



HOSPITAL ACQUIRED INFECTION

BY



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INTRODUCTION:

- DEFINATION: (HAI) is an infection which is acquired by patient during hospital stay other than its primary diagnosis after 48 hours of its admission whose development is favoured by hospital setting.
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OBJECTIVES:

- To study and understand the infection control protocols of Aster Adhar Hospital, Kolhapur.
 - To observe and analyze the various infection control practices followed at Hospital
 - To find out the rates of Hospital Acquired Infections (HAIs)
 - To search for areas of problem and find reasons for the same
 - To give recommendations to further improve the infection control practices and minimize hospital acquired infections (HAIs).
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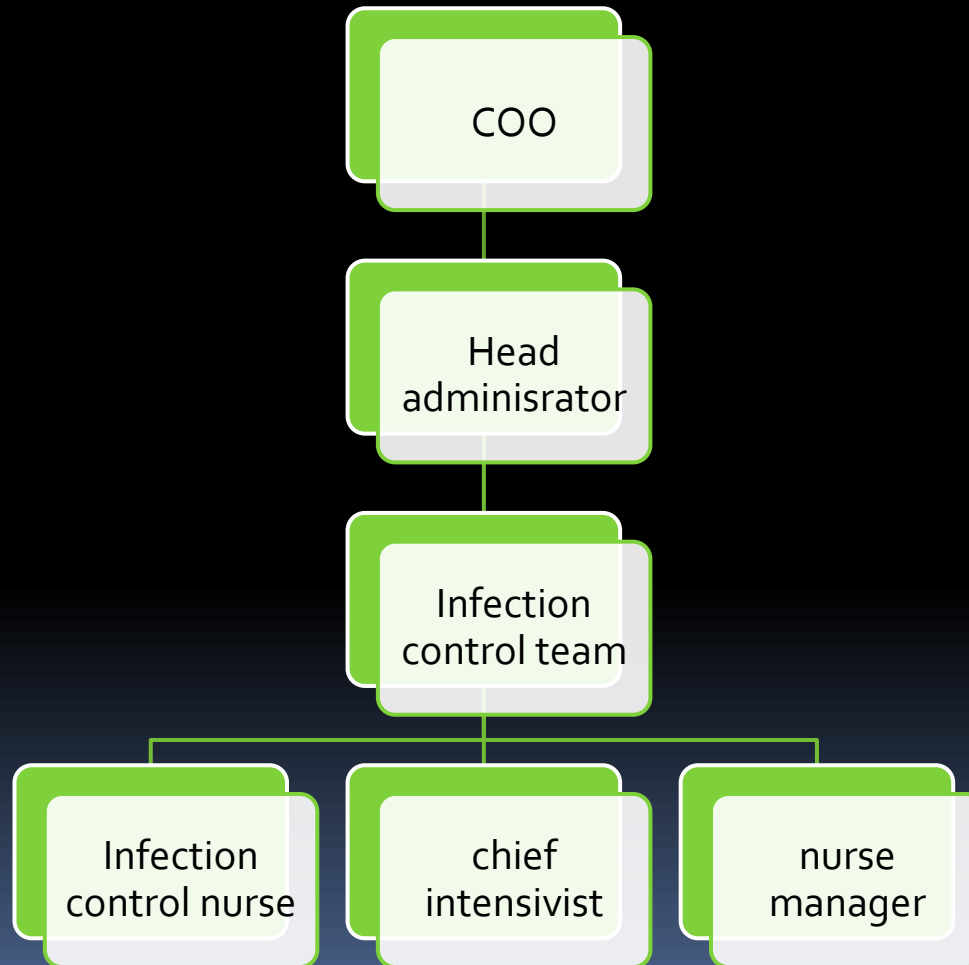


METHODOLOGY:

- Focused discussion with various members of the Infection Control team
 - Discussions with staff of the departments like OT, ICU, ICCU, NICU, etc
 - Retrospectively through various records maintained

 - **Data collection sources**
 - Primary sources
 - Through personal observations
 - Through interviews
 - Secondary sources
 - Through standard operating protocols
 - Through various records maintained
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ORGANOGRAM





Standard precautions to be followed

- Hand washing
 - Use of gloves, masks and protective aprons
 - Disposal of infected materials (cotton, gauze, etc) in red bins
 - Disposal of non – infected materials in black bins
 - Disposal of sharps and needles
 - Disinfecting soiled linens
 - Cleaning of bed pans, etc (swabbing, scouring, washing)
 - Double gloves are to be worn while handling serology positive patients
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Hand washing technique

