



सत्यमेव जयते

Ministry of Health & Family Welfare  
Government of India

# Infection Prevention and Control Programme

## Training Session – III



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National Center for Disease Control, New Delhi

# Outline

- IPC programme – objectives and structure
- Hospital infection control committee (HICC) and teams
- Roles and responsibilities
- IPC manual
- Antimicrobial use and management
- Educational programmes and strategies
- Risk assessment (RA) and risk management (RM)
- Planning, monitoring, audit and feedback

# Importance of IPC programme

- IPC and quality standards of healthcare are essential for the well-being and safety of patients, their families, health workers, and the community
- A well-organized IPC program is a basic requirement in every HCF to assist HCWs in the provision of quality healthcare services
- The first step towards implementation is the establishment of an IPC program at the HCF level

# IPC programme – goal & objectives

- **Goal:** Minimize the risk of HAIs to patients, HCWs, and visitors
  
- **Objectives:**
  - Enable and assist all categories of HCWs to adhere to comprehensive IPC practices at all levels of care
  
  - Provide safe and quality healthcare
  
  - Improve outcomes by reducing morbidity and mortality

**Head/administrator of the HCF shall establish HICC with well-defined composition, roles, and responsibilities as well as adequate human, financial and logistic resources for effective functioning of the IPC program**

# An effective IPC programme should have

- Policies and guidelines, SOPs and best practices document
- Well functioning HICC
- Adequately trained, dedicated and motivated human resource
- Budget allocation for IPC implementation
- Continuous and adequate supply of PPE
- Antimicrobial use policy and antimicrobial stewardship programme (AMSP)
- HAI surveillance and outbreak investigation
- Microbiology laboratory support
- Evaluation of the programme activities: monitoring and feedback
- Environmental protection
- Implementation through a multimodal approach

# Hospital infection control committee (HICC)

- HICC is an integral component of the IPC program of the HCF
- The HICC is responsible for establishing and maintaining the IPC program and its various functions of monitoring, surveillance, reporting, research, and education
- The HICC should have wide representation from all relevant disciplines or departments in the facility
- If required, in a large tertiary care facility, in addition to HICC additional IPC teams might be constituted from each clinical specialty to support HICC members

# HICC – structure

- Chairperson: head of the institute
- Member-secretary: infection control officer
- Members
- Representation from management/ administration: Dean/Director/ Superintendent; nursing services; medical services; operations
- Representation from relevant medical, surgical and microbiology departments
- Infection control nurse (ICN)
- Representation from support services: OT, CSSD, laundry, housekeeping/sanitation, engineering, pharmacology/pharmacy, stores

# HICC – functions

- Develop an action plan for strengthening IPC measures
- Constitute infection control team(s) to conduct IPC activities
- Review and revise annually IPC guidelines with policies, recommendations, and protocols
- Organize education and training programs for all staff
- Develop an antimicrobial stewardship program (AMSP)
- Conduct HAI surveillance, analysis, and plan of action for prevention of HAI
- Monitor and assess compliance with recommended practices
- Investigate outbreaks of HAIs

# HICC – responsibilities

- Evaluate/audit the effectiveness of IPC interventions
- Participate in selection of equipment and material and provide advice and focus on IPC measures
- Help control environmental risks for infection
- Establish links with related public health programmes in the HCF
- Ensure a multimodal approach and system change
- Organize periodic (monthly/quarterly) meetings of HICC and take minutes with clear action points and responsibilities
- Help to ensure occupational safety of healthcare providers



# Roles and Responsibilities

# Infection control officer

- Usually a clinical microbiologist/ physician specializing in infectious diseases /medical epidemiologist or any other physician with IPC training
- Should be the member-secretary of HICC
- Leads the IPC team and is responsible for monitoring day-to-day IPC activities
- Should have direct access to the head of the HCF
- Coordinate microbiological surveillance as decided by the HICC

## Infection control officer contd.

- Develop policies, guidelines and SOPs on IPC
- Monitor and analyze HAI surveillance trends for action
- Advise/educate staff on all aspects of IPC
- Analyze and disseminate antibiograms and facilitate AMSP
- Oversee sterilization, disinfection and needle-stick/sharp exposure and injuries
- Investigate outbreaks, and advise on control measures and isolation procedures
- Audit infection control procedures, and antimicrobial usage
- Coordinate with Chairman for regular conduct of HICC meetings

