

Course Overview

Diagnostic Microbiology

Course code :	LMT404
Course title:	Diagnostic Microbiology
Level/semester:	Forth Semester
PRECEDING COURSES	Principles of Microbiology, Microbiology
Credit hours:4	Theoretical: 3
	Practical: 2

Course Syllabus:

Epidemiology & transmission of infectious diseases, Normal Micro flora & its role in health & disease causation. Principles & procedures of diagnostic microbiology, Microbial infections of respiratory tract , Microbial infections of Gastro – intestinal tract , Microbial infections of circulatory & Lymphatic system , Microbial diseases of reproductive & Urinary systems , Microbial infections of central nerves system & Eye, Strategy of Antimicrobial chemotherapy , Hospital infections.

Course description:

Epidemiology & Transmission of Infectious diseases.

- Principles of Epidemiology.
- Types of outbreaks, Morbidity & Morality rates.
 - Source & Transmission of infection – person to person, healthy Human carriers, animal carriers , Zoo noses.
- Control of community infection , Prophylactic immunization , Herd Immunity.

Principles & procedures of Diagnostic Microbiology.

- Objectives.
- Specimen collection & precautions.
- Microscopic Examination of patient specimens.
- Culture & Isolation of Microorganisms, Media, identification.
- Detection of pathogen – specific Macromolecules.

Microbial Diseases of the skin , nails, & Hairs.

- Structure & collection. skin , nail, & Hair

- Bacterial diseases – pimples , furuncle , abscess impetigo , scalded skin syndrome , TSS , Erysipelas, otitis external, burns.
- Mycotic diseases, viral diseases - chicken pox , herpes zoster, measles hrpes simplex infection , warts etc.

Oral Microbiology .

- Structure & function of buccal cavity.
- Bacterial infection – dental caries, fusospirochaetal stomatitis , Gengivitis periodontal diseases & diseases related to oral foci of infection.
- Mycotic infection – thrush.
- Viral infections – mups , papillomatosis stomatitis, leukoplakia, etc.

Microbial infections of Respiratory tract.

- Structure of upper & lower respiratory system.
- Bacterial diseases of upper respiratory tract sinusitis pharyngitis – common cold- influenza. Laryngitis , Epiglottitis sore – throat , otitis media , scarlet fever , diphtheria croup.
- Bacterial diseases of lower respiratory tract.
- Bronchitis, bronchiolitis, pneumonia acute & chronic- hospital – acquired & community.
- Pulmonary tuberculosis.

Microbial infections of gastro – intestinal tract.

- Structure , organization and function.
- Normal bowel flora stomach, small intestine, large intestine B.C. 30% wet weight of faeces.
- Infectious diarrhoea, summer, winter diarrhoea (Rota Vs), Bacillus cereus, clostridium perfringens, staphylococcus, E- coli- ETEC, vibrio cholerae, viral hepatitis A,B,C.
- Enteric infections.
- Food poisoning , enteritis , cellulitis, proctatitis, Enterocolitis poliomyelitis.
- Parasitic infestations causing diarrhea, Amoebiasis, Giardiasis.
- Intra-abdominal abscess, liver, pancreas, spleen.....

Microbial infections of Circulatory & Lymphatic systems.

- Structure, organization, function(Blood, Lymph & Joints)
- Infective endocarditis (IE).

- Bacteria, Fungus, Rickettsia, Chlamydia.
Streptococci viridans 40%, Enterococci 10%, others streptococci 20%,
Staphylococcus aureus ,Staphylococcus epidermidis 20%
- Pericarditis – viral entero viruses A & B – echovs, influenza mups.
Pyogenic – streptococcus pneumonia – slaphylocousauerers –
G- negative anerobic bacteria – Neisseria meningitidis –
Neisseria genorrhaea.
- Tuberculous pericarditis M. tuberculosis – M . bovis.
- Myocarditis – Vs Bract Parasites
- Tooth extraction and heart infection.