- For routine hand washing, soap solution is used. The staff has to vigorously rub together all surfaces of lathered hands for at least 1.5 minutes followed by thorough rinsing under a stream of water
 - For hand-washing before caring for high-risk patients, between patients in high risk units, and before caring for patients who are severely immune-suppressed, anti-microbial solutions are used
 - Five moments of hand hygiene
 - Before touching a patient
 - Before a clean/aseptic procedure
 - After body fluid exposure risk
 - After touching a patient
 - After touching patients surroundings
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Personal hygiene

- To be followed by all staff members
 - All the staff are advised to keep hair and nails at short levels
 - All staff are expected to come to work in neat and clean uniforms
 - Jewellery and other ornaments should be removed before coming for duty
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Cleaning, Disinfecting and Sterilizing Equipment

- After patient is discharged, room is thoroughly cleaned, swept, washed with disinfectant and curtains are changed if needed
 - Bedding
 - Blanket – changed on soiling/discharge
 - Bed sheets – daily and whenever needed
 - Cots – cleaned after discharge
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- Bedpans and urinals
 - Handled only after wearing gloves
 - Contents are emptied and flushed
 - Cleaned in detergent
 - Disinfected by keeping in 1% sodium hypochlorite solution for 20 min, then rinsed and dried



Other precautions

- Individual thermometers for each patient. To be cleaned with disinfectant after each use
 - All iv bottles to be labeled with date, time and added drug
 - Fresh blood transfusion set to be used for every transfusion
 - Blood stained linen soaked in 1% hypochlorite for 20 min and then sent to laundry in red bag
 - Instruments used for serology positive patient is soaked in 1% hypochlorite for 20 min and then sent to CSSD in red bag
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- Universal precaution stickers put on all samples and requisition forms of serology positive patients before sending them to the lab.
 - Distilled water in oxygen humidifier is changed every 24 hours
 - A disposable suction catheter to be used before each suction and the suction tube is to be changed and sent for autoclaving every day.
 - All oxygen humidifiers are thoroughly washed with soap and water and kept dry when not in use
 - Distilled water in oxygen humidifier is changed every 24 hours



High risk areas in hospital

- OT
 - ICU/ICCU
 - NICU
 - Dialysis
 - CSSD
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Infection control in ICU

- Anyone entering into the ICU/ICCU has to first clean their hands with hand rub- provided outside
 - All staff members are expected wear face mask properly covering nose and mouth and head cap properly covering whole head on entering the unit.
 - Hand rub solution to be present at all bedsides
 - Separate bedside stethoscope for each patient
 - Ambu bag, face mask and stethoscope to be cleaned with hand rub solution after each use.
 - Ambu bag if used for infected cases, is to be kept in gluteraldehyde solution for 1 hour, then washed and dried
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- Labeling the IV bottles and IV lines by writing date, time and drugs added
 - IV sets to be changed every 72 hours. For TPN, set is changed every 24 hours
 - All central lines are inserted with full sterile precautions using gown, mask, sterile gloves and isolating the area with sterile towels
 - Central line dressing is to be changed every alternate day and whenever soiled. The site is to be checked for redness, discharge and swelling during every dressing
 - All 3-way stop cocks of central line to be wrapped in betadiene soaked gauze, which is changed every 8 hourly and is further wrapped in green towel.
 - The central lines and arterial lines are changed only in case of catheter related infection and tip of catheter is sent for culture, if indicated

Infection control in dialysis.

- All standard precautions to be followed
- Sterilium to be used before entering dialysis unit
- Footwear should be left outside on the shoe stand and unit slippers worn inside
- Separate procedure tray to be maintained for every patient
- Dialyser tubing and dialyser is labeled with full identification of the particular patient, date of first use and last disinfection
- Dialyser not used for more than 10 cycles
- Dialyser tubing not used for more than 15 cycles

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- Dialyser and dialyser tubing is kept in hemoclean solution till its next use and flushed with normal saline before its next use
 - All staff working in the unit vaccinated against Hepatitis B
 - Dialysis fluid sent for electrolyte analysis every month
 - Reverse osmosis water is sent for chemical and bacteriological analysis every month



