



ZAMBIA COLLEGE OF MEDICINE & SURGERY

Advancing Specialist Care & Professional Growth

Specialty Training Programme

Curriculum & learning guide

for

INFECTIOUS DISEASE

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GENERAL INTRODUCTION

This Curriculum and Learning Guide describes the work and competence-based professional training programme for the Specialty Training Programme (STP) in Infectious Diseases (ID) in Zambia. The intended readership for the curriculum and guideline include the following:

- Trainees, host departments and managers of ID healthcare services;
- STP ID trainers, which includes all those involved in supervising, coordinating, assessing and delivering specialist education and training in Infectious Diseases;
- Academic, administrative and professional staff within Higher Education Institutions (HEIs), the Higher Education Authority (HEA), and the Zambia Qualifications Authority (ZAQA);
- Strategic partners involved in supporting physician education and the training of healthcare practitioners in these related fields.

Zambia College of Medicine and Surgery (ZACOMS) advances professional training of medical specialists using the professional competence-based certification model beyond traditional university-based specialist training. It promotes specialist training as a vital pursuit for a successful professional medical career. The ZACOMS also promotes the increase in universal health coverage (UHC) by promoting equitable access to cost-effective quality specialist care as close to the family as possible for people in Zambia at all levels of socioeconomic status and geographical location.

The ZACOMS certifies and admits members and/or fellows as specialists in a medical and/or surgical specialty in any of the various specializations of medicine and surgery.

The Zambia College of Medicine and Surgery (ZACOMS) oversees the training of Infectious Diseases specialists working through the Zambia College of Physicians (ZACOPH).

Infectious Diseases encompasses the diagnosis, assessment and medical management of disorders arising from infections affecting various human systems. The STP ID training provides specialist training in Infectious Diseases. This is a relevant programme because of the critical shortage of Infectious Disease Specialists. The STP ID will equip trainees

with core competencies reflecting the wide array of medical subspecialties. This will mean for every trainee who completes this programme, the population they serve will have gained access to a physician with competencies aligned to Infectious Diseases. Furthermore, the graduate of this programme will offer support to the various medical and surgical subspecialties, improving outcomes in the management of a broad spectrum of pathology arising from infections.

VISION

Our vision is to be innovative in providing a teaching and support structure that will empower every trainee to excel in Infectious Diseases knowledge, skills and research through internal and external collaboration.

MISSION STATEMENT

The mission of STP ID training in Zambia is to train specialists who shall endeavor to improve the health care services to the adult population by providing safe, evidence-based, humanistic specialist care in the field of Infectious Diseases in an efficient and proficient manner to meet the needs of the Zambian community, and contribute to the field of medicine in the region and globally.

VALUES

- Professional excellence
- Integrity
- Sensitivity to reproductive health needs
- Interdisciplinary, inter institutional collaboration
- Continuous professional development
- Innovation
- Academic Excellence
- Self and peer review

RATIONALE FOR STP ID

STP ID aims to train specialists in Infectious Diseases in order to prepare them for specialist service in the healthcare service. The STP ID aims to bridge the critical shortage of Infectious Diseases Specialists by advancing professional training of Infectious Diseases Specialists using the competence-based certification model beyond traditional university-based specialist training. Simply put, this model works on the principle that every health facility equipped well enough to support an Infectious Diseases practice has the basic requirements to train an Infectious Diseases Specialist. The curriculum therefore is informed by the training requirements of the Health Professions Council of Zambia (HPCZ), the professional creed of the Zambia College of Physicians (ZACOPH) and is alive to the unique opportunities obtaining across the various training sites. The training programme encourages self-directed learning, life-long learning, and student centered approaches while providing robust and structured guidance.

This curriculum provides a framework for the four year postgraduate specialty training and educational curriculum in Infectious Diseases. Trainees who successfully complete the requirements and meet the minimum standards set out in this curriculum should be expected to demonstrate competence in Infectious Diseases at specialist level.

The key outcomes are twofold as stipulated in outcome 1 and 2.

OUTCOME 1. APPLY, AT MASTERY LEVEL, BIOMEDICAL SCIENCES, BEHAVIOURAL & SOCIOLOGY, AND SCIENTIFIC PRINCIPLES TO THE PRACTICE OF INFECTIOUS DISEASES

1. The graduate should be able to apply to Infectious Diseases practice biomedical scientific principles, method and knowledge relating to anatomy, biochemistry, cell biology, genetics, immunology, microbiology, nutrition, pathology, pharmacology and physiology. The graduate should be able to:
 - a) Explain normal human structure and function relevant to Infectious Diseases.
 - b) Explain the scientific bases for common diseases and conditions' signs, symptoms and treatment relevant to Infectious Diseases.
 - c) Justify and explain the scientific bases of common investigations for diseases and conditions relevant to Infectious Diseases.

- d) Demonstrate knowledge of drugs, drug actions, side effects, and interactions relevant to Infectious Diseases.
2. Apply Behavioral and Sociology Principles to the Practice of Infectious Diseases
 - a) Explain normal human behavior relevant to Infectious Diseases.
 - b) Discuss psychological and social concepts of health, illness and disease relevant to Infectious Diseases.
 - c) Apply theoretical frameworks of psychology and sociology to explain the varied responses of individuals, groups and societies to disease relevant to Infectious Diseases.
 - d) Explain psychological and social factors that contribute to illness, the course of the disease and the success of treatment relevant to Infectious Diseases.
 3. Apply Population Health to the Practice of Infectious Diseases
 - a) Discuss population health principles related to determinants of health, health inequalities, health risks and surveillance relevant to Infectious Diseases.
 - b) Discuss the principles underlying the development of health and health service policy, including issues related to health financing, and clinical guidelines relevant to Infectious Diseases.
 - c) Evaluate and apply basic principles of infectious and non-communicable disease control at community and hospital level relevant to Infectious Diseases.
 - d) Discuss and apply the principles of primary, secondary, and tertiary prevention of disease relevant to Infectious Diseases.
 4. Apply Scientific Method and Approaches to Infectious Diseases Research.
 - a) Evaluate research outcomes of qualitative and quantitative studies in the medical and scientific literature relevant to Infectious Diseases.
 - b) Formulate research questions, study designs or experiments to address the research questions relevant to Infectious Diseases.
 - c) Discuss and apply appropriate research ethics to a research study relevant to Internal Medicine.

**OUTCOME 2. COMPETENCE, AT MASTERY LEVEL, IN INFECTIOUS DISEASES
CLINICAL PRACTICE. ON SUCCESSFUL COMPLETION OF THE
WORK-BASED STP TRAINEES:**

1. The trainees should have clinical and specialist expertise in Infectious Diseases, underpinned by broader knowledge, skills, experience and professional attributes necessary for independent practice.
2. Trainees should be able to undertake complex clinical roles, defining and choosing investigative and clinical options, and making key judgments about complex facts and clinical situations.
3. The trainees should contribute to reduction of morbidity and mortality thus improve health in the context of the national health priorities, by application of safe, high quality, cost effective, evidence based practice within the Zambian health system.
4. The trainees should possess the essential knowledge, skills, experience and attributes required for their role and should demonstrate:
 - A systematic understanding of clinical and scientific knowledge, and a critical awareness of current problems, future developments, research and innovation in Infectious Diseases practice, much of which is at, or informed by, the forefront of their professional practice in a healthcare environment
 - Clinical and scientific practice that applies knowledge, skills and experience in a healthcare setting, places the patient and the public at the centre of care prioritizing patient safety and dignity and reflecting outstanding professional values and standards
 - Clinical, scientific and professional practice that meets the professional standards defined by the Health Professions Council of Zambia (HPCZ)
 - Personal qualities that encompass self-management, self-awareness, acting with integrity and the ability to take responsibility for self-directed learning, reflection and action planning
 - The ability to analyze and solve problems, define and choose investigative and scientific and/or clinical options, and make key judgments about complex facts in a range of situations