# Infection control nurse

- ICN should be a full-time nursing staff with training in IPC
- Minimum: one dedicated ICN for every 250 hospital beds
- If resources permit advisable to have 1/100 beds\*
- Ensure implementation of IPC practices by HCWs
- Liaise between the microbiology laboratory, clinical departments and the wards, ICU, OTs, etc. to identify problems and implement solutions
- Supported by specifically designated link nurses in each ward, ICU, OT or unit

## Infection control nurse contd.

- Conduct infection control rounds daily and liaise with microbiology laboratory for culture sensitivity reports
- Track all infected cases and maintain surveillance data
- Impart education and training to HCWs under the supervision of the infection control officer
- Monitor implementation of IPC practices and SOPs
- Monitor compliance with the hospital's biomedical waste (BMW) management policy
- Monitor compliance with staff immunization

# Head of HCF/hospital administrator

**Provides leadership/support to the IPC program as chairperson of the HICC**

- Establish and support a multidisciplinary HICC and AMSP
- Allocate appropriate resources for the IPC programme and ensure availability of appropriate infrastructure, financial and human resources
- Ensure implementation of HAI surveillance system
- Approve and review policies and guidelines for IPC
- Support educational and training activities for all staff
- Establish HCW safety program – immunization, PPE, and PEP
- Ensure safe food/drinking water and BMW management

# Microbiologist/Microbiology Department

## Key role in the IPC programme



- Responsible for identification, characterization, reporting and storage of causative organisms and guide appropriate antimicrobial therapy
- Develop guidelines for safe laboratory practices, specimen transportation and ensure implementation
- Conduct surveillance for common HAIs
- Analyze and report the antibiogram and help framing institutional antibiotic policy
- Communicate promptly about suspected HAI outbreaks to HICC and ICT
- Conduct epidemiological investigation of outbreaks
- Do microbiological surveillance of drinking & dialysis water, biological testing of sterilizers as per HICC policy

**Must not conduct random, undirected microbiological sampling of air, water and environmental surfaces in healthcare facilities**

# Doctors



- Provide unit level IPC leadership
- Provide quality patient-care services to minimize infection as per the recommended IPC practices
- Support the IPC team and activities
- Ensure collection of appropriate microbiological specimens when an infection is suspected
- Notify infected/ HAI cases to the IPC team
- Comply with the antibiotic policy and support the ASMP
- Advise patients, visitors and staff on measures to prevent the transmission of infection

# Pharmacist and Pharmacology department

- Store, dispense, and maintain a record of medicines including antimicrobials, antiseptics, disinfectants, vaccines, sera
- Share analysis and trends of antimicrobial consumption/use with HICC
- Provide information on activity and side-effects of disinfectants and antiseptics

# Nursing Administrators

- Promote development and improvement of nursing techniques, and review of aseptic nursing policies, approved by the HICC
- Develop and mandate continuing medical education (CME) and training programs for all nurses
- Supervise the implementation of nursing compliance with IPC policies and practices
- Document, report, and maintain suspected HAI cases based on records and information
- Empower the nurse in charge of the ward/ unit/ OT for implementation, monitoring, and adherence to HICC practices in the ward/ unit/ OT

# Nurse in-charge of ward/unit

- Maintain and monitor IPC practices consistent with hospital policies and good nursing practices
- Report promptly any evidence of infection in patients to the attending physician
- Initiate patient isolation and facilitate culture specimens requests for patients showing signs of a communicable disease
- Maintain PPE and patient care supply inventory
- Limit patient exposure to visitors, hospital staff and other patient or devices/equipment
- Ensure safe storage of medicines and blood products in the ward
- Participate in the training of HCWs and patient education programs
- Participate in the investigation of outbreaks

# Responsibilities of the link nurse

- A nurse in every patient-care unit is designated as an infection control liaison or “link nurse”
- Is a useful adjunct to the ICN to implement infection control practices in the ward and to assist in surveillance of HAI by informing the ICN about suspected cases
- The link nurse does not replace an ICN as the link nurse’s primary responsibility and area of work are the patients under her care in the ward

