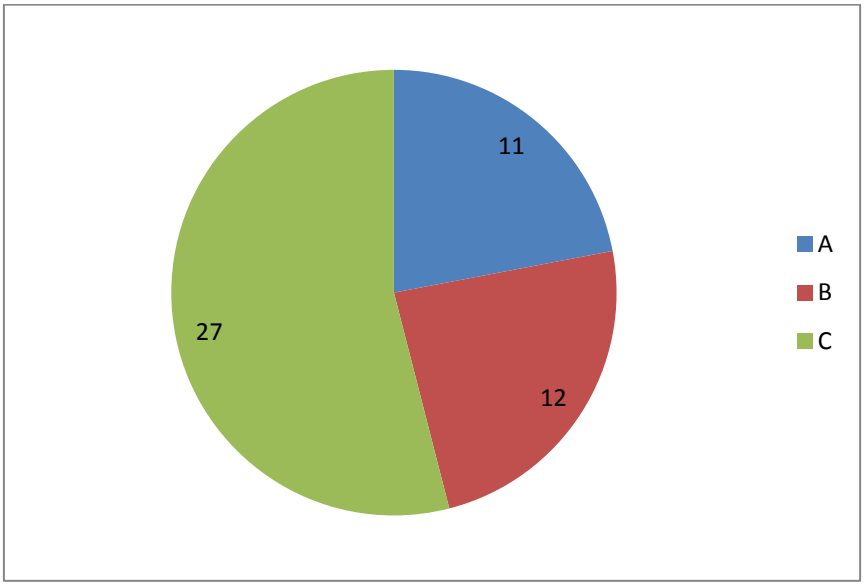


**Figure2.6 shows Average Scores Where A=Score 0; B= Score 5, C= Score 10**

**INTERPRETATION:**

This graph makes it evident that in the second phase of the study the objective elements of the respective standards showed an improvement in the compliance rates with the actual NABH guidelines.

The objective elements showing a score of zero were observed to be 11 which has reduced from that observed in phase first of the study, that is 21.

Similarly, the number of objective elements showing a score of 5 was reduced from 17 to 12 and the number of objective elements showing full compliance increased from 12 to 27

D) The maximum score was seen in the BMW management standard(9)