- The ability to deal with complex issues both systematically and creatively, make sound judgements in the absence of complete data, and to communicate their conclusions clearly to specialist and non-specialist audiences including patients and the public;
 - The ability to be independent self-directed learners demonstrating originality in tackling and solving problems and acting autonomously in planning and implementing tasks at a professional level.
 - A comprehensive understanding of the strengths, weaknesses and opportunities for further development of Infectious Diseases as applicable to their own clinical practice, research, innovation and service development which either directly or indirectly leads to improvements in clinical outcomes and scientific practice;
 - Conceptual understanding and advanced scholarship in their specialism that enables the graduate to critically evaluate current research and innovation methodologies and develop critiques of them and, where appropriate, propose new research questions and hypotheses.
5. Scientific and clinical leadership based on the continual advancement of their knowledge, skills and understanding through the independent learning required for continuing professional development.
6. Once registered as a specialist in Infectious Diseases, a range of career development options will be available including sub-specialist training. Alternatively, others may opt to undertake further career development in post, as specialist, through structured Continuing Professional Development (CPD), provided by Accredited CPD providers. The outcomes of STP ID training are affiliated to the following curriculum outcome categories:

CURRICULUM OUTCOME CATEGORIES

CATEGORY I: SCIENTIFIC FOUNDATIONS

Goal 1: Understand the normal structure and function of the human body, at levels from

Goal 2: Molecules to cells to organs, to the whole organism.

Goal 3: Understand the major pathological processes and their biological alterations.

Goal 4: Understand how the major pathologic processes affect the organ systems.

Goal 5: Integrate basic science and epidemiological knowledge with clinical reasoning.

Goal 6: Understand the principles of scientific method and evidence-based medicine including critical thinking.

CATEGORY II: CLINICAL SKILLS

Goal 7: Obtain a sensitive, thorough medical history.

Goal 8: Perform a sensitive and accurate physical exam including mental state examination.

Goal 9: Establish and maintain appropriate therapeutic relationships with patients.

CATEGORY III: COMMUNICATION AND INTERPERSONAL SKILLS

Goal 10: Develop the knowledge, skills, and attitudes needed for culturally-competent care.

Goal 11: Participate in discussion and decision-making with patients and families.

Goal 12: Work effectively with other providers in the health system.

Goal 13: Clearly communicate medical information in spoken and written form.

CATEGORY IV: PREVENTION

Goal 14: Develop knowledge, skills, and attitudes to practice the basic principles of prevention.

Goal 15: Practice personalized health planning for long-range goals.

Goal 16: Understand the planning for communities and populations.

CATEGORY V: DIAGNOSIS

Goal 17: Elicit and correctly interpret symptoms and signs of Internal Medicine conditions.

Goal 18: Diagnose and demonstrate basic understanding of common disease and conditions.

Goal 19: Appropriately use testing to help guide diagnostic and therapeutic decisions.

Goal 20: Demonstrate sound clinical reasoning.

CATEGORY VI: TREATMENT, ACUTE AND CHRONIC

Goal 21: Understand therapeutic options and participate in the multidisciplinary care of patients with complex problems.

Goal 22: Recognize acute life-threatening medical problems and initiate appropriate care.

Goal 23: Acquire the knowledge and skills necessary to assist in the management and rehabilitation of chronic diseases.

Goal 24: Participate in care in a variety of settings; including knowledge about palliative care.

CATEGORY VII: PATIENT SAFETY

Goal 25: Identify and remove common sources of medical errors.

Goal 26: Understand and apply models of Quality improvement.

Goal 27: Appreciate the challenges associated with reporting and disclosure.

CATEGORY VIII: INFORMATION MANAGEMENT

Goal 28: Use information and educational technology to facilitate research, education, and patient care.

CATEGORY IX: ETHICS, HUMANITIES, AND THE LAW

Goal 29: Develop a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to diversity.

Goal 30: Develop a critical understanding of the multiple factors that affect the practice of medicine, public health and research.

Goal 31: Incorporate ethical principles in clinical practice and research.

CATEGORY X: PROFESSIONALISM

Goal 32: Develop healthy self-care behaviors and coping skills.

Goal 33: Model service to patients and community.

CATEGORY XI: LEADERSHIP & MANAGEMENT

Goal 34: Develop interpersonal and communication skills that result in leadership in patient health service delivery and health human resource management.

ADMISSION CRITERIA TO STP ID

Applicants to STP ID must possess a primary qualification in medicine, that is, Bachelor of Medicine and Bachelor of Surgery (MB ChB) or equivalent, from a recognized university. Additionally, they must have completed internship and retain full registration and a practicing license issued by the Health Professions Council of Zambia. Other Ministry of Health policies and directives, for example, completion of rural posting, may apply.

CURRICULUM DESIGN/MODEL OF STP ID

STP ID Curriculum is a work and competence-based professional training situated in an accredited training facility managed by specialists in Infectious Diseases with oversight by the Zambia College of Medicine and Surgery (ZACOMS) working through ZACOPH. This curriculum is based on a process model of curriculum and is designed to be flexible and open ended rather than predetermined; maximizing the potential for growth and development.

During the STP ID programme the specialty registrar is an integral member of the clinical work of the department in which they are training to gain the required clinical experience and competence. STP ID programme is a work and competence-based professional training leading to the award of the Certificate of Completion of Specialty Training (CCST) by the Zambia College of Medicine and Surgery (ZACOMS). Graduates are then eligible to apply to the Health Professions Council of Zambia to enter the Specialist Registers in Infectious Diseases.

TEACHING METHODS IN STP ID

STP ID training is a work-based professional competence-based programme and should encompass diverse teaching and learning approaches that are appropriate for the target educational domain, i.e., cognitive (knowledge), psychomotor (practical), or affective (attitude) domain.

The teaching methods may include, but not limited to, the following: Telehealth teaching using the ECHOTM platform, expository lectures, tutorials, seminars, practical classes, skills laboratories, clinical demonstrations, clinical clerkships (bedside teaching, ward rounds, ambulatory care teaching, operating theatre experience, post-mortem, and on-call duties), field and community based learning, and other ICT supported learning experiences.

Certain concepts and skills are taught every year, from early years of undergraduate training to final and then through several years of STP training. However, the subject is taught in an upward spiral of difficulty and complexity, such that the competency of the practitioner becomes demonstrably more proficient.

The Health Professions Specialty Training Guidelines for Zambia and Zambia College of Medicine and Surgery Society Objectives and By-Laws provide detailed guidance to the trainee about the STP and ZACOMS, respectively.

STP ID CURRICULUM STRUCTURE AND MAP

TABLE 1: STP ID CURRICULUM STRUCTURE

STP YEAR 1 IDM 1016	ZACOMS PT 1	STP YEAR 2 IDM 2016	ARCP	STP YEAR 3 IDM 3016		STP YEAR 4 IDM 4016	ZACOMS CCST Exams
Applied Basic Sciences in IM and ID (3 months)		Principles of Clinical ID II (3 months)		Management in Clinical ID (3 months)		Health systems management (3 months)	
Principles and Practice of General Infectious Diseases (3 months)		ID Lab Rotations (3 months)		Research Methods (3 months)		Research Project (clinical ID outcome indicators analysis) (3 months)	
Principles of Clinical ID (3 months)		ID Relevant Rotation 1 (3 months)		Elective Rotation (3 months)		Elective Rotation (3 months)	
Ongoing Clinical Management Practice and mentorship (3 months)		ID Relevant Rotation 2 (3 months)		Specialist ID Rotation (3 months)		Global Rotation (3 months)	
Part 1: : Basic & Biomedical Sciences Applied To Practice of Infectious Diseases (1 Year)	Part 2: General And Themed Infectious Diseases (3 Years)						

1. ARCP = Annual Review of Competence Progression
2. CCST = Certificate of Completion of Specialty Training Examination;
3. STP = Specialty Training Programme;
4. ZACOMS PT 1 = Zambia College of Medicine and Surgery Part 1 Examinations in Basic Sciences, Behavioral Sciences, Health Population Studies, and Professionalism & Ethics; ZACOMS CCST Examinations = Certificate of Completion of Specialist Training in Medicals & Child Health Examinations
5. Global Rotation = Attachment to a surgical unit away from the primary training site to gain experience of comprehensive general surgery care.