# Central sterile supply department (CSSD)/sterile supply department (SSD)

## Has a major role in IPC and patient safety

- The CSSD/ SSD serves all hospital areas, including the OT
- Receive pre-cleaned instruments and medical devices, sterilize, and distribute
- Qualified/experienced individual must be responsible for managing the CSSD
- Work in collaboration with the HICC and other relevant departments in the facility to develop and monitor policies on cleaning, decontamination, and sterilization of reusable and contaminated devices for patient care

# Responsibilities of the CSSD manager

- Develop a procedure manual approved by HICC, to document SOPs for all processes carried out in the CSSD
- Oversee the various processes carried out in the department, namely cleaning, decontamination, disinfection, wrapping, sterilization, storage and distribution
- Monitor the processes using different methods such as physical, chemical and biological indicators according to the policy of the HCF
- Ensure technical maintenance of the equipment according to national standards and manufacturers' recommendations
- To maintain complete records of each sterilizer run and preserve records as per standard recommendations

# Laundry services

- Collect and transport soiled/ dirty linen in appropriate bags/closed containers
- Ensure appropriate flow of linen, separation of “clean” and “dirty” areas
- Disinfect soiled linen
- Maintain laundry equipment and monitor the recommended washing conditions-temperature, duration etc.
- Distribute OT and ward linen, working clothes in different areas, and maintaining appropriate supplies
- Ensure safety of the laundry staff through prevention of exposure to sharps or laundry contaminated with potential pathogens

**These are formulated in accordance with the policies of the HCF and approval of the HICC**

# Housekeeping services

- Regular and routine cleaning of all surfaces and maintaining a high level of hygiene in the facility
- Collection and transportation, treatment and disposal of waste generated in the facility
- Waste management policy should be in compliance with appropriate rules under the environmental protection act including Biomedical Waste Management Rules

**These are formulated in accordance with policies of the HCF with the approval of the HICC**

# Facility/building maintenance committee, department or agency



- Ensure regular building maintenance and record-keeping – plumbing, power supply equipment, electrical fittings, Heating Ventilation and Air-Conditioning systems (HVAC) and high-efficiency particulate air (HEPA) filters
- Collaborate with the HICC, housekeeping, nursing staff, etc. in selecting and maintaining equipment
- Ensure environmental safety of the community from hospital activities such as waste disposal and protection of water sources

# IPC Manual

- Every HCF to develop their IPC manual coordinated by IPC team, in alignment with IPC policy defined by HICC
- Include facility-specific standardized protocols, policies, guidelines, SOPs and recommendations, IPC practices, control of the environment, surveillance of HAIs and management of outbreaks, IPC in special areas/ situations, preventing infections among HCWs, monitoring and evaluation
- Guide the training programmes for all staff
- Should be reviewed periodically and updated preferably every year
- Should be widely available and used in all areas of HCF

**HCF IPC manual should be developed based on the NGIPC adapted to local conditions, type of facility, services provided, infrastructure and availability of human resource**

# Antimicrobial Stewardship Program (AMSP)



- Integral part of the IPC programme and HICC
- Aims to facilitate the establishment of effective and rational antibiotic use
- Every HCF should establish an AMSP team/committee
- Develop and implement Standard Treatment Guidelines (STGs)
- Develop antibiotic policy for optimizing antimicrobial use:
- Culture & AST driven selection, escalation/ de escalation of antibiotic therapy
- Appropriate dosing, route of administration, and duration of antimicrobial therapy using the AST results/local antibiograms
- Provide ongoing education on AWARe\* classifications of antimicrobials
- To monitor surveillance of AMR and antimicrobial use

**Antibiotic prophylaxis is not a substitute for appropriate aseptic surgical technique and other infection control measures**

[\\*WHO releases the 2019 AWARe Classification Antibiotics](#)

# Educational programmes and strategies

- Appropriate educational material and visual aids on IPC in local language should be available to all HCWs, patients and visitors
- Induction and refresher trainings (at least annually/when updated information is available) on IPC to be given for all healthcare staff
- Continuing educational interactive programmes and awareness drives should be conducted periodically
- Awareness programmes should be organized on the prevention and control of specific infectious diseases for different levels of staff of the HCF and for the patients and community