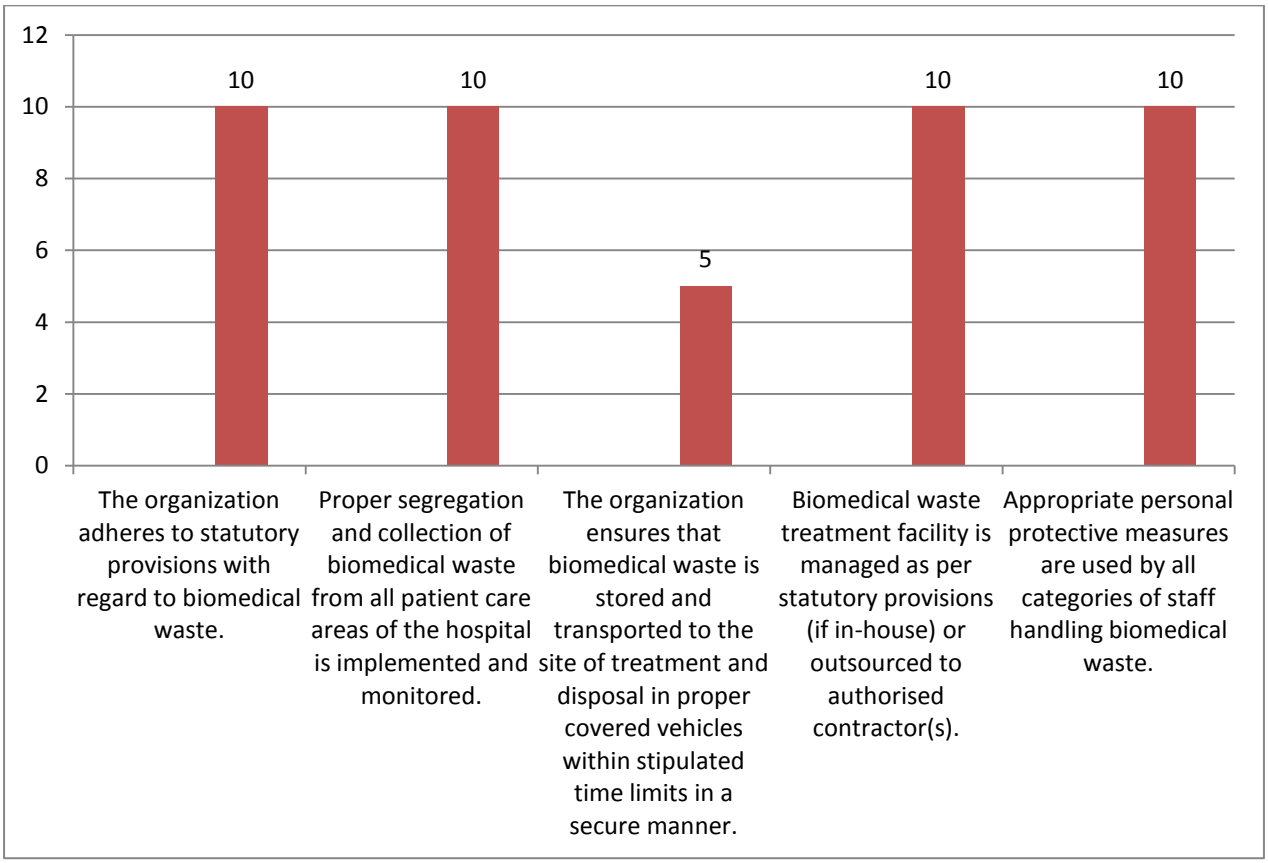


**Figure2.7 shows average scores of objective elements for HIC.9**

## 2.10 DISCUSSIONS:

The present study was carried out to assess the compliance rate of the existing Hospital infection Control with the NABH chapter on HIC in Civil Hospital, Hoshiarpur, Punjab.

The hospital had a poor hospital infection control system un terms of documentation, surveillance, BMW management, policies and procedures related to infection control manual were not made or followed in the hospital.

The compliance was checked in accordance with the NABH 3rd editions' Fifth chapter on Hospital Infection Control.

The study revealed that in the first phase, the objective elements of the various 9 standards showed no compliance in 21 elements, partial compliance in 17 elements and full compliance in just 12 elements.

After, recommendations and implementations, the second phase showed that the objective elements with no compliance reduced to 11, partial compliance reduced to 12 whereas, the number of objective elements showing a score of 10, full compliance have increased from 12 to 27.

This showed a remarkable improvement in the Hospital Infection Control Programme being followed in the hospital. There were certain main objective elements of the hospital which were worked upon and the compliance improved.

Also, there were certain elements which could not be worked upon due to certain constraints like the lack of the resources, improper training to the class IV and sweepers and also the other staff, lack of knowledge amongst the staff about NABH and the resistance to change.

## 2.11 CONCLUSION:

The study concludes that the hospital had an inefficient hospital infection control system due to certain constraints like the lack of the resources, improper training to the class IV and sweepers and also the other staff, lack of knowledge amongst the staff about NABH and the resistance to change.

After the study was initiated it was found that the elements showing non--compliance to the NABH standards was very high amongst the 50 objective elements of the nine HIC standards. It meant that there was a need of certain recommendations to be tried and implemented in order to achieve a good compliance with the actual standards.

The recommendations were implemented to a certain level in accordance to the resources available and the ability of the staff to adapt to change. The number of objective elements showing full compliance was increased from 12 to 27.

The staff lacked awareness about the NABH chapter on hospital infection control except for a few objective elements. There was no proper supervision of the regular monitoring and training of the staff in regards with the HIC of NABH standards of 3$^{rd}$ edition.

The implementation of HIC standards is still in process in the hospital so that each objective element could show full compliance and the NABH chapter on HIC could be made functional in the hospital.

## 2.12 INSTRUMENTS:

Excel checklist was used to find the average score and check the compliance for the HIC chapter of NABH 3rd edition.

| Chapter on Hospital Infection Control {first phase of study} | Documentation (Yes/ No) | Implementation (Yes/ No) | Scores (0/ 5/ 10) |
|---|---|---|---|
| The organization has a well-designed, comprehensive and coordinated Hospital Infection Prevention and (HIC) programme aimed at reducing/ eliminating risks to patients, visitors and providers of care. | | | |
| The hospital infection prevention and control programme is documented which aims at preventing and reducing risk of healthcare associated infections. | | | |
| The infection prevention and control programme is a continuous process and updated at least once in a year. | | | |
| The hospital has a multi-disciplinary infection control committee which co-ordinates all infection prevention and control activities. | | | |