ASSESSMENT IN STP ID

Progression to the next level of training is NOT automatic and is dependent on the trainee satisfying all the competency requirements of each defined level as per this curriculum and learning guide. The assessment framework is designed to provide a coherent system of assessing both formative and summative assessment which are workplace based and in examination settings.

Each training site must ensure that they use valid, reliable and appropriate methods for assessing the knowledge, clinical skills and attitude domains. The continuous assessments and final annual assessments are weighted at 40% and 60% of the final mark of Annual Review of Competence Progression, respectively.

Assessment methods may include, but are not limited to, the following: attendance of ECHO sessions, log of experiences and procedures completed, case reports, portfolios, project reports, multiple choice questions, essay questions, short answer questions, modified essay questions, short and long cases, objective structured clinical examinations (OSCE), practical examinations, objective structured practical examinations (OSPE), Mini-clinical Examination (MiniCEX), Viva Voce, etc.

It is emphasized that marks from theory examinations **may not** compensate for poor scores in the clinical examinations; Students **MUST** pass the clinical examinations in order to progress to the next stage of training or completion. **Trainees are required to attend 75% of the ECHO™ sessions to progress to the next stage.**

TABLE 2: ASSESSMENT RUBRIC FOR STP ID

Assessment	Knowledge, Skill and	Examining Body
Formative Workplace Based Assessments	Outcome 1 & 2	Training Site
Annual Review of Competence Progression	Outcome 1 & 2	Training Site in conjunction with ZACOMS
ZACOMS Part 1 Examination	Outcome 1	ZACOMS
ZACOMS Certificate of Completion of Specialist Registration Examinations	Outcome 2	ZACOMS

A candidate shall be allowed a maximum of three attempts for ZACOMS Part 1 and/or Part 2 Examinations. Candidates must have submitted a completed log book to be eligible to attempt the ZACOMS Part 2 Examination.

For ease of tracking progress and planning for Infectious Diseases care, all STP ID trainees will be registered with ZACOMS and ZACOPH for the duration of their training and will be allocated a Health Professions Council of Zambia Specialty Registrar Index Number.

GRADING SCHEME

The STP ID Curriculum and Guide are the basis for all specialty training which contextualize the standards of proficiency set down by the Zambia College of Medicine and Surgery (ZACOMS) in consultation with the Zambia College of Physicians (ZACOPH) in a way that is accessible to the profession and the public. The Certificate of Completion of Specialist Training (CCST) is not graded. Separate assessments and examinations may be graded to show the level of achievement of the trainee in a particular course or assignment.

TABLE 3: ASSESSMENT OF ATTAINMENT OF COMPETENCE IN AN ACADEMIC SUBJECT

Status & Level	Description of Competence Features	% Range
Outright Fail [D]	<ul style="list-style-type: none"> ▪ Has poor and inaccurate command of the subject vocabulary ▪ Has poor and inaccurate command of the concepts (knowledge, skills and attitudes) of the subject across a broad range of topics. 	44.9% & Below
Bare Fail [D+]	<ul style="list-style-type: none"> ▪ Has the basics of subject vocabulary ▪ Has the basics of concepts (knowledge, skills and attitudes) of the subject across a broad range of topics ▪ Unable to transfer and apply knowledge, skills and attitudes of the subject in a range of situations. ▪ Unable to exercise independent judgement in a range of situations 	45 – 49.9

Clear Pass [C]	<ul style="list-style-type: none"> ▪ Has sound command of subject vocabulary ▪ Has sound command of concepts (knowledge, skills and attitudes) of the subject across a broad range of topics ▪ Able to formulate responses and demonstrate skill and exhibit appropriate attitude in well-defined and abstract problems/professional settings across a broad range of topics of the subject 	50 – 64.9
Meritorious Pass [B]	<p>All of above in level 3 and:</p> <ul style="list-style-type: none"> ▪ Able to transfer and apply knowledge, skills and attitudes and exercise significant independent judgement in a broad range of topics of the subject 	65 – 74.9
Distinction Pass [A]	<p>All of the above in level 4 and:</p> <ul style="list-style-type: none"> ▪ Displays masterly of complex and specialized areas of knowledge, skills and attitudes in a broad range of topics of the subject. 	75% & Above

COURSES FOR SPECIALITY ID TRAINING

PART1: BASIC & BIOMEDICAL SCIENCES APPLIED TO PRACTICE OF INFECTIOUS DISEASES

Course Name Code STP ID 1	Applied Basic Sciences and Introduction to Principles Internal Medicine and Infectious Diseases
Aim/Purpose:	This Course aims at consolidating the applied basic scientific principles and aims to introduce principles of internal medicine that will help in dealing with the wide range of cases seen in infectious diseases. The course is taken concurrent with regular duty while attached to an Infectious Diseases division, including coordinating acute medical admissions as part of multidisciplinary team; recognition and active management of patient in relation to illness severity including monitoring response to intervention; develop safe out-patient protocols and procedures; co-ordinate care at home when appropriate; provide back up for colleagues during practical procedures (e.g. failed central venous access); establish, maintain and secure a patent airway; teach and supervise procedural skills within the acute setting; recognize atypical presentations of common disease, and typical presentations of uncommon disease.
Learning Outcomes:	At the completion of the course students will be able to: <ol style="list-style-type: none">1. Explain and integrate relevant principles of physiology, anatomy, pharmacology and pathology to the care of patients and diseases.2. Demonstrate advanced skills in history taking and clinical examination of the adult patient.3. Demonstrate a solid basis in knowledge of the principles and practice of common Infectious Diseases disease conditions, problem solving skills and health education and counselling

skills.

4. Identify, initiate as well as interpret laboratory and bedside investigations required to make a diagnosis and manage the medical conditions.
5. Demonstrate the skills and attitudes appropriate for the care of adults including communication with patients, their family and colleagues.
6. Appreciate and apply evidence-based clinical Infectious Diseases practice and basic technical skills.
7. Demonstrate basic practical clinical skills in Infectious Diseases.
8. Demonstrate leadership and role modelling to junior doctors and medical trainees.
9. Function as senior house officers (SHO) within the department with clinical duties including:
 - Participation in daily ward work
 - Participating in outpatient clinics
 - Taking on-calls at SHO level
 - Supervision of interns and other junior health workers
 - Teaching of undergraduates, interns and junior health workers
 - To take a part in all academic activities in the department and also to join in postgraduate activities of the department such as Journal Club, clinical meetings and respective departmental unit's Grand Rounds
10. Be a role model and demonstrate professional behaviors, including understanding one's professional limitations.
11. Understand the importance and principles of scientific research skills and to emphasize the importance of an evidence-base for contemporary medical practice.
12. Access and analyze scientific publications and research in the field of Infectious Diseases.