# Risk assessment (RA) and risk management (RM)

- Procedures and processes associated with risk of infection can be evaluated to assess the risk in the HCF to prepare annual IPC implementation plan
- General approach to RA-RM is:
  - System for RA-RM needs to be divided into individual functional, structural and operational components
  - Hypothetical frequency of occurrence of a given event needs to be semi-quantified – unlikely, extremely rare, infrequent, frequent or imminent
  - Semi-quantification of the magnitude of impact of a given event needs to be done- Mild, Moderate, Severe, Catastrophic

**Frequency of occurrence and magnitude of impact are arbitrary and generally 3- or 5-point scales**



# Exercise on RA and RM

# Risk assessment-Steps

- Identify the hazard
- Evaluate the problem: who might be harmed and how
- Categorize the risk: assess the likelihood and consequences of infection
- Record and implement priority interventions to manage the risk
- Review the risk and evaluate the success of interventions

# Categorization of IPC risk

- High, medium, or low risk depending on the severity of the consequences of the particular hazard
- Low risk: e.g. not wearing gloves when obtaining a blood sample
- Medium risk: e.g. Handling a patient's central venous catheter without performing hand hygiene
- High risk: If a clinician performed an aseptic procedure (e.g. surgery) without performing adequate hand antisepsis

# Categorization of IPC risk contd.

INFECTION EVENT	LIKELIHOOD OF OCCURRENCE				CONSEQUENCE/LEVEL OF HARM FROM EVENT				RISK LEVEL  (Scores ≥ 4: highest priority for action)
	(How likely is this to occur?)				(What would be the most likely?)				
Score	High	Med.	Low	None	Serious Harm	Moderate Harm	Temp. Harm	None	
	3	2	1	0	3	2	1	0	
<b>Practices</b>									
Lack of accessible alcohol-based hand rub									
Lack of accessible personal protective equipment (PPE)									
Inappropriate selection and use of PPE									
Inadequate staff adherence to hand hygiene									
Inadequate staff adherence to glove and gown use when working in Contact Precautions area									
Inadequate staff adherence to facemask use when working in Droplet Precautions area									

# Example 1: High Rate of Needlestick Injuries among Staff

# Examples of step wise risk assessment

Steps of risk assessment	Example 1
Identify hazard	
Evaluate the problem	
Categorize the risk : Assess likelihood of occurrence & consequences of infection	
Determine and implement priority interventions to manage the risk	
Monitor the risk and evaluate the success of your interventions	

# Examples of step wise risk assessment

Steps of risk assessment	Example 1
Identify hazard	High rate of needlestick injuries among staff
Evaluate the problem	Review data of needle stick injuries for: Number, Type, Unit whose staff were affected, when, where and how
Categorize the risk : Assess likelihood of occurrence & consequences of infection	Untrained staff, when taking blood from uncooperative patients, extended hours of work etc.
Determine and implement priority interventions to manage the risk	Training of all staff in sharps management, sharps containers in all rooms or ensure eye shields available in casualty/obstetrics.
Monitor the risk and evaluate the success of your interventions	Maintain and monitor records of all needle stick injuries before, during and after the interventions, monitor how well the interventions were implemented, improve policies and re-train staff periodically.

## Example 2: Non Compliance to Hand Hygiene in a Particular Unit

# Example of step wise risk assessment contd.



Steps of risk assessment	Example 2
Identify hazard	
Evaluate the problem	
Categorize the risk: Assess likelihood of occurrence & consequences of infection	
Determine and implement priority interventions to manage the risk	
Continually monitor the risk and evaluate the success of your interventions	

# Example of step wise risk assessment contd.

Steps of risk assessment	Example 2
Identify hazard	Noncompliance to Hand hygiene in a particular Unit
Evaluate the problem	Review routine monitoring data of hand hygiene collected as a part of routine monitoring by ICN and identify units with poor compliance to hand hygiene
Categorize the risk: Assess likelihood of occurrence & consequences of infection	Identify all points of risk for poor hand hygiene : untrained staff, when taking blood from uncooperative patients, extended hours of working of staff etc.
Determine and implement priority interventions to manage the risk	Training of all staff in hand hygiene, pictorial reminders in all rooms
Continually monitor the risk and evaluate the success of your interventions	Maintain and monitor records of all hand hygiene lapses before, during and after the interventions, monitor how well the interventions were implemented, improve policies and re-train staff periodically.

