

**Summer Training at  
Narayana Multispecialty Hospital, Jaipur  
(April 10- May 31, 2014)**

**Study on Hospital Acquired Infection Control Bundle Compliance and  
Validation**

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**Under the guidance of  
Dr. Santosh Kumar**

**MBA- Hospital & Health Management (MBA-HM)  
2013-2015**



**The IIHMR University, Jaipur  
2014**

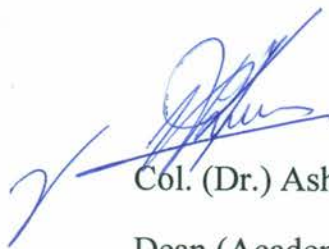
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**CERTIFICATE**

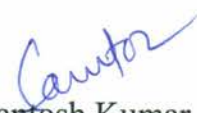
This is to certify that **Dr. Gaurav Sharma** has undergone his summer training in Narayana Multispecialty Hospital, Jaipur from 1st April, 2014 to 31st May, 2014. The candidate himself carried out all the studies related to his summer training. His approach to the study has been scientific and analytical. This summer training is partial fulfilment of course requirement is recommended for the award of post graduate diploma in hospital management.

I wish him success in all his future endeavours.

  
Col. (Dr.) Ashok Kaushik

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NH/HRD-Off/2014/245

Date: 2<sup>nd</sup> June, 2014

**TO WHOM SO EVER IT MAY CONCERN**

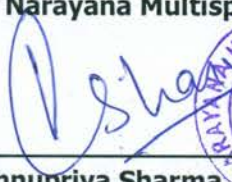
This is to certify that **Dr. Gaurav Sharma** from Institute of Health Management Research, Jaipur has completed his Summer Training Successfully in Narayana Multispecialty Hospital, Jaipur from 1<sup>st</sup> April, 2014 to 31<sup>st</sup> May, 2014.

His Work during the Period was Commendable and appreciable. His character and conduct was good.

The project was on "Hospital Acquired Infection Control Bundle Compliance and Validation"

We wish him success in his future endeavors.

**For Narayana Multispecialty Hospital, Jaipur**

  
**Vishnupriya Sharma**  
Sr. Manager-Human Resources



Now, Narayana Hrudayalaya Hospital, Jaipur will be known as Narayana Multispecialty Hospital, Jaipur and this change is supported by a new logo. However, all legal agreements will continue to be in the name of Narayana Hrudayalaya Pvt. Ltd. The legal entity has not changed. This is only a brand change.



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## **ACKNOWLEDGEMENT**

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Dr. Gaurav Sharma

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### **Acronyms/Abbreviations**

BSI – Blood Stream Infection

CAUTI – Catheter Associate Urinary Tract Infection

CCU – Cardiac Care Unit

CSSD - Central Sterile Services Department

CTVS – Cardiothoracic and vascular surgery

CVP line - Central Venous Pressure Line

FGW – Female General Ward

HDU –High Dependency Unit

HAI – Hospital Acquired Infection

HK - Housekeeping

IC Sheet – Infection Control Sheet

ICD – Infection control Department

IPD – In patient Department

ITU – Intensive Therapy Unit

JCI – Joint Commission International, USA

MGW – Male General Ward

MICU – Medical Intensive Care Unit

NH – Narayana Health

NICU – Neonatal ICU

VAP – Ventilator Associates Pneumonia

## **1. ORGANIZATION PROFILE**

Narayana Health, one of India's largest and World's most economical healthcare service providers is set to emerge as a global industry model for its ability to reconcile quality, affordability, scale, transparency, credibility and sustainable profitability. Equipped with all super-specialty and tertiary care facilities that the medical world has to offer, it is now a one-stop destination for any healthcare requirement a common man needs. No one is refused treatment due to lack of funds. From a humble beginning of a 300 beds hospital in 2001, Narayana Health has grown to a 6000 beds health care conglomerate in 2013 with 17 hospitals present in 13 locations within the country.

Famous for its cost-cutting approach in many ingenious ways, NH has been ranked 36th among "WORLD'S 50 MOST INNOVATIVE COMPANIES" by Fast Companies in 2012.

In India, where accessibility to good healthcare facility still depends on one's economic status Dr Devi Shetty founder of Narayana Health bring a revolution in the health sector.

### **Vision-**

To provide high quality healthcare, with care and compassion, at an affordable cost, on a large scale.