Infection control in NICU

- All external clothing of the staff is changed to surgical attire and NICU slippers before entering NICU
 - All visitors are required to wear full-sleeved gown and NICU slippers before entering the NICU
 - All formula feeds are prepared in boiled water
 - Chatters forceps is autoclaved every day
 - Laryngoscope is chemically disinfected after each patient use
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- Only autoclaved linen is used
 - Microbiological surveillance is carried out once in a month and as and when indicated
 - Fogging done as and when required eg. After discharge of an infected case, after outbreaks of infection, etc

Infection control in OT

- Entry into the OT requires a change from external clothes to OT clothes shoes and footwear
- OT suits, slippers, gowns cannot be worn outside OT
- In no situation is an OT staff allowed to go outside OT in OT clothes except in emergency and to ICU. But one has to change to new OT dress before re-entering

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- All general instruments are washed in running water and then sent to CSSD
 - Endoscopic instruments are first washed in running water, then soaked in enzyme for 30 minutes followed by wash in plain water and then sent to CSSD
 - Instruments used for infected cases are washed in running water and then kept in cidex solution for 30 minutes. They are then sent to the CSSD for double autoclaving
 - The heart lung machines used for bypass cases are cleaned with disinfectant solution Virkon. Swabs are taken from its surface following fumigation.

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- Ideal temperature – 18-21 degree Celsius
 - Humidity – 55%
 - Positive air pressure
 - 20 air changes per hour
 - Microbial surveillance of OT swabs done every 15 days to monitor bacterial load
 - OT tables and trolleys cleaned with Virkon solution in between the cases
 - OT is washed and fumigated once a week
 - Air sampling is done every 15 days by microbiology department

Management of infected case

- Scheduled infected cases are taken only after completion of clean cases
- All linen coming in contact with infected person are soaked in 1% hypochlorite solution for 30 minutes. This linen is then kept in a red bag with "UP" label and sent to the laundry for washing
- Only disposable materials are used
- All micro and endoscopic instruments are immersed in cidex solution for 30 minutes and general instruments in 1% hypochlorite solution for 30 minutes. The cidex solution is then discarded.
- These instruments are then placed in a red bag with the "UP" label and then sent to CSSD for double autoclaving

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- The OT staff has to wash hands and change into fresh OT clothes before coming in contact with new patient. Used clothes are immersed in 1% hypochlorite solution and kept in red bag and then sent to laundry
 - OT is thoroughly cleaned with Virkon solution
 - Patient details are entered into OT register with “UP” label
 - All equipments are mopped with 0.5% Virkon solution and the mop is then discarded

Fumigation of rooms

- Done by fogging
- Indications:
 - To receive a post-transplant patient
 - Following discharge of patient with following diagnosis:
 - Positive for MRSA
 - Pulmonary Koch
 - Chicken pox, diphtheria, influenza, etc
- First thorough cleaning of the room is done using Virkon 0.5% solution followed by fumigation is done using 0.25% Virkon solution for 15 minutes
- The room is opened after 1 hour and swabs are taken for surveillance
- The room is fit for use only after report shows no growth

Surveillance protocol

- Daily surveillance – infection control nurse. The findings are then recorded in daily report book
- Fortnightly – done in OT & CSSD. Swabs in OT taken from OT table, air, water, floor, anaesthesia trolley, AC grill, overhead lamp
- Monthly – done in ophthalmology, OPD, IVF, ICU, ICCU, NICU, LDRP, dental, blood bank, pathology
- Swabs in ICU are taken from bed, bedside locker, floor, wall, monitor, stethoscope, thermometer and cardiac table.
- Swabs in ward are taken from bed, bedside locker, floor and 2 opposite walls.

