

PDCC Hospital Infection Control

Course Curriculum:

Course: Post-doctoral certificate course (PDCC) - Hospital Infection Control

Duration of the course – 1 year

Learning: Independent self-directed + Work-based experiential learning

Assessment: Continuous cumulative assessment (Formative + Summative)

COURSE LEARNING MODULES:

- I. GOOD MICROBIOLOGY LABORATORY PRACTICE & DIAGNOSTIC STEWARDSHIP

- II. BASICS OF DISINFECTION, STERILIZATION, CSSD PRACTICES

- III. HOSPITAL ACQUIRED INFECTIONS- DIAGNOSIS AND SURVEILLANCE

- IV. ADMINISTRATIVE ASPECTS OF INFECTION CONTROL- HICC AND ICT

- V. APPLICATION OF CLINICAL MICROBIOLOGY IN INFECTION CONTROL

- VI. OCCUPATIONAL HEALTH AND SAFETY

- VII. RESEARCH IN INFECTION CONTROL

- VIII. PERIPHERAL POSTING

Each of these learning modules are addressed below using the principles of Bloom's taxonomy to assess the areas of

- A. Knowledge (Cognitive domain)
- B. Skills (Psychomotor domain) and
- C. Attitude/Behaviour (Affective domain)

I. GOOD MICROBIOLOGY LABORATORY PRACTICE & DIAGNOSTIC STEWARDSHIP

Learning component	Year quarter	Assessment method
Knowledge		
<p>a. Pre-analytical phase</p> <ul style="list-style-type: none"> I. Describes the various diagnostic tests available for detection of various pathogens/clinical syndrome evaluation II. Explain the correct sample, optimum collection procedure, storage, and transport <p>b. Analytical phase</p> <ul style="list-style-type: none"> I. Explains the principle, advantages and disadvantages of diagnostic tests II. Explains the biosafety precautions which are to be followed while performing these diagnostic tests <p>c. Post-analytical phase</p> <ul style="list-style-type: none"> I. Explains how to accurately interpret test results and the importance of documentation <p>d. Explains how to cumulatively assess the test results with other accessory tests (Biochemical tests, cytology/histopathological examination/imaging etc.)</p> <ul style="list-style-type: none"> II. Explains methods to ensure test result quality (repeatability and reproducibility) 	Q1-2	<p>Seminar presentation on topics like</p> <p>Standard operating protocols (SOP)</p> <p>Biosafety levels, controls, external quality assurance schemes</p> <p>Resistance mechanisms in Bacteria and fungi</p> <p>Antibiotic susceptibility tests and their interpretation</p> <p>Newer antibiotics and their use.</p>
Skills		
<p>a. Pre-analytical phase</p> <ul style="list-style-type: none"> I. Suggests/chooses optimal diagnostic test for diagnosis of an infectious disease <p>b. Analytical phase</p> <ul style="list-style-type: none"> I. Demonstrates the ability to perform as well as guide laboratory staffs as per the local SOP in performing diagnostic tests 	Q1-2	<p>Clinical case presentation</p> <p>Presents cases (as a whole) before the reporting</p> <p>Trouble-shooting of wrong outcomes</p> <p>Laboratory-reporting sessions</p>

<p>c. Post-analytical phase</p> <p>I. Demonstrates producing an accurate test result/interpretation with clinical and other laboratory tests correlation</p>		<p>Case-based discussions, Day-to-day case scenarios</p>
Attitude/Behaviour		
<p>a. Pre-analytical phase</p> <p>I. Liases with clinical and laboratory staffs in appropriate sample collection, storage, transport, and processing of samples</p> <p>II. If unaware, refers to standard operating procedure (SOP) and/or seeks help from senior staffs</p> <p>b. Analytical phase</p> <p>I. Demonstrates eagerness to learn new techniques</p> <p>II. Elicits good rapport with laboratory staffs in guiding performance of the diagnostic tests</p> <p>III. Elicits and guides good laboratory practice</p> <p>c. Post-analytical phase</p> <p>I. Ensures confidentiality when necessary</p> <p>II. Liases with clinical staff in a timely manner to generate a clinically relevant accurate report</p>	<p>Q1-2</p>	<p>Log Book Recording the day-to-day Case-based discussions and follow-up</p> <p>Recording of new techniques learnt</p> <p>Records all such events in Log book</p> <p>- Faculty remarks</p>