### **Values-**

Narayana Health's Core Values are defined by **I – CARE**

**Innovation and efficiency** – to continuously reduce cost of delivery of high quality health care and improve reach

**Compassionate Care** – in providing accessible care that makes a difference to our patients

**Accountability** – to honor our commitments with integrity and transparency to our patients, employees and investors

**Respect for all** – recognize the contribution of every employee and respect rights and dignity of every patient and employee

**Excellence** – create a culture of individually excelling to collectively ensuring highest quality of consistent, reliable service to our patients and sustainable value to all our stakeholders

**Brand.....**

**Narayana Health:**

NARAYANA in sanskrit means the preserver of the universe which matches with the NH ethos of being committed to the health of every life

**Colour:**

BLUE is the colour of calm, peace and cure... Leaf is a symbol of life

**NH:**

NH does not have any gaps in between as there is no space for discrimination while catering to the health needs of every individual

**3 Leaves:**

The THREE LEAVES three core values of NH – Compassion, Quality, Affordability

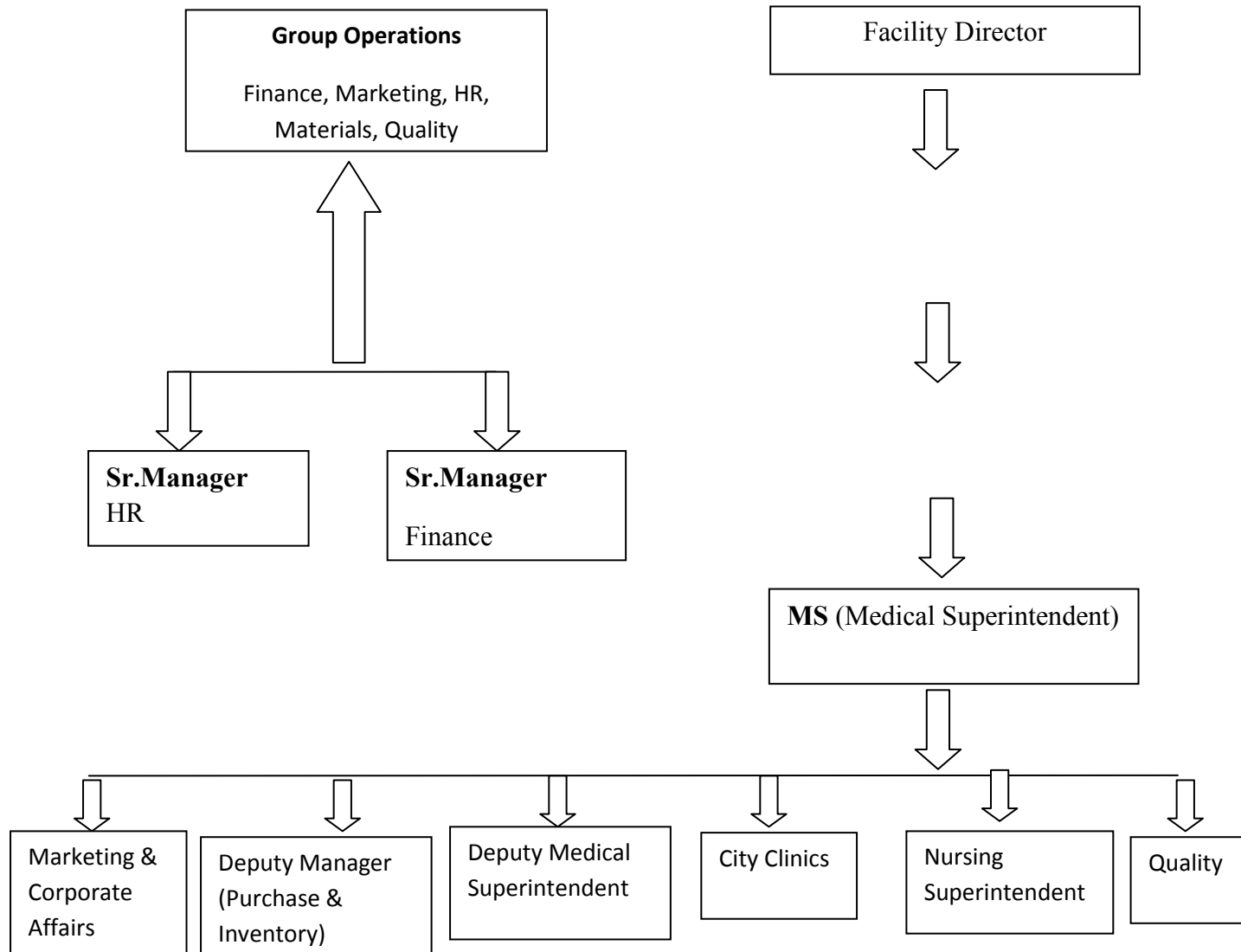
**Sunrise:**

The SUNRISE behind the letters NH marks a new dawn in healthcare that Narayana Health is trying to bring about

**Narayana Multispecialty Hospital, Jaipur**

Narayana Multispecialty Hospital, Jaipur was commissioned on 29th of January 2011. In 26 July 2012, the hospital was awarded the international accreditation from Joint Commission International (JCI) making it the first hospital in Rajasthan to receive this prestigious recognition. The 200 bed multispecialty tertiary care hospital is located at Pratap Nagar within a sprawling campus of 4.7 acres. Specialties at the hospital include both adult and pediatric cardiac services, orthopedics, obstetrics & gynecology, neurosciences, nephrology, urology and gastroenterology offering advanced treatment procedures including Laparoscopic and Minimally Invasive surgeries. Hospital has in-house Radiology, Laboratory and Blood Bank services offering Emergency and Trauma care.