13. Provide mentorship to at least 10 districts/facilities providing HIV services within the province
14. Identify gaps in routine data and present a research Project proposal with an appropriate intervention in the field of Infectious Diseases relevant to Zambia. (AUDIT)

Knowledge:

At the end of the year, the trainee shall be able to:

1. Know how to assess and manage individuals with infectious diseases
2. Understand systemic infections, emerging infectious diseases and infections in travelers.
3. Recognize and manage patients with HIV/AIDS as well as opportunistic infections in all immunocompromised patients including HIV/AIDS
4. Demonstrate that they are becoming effective teachers in the discipline of infectious diseases
5. Understand mechanisms of action and adverse reactions of antimicrobial agents; antimicrobial and antiviral resistance; drug-drug interactions; the appropriate use and management of antimicrobial agents in a variety of clinical settings; methods of determining antimicrobial activity of a drug, principles of prophylaxis and immune-prophylaxis; characteristics, use, complications of antiretroviral agents; mechanisms and clinical significance of viral resistance to antiretroviral agents, and understanding of anti-parasitic drugs.
6. Know the utility, sensitivities and specificities of major diagnostic tests used in diagnosing infectious disease

7. Know the principles of infection control and isolation in a hospital setting.
8. Understand the epidemiology, clinical course, manifestations, diagnosis, treatment and prevention of mycobacterial infections, major viral and bacterial pathogens and major parasitic diseases.
9. Know how to perform an outbreak investigation

Skills:

At the end of the year, the trainee shall be able:

1. Generate a differential diagnosis and unique treatment plan for each patient encounter
2. Perform literature searches in order to gather information on the most up-to-date treatment and management of infectious diseases.
3. Act as teachers and educational mentors to medical students, interns, and ID trainees, making optimal use of “teaching pearls” and “teachable moments;” instructing ID trainees in the proper content and format for concise and organized patient presentation; helping students and interns to define patient care plans; and providing ID trainees with timely and constructive evaluation and feedback.
4. Demonstrate the role of antimicrobial stewards and the judicious use of antimicrobial agents in the clinical care setting
5. Know appropriate procedures for specimen collection relevant to infectious disease.
6. Practice judicious use of ordering appropriate diagnostic laboratory tests to narrow the differential diagnosis and to evaluate a specific syndrome.

7. Describe isolation procedures and infection control measures for a variety of infectious diseases
8. Describe or take part in an outbreak investigation

Behaviors:

At the end of the training, the trainee shall be able to:

1. Demonstrate respect, compassion, and integrity in their professional behavior
2. Place patient safety and care above all competing considerations at all times.
3. Approach patients/families with a friendly, interested, and respectful demeanor.
4. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, disabilities, religion, and other parameters of human diversity.
5. Operate with respect for patient confidentiality at all times.
6. Work effectively with others as a member or leader of a health care team or other professional group.

7. Clearly and openly identify and repudiate statements of prejudice made by professional colleagues, and will not permit their actions as physicians to be influenced by such prejudice.
8. Cultivate the ability to identify and articulate their own cultural values and preferences, comforts and discomforts; and to be self-aware in attempting to deliver fair and optimal medical care to all patients – including recognizing their obligation to transfer care to another physician should the occasion arise in which personal values or biases interfere with such care delivery to any patient or family.
9. Work effectively and respectfully with others as a leader and teacher of a health care team

	<p>10. Work closely and respectfully with trained pharmacist in managing the complications of antimicrobial agents in their patients</p> <p>11. Work closely and respectfully with trained laboratory staff, microbiologists, etc. to help diagnose a variety of infectious diseases.</p> <p>12. Work closely and respectfully with hospital administration to ensure all infection control practices are being strictly adhered to at all times by all hospital staff/employees.</p> <p>13. Work effectively and respectfully with other members of the outbreak investigation team.</p>
<p>Course Content</p>	<p>Anatomy</p> <ul style="list-style-type: none"> ▪ Basic tissue types. ▪ Basic and applied systemic anatomy for systems and disease conditions relevant to Infectious Diseases. ▪ General principles of embryology and embryogenesis of different organ systems especially heart, genitourinary system, gastro-intestinal tract. ▪ Developmental and congenital malformations relevant to Infectious Diseases. <hr/> <p>Biochemistry</p> <ul style="list-style-type: none"> ▪ Carbohydrate, protein and fat. Their general properties and functions ▪ an outline of the main metabolic pathways. Their main sources, and the roles in the body functions. ▪ Enzymes: Their nature, functions and relation to intermediary metabolism. ▪ Nutrients, micronutrients, and minerals in metabolism, nutrition and nutrition disorders. <hr/> <p>Cell biology and genetics</p> <ul style="list-style-type: none"> ▪ The structure and function of the different components of a

typical human cell.

- The principles of a genetic code, and its determination
- Mitosis and meiosis
- Chromosomal constitution and anomalies of the karyotype
- Mechanisms of inheritance of genetically determined abnormalities
- Transfer of substances across the cell membranes of different tissues/organs.
- Cellular features associated with damage, particularly those associated with ionizing radiation, inflammation and trauma (e.g. surgical)

Guidelines for clinical mentorship

- Introduction to Clinical Mentorship
- General Principles of Teaching and Learning
- Building Relationships & Conflict Management
- General Principles of Critical Thinking
- Clinical Teaching Skills
- Clinical Mentorship Process
- Mentorship Tools

Essential of Biostatistics (Essentials of biostatistics, epidemiology and behavioral sciences).

- Basic biostatistical techniques. One should understand terms such as mean, median, mode, standard deviation and normal distribution, etc., their use and interpretation.
- The principles of using tests of significance, relative risk, odds ratio, and the levels of probability which are normally accepted as demonstrating differences between groups of populations.
- The different data analysis packages, techniques and when to use which.
- General principles of identifying a topic for a research study and understand the various types of study designs, when and

how to use which, the general principles of conducting research studies, analyzing data, interpreting the results, and how such results can be presented, e.g. for publication, conference presentations, or dissertation/thesis.

- Essential principles of human disease and factors which influence them.
- Secondary data analysis
- Ethics as they relate to research on human subjects

Immunology

- The principles of immunology; properties of antigens, and antibodies; their reactions, and effects (results) thereof.
- The development of immunity to infection, etc. – (active and passive).
- Rhesus and ABO incompatibility: their etiology, effects and prevention.
- Auto-immune diseases.

Endocrinology

- The hypothalamus and pituitary. The hormones of the hypothalamus: their nature and secretory control. Hormones of the anterior and posterior pituitary: their nature and control of secretion. The physiological functions and effects of these hormones.
- Ovarian Hormones: Production and actions of ovarian steroidal hormones. An understanding of the basic pathways involved in their synthesis.
- The adrenal gland: The action of ACTH, aldosterone, cortisone and catecholamines and an understanding of the metabolic pathways involved in the production of these hormones.
- The Pancreas: Insulin, its nature, secretion and effects on carbohydrate metabolism. Changes in pregnancy and their

effects.

- The Thyroid: Control and secretion of thyroid hormones. The actions of thyroxine. Changes in pregnancy and their effects.

Microbiology/parasitology/virology/mycology.

- The principles of microbiology, parasitology, virology and mycology in broad outlines.
- Behaviour and characteristics of the common bacteria, parasites, viruses, fungi and protozoa causing diseases of the female/male reproductive organs and their effects on pregnancy and fertility in general.
- The microbiology of STI's in both females and males and how these affect reproductive health.
- Common viruses (including HIV); protozoa, fungi, etc., which impact on reproduction or fertility.
- The principles of infection control, asepsis, sterilization, disinfection, isolation and control of epidemics.
- The principles underlying the use of chemotherapeutic, antimicrobial, antiviral, antifungal, antiparasitic agents.

Pathology

- The general pathological and histological patterns of trauma, inflammation, neoplasia and degeneration.
- The principles of human tissue response to various trauma, infection, surgery, etc., and factors influencing it.
- The normal process of wound healing and factors influencing it.
- Pathological features of wound healing and wound infection and predisposing factors.
- The pathogenesis and pathophysiology of medical neoplasia both benign and malignant, and other common disease conditions.

Pharmacology

- The principles underlying the mode of action and side effects of the following groups of drugs:
 - Anesthetics, analgesics and sedatives, tranquilizers, anticonvulsants.
 - Chemotherapeutic agents: antibiotics, antiphrastic, antifungal and antivirals.
 - Cytotoxic agents.
 - Drugs acting upon the sympathetic and parasympathetic nervous system.
 - The principles underlying the metabolism, distribution and excretion of drugs and the changes in pregnancy and lactation
- The teratogenic dangers of drugs and other effects on the fetus, neonate and pregnant woman.
- The pharmacology of drugs acting upon the body systems.