II. BASICS OF DISINFECTION, STERILISATION AND CSSD PRACTICES

Learning component	Year quarter	Assessment method
Knowledge	<p>1-2</p>	<p>Seminar On the same topics</p>
Sterilisation practices for OT		
Sterilisation practices for specialized areas like Cath Lab, IR Lab		
Device reprocessing		
OT- standards for the environment		
Hospital policy on disinfection		
Hospital policy on Biomedical Waste		
Skills		<p>Logbook</p>
Assessment of OT for sterile practices		
Sampling of environment in OT		<p>Exercises done in ensuring sterile practices and environment in the</p>
Cleaning practices in Wards and ICUs		
Implementing BMW segregation in different units		
CSSD posting and observing practices there		

		OT
Attitudes and practices		Liaison with ICN
Visits to ICUs and isolation units		Observation of bundle care and interaction with link nurses
Visits to OT and observation of practices followed there.		SOPs reviewed Discussion with Technicians and nurses in OTs and special procedure units

III. HOSPITAL ACQUIRED INFECTIONS- DIAGNOSIS AND SURVEILLANCE

Learning component	Year quarter	Assessment method
Knowledge		
Describes chain of transmission, methods to break chain of transmission, risk factors for HCAI, principles in outbreak investigation, reporting and control, concepts of A. colonization/infection/disease B. Infection control precautions (Standard & Transmission-based) C. Clinical audit	Q1-2	Seminar presentation on Surveillance strategies Outbreak management Molecular methods for outbreak analysis
Describes scientifically-proven infection control measures and practices		
Describes infection prevention and control precautions and measures in special situations eg: pregnancy, travel, immunosuppression, patients undergoing life-sustaining treatment like haemodialysis, transplantation, ECMO etc		Epidemiology of infectious disease outbreaks Isolation precautions
Skills		
Recognises potential clinical situations of infection transmission/outbreaks and appropriate utilization of laboratory resources and methods for investigating outbreaks		Logbook
Disseminates reliable information on infection control precautions and measures	Q2-4	Clinical case presentation and clinicomicrobiological correlation
Demonstrates adherence to national/local infection prevention and control guidelines		Case-based discussions
Report and interpret HCAI surveillance data		Day-to-day clinical scenarios
Undertake infection-control audit in close liaison with the infection control nurse (ICN)		
Attitude/Behaviour		Clinical rounds (wards/ICU)- Describe follow up of specific

		cases of HCAI, like VAP, CLABSI
Demonstrates good liasoning, team-building and leadership qualities		
	Q1-4	Multidisciplinary feedback

IV. ADMINISTRATIVE ASPECTS OF INFECTION CONTROL- HICC AND ICT

Learning component	Year quarter	Assessment method
Knowledge		Seminar
Describes the constitution, roles, and responsibilities of Infection Control Team (ICT) and Hospital Infection Control Committee (HICC)	Q3-4	HICC
Describes the constitution of antimicrobial stewardship team and their roles and responsibilities		Infection control manual
Knows the epidemiology of common multidrug-resistant organisms – bacteria, fungi and viruses(Global/National/Local) and management of outbreaks and epidemics in a hospital		Antimicrobial stewardship team Antibiogram and its applications
Skills		Log book
Formulating an antibiotic policy in close liaison with a clinical team		Shows the formulated policies in antibiotic use
Implementation and monitoring of policies in the Infection control Manual e.g. Handwashing Policy		Shows the formulated policies in infection prevention
Attitudes and practice		
Educates and trains students & staffs of various levels in appropriate antimicrobial use		Multidisciplinary feedback
Demonstrates good rapport and communication with the multidisciplinary/interdisciplinary team (eg: ICT)		
Advises infection prevention strategies to avoid future antibiotic use (Use of coated catheters, antibiotic lock solutions, implementation of care bundles etc.)		