## ORGANIZATIONAL STRUCTURE



## **DEPARTMENTS & SERVICES:-**

1. Cardiology and cardiac surgery
2. Neurosciences
3. Nephrology and urology
4. Gastroenterology
5. Orthopedics and joint replacement
6. Trauma care and emergency services
7. Critical care
8. Mother and child care
9. Pulmonary medicine
10. plastic surgery, cosmetic & reconstructive surgery
11. Internal medicine
12. Diabetes & endocrinology
13. Physiotherapy & rehabilitation centre
14. Nutrition
15. Radio diagnosis and imaging
16. Pathology & microbiology
17. Comfort, safety and supportive care

## **2. INTRODUCTION:**

The word hospital is closely related to the word hospitality and is derived from the word HOSPICE‘ which means ‘a house for rest’. Various functions of hospital are as follows:

1. Care of sick and injured.
2. Education of physician, nurses, paramedical and others.
3. Public health- disease prevention and health personnel.
4. Research works.

The word Nosocomial comes from the Greek word NOSOKOMEION‘ means —“to take care of disease” therefore Nosocomial infection is define as ‘Infection which is a result of treatment during the take care of a disease in hospital or health care services unit. It is also known as Hospital acquired Infection’ Infections are considered Hospital acquired Infection when it first appear 48hours or more than after hospital admission or with in 30 days after discharge. According to WHO —“HAI is an infection acquired in hospital by patient who was admitted for a reason other than that infection.” 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 also occupational infections among staff of the facility.

Hospital-acquired infections add to functional disability and emotional stress of the patient and may, in some cases, lead to disabling conditions that reduce the quality of life. Nosocomial infections are also one of the leading causes of death. The economic costs are considerable. The increased length of stay for infected patients is the greatest contributor to cost. Prolonged stay not only increases direct costs to patients or payers but also indirect costs due to lost work. The increased use of drugs, the need for isolation, and the use of additional laboratory and other diagnostic studies also contribute to costs. Hospital-acquired infections add to the imbalance between resource allocation for primary and secondary health care by diverting scarce funds to the management of potentially preventable conditions.

## **Factors influencing the development of Hospital Acquired infections**

### **1. The microbial agent**

The patient is exposed to a variety of microorganisms during hospitalization. Contact between the patient and a microorganism does not by itself necessarily result in the development of clinical disease — other factors influence the nature and frequency of Nosocomial infections. The likelihood of exposure leading to infection depends partly on the characteristics of the microorganisms, including resistance to antimicrobial agents, intrinsic virulence, and amount (inoculum) of infective material. Many different bacteria, viruses, fungi and parasites may cause Nosocomial infections. Infections may be caused by a microorganism acquired from another person in the hospital (cross-infection) or may be caused by the patient's own flora (endogenous infection). Some organisms may be acquired from an inanimate object or substances recently contaminated from another human source (environmental infection). Before the introduction of basic hygienic practices and antibiotics into medical practice, most hospital infections were due to pathogens of external origin (food borne and airborne diseases, gas gangrene, tetanus, etc.) or were caused by microorganisms not present in the normal flora of the patients (e.g. diphtheria, tuberculosis). Progress in the antibiotic treatment of bacterial infections has considerably reduced mortality from many infectious diseases. Most infections acquired in hospital today are caused by microorganisms which are common in the general population, in whom they cause no or milder disease than among hospital patients (*Staphylococcus aureus*, coagulase-negative staphylococci, enterococci, Enterobacteriaceae).

### **2. Patient susceptibility**

Important patient factors influencing acquisition of infection include age, immune status, underlying disease, and diagnostic and therapeutic interventions. The extremes of life — infancy and old age — are associated with a decreased resistance to infection. Patients with chronic disease such as malignant tumors, leukemia, diabetes mellitus, renal failure, or the acquired immunodeficiency syndrome (AIDS) have an increased susceptibility to infections with opportunistic pathogens. The latter are infections with organism(s) that are normally

innocuous, e.g. part of the normal bacterial flora in the human, but may become pathogenic when the body's immunological defenses are compromised. Immunosuppressive drugs or irradiation may lower resistance to infection. Injuries to skin or mucous membranes bypass natural defense mechanisms. Malnutrition is also a risk. Many modern diagnostic and therapeutic procedures, such as biopsies, endoscopic examinations, catheterization, intubation/ventilation and suction and surgical procedures increase the risk of infection. Contaminated objects or substances may be introduced directly into tissues or normally sterile sites such as the urinary tract and the lower respiratory tract.

### **3. Environmental factors**

Health care settings are an environment where both infected persons and persons at increased risk of infection congregate. Patients with infections or carriers of pathogenic microorganisms admitted to hospital are potential sources of infection for patients and staff. Patients who become infected in the hospital are a further source of infection. Crowded conditions within the hospital, frequent transfers of patients from one unit to another, and concentration of patients highly susceptible to infection in one area (e.g. newborn infants, burn patients, and intensive care) all contribute to the development of Nosocomial infections. Microbial flora may contaminate objects, devices, and materials which subsequently contact susceptible body sites of patients. In addition, new infections associated with bacteria such as waterborne bacteria (atypical mycobacteria) and/or viruses and parasites continue to be identified.