# Examples of RA & RM



	Likelihood of occurrence	Consequence/ level of harm	Action plan
IPC implementation not in place	Immediate	High	Constitute HICC within 1 month; organize meeting within 2 months
Inadequate microbiology lab support	Frequent	High	Better resources including manpower, infrastructure, equipment, consumables, funds allocation based on priorities
Inadequate number of human resource for IPC	Frequent	High	Multi-tasking; planning/recruitment of dedicated HR
Inadequate supply of PPE	Frequent	High	Better inventory management, staff education about appropriate use of PPE, PPE wastage audit; funding
Inadequate supply of essential medicines	Frequent	High	Hospital formulary development, AMSP, emphasis on IPC, staff training
Inadequate training for IPC	Frequent	High	Training of trainers programme, mandatory training in IPC, staff incentives based on IPC compliance
Fire	Frequent	Very High	Mandatory fire safety audit and fire safety training

# When and how IPC risk assessment conducted?

- During the establishment of health care services (standard precautions, transmission-based precautions, HAI surveillance, cleaning, laundry and waste management, reprocessing of re-usable instruments, renovation projects, new procedure or diagnostic test is implemented)
- A problem in IPC practice, policy or related issue is identified
- Performed by an experienced IPC practitioner
- Assistance from clinicians, laboratory staff, or data managers, depending on the location and type of hazard being investigated
- Input should be gathered from staff in the clinical area concerned (e.g. casualty and theatre staff for needlestick injuries)

**Risk assessment should be conducted at least annually to re-evaluate the priorities for your facility's IPC programme**

# Annual Action plan for IPC

- Based on the risk assessment, an annual plan of action should be charted out at the end of the current year and ratified by the HICC
- Targets to be achieved on the lines of aims and objectives of the IPC program and strategies to be implemented to achieve these should be emphasized
- Main purpose is to achieve behavioral change or other process modifications to improve the quality of care and practices with the aims of reducing the risk of HAI and the spread of AMR

# Implementation of multimodal strategies

- Multimodal strategy for IPC activities to improve practices and reduce HAI and AMR
- Aims to improve outcomes (bundle approach), and includes tools (bundles and checklist) developed by multidisciplinary teams based on local conditions to enable IPC practices
- System change with appropriate infrastructures and supplies
- Education and training of relevant staff
- Monitoring of the infrastructure, practices, processes, outcomes and providing feedback
- Reminders in the workplace and communication
- Culture change within the HCF and strengthening the safety climate

# Audit

- Regular monitoring/ audit of IPC practices and feedback (individual/ team/ unit)
- Indicators:
  - Compliance with processes such as hand hygiene, checklists, care bundles
  - Results of knowledge, attitude, and practice (KAP) studies to indicate behavior change
  - Compliance with rules and regulations such as the BMW management rules
  - HAI rates obtained through the surveillance system

**WHO's Infection Prevention and Control Assessment Framework for health care facilities (IPCAF) tool can be used for monitoring IPC at the HCF level**

# Evaluation and feedback

- Periodic evaluation to assess the extent to which the objectives of the programme have been met
- Ascertain whether the activities are being performed in accordance with the facility IPC manual
- Identify aspects that need improvement
- Indicators:
  - Process indicators: e.g. compliance with hand hygiene, care bundles
  - Outcome indicators: e.g. HAI rates, mortality and morbidity

# Summary



- Well-organized IPC program with functional HICC is a basic requirement in every HCF
- Facilities must develop an IPC manual based on NGIPC adapted to local conditions
- Key stakeholders in the implementation of the IPC program
  - Infection control officer
  - Infection control nurse
  - Hospital administrator
  - Microbiologist/ microbiology department
  - Leadership by doctors, pharmacists, nursing staff, CSSD/SSD, laundry, housekeeping service, maintenance committee
- Risk assessment and risk management
- Implementation strategies, adherence



# Questions?