V. APPLICATION OF CLINICAL MICROBIOLOGY IN INFECTION CONTROL

Learning component	Year quarter	Assessment method
Knowledge		
Describes the antimicrobial classes, mechanism of action, spectrum, pharmacokinetics-pharmacodynamics, adverse effects/toxicity profile, indications/contraindications, key interactions and	Q2-3	Seminar presentation Modes of resistance in Gram

mechanisms of resistance (intrinsic/acquired)		positives and Gram negatives Classes of antibiotics and the pharmacodynamics Antibiogram Antibiotic policy Antifungals Resistance to antifungals Antimicrobial stewardship and role of Microbiologist
Describe invitro methods of determining antimicrobial susceptibility, resistance mechanisms and their limitations		
Explains the concepts of a) MIC/MBC, MIC index, MIC creep b) escalation and de-escalation c) empiric, pre-emptive & targeted therapy d) synergism/antagonism/indifference e) therapeutic drug monitoring – peak/trough levels for appropriate antibiotics f) Outpatient parenteral antibiotic therapy (OPAT)		
Describes the impact of inappropriate antibiotic use in patients		
Describes the methods of measuring antimicrobial use and various strategies to control antibiotic use		
Skills		
Demonstrate appropriate interpretation of susceptibility reports, selective/cascade reporting and use of softwares for surveillance		
Demonstrates adherence to national/local guidelines		
Demonstrates basic computing to generate antibiogram and thereby formulation/updation of antibiotic policy		
Integrates clinical and laboratory data to assess whether antimicrobial agent is indicated		
Recognises other interventions to supplement systemic antimicrobials (eg. Surgical drainage, device removal, topical treatment/local care, improving nourishment/immune status etc.)		
Recognises inappropriate use (indication)/choice/route/dose/duration/combinations during stewardship rounds		
Recognises MDR microbe outbreaks and advise relevant isolation/control measures		
Attitude/Behaviour		
Seeks expert advice in case of doubts/queries		
Demonstrates enthusiasm to update awareness of newer drugs, recent interpretative criteria to determine susceptibility to antibiotics etc.		
Translates theoretical knowledge to bench/bed-side practice	Case-based discussions Clinical case presentation AMSP rounds (Wards/ICU) Log Book	

VI. OCCUPATIONAL HEALTH AND SAFETY

Learning component	Year quarter	Assessment method
Knowledge		Seminar

Nosocomial infections transmitted to healthcare worker	Q-3	Blood borne Nosocomial infections Air-borne infections Personal protective equipment
Vaccines for Healthcare workers		Chickenpox/ Zoster vaccines Hep B vaccine and titre of antibody Influenza prevention
Hazards in the hospital environment		Eye and needle stick injuries
Skills		Logbook
Reviewing hazards and ways of mitigation Data updation on vaccination status of employees Cluster detection and reporting		Number of hazard reports reviewed with comments on how to prevent it in the future
Attitude		
Observing HCWs on appropriate use of PPE Devising interventions to prevent hazards and infections		

VII. RESEARCH IN INFECTION PREVENTION AND CONTROL

Learning component	Year	Assessment method
Knowledge		Seminar
Describes basic research methodology	Q1-2	Presents simple research studies that can be done here.
Describes study/ audit designing and execution		
Describes common statistical tests for result analysis and critical appraisal tools for evaluation of a research publication		
Skills		Journal club presentation
Assimilates current knowledge (literature review) and clinical queries to generate research hypothesis	Q3-4	Critical appraisal Writing manuscripts & Thesis (Assessment by Guide & co-guides) Journal presentations
Critically appraises research publications using standard methods & tools		
Consolidating study results as a publication		
Interpret study results using appropriate statistical analysis tests/software		

		(Objective faculty feedback)
Attitude/Behaviour		
Enthusiasm to conduct research	Q3-4	Faculty feedback
Conducts ethical research		
Acknowledges the contribution of various members of the research team		

Research Project/Clinical audit

The candidate will be required to execute a short research project OR a clinical audit during the 1-year course.

Publication:

The candidate will be required to have 1 accepted manuscript based on the work during the 1-year course period (Any category: Case report/Letter to Editor/Short research note/Review article/Original article)

PERIPHERAL POSTING:

Memoranda of Understanding (MOU) will be executed with other Institutes to implement an observership programme during the course period

Department of Microbiology (Infection control section) – JIPMER, Puducherry (2 weeks) – Q1/2 Alternatively, candidate may attend one workshop on infection control conducted there

Department of Infectious Diseases – MCH, Thiruvananthapuram (1 week) – Q2/3 For observing management of infectious diseases spread through different routes inside a hospital, like blood borne-HIV & Hepatitis, Airborne- Influenza & Tuberculosis, Contact – Chickenpox, Faeco-oral-Cholera/dysentery and their containment