Infection of urinary(tract) systems (kidney and UT infections)

- Structure , organization & function
- UTI – Asymptomatic .
- Bacillary. bacterium, pyuria, UTI.
- Predisposing Factors to UTI.
- Types of genito - urinary infection.
- Urethritis.
- Prostatitis , orchitiss , epididymo - orchitis.
- Cystitis.
- Pylelonephritis.
- Renal carbuncle (perinephric abscess)
- Urethral syndrome in females
- Specimen collection, precaution and treatment..

-Genital tract infections

- Structure, organization & function.
- Genital diseases - genital herpes (HSV II), syphilis, chancroid,
Thrush (vaginal candidiasis), Bacterial vaginitis, gonorrhoea,
chlamydiosis, ophthalmia neonatorum.
- Papilloma virus (HPV) infection – warts & cancer.
- Pelvic inflammatory disease (Gonococci & Chlamydia)non gonococcal
infection.
- Parasite infestation(Trichomonas vaginal is both male & female.

Microbial diseases of central nervous system.

- Struture, organization, function & blood, brain barrier.

- Bacterial meningitis – meningococcal meningitis, pneumococcal meningitis, Haemophilus influenzae meningitis & E.coli, Pseudomonas & Klebsiella meningitis.
- Aseptic meningitis.
- Cryptococcal meningitis.
- Mosquito borne arbovirus encephalitis, poliomyelitis, Rabies, slow virus diseases.
- Tetanus, botulism, leprosy.
- Trypanosomiasis & Toxoplasmosis

Microbial diseases of eye.

- Conjunctivitis – pink eye (contagious Conjunctivitis) Moraxella & Staphylococci Conjunctivitis.
- Uveitis, staphylococcus aureus postoperative infections, pseudomonas aeruginosa.
- Neonatal gonorrhoeal ophthalmia.
- Trachoma , inclusion Conjunctivitis of infants.
- Chlamydia trachomatis- Trachoma & Neonatal conjunctivitis HSV, Enterovirus 70 , Adenoviruses types 8 & 17.
- Herpetic keratitis.

Antimicrobial chemotherapy.

- Criteria for Antimicrobial drugs, spectrum of activity.
- Types of antibiotics:- Naturally, synthetics & semisynthetics. Bactericidal, bacteriostatic MIC MBC, synergy, antagonism
- Mechanism of action of antibiotics.
- Inhibition of bacterial cell wall synthesis – penicillin, ampicillin, amoxicillin, carbenicillin, cephalosporins, Vancomycin bacitracin.
- Inhibitors of bacterial protein synthesis:- tetracyclines, chloramphenicol, aminoglycosides, macrolides.
- Injury to plasma membrane:- polymyxins.
- Inhibitors of nucleic acid synthesis – rifamycins.
- Synthetic antimicrobials – isoniazid, ethambutol, sulphonamides, trimethoprim, nitrofurans.
- Development of antibiotic resistance.

- Antifungal drugs- polyenes, imidazoles Nystatin
- Antiviral drugs, amantadine, idoxuridine, acyclovir.

Hospital (aquired hospital) infections (Nosocomial).

- History & definition.
- Nosocomial infections source – Hospital personal, medicalstaff, medical devices, environmental sources.
- Etiologic agents – staphylococci, Escherichia coli, klebsiella, pseudomonas, group D streptococci.
- Infection control – Asepsis ; operation room, hospital ward , equipments, delivery room, outpatient clinic.
- Isolation procedures.

PRACTICAL

1.	<u>Preparation of different stains & reagents</u>
2.	<u>Collection, transport, general examination & culture & sensitivity test</u> Urine sample Stool sample Sputum specimen Swabs <ul style="list-style-type: none"> - Throat - Eye - Ear - Vaginal - Abscesses & wound - Skin Blood specimen
3.	<u>Determination of viable count of bacteria in serial dilution of sample</u>
4.	<u>Bacteriological testing of water</u>