### **4. Bacterial resistance**

Many patients receive antimicrobial drugs. Through selection and exchange of genetic resistance elements, antibiotics promote the emergence of multi drug resistant strains of bacteria; microorganisms in the normal human flora sensitive to the given drug are suppressed, while resistant strains persist and may become endemic in the hospital. The widespread use of antimicrobials for therapy or prophylaxis (including topical) is the major determinant of resistance. Antimicrobial agents are, in some cases, becoming less effective because of resistance. As an antimicrobial agent becomes widely used, bacteria resistant to

this drug eventually emerge and may spread in the health care setting. Many strains of pneumococci, staphylococci, enterococci, and tuberculosis are currently resistant to most or all antimicrobials which were once effective. Multi-resistant *Klebsiella* and *Pseudomonas aeruginosa* are prevalent in many hospitals. This problem is particularly critical in developing countries where more expensive second-line antibiotics may not be available or affordable.

### **Epidemiology of Hospital Acquired infections:**

Studies throughout the world document that Hospital Acquired infections are a major cause of morbidity and mortality (1–13). A high frequency of Hospital Acquired infections is evidence of a poor quality of health service delivery, and leads to avoidable costs. Many factors contribute to the frequency of hospital acquired infections: hospitalized patients are often immune compromised, they undergo invasive examinations and treatments, and patient care practices and the hospital environment may facilitate the transmission of microorganisms among patients. The selective pressure of intense antibiotic use promotes antibiotic resistance. While progress in the prevention of Nosocomial infections has been made, changes in medical practice continually present new opportunities for development of infection.

Nosocomial infections may also be considered either endemic or epidemic. Endemic infections are most common. Epidemic infections occur during outbreaks, defined as an unusual increase above the baseline of a specific infection or infecting organism.

The following table (Table 1) provides definitions for common infections that could be used for surveys in facilities with limited access to sophisticated diagnostic techniques.

**TABLE 1 Simplified criteria for surveillance of Hospital Acquired infections**

| <b>Type of Hospital Acquired infection</b> | <b>Simplified criteria</b>                                                                                                                                                                        |
|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Surgical site infection                    | Any purulent discharge, abscess, or spreading cellulites at the surgical site during the month after the operation                                                                                |
| Urinary infection                          | Positive urine culture (1 or 2 species) with at least 10 <sup>5</sup> bacteria/ml, with or without clinical symptoms                                                                              |
| Respiratory infection                      | Respiratory symptoms with at least two of the following signs appearing during hospitalization:<br>— cough<br>— purulent sputum<br>— new infiltrate on chest radiograph consistent with infection |
| Vascular catheter Inflammation,            | lymphangitis or infection purulent discharge at the insertion site of the catheter                                                                                                                |
| Septicaemia                                | Fever or rigours and at least one positive blood culture                                                                                                                                          |

## **1. Urinary infections**

This is the most common Nosocomial infection; 80% of infections are associated with the use of an indwelling bladder catheter (1, 2, and 3). Urinary infections are associated with less morbidity than other Nosocomial infections, but can occasionally lead to bacteraemia and death. Infections are usually defined by microbiological criteria: positive quantitative urine culture ( $\geq 10^5$  microorganisms/ml, with a maximum of 2 isolated microbial species). The bacteria responsible arise from the gut flora, either normal (*Escherichia coli*) or acquired in hospital (multiresistant *Klebsiella*).

## **2. Surgical site infections**

Surgical site infections are also frequent: the incidence varies from 0.5 to 15% depending on the type of operation and underlying patient status (18,19,20). These are significant

problems which limit the potential benefits of surgical interventions. The impact on hospital costs and postoperative length of stay (between 3 and 20 additional days) (21,22,23,24) is considerable. The definition is mainly clinical: purulent discharge around the wound or the insertion site of the drain, or spreading cellulites from the wound. Infections of the surgical wound (whether above or below the aponeurosis), and deep infections of organs or organ spaces are identified separately. The infection is usually acquired during the operation itself; either exogenously (e.g. from the air, medical equipment, surgeons and other staff), endogenously from the flora on the skin or in the operative site or, rarely, from blood used in surgery. The infecting microorganisms are variable, depending on the type and location of surgery, and antimicrobials received by the patient. The main risk factor is the extent of contamination during the procedure (clean, clean contaminated, contaminated, dirty), which is to a large part dependent on the length of the operation, and the patient's general condition (25). Other factors include the quality of surgical technique, the presence of foreign bodies including drains, the virulence of the microorganisms, concomitant infection at other sites, the use of preoperative shaving, and the experience of the team.