Physiology

- Reproduction: All aspects of systemic physiology, much of which is covered under other headings within this syllabus.
- Electrolyte and water metabolism.
- Acid –base balance
- Normal renal function.
- The cardiovascular system including knowledge of the control of blood pressure, heart rate and regional blood flow.
- Respiration, oxygen and carbon dioxide transport mechanisms.
- The working and arrangement of somatic and autonomic nervous system including the chemical transmission of nerve Impulses.
- Digestive tract including absorption of different food

	<p>substances</p> <ul style="list-style-type: none"> ▪ Carbohydrate, lipid and protein metabolism.
	<p>Nutrition</p> <ul style="list-style-type: none"> ▪ The general principles of dietetics ▪ The constitution of a normal diet ▪ Maternal nutritional disorders: impact on fetal outcome. ▪ Nutritional disorders; vitamins and minerals – normal requirements, sources, its role and deficiencies. ▪ Trace elements of nutritional Importance. ▪ Enteral nutrition. ▪ Nutritional management in diarrhea. ▪ Parenteral nutrition. ▪ Obesity and adolescent and adult nutrition.
	<p>Elementary biophysics</p> <ul style="list-style-type: none"> ▪ The basic principles of: ▪ Ionising radiation ▪ Diagnostic radiology ▪ Ultrasonography ▪ CT Scan ▪ Radiotherapy
	<p>Health Care Ethics and Professionalism</p> <ul style="list-style-type: none"> ▪ Philosophical bases of healthcare ethics ▪ Principles and values in healthcare ethics ▪ International and national ethical codes.
	<p>HIV Basics</p> <ul style="list-style-type: none"> ▪ History, Epidemiology, and Pathophysiology of HIV Infection ▪ Immunology and Virology of HIV ▪ Acute HIV infection and chronic HIV infection ▪ Treatment Preparation, Initiation and Adherence
	<p>Care and Treatment Guidelines for HIV /AIDS</p>

	<ul style="list-style-type: none"> ▪ DHHS guidelines ▪ EACS ▪ WHO ▪ ZCG
<p>Contact Hours:</p>	<p>Lectures (25% in-person 75 % ECHO™) 1hr/week Tutorial 1 hour per week or mentorship site visit 1 day per week Self-Directed Student-Centered Learning Activity 6 hr/week Clerkship Rotations (as per department's work schedule).</p>
<p>Teaching Methods:</p>	<p>The teaching methods may include, but not limited to, the following: Telehealth using the ECHO™ platform expository lectures (students should have at least 75% contact time), tutorials, seminars, practical classes, skills laboratories, clinical demonstrations, clinical clerkships (bedside teaching, ward rounds, ambulatory care teaching, operating theatre experience, post- mortem, and on-call duties), field and community based learning, and other ICT supported learning experiences.</p>
<p>Assessment Methods and Weighting:</p>	<p>Log of experiences and procedures completed, case reports, portfolios, project reports, multiple choice questions, essay questions, short answer questions, modified essay questions, short and long cases, objective structured clinical examinations (OSCE), practical examinations, objective structured practical examinations (OSPE), Mini-clinical Examination (MiniCEX), Viva Voce. Trainees must attend at least 75% of the ECHO™ sessions to proceed to the next stage.</p> <p>Annual Review of Competence Progression</p> <ul style="list-style-type: none"> a) Continuous Assessment - 40% b) Final Examinations - 60% <p>ZACOMS Administered Examinations</p>

	<p>Taken according to ZACOMS Examinations Schedule</p>
Prescribed Readings	<ol style="list-style-type: none"> 1. Azer, S., (2005) Core Clinical Cases in Basic Biomedical Science: A Problem-Based Learning Approach. Hodder Arnold. ISBN: 0340816716 2. Longo, D., Fauci, A., Kasper, D et al., Harrison's Principles of Internal Medicine, volume 1 and 2, 18th edition. McGraw-Hill Professional. 2011. ISBN-13: 978-0071748896 3. Kliegman, RM., Behrman, R E., Jenson, H B et al., Nelson Textbook of Pediatrics. 18th edition. Saunders. 2007. ISBN-13: 978-1437707557 4. Kumar V., et al. Robbins and Cotran Pathologic Basis of Disease 9th Ed. Elsevier; 2014. ISBN: 9780323266161. eBook ISBN: 9780323313094 5. Graham, D., Fiona, N., Colin R., Macleod's Clinical Examination, 13th Ed. Churchill Livingstone: Elsevier; 2013. Paperback ISBN: 9780702047299/ 9780702047282; eBook ISBN: 9780702053573/ 9780702052187/ 9780702053375 6. Underwood JCE (2009). General and Systemic Pathology (5th edition). Churchill. ISBN: 978-0-443-06888
Recommended Readings	<ol style="list-style-type: none"> 1. Kumar, P., Clark, ML., Kumar and Clark's Clinical Medicine. 7th edition. Saunders. 2009. ISBN-13: 978-0702029936 2. Goldman, L., Schafer, AI., Goldman's Cecil Medicine. 24th edition. Saunders. 2011. ISBN-13: 978-1437727883 3. Swash, M. and Glynn M., Hutchinson's Clinical Methods: An integrated approach to clinical practice, 22nd Ed. Edinburgh London: Saunders Elsevier; 2007. ISBN 978 0 7020 27987.

PART 2A: GENERAL & THEMED CLINICAL INFECTIOUS DISEASES

<p>Course Name Code STP ID 2</p>	<p>INTRODUCTION TO PRINCIPLES AND PRACTICE OF INFECTIOUS DISEASES</p>
<p>Aim/Purpose:</p>	<p>This Course aims to consolidate the clinical care and leadership skills in Infectious Diseases in the trainees. This course aims at providing a firm foundation in the practice of Infectious Diseases as a basis for the development of specialist attributes.</p>
<p>Learning Outcomes:</p>	<p>At the completion of the course students will be able to:</p> <ol style="list-style-type: none"> 1. Function as registrars within the department with clinical duties including: <ul style="list-style-type: none"> ▪ Participation in daily ward work ▪ participating in outpatient clinics ▪ Taking on-calls at registrar level ▪ Supervision of interns and other junior health workers ▪ Teaching of undergraduates, interns and junior health workers 2. Take a full part in all academic activities in the department and also to join in postgraduate activities of the department such as Journal Club, clinical meetings and respective departmental units Grand Rounds. 3. Act as a role model and demonstrate professional behaviours. 4. Contribute to evidence-base knowledge for child health practice and improve the Health Systems in Zambia with regards to newborn and children’s holistic health care standards, including prevention and health promotion. 5. Analyze facility site data for their research project in the field of Infectious Diseases health care 6. provide mentorship in ID to facilities within the district

Knowledge

At the end of the year, the trainee shall be able to

1. Know how to assess and manage individuals with infectious diseases
2. Understand infections of gastrointestinal tract, cardiovascular system, respiratory system and reproductive organs (STDs), viral hepatitis, emerging infectious diseases and infections in travelers.
3. Recognize and manage patients with HIV/AIDS as well as opportunistic infections in all immunocompromised patients including HIV/AIDS
4. Describe mechanisms of action and adverse reactions of antimicrobial agents; antimicrobial and antiviral resistance; drug-drug interactions; the appropriate use and management of antimicrobial agents in a variety of clinical settings; methods of determining antimicrobial activity of a drug, principles of prophylaxis and immune-prophylaxis; characteristics, use, complications of antiretroviral agents; mechanisms and clinical significance of viral resistance to antiretroviral agents, and understanding of anti-parasitic drugs.
5. Know the utility, sensitivities and specificities of major diagnostic tests used in diagnosing infectious disease
6. Know the epidemiology, clinical course, manifestations, diagnosis, treatment and prevention of mycobacterial infections, major viral and bacterial pathogens and major parasitic diseases.
7. Know how to perform an outbreak investigation
8. Describe the history, current use, and complications of vaccines in adults and children.