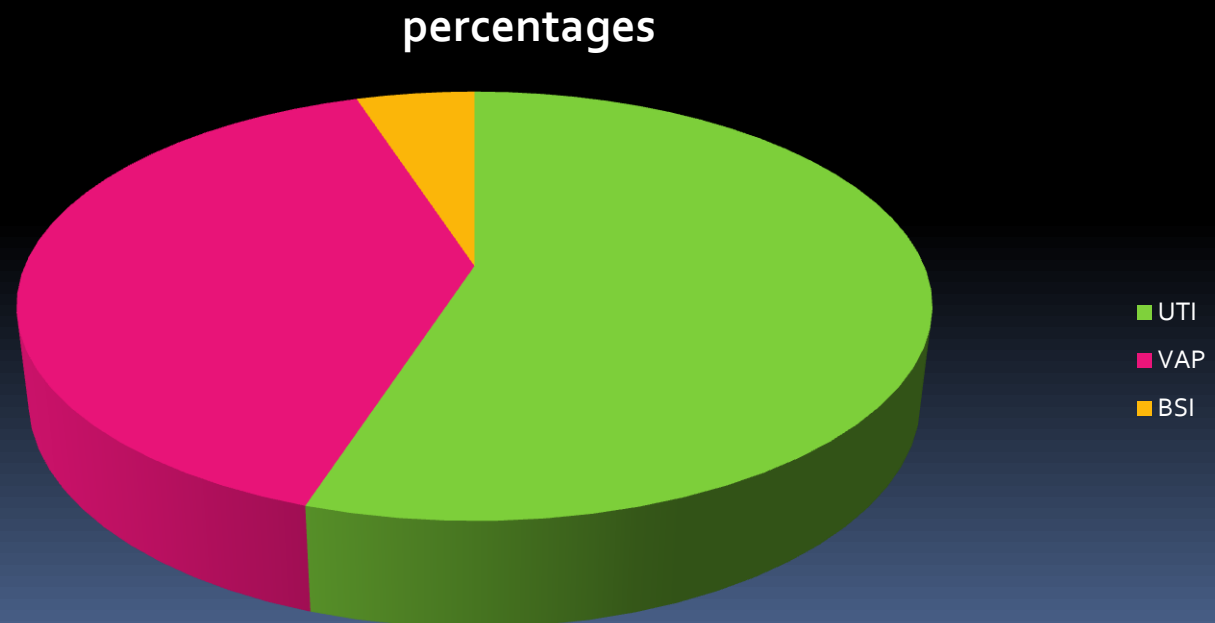
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- All swabs are sent to pathology dept.
 - If positive, then unit is shut down immediately
 - Fumigation is done
 - Repeat swabbing and fumigation done till culture shows “no growth”



PERFORMANCE EVALUATION

Feb 14 –Feb 15

- Breakup of HAIs
 - UTI – 55%
 - VAP – 40%
 - BSI – 5%



Urinary catheter associated UTI (ICU)

Month	Admissions in ICU	No. of patients on catheter	Urinary catheter days	UTI cases among patients
Feb	125	43	248	3
March	153	58	226	2
April	185	45	329	6
Total	463	146	803	11

Rate of UTI

- Catheter associated UTI rate = no. of UTI cases/no. of catheter days x 1000
- Catheter associated UTI rate = $11/803 \times 1000 = 13.69$

Ventilator associated pneumonia

Month	Admissions in ICU	No. of patients on ventilator	Ventilator days	No. of VAP cases
May	125	18	91	1
June	153	28	102	0
July	185	38	157	1
Total	463	84	350	2

Rate of VAP

- VAP rate = no. of VAP cases/no. of ventilator days x 1000
- VAP rate = $2/350 \times 1000 = 5.71$

Central associated BSI

Month	Admissions in ICU	No. of patients on central line	Central line days	No. BSI cases
Feb	125	39	266	1
March	153	33	215	1
April	185	49	329	2
Total	463	121	810	4



BSI rate

- Central line associated infection rate = no. of BSI cases/ no. of central line days x 1000
- Central line associated infection rate = $4/810 \times 1000 = 4.9$

HAI Comparison data

Time period	VAP rate	IVD – BSI rate	UTI rate
Jan' 10 – feb'10	4.47	6.6	10.7
feb'10 – march'10	5.71	4.9	13.69
march'10 – april'10	4.18	10	9.06

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- 12/6 – OT 6 air – 50 colonies of acinetobacter
 - 17/6 OT 6 water – 50 colonies of acinetobacter
 - Repeat done after A/C duct cleaning and tap cleaning – no growth
 - 18/6, 19/6 – ICU/ICCU – trolley and locker – S. aureus. Repeat done after cleaning

Hand hygiene adherence rate

- Observations made in ICU in april 15 during morning and afternoon shift – 66
- Compliance – 43
- Non compliance – 23
- Hand hygiene adherence rate – $43/66 \times 100 = 65.15\%$



SUGGESTION:

- 1) Formation of new IC team that include:
 - One person from microbiology department
 - One from nursing
 - Head administrator
 - Sanitary inspector
 - 2) More emphasis is given on Hand Hygiene technique.
(Training and evaluation.)
 - 3) Timely submission of report
 - 4) Evaluation of report and necessary action to be taken at the same time.
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4) Laundry process should be changed
for wards twice a week

OT per days

critical areas : per day

OPD : Alternate days

administrative areas : twice week.



6) Clearly define restricted areas with SIGN
BOARD.



THANK YOU