### **3. Nosocomial pneumonia**

Nosocomial pneumonia occurs in several different patient groups. The most important are patients on ventilators in intensive care units, where the rate of pneumonia is 3% per day. There is a high case fatality rate associated with ventilator-associated pneumonia, although the attributable risk is difficult to determine because patient co morbidity is so high. Microorganisms colonize the stomach, upper airway and bronchi, and cause infection in the lungs (pneumonia): they are often endogenous (digestive system or nose and throat), but may be exogenous, often from contaminated respiratory equipment. The definition of pneumonia may be based on clinical and radiological criteria which are readily available but non-specific: recent and progressive radiological opacities of the pulmonary parenchyma, purulent sputum, and recent onset of fever. Diagnosis is more specific when quantitative microbiological samples are obtained using specialized protected bronchoscope methods. Known risk factors for infection include the type and duration of ventilation, the quality of respiratory care, severity of the patient's condition (organ failure), and previous use of antibiotics.

#### **4. Hospital Acquired bacteraemia**

These infections represent a small proportion of Hospital Acquired infections (approximately 5%) but case fatality rates are high — more than 50% for some microorganisms. The incidence is increasing, particularly for certain organisms such as multiresistant coagulase-negative *Staphylococcus* and *Candida* spp. Infection may occur at the skin entry site of the intravascular device, or in the subcutaneous path of the catheter (tunnel infection). Organisms colonizing the catheter within the vessel may produce bacteraemia without visible external infection. The resident or transient cutaneous flora is the source of infection. The main risk factors are the length of catheterization, level of asepsis at insertion, and continuing catheter care.

#### **5. Other Hospital Acquired infections**

These are the four most frequent and important Hospital Acquired infections, but there are many other potential sites of infection.

For example:

- Skin and soft tissue infections: open sores (ulcers, burns and bedsores) encourage bacterial colonization and may lead to systemic infection.
- Gastroenteritis is the most common Nosocomial infection in children, where rotavirus is a chief pathogen: *Clostridium difficile* is the major cause of Nosocomial gastroenteritis in adults in developed countries.
- Sinusitis and other enteric infections, infections of the eye and conjunctiva.
- Endometritis and other infections of the reproductive organs following childbirth.

There are four infection control indicators:

- VAP (Ventilator Associate Pneumonia)
- CA-UTI (Catheter – Urinary tract infection)
- BSI (Blood stream infection)

- SSI (Surgical site infection)

### **Declaration of HAI:**

- CA UTI infection is declare when urine culture is positive and more than 5 pus cells present in urine of patient.
- VAP infection is declare when ET culture and sputum culture are positive and Clinical Pulmonary Infection Score is more than 6
- BSI is considered when patient on center line more than 48 hours than blood culture of patient is positive.

### **Hospital Acquired infection control in Hospital**

During my summer training project I studied the infection control department of hospital which work for the prevention of hospital acquired infection among the patients and staff of hospital those are prone to get infection. This department works to provide help prevent hospital acquired infection by:

- Providing advice services for the staff to help and prevent and manage infection.
- Conduct the programme of audit and surveillance.
- Produce guideline on the prevention and management of infection.

There is a committee who overhead this department forming norm guidelines and monitoring them.

There are following members of Hospital infection control committee:

- Microbiologist
- Facility Director
- Medical Administrator
- General Manager Hospital
- Chief anaesthetist
- Surgical Intensivist
- Consultant Pulmonology

- Infection control nurses
- Nursing Superintendent
- In charge CSSD
- Chief Engineer
- In charge Housekeeping
- In charge Food and beverages
- Human resource Manager
- In charge purchase
- Quality Representative
- Coordinators

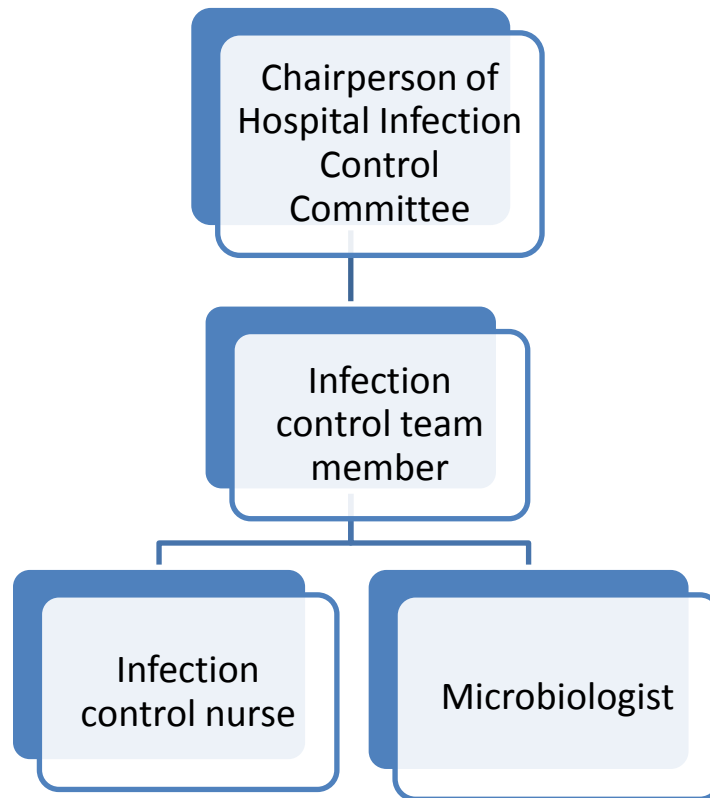
There is following manpower of Infection control department:

- Microbiologist - 1
- Infection control Assistant - 1
- Infection Control Nurses -2
- Critical Care Assistant -1

This committee yearly reviews its infection incidence rate for different wards for different infections. Formulas to calculate infection incidence rate:

- Catheter associated UTI rate (CAUTI) =  $\text{no. of UTI cases} / \text{no. of catheter days} \times 1000$
- Ventilator Associate Pneumonia rate (VAP) =  $\text{no. of VAP cases} / \text{no. of ventilator days} \times 1000$
- Central line associated infection rate (CVP) =  $\text{no. of BSI cases} / \text{no. of central line days} \times 1000$

### **Organogram of infection control department**



### **Responsibility of Infection Control Nurses**

- They check nursing records and files.
- Collect samples from different areas.
- Periodically audit of wards and other areas of hospital.
- Monitoring and supervision of infection among hospital staff.
- Conduct CNE on correct hygiene practices and aseptic technique.
- Collect Samples scrub from OT, water sample of OT, Drinking water, Throat swab of staff.

**Guidelines for nursing care:**

- Ventilator tubing (ET) should be changing every 72 hourly.
- Central line should be change on 14<sup>th</sup> day after insertion.
- Peripheral line (Cannula) should be change after 72 hrs of insertion.
- Catheter should be change every 15<sup>th</sup> day.
- Urobag should be changed every 7<sup>th</sup> day.
- Catheter Care should be done every 8 hourly with Betadiene swab
- Urobag empty - Every 8 hourly

**2.1 Objectives:**

1. To determine the percentage of Infection Control bundle compliance and noncompliance in each ward of hospital.
2. To assess the knowledge of nursing staff about the infection control measures.
3. To assess the knowledge of housekeeping staff about the Cleaning measures followed by Hospital.

### **3. METHODOLOGY:**

3.1 Duration of study : One and half months from 14<sup>th</sup> April to 31<sup>st</sup> May 2014

3.2 Sample:

- The sample includes files of patients who admitted in the wards of hospital.

There is following inclusion and exclusion criteria for taking sample:

- Inclusion criteria: Patients who were on ventilator, Central line or peripheral line and have Foley's catheter.
  - Exclusion Criteria: New admitted patients and patients those have not insertion any catheter.
- For assessment of nursing and house keeping staff I have taken nursing and housekeeping staff of morning and evening shift and those have more than 2 months working experience in hospital and exclude night shift nursing and housekeeping staff because of limitation of my working hours.

3.3 Sampling method : Random Sampling

3.4 Sample Size –

- To determining the compliances I have taken 40 patient's files from each ward.
- For assessment of nursing and house keeping staff I have taken 10 nursing staff from every ward of hospital and 44 housekeeping staff of wards of hospital
- There were different sample size of nursing staff in MGW-I (7 staff), NICU (3 staff), PICU (3 staff), ANC (7 staff) due less number of staff in morning and evening shift.

3.5 Area of study – Wards of hospital

3.6 Type of data – Primary data

3.7 Tool and technique for data collection –

- Infection control sheet which was specifically designed to record the details of inserted devices to the patients including their duration such as intubation and extubation date and time.

- I assessed this infection control sheet in patient file in wards and cross check their entries by asked the patients and attendants.
- For assessment of nursing and house keeping staff I have done Face to face interview of both staff according to Questionnaire which was prepared for Nursing Staff and housekeeping staff respectively.