Skills

At the end of the year, the trainee shall be able to:

1. Perform a complete history including chief complaint, history of present illness, review of systems, past medical history, social history (with particular attention to travel history, occupation, animal exposure, sexual history, drug and alcohol use history and other factors that are particularly relevant to infectious diseases), family history, list of current medications including current and recent antibiotics, allergy history with particular attention to antibiotic related allergies, and vaccine history.
2. Perform a thorough physical examination including pertinent parts of the neurological and ophthalmological examinations
3. Generate a differential diagnosis and unique treatment plan for each patient encounter
4. Perform literature searches in order to gather information on the most up-to-date treatment and management of infectious diseases.
5. Demonstrate the role of antimicrobial stewards and the judicious use of antimicrobial agents in the clinical care setting
6. Know appropriate procedures for specimen collection relevant to infectious disease.
7. Practice judicious use of ordering appropriate diagnostic laboratory tests to narrow the differential diagnosis and to evaluate a specific syndrome.
8. Describe or take part in an outbreak investigation
9. Demonstrate how to administer vaccines to children and adults

Behaviors

At the end of the year, the trainee shall be able to:

	<ol style="list-style-type: none"> 1. Demonstrate respect, compassion, and integrity in their professional behavior 2. Place patient safety and care above all competing considerations at all times. 3. Approach patients/families with a friendly, interested, and respectful demeanor. 4. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, disabilities, religion, and other parameters of human diversity. 5. Operate with respect for patient confidentiality at all times. 6. Work closely and respectfully with trained pharmacist in managing the complications of antimicrobial agents in their patients 7. Work closely and respectfully with trained laboratory staff, microbiologists, etc. to help diagnose a variety of infectious diseases. 8. Work effectively and respectfully with other members of the outbreak investigation team
<p>Course Content</p>	<p>Approach to the ID patient</p> <ul style="list-style-type: none"> ▪ History taking in infectious diseases ▪ Clinical examination in ID ▪ Decision making and clinical reasoning in ID ▪ Therapeutics and safe prescribing <hr/> <p>Emergency Presentations:</p> <ul style="list-style-type: none"> ▪ Shocked Patient ▪ Unconscious Patient <hr/> <p>HIV Medicine and Tuberculosis</p> <ul style="list-style-type: none"> ▪ Antiretroviral Pharmacology, Pharmacokinetics and Toxicity ▪ Antiretroviral Resistance

- Management and Monitoring of ART
- Treatment Failure and When to Switch
- Opportunistic Diseases and other complications of HIV Infection
- Immune Reconstitution Inflammatory Syndrome (IRIS)
- HIV – Tuberculosis Co-Infection
- Other Co-infections
- HIV and Sexually Transmitted Infections
- Treatment Models and Care Delivery Systems including Prevention
- Prevention of Mother to Child Transmission and Infant Survival
- Pediatric HIV Management
- Palliative Care and HIV Ethics
- HIV and malnutrition/micronutrient deficiencies
- Tuberculosis
- Drug resistant TB

General Infectious Diseases

- Fever
- Bloodstream infections
- Sepsis and shock
- Fever of unknown origin
- Pneumonia
- Other respiratory infections
- Cardiovascular infections
 - i. Infective endocarditis
 - ii. Pericarditis
 - iii. Myocarditis
 - iv. Catheter related infections
- CNS infections
 - i. Acute meningitis

- ii. Chronic meningitis
- iii. Brain abscesses
- iv. Other CNS infections

- Gastrointestinal and intra-abdominal infections
- Neurosurgical infections
- Skin and soft tissue infections
- Tickborne diseases
- Urinary tract infections
- Sexually transmitted infections
- Bone and joint infections
- Infection control
- Health promotion and public health
- Outbreak investigation
- Legal framework for practice
- Evidence-based practice and guidelines
- Quality improvement (including Audit)
- Principles of medical ethics and confidentiality
- Research skills and Assessing medical literature
-
- Teaching and training

Cardiology

- Arrhythmias:
 - i. Treatment of heart block, bradycardia
 - ii. SVT, AF, VT, VF
- Cardiac arrest
- Ischemic Heart Disease: acute coronary syndromes, stable angina, atherosclerosis
- Heart Failure (medical management and interventional therapy)
- Hypertension - including investigation and management of accelerated hypertension in

	<p>pregnancy</p> <ul style="list-style-type: none">▪ Valvular Heart Disease▪ Endocarditis▪ Myocarditis▪ Pericarditis▪ Congenital heart disease▪ Cardiomyopathies▪ Syncope▪ Dyslipidemia
	<p>Corticosteroid treatment:</p> <ul style="list-style-type: none">▪ indications▪ short and long-term complications▪ safe withdrawal of corticosteroids▪ counselling for patients on steroids
	<p>Specific treatment of poisoning and toxicity with:</p> <ul style="list-style-type: none">▪ Organophosphate▪ Paracetamol▪ Alcohol▪ Aspirin▪ Anticoagulants▪ Amphetamines▪ Drugs of misuse▪ Paraffin and other hydrocarbons▪ Tricyclics anti-depressants▪ Corrosive agents▪ Carbon monoxide▪ Opiates and opioids▪ Digoxin▪ Benzodiazepines▪ Knowledge of appropriate treatment of common medical conditions

Immunology and allergy

- Anaphylaxis
- Primary Immune deficiencies
- Structure and function of reticuloendothelial system
- Innate and adaptive immune responses
- Principles of hypersensitivity
- Principles of transplantation
- Mechanisms of organism pathogenesis
- Host response to infection
- Principles of vaccination

Rheumatology

- Septic arthritis
- Rheumatoid arthritis
- Osteoarthritis
- Seronegative arthritides
- Crystal arthropathies
- Polymyalgia and temporal arteritis
- Acute connective tissue disease: systemic lupus erythematosus, scleroderma, poly- and dermatomyositis, Sjogren's syndrome, vasculitides
- Pharmacology of major drug classes in rheumatology: local and systemic

Dermatology

- Psoriasis
- Eczema
- Skin tumours
- Skin failure: eg erythroderma, toxic epidermal necrolysis
- Urticaria and angio-oedema
- Cutaneous vasculitis
- Dermatomyositis
- Scleroderma

- Viral infections e.g. Herpes Zoster and Herpes Simplex infections
- Bacterial skin infections
- Fungal skin infections
- Ulcers
- Bullous disorders
- Skin infestations
- Cutaneous drug reactions
- Skin manifestations of systemic disorder
- Structure and function of skin, hair and nails
- Lymphoedema
- Pharmacology of major drug classes in dermatology: local and systemic

Endocrinology

- Diabetic ketoacidosis
- Non-acidotic hyperosmolar coma / severe hyperglycaemia
- Hypoglycaemia
- Care of the acutely ill diabetic
- Peri-operative diabetes care
- Disorders of sodium
- Thyroid dysfunction
- Diabetes insipidus
- hypercortisolemia
- Adrenocortical insufficiency
- Pituitary tumours e.g. prolactinoma, acromegaly and their complications
- Endocrine emergencies: myxoedema coma, thyroid storm, Addisonian crisis, hypopituitary coma, pheochromocytoma crisis
- Calcium metabolism
- Disorders of calcium metabolism

- osteomalacia
- Osteoporosis – risk factors, and primary and secondary prevention of complications of osteoporosis