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|---|---|---|---|
| The hospital has designated infection control officer as part of the infection control team. | | | |
| The hospital has an infection control team which co-ordinates implementation of all infection prevention and control activities. | | | |
| The hospital has designated infection control officer as part of the infection control team. | | | |

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| HIC.2: The organization implements the policies and procedures laid down in the Infection Control Manual. |

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| The organization identifies the various high-risk areas and implements policies and/or procedures to prevent infection in these areas | | | |
| The organization adheres to standard precautions at all times. | | | |
| The organization adheres to hand hygiene guidelines. | | | |
| The organization adheres to safe injection and infusion practices. | | | |

| | | | |
|---|---|---|---|
| The organization adheres to transmission based precautions at all times. | | | |
| The organization adheres to cleaning, disinfection and sterilization practices | | | |
| An appropriate antibiotic policy is established and implemented. | | | |
| The organization adheres to laundry and linen management processes. | | | |
| The organization adheres to kitchen sanitation and food handling issues. | | | |
| The organization has appropriate engineering controls to prevent infections. | | | |
| The organization adheres to housekeeping procedures. | | | |

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| HIC.3: The organization performs surveillance activities to capture and monitor infection prevention and control data. |

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| Surveillance activities are appropriately directed towards the identified high-risk areas and | | | |

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| procedures. | | | |
| Collection of surveillance data is an on-going process. | | | |
| Verification of data is done on a regular basis by the infection control team. | | | |
| Scope of surveillance activities incorporates tracking and analysing of infection risks, rates and trends. | | | |
| Surveillance activities include monitoring the compliance with hand hygiene guidelines. | | | |
| Surveillance activities include monitoring the effectiveness of housekeeping services. | | | |
| Appropriate feedback regarding HAI rates are provided on a regular basis to appropriate personnel. | | | |
| In cases of notifiable diseases, information (in relevant format) is sent to appropriate authorities. | | | |

| HIC.4: The organization takes actions to prevent and control Healthcare Associated Infections (HAI) in patients. |
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|---|---|---|---|
| The organization takes action to prevent urinary tract infections. | | | |
| The organization takes action to prevent urinary tract infections. | | | |
| The organization takes action to prevent intra-vascular device infections. | | | |
| The organization takes action to prevent surgical site infections. | | | |

| HIC.5: The organization provides adequate and appropriate resources for prevention and control of Healthcare Associated Infections (HAI). |
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| Adequate and appropriate personal protective equipment, soaps, and disinfectants are available and used correctly. | | | |
| Adequate and appropriate facilities for hand hygiene in all patient care areas are accessible to health care providers. | | | |

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| Isolation / barrier nursing facilities are available. | | | |
| Appropriate pre and post exposure prophylaxis is provided to all concerned staff members. | | | |

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| HIC.6: The organization identifies and takes appropriate action to control outbreaks of infections. |

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| Organization has a documented procedure for identifying an outbreak. | | | |
| Organization has a documented procedure for handling such outbreaks. | | | |
| This procedure is implemented during outbreaks. | | | |
| After the outbreak is over appropriate corrective actions are taken to prevent recurrence. | | | |

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| HIC.7: There are documented policies and procedures for sterilization activities in the organization. |

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| The organization provides adequate space and appropriate zoning for sterilization activities. | | | |

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| Documented procedure guides the cleaning, packing, disinfection and/or sterilization, storing and issue of items. | | | |
| Reprocessing of instruments and equipment are covered. | | | |
| Regular validation tests for sterilization are carried out and documented. | | | |
| There is an established recall procedure when breakdown in the sterilization system is identified. | | | |

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| HIC.8: Biomedical waste (BMW) is handled in an appropriate and safe manner. |

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| The organization adheres to statutory provisions with regard to biomedical waste. | | | |
| Proper segregation and collection of biomedical waste from all patient care areas of the hospital is implemented and monitored. | | | |
| The organization ensures that biomedical waste is stored and | | | |

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|---|---|---|---|
| transported to the site of treatment and disposal in proper covered vehicles within stipulated time limits in a secure manner. | | | |
| Biomedical waste treatment facility is managed as per statutory provisions (if in-house) or outsourced to authorised contractor(s). | | | |
| Appropriate personal protective measures are used by all categories of staff handling biomedical waste. | | | |

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| HIC.9: The infection control programme is supported by the management and includes training of staff. |

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| The management makes available resources required for the infection control programme. | | | |
| The organization earmarks adequate funds from its annual budget in this regard. | | | |
| The organization conducts induction training for all staff. | | | |

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