### 3.8 Data Analysis – By using MS Excel

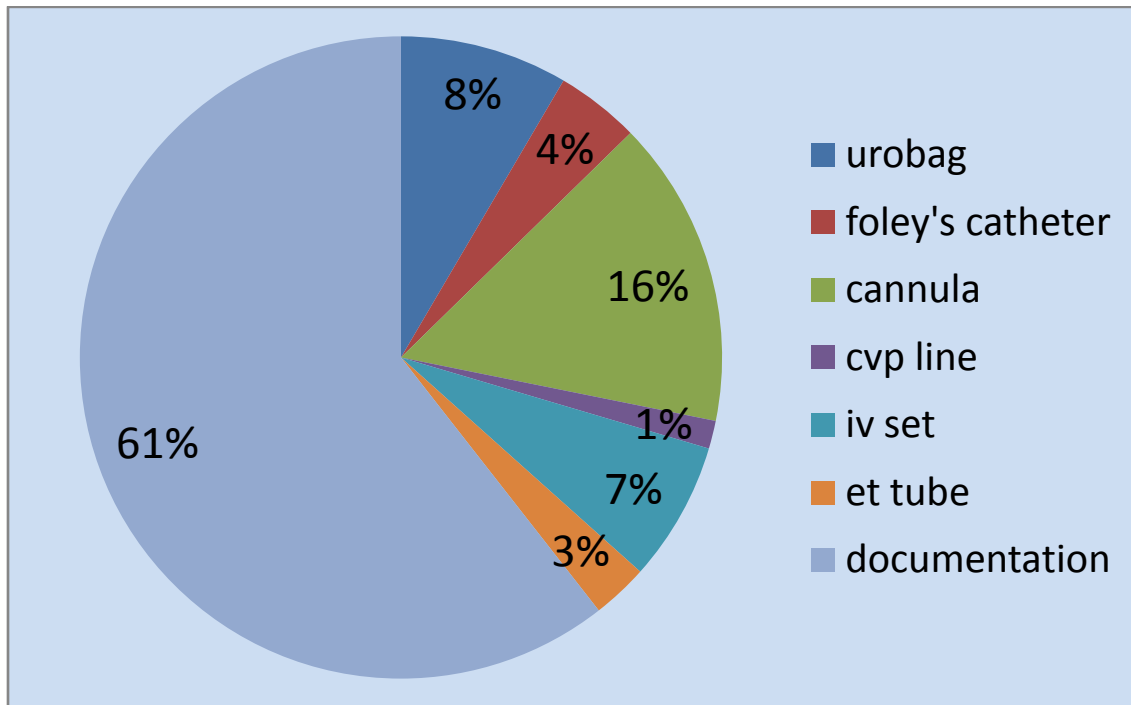
#### **4. FINDINGS:**

Table: 1 Ward wise level of compliances and non compliances of infection control bundles

| <b>Wards</b>          | <b>No. of Compliance files</b> | <b>No. of Non Compliance files</b> | <b>Percentage of Compliance</b> | <b>Percentage of Non Compliance</b> |
|-----------------------|--------------------------------|------------------------------------|---------------------------------|-------------------------------------|
| MGW-I                 | 32                             | 8                                  | 80%                             | 20%                                 |
| MGW-II                | 31                             | 9                                  | 78%                             | 22%                                 |
| FGW                   | 30                             | 10                                 | 75%                             | 25%                                 |
| II Floor              | 25                             | 15                                 | 63%                             | 37%                                 |
| Private/ Semi private | 36                             | 4                                  | 90%                             | 10%                                 |
| ANC/Pedio             | 36                             | 4                                  | 90%                             | 10%                                 |
| MICU                  | 28                             | 12                                 | 70%                             | 30%                                 |
| CCU                   | 37                             | 3                                  | 93%                             | 7%                                  |
| Total                 | 255                            | 65                                 | 79%                             | 21%                                 |

- There is maximum 15 non compliance files out of 40 files (67%) found at II floor i.e. CTVS male and female wards, Ortho ward, neuro wards and HDU. As well as MICU have 30% non compliance files i.e. 12 files out of 40.
- Documentation of work is not done properly by nursing staff. (They delayed it or some time forgot.) They enter wrong data like entry of Cannula done in CVP line column & vice versa.
- On II floor 73% of non compliance is because of documentation which is done by new joining staff and in MICU it is 58%.

Fig: 1 Presentation of the share of total non compliance of wards in different categories



- Fig: 1 shows that Maximum non compliances 61% occurs due to documentation problem i.e. incomplete or wrongly filled IC sheet.
- Some people entered in MICU with bare feet. (Without wear shoe cover)

Table – 2 Number of nursing staff under different grads in respective wards

| <b>Wards</b> | <b>Excellent</b> | <b>Very Good</b> | <b>Average</b> | <b>Poor</b> | <b>Very Poor</b> |
|--------------|------------------|------------------|----------------|-------------|------------------|
| MGW-I        | 3                | 2                | 2              | 0           | 0                |
| MGW-II       | 2                | 5                | 3              | 0           | 0                |
| FGW          | 6                | 1                | 3              | 0           | 0                |
| II Floor     | 6                | 2                | 1              | 0           | 1                |
| Private/SP   | 5                | 2                | 1              | 2           | 0                |
| ANC/Pedio    | 4                | 2                | 0              | 1           | 0                |
| MICU         | 3                | 5                | 1              | 1           | 0                |
| CCU          | 2                | 4                | 3              | 0           | 1                |
| ITU          | 6                | 1                | 1              | 1           | 1                |
| NICU         | 1                | 1                | 1              | 1           | 0                |
| PICU         | 1                | 1                | 0              | 1           | 0                |
| Total        | 39               | 26               | 16             | 7           | 3                |

- There are 33% poor response by nursing staff of NICU, 20/% poor in semi private and 10% poor in II floor, MICU, CCU which should be considerable under the nursing training.
- Overall it is quit well; around 71% (excellent and very good) nursing staffs have knowledge about infection control measures for the patient safety.
- There is confusion among the nursing staff about changing of CVP line. New protocol which is taught to staff is 14 days but most of the staff still knows it is as 7 days which is wrong. (50% staff)

- Nursing staff has knowledge about orange category patients but they are confused in colour recognition because when I asked them —~~what~~ what is colour code for infected patient?” they answer me RED (1 staff), PINK (1 staff), YELLOW (2 staff).