Gastroenterology & Hepatology

- Peptic Ulceration and Gastritis
- Gastroenteritis
- GI malignancy (oesophagus, gastric, hepatic, pancreatic, colonic)
- Inflammatory bowel disease
- Iron deficiency anaemia
- Acute GI bleeding
- Alcohol withdrawal syndrome
- Acute liver dysfunction: jaundice, ascites, encephalopathy
- Liver cirrhosis
- Gastro-oesophageal reflux disease
- Dysentery (shigellosis, amoebic, enteroinvasive E. coli)
- Viral hepatitis
- Malabsorption

Haematology

- Bleeding disorders: DIC, haemophilia
- Thrombocytopaenia
- Anticoagulation treatment: indications, monitoring, management of over-treatment
- Transfusion reactions
- Anaemia: iron deficient, megaloblastic, haemolysis, sickle cell
- Thrombophilia: classification; indications and implications of
- Bone marrow failure: causes and complications

Neurology

- Structure and function of the central, peripheral and sympathetic nervous systems
- Physiology of nerve conduction
- Principles of neurotransmitters
- Structure and physiology of visual, auditory, and balance systems
- Cerebral automaticity
- Anatomy of cerebral blood supply
- Stroke and transient ischaemic attack
- Sub-arachnoid haemorrhage
- Central Nervous System infection: encephalitis, meningitis, brain abscess
- Raised intra-cranial pressure
- seizure disorders (see also syncope)
- Acute paralysis: Guillain Barre, myasthenia gravis, spinal cord lesion
- Multiple sclerosis
- Motor neurone disease
- Confusional states: Wernicke's encephalopathy
- Neuropathies: peripheral and cranial
- CNS tumours: cerebral metastases, pituitary tumours
- Retinopathy: diabetes mellitus, retinitis pigmentosa, retinal ischaemia or haemorrhage
- Visual disturbance

Nephrology

- Homeostasis of fluid, electrolytes and acid base
- Disturbances of potassium, acid/base disorders, and fluid balance (and appropriate acute interventions)
- Acute renal failure

	<ul style="list-style-type: none"> ▪ Chronic renal failure ▪ Glomerulonephritis ▪ Nephrotic syndrome ▪ Renal replacement therapy ▪ Urinary tract infection
	<p>Respiratory Medicine</p> <ul style="list-style-type: none"> ▪ Respiratory failure and methods of respiratory support ▪ COPD ▪ Asthma ▪ Pneumonia ▪ Pleural disease: Pneumothorax, pleural effusion, mesothelioma ▪ Lung cancer ▪ Venous thromboembolism; Pulmonary embolism and DVT ▪ Interstitial lung disease ▪ Obstructive sleep apnoea ▪ Cystic fibrosis ▪ Bronchiectasis ▪ Respiratory failure and cor-pulmonale ▪ Pulmonary hypertension
	<p>Oncology</p> <ul style="list-style-type: none"> ▪ Neutropenic sepsis ▪ Common cancers (presentation, diagnosis, staging, treatment principles): lung, bowel, breast, prostate, stomach, oesophagus, bladder, skin, haematological, testicular and ovarian ▪ Paraneoplastic conditions e.g. ectopic ACTH ▪ Principles of oncogenesis and metastatic spread ▪ Principles of staging ▪ Principles of screening ▪ The role of infectious agents in malignancy

	Palliative Care and End of Life Care
	<ul style="list-style-type: none">▪ Pain▪ Appropriate use of analgesia▪ Analgesic ladder▪ Side effects▪ Role of Radiotherapy▪ Constipation▪ Breathlessness▪ Nausea and vomiting▪ Anxiety and depressed mood▪ Pharmacology of major drug classes in palliative care: anti-emetics, opioids, NSAIDS, agents for neuropathic pain, bisphosphonates, laxatives, anxiolytics
	Investigation Competencies

	a. Biochemistry
	<ul style="list-style-type: none">▪ Basic blood biochemistry: urea and electrolytes, liver function tests, bone biochemistry, glucose, magnesium▪ Cardiac biomarkers and cardiac-specific troponin▪ Creatine kinase▪ Thyroid function tests▪ Inflammatory markers: CRP / ESR▪ Arterial Blood Gas analysis▪ Cortisol and short Synacthen test▪ HbA1C▪ Lipid profile▪ Amylase▪ Drug levels: paracetamol, salicylate, digoxin, antibiotics, anti- convulsants, theophylline
	b. Haematology

	<ul style="list-style-type: none"> ▪ Full blood count ▪ Coagulation screen ▪ Haemolysis screen ▪ D dimer ▪ Blood film report ▪ Haematinics
	<p>c. Microbiology / immunology</p> <ul style="list-style-type: none"> ▪ Blood / Sputum / urine culture ▪ Fluid analysis: pleural, cerebro-spinal fluid, ascitic ▪ Urinalysis and urine microscopy ▪ Auto-antibodies ▪ H. Pylori testing ▪ Tumour marke ▪ Coeliac serologygyy ▪ Viral hepatitis serology ▪ Myeloma screen ▪ Stool testing ▪ HIV testing
	<p>d. Radiology</p> <ul style="list-style-type: none"> ▪ Chest radiograph ▪ Abdominal radiograph ▪ Joint radiographs (knee, hip, hands, shoulder, elbow, dorsal spine, ankle) ▪ Ultrasound ▪ Detailed imaging: Barium studies, CT, CT pulmonary angiography, high resolution CT, MRI ▪ imaging in endocrinology (thyroid, pituitary, adrenal) ▪ Renal imaging: ultrasound, KUB, IVU, CT
	<p>e. Physiological</p> <ul style="list-style-type: none"> ▪ ECG ▪ Peak flow tests

	<ul style="list-style-type: none"> ▪ 24 hour ECG monitoring ▪ Ambulatory blood pressure monitoring ▪ Exercise tolerance test ▪ Cardiac perfusion scintigraphy ▪ Tilt testing ▪ Neurophysiological studies: EMG, nerve conduction studies, visual and auditory evoked potentials
	<p>f. Endoscopic Examinations</p> <ul style="list-style-type: none"> ▪ Bronchoscopy ▪ Upper and lower GI endoscopy ▪ ERCP
	<p>Pathology</p> <ul style="list-style-type: none"> ▪ Liver biopsy ▪ Renal biopsy ▪ Bone marrow and lymph node biopsy ▪ Cytology: pleural fluid, ascitic fluid, cerebro-spinal fluid, sputum
	<p>Procedures</p> <p>Competencies</p> <ul style="list-style-type: none"> ▪ Venepuncture ▪ Cannula insertion, including large bore ▪ Arterial blood gas sampling ▪ Lumbar Puncture ▪ Pleural tap and aspiration, biopsy ▪ Intercostal drain insertion: Seldinger technique ▪ Ascitic tap ▪ Abdominal paracentesis ▪ Central venous cannulation ▪ Initial airway protection: chin lift, Guedel airway, nasal airway, laryngeal mask, tracheal intubation ▪ Basic and, subsequently, advanced cardiorespiratory

	<p>resuscitation</p> <ul style="list-style-type: none"> ▪ DC cardioversion ▪ Bone marrow aspiration ▪ Lymph node biopsy ▪ Pericardial aspiration ▪ Urethral catheterisation ▪ Nasogastric tube placement and checking ▪ Electrocardiogram ▪ Knee aspiration ▪ Skin Biopsy (this is not mandated for all trainees but opportunities to become competent in this technique should be available especially for trainees who subsequently wish to undertake specialist dermatology training)
<p>Contact Hours:</p>	<p>Lectures (25% in-person 75 % ECHO™) 1hr/week Tutorial 1 hour per week or mentorship site visit 1 day per week Self-Directed Student-Centred Learning Activity 6 hr/week Clerkship Rotations (as per department's work schedule).</p>
<p>Teaching Methods:</p>	<p>The teaching methods may include, but not limited to, the following: Telehealth using ECHO™ expository lectures (students should have at least 75% contact time), tutorials, seminars, practical classes, skills laboratories, clinical demonstrations, clinical clerkships (bedside teaching, ward rounds, ambulatory care teaching, operating theatre experience, post- mortem, and on-call duties), field and community based learning, and other ICT supported learning experiences.</p>
<p>Assessment Methods and Weighting:</p>	<p>Log of experiences and procedures completed, case reports, portfolios, project reports, multiple choice questions, essay questions, short answer questions, modified essay questions, short and long cases, objective structured clinical examinations (OSCE), practical examinations, objective structured practical</p>