Table: 3 Number of Housekeeping staff according to their grades

| Category             | No. of Housekeeping Staff |
|----------------------|---------------------------|
| Excellent = 5/5      | 14                        |
| Very Good = 4/5      | 9                         |
| Average = 3/5        | 14                        |
| Poor = 2/5           | 2                         |
| Very Poor = 1/5      | 3                         |
| Not Acceptable = 0/5 | 2                         |

- There are 52% (Excellent and very good) housekeeping staff in hospital who has sufficient knowledge of cleaning and safety measures which prevent the HAI incidence.
- There are 16% housekeeping staff that has need of training.
- Housekeeping staff do not know the name of chemical which they are using for cleaning of window glasses of wards but they know something which is blue colour spray or something given by supervisor. (42% staff know correct answer)
- 38% staff did not know 6 steps of hand washing.

## **5. RECOMMENDATIONS:**

- Strictly implement hand washing for both nursing and housekeeping staff. This can be achieved through monitoring and regularly prompt by on-duty nursing supervisor and housekeeping supervisor.
- Regular monitoring and training of new joining nursing staff should be there because most of the mistakes are carried out by them.
- New Infection control sheet which was updated by Infection control department should be available in wards as soon as possible.
- Close circuit cameras can be installed to keep a check on any malpractices and weekly review of them.
- Guard should check that everyone wear shoe cover before entering MICU.
- Proper training of housekeeping staff.
- Assure availability of house keeping staff in every ward by new recruitments.

## **6. REFERENCES**

- ICD manual of Narayana multispecialty Hospital, Jaipur.
- Prevention of hospital-acquired infections-A practical guide (2nd edition) – WHO
- Ducel G et al. guide pratique pour la lutte contre l — infection hospitaliere” . WHO/BAC/79.1.
- Coella R et al. The cost of infection in surgical patients: a case study. J Hosp Infect, 1993,25:239-250.
- Resources. In: Proceedings of the 3<sup>rd</sup> Decennial International Conference on Nosocomial Infections, Preventing Nosocomial Infections. Progress in the 80’s Plans for the 90’s , Atlanta, Georgia, July 31- August 3, 1990:30 (abstract 63).
- Vasque J, Rossello J, arribas JL. Prevalence of nosocomial infections in Spain: EPINE study 1990-1997. EPINE working group. J Hosp Infect, 1999, 43Suppl:S105-S111.
- Gastmeier P et al. Prevalence of Nosocomial Infections in representative German hospitals. J HospInfect, 1998,38:37-49.
- Emmerson AM et al. The second national prevalence survey of infection in hospitals- overview of results . J Hosp Infect, 1996, 32:175-190.
- Wenzel RP. The economics of nosocomial infections. J Hosp Infect 1995, 31:79-87.
- Tikhomirov E. WHO programme for the control of hospital infections. Chemiotherapia, 1987, 3:148-151.

## **ANNEXURE - 1**

### Questionnaire For ICU/ Critical area

#### Set 1

- 1 What is colour coding for infected patients?
- 2 When do you change of IV bottle?
- 3 What is changing frequency of catheter?
- 4 When do you discard sharp container?
- 5 What are the infection control indicators?

#### Set 2

- 1 What is frequency of catheter care?
- 2 What is changing frequency of cannula?
- 3 What is the frequency of water changing in humidifier?
- 4 What is the changing frequency of IV set/PMO line?
- 5 What is changing frequency of Uro bag?

#### Set 3

- 1 What is changing frequency of tracheostomy tube?
- 2 What is used for disinfection of infusion pump?
- 3 What is used for cleaning of O<sub>2</sub> nebulizer mask?
- 4 What is used for mouth washing of patient?
- 5 What is normal range of general ward temperature?

#### Set 4

- 1 Head of ventilator patient should keep at which angle?
- 2 How to disinfect ambu bag?
- 3 What pressure is maintained in to ET tube cuff?
- 4 What is used for prevent deep vein thrombosis?
- 5 What is changing frequency of CVP site?

## **Annexure - 2**

### Questionnaire for non critical wards

#### Set 1

- 1 What is colour coding for infected patients?
- 2 When do you change of IV bottle?
- 3 What is changing frequency of catheter?
- 4 When do you discard sharp container?
- 5 What are the infection control indicators?

#### Set 2

- 1 What is frequency of catheter care?
- 2 What is changing frequency of Cannula?
- 3 What is the frequency of water changing in humidifier?
- 4 What is the changing frequency of IV set/PMO line?
- 5 What is changing frequency of Uro bag?

#### Set 3

- 1 What is changing frequency of tracheostomy tube?
- 2 What is used for disinfection of infusion pump?
- 3 What is used for cleaning of digital thermometer?
- 4 What is used for mouth washing of patient?
- 5 What is normal range of general ward temperature?

#### Set 4

- 1 What is cleaning frequency of suction jar?
- 2 What is used for cleaning of ECG knobs and defibrillator??
- 3 What is used for cleaning of ounce glass?
- 4 What is used for prevent deep vein thrombosis?
- 5 What is changing frequency of CVP site?

### **Annexure - 3**

#### **Questionnaire for Housekeeping Staff**

##### **Questions**

- Q1 Which chemical is used for cleaning of floor and walls?
- Q2 Which chemical is used for cleaning of window glass?
- Q3 What are the steps of hand washing?
- Q4 What do you understand by orange category patients?
- Q5 Where do you discard gloves and Uro bag?