	<p>examinations (OSPE), Mini-clinical Examination (MiniCEX), Viva Voce,</p> <p>Annual Review of Competence Progression</p> <p>(a) Continuous Assessment - 40%</p> <p>(b) Final Examinations - 60%</p> <p>ZACOMS Administered Examinations</p> <p>Taken according to ZACOMS Examinations Schedule</p>
<p>Prescribed Readings:</p>	<ol style="list-style-type: none"> 1. Longo, D., Fauci, A., Kasper, D et al, Harrison’s Principles of Internal Medicine, volume 1 and 2, 18th edition. McGraw-Hill Professional. 2011. ISBN-13: 978-0071748896 2. Kliegman, RM., Behrman, R E.,Jenson, H B et al, Nelson Textbook of Pediatrics. 18th edition. Saunders. 2007. ISBN-13: 978-1437707557 3. Hulley SB, Cummings SR, Browner WS, et al, Designing Clinical Research.3rd ed. Philadelphia: Lippincott Williams & Wilkins; 2007. ISBN-13: 978-0781782104 4. Kirkwood, B., Sterne, J., Essentials of Medical Statistics. 2nd edition. Wiley-Blackwell. 2001. ISBN-13: 978-0865428713 5. Bernard, L. Resolving Ethical Dilemmas: A Guide For Clinicians. Lippincott Williams & Wilkins. 5th Ed. 2015. Philadelphia: Wolters Kluwer Health; 2015 6. Kenneth J Rothman: Epidemiology: An introduction Oxford University press 2002
<p>Recommended Readings</p>	<ol style="list-style-type: none"> 1. Kumar, P., Clark, ML., Kumar and Clark’s Clinical Medicine. 7th edition. Saunders. 2009. ISBN-13: 978-0702029936 2. Goldman, L., Schafer, Al., Goldman’s Cecil Medicine. 24th edition. Saunders. 2011. ISBN-13: 978-1437727883 Colledge, NR., Walker, BR., Ralston, SH.

3. Davidson's Principles and Practice of Medicine. Churchill Livingstone. 21st edition. 2010. ISBN-13: 978-0702030857

PART 2B: GENERAL & THEMED INFECTIOUS DISEASES

Course Name Code STP ID 3	PRINCIPLES AND PRACTICE OF INFECTIOUS DISEASES
Aim/Purpose:	This Course aims at consolidating the concept of infectious disease consultation and leadership skills, it aims at giving them the final responsibility of teaching and supervising activities of staff at all levels, This course also aims at providing mentorship and guidance to the trainee for the finalizing of the analysis of the facility data outcomes.
Learning Outcomes:	At the completion of the course students will be able to: <ol style="list-style-type: none">1. To practice independently as an ID physician.2. To teach medical students, trainees in internal medicine and other trainees in infectious diseases.3. To understand pharmacology of antimicrobial agents and demonstrate their appropriate use in the inpatient and outpatient clinical setting.4. To understand the appropriate use and limitations of tests in the microbiology laboratory in order to give advice on the repertoire of diagnostic tests available at routine and/or reference laboratories and be able to interpret laboratory data in the context of clinical information.5. To attend at least two infection control meetings at hospital level and describe steps involved in implementing infection control/isolation measures in a hospital setting.6. To demonstrate familiarity with the basics of the epidemiology of infectious diseases and participate in at least one disease outbreak investigation or describe steps involved in disease outbreak investigation.

7. To portrait as a role model and demonstrate healthy Professional behaviours.
8. To contribute to evidence-base knowledge for Infectious Diseases practice and improve the Health Systems in Zambia with regards to newborn and child, holistic health care standards, including prevention and health promotion.
9. To provide independent mentorship and didactic teaching to junior trainees as well as district mentees from all health care cadres

Knowledge:

At the end of the year, the trainee shall be able to:

10. Know how to assess and manage individuals with infectious diseases
11. Understand systemic infections, emerging infectious diseases and infections in travellers.
12. Recognize and manage patients with HIV/AIDS as well as opportunistic infections in all immunocompromised patients including HIV/AIDS
13. Demonstrate that they are becoming effective teachers in the discipline of infectious diseases
14. Understand mechanisms of action and adverse reactions of antimicrobial agents; antimicrobial and antiviral resistance; drug-drug interactions; the appropriate use and management of antimicrobial agents in a variety of clinical settings; methods of determining antimicrobial activity of a drug, principles of prophylaxis and immunoprophylaxis; characteristics, use, complications of antiretroviral agents; mechanisms and clinical significance of viral resistance to antiretroviral agents, and understanding of antiparasitic drugs.

15. Know the utility, sensitivities and specificities of major diagnostic tests used in diagnosing infectious disease
16. Know the principles of infection control and isolation in a hospital setting.
17. Understand the epidemiology, clinical course, manifestations, diagnosis, treatment and prevention of mycobacterial infections, major viral and bacterial pathogens and major parasitic diseases.
18. Know how to perform an outbreak investigation

Skills

At the end of the year, the trainee shall be able:

19. Generate a differential diagnosis and unique treatment plan for each patient encounter
20. Perform literature searches in order to gather information on the most up-to-date treatment and management of infectious diseases.
21. Act as teachers and educational mentors to medical students, interns, and ID trainees, making optimal use of “teaching pearls” and “teachable moments;” instructing ID trainees in the proper content and format for concise and organized patient presentation; helping students and interns to define patient care plans; and providing ID trainees with timely and constructive evaluation and feedback.
22. Demonstrate the role of antimicrobial stewards and the judicious use of antimicrobial agents in the clinical care setting
23. Know appropriate procedures for specimen collection relevant to infectious disease.

24. Practice judicious use of ordering appropriate diagnostic laboratory tests to narrow the differential diagnosis and to evaluate a specific syndrome.
25. Describe isolation procedures and infection control measures for a variety of infectious diseases
26. Describe or take part in an outbreak investigation

Behaviors:

At the end of the training, the trainee shall be able to:

27. Demonstrate respect, compassion, and integrity in their professional behavior
28. Place patient safety and care above all competing considerations at all times.
29. Approach patients/families with a friendly, interested, and respectful demeanor.
30. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, disabilities, religion, and other parameters of human diversity.
31. Operate with respect for patient confidentiality at all times.
32. Work effectively with others as a member or leader of a health care team or other professional group.

33. Clearly and openly identify and repudiate statements of prejudice made by professional colleagues, and will not permit their actions as physicians to be influenced by such prejudice.
34. Cultivate the ability to identify and articulate their own cultural values and preferences, comforts and discomforts; and to be self-aware in attempting to deliver fair and optimal medical care to all patients – including recognizing their obligation to transfer care to another physician should the

	<p>occasion arise in which personal values or biases interfere with such care delivery to any patient or family.</p> <p>35. Work effectively and respectfully with others as a leader and teacher of a health care team</p> <p>36. Work closely and respectfully with trained pharmacist in managing the complications of antimicrobial agents in their patients</p> <p>37. Work closely and respectfully with trained laboratory staff, microbiologists, etc.. to help diagnose a variety of infectious diseases.</p> <p>38. Work closely and respectfully with hospital administration to ensure all infection control practices are being strictly adhered to at all times by all hospital staff/employees.</p> <p>39. Work effectively and respectfully with other members of the outbreak investigation team.</p>
<p>Course Content</p>	<p>Clinical Pharmacology</p> <p>Antimicrobial stewardship</p> <p>Pharmacology of major drug classes:</p> <ul style="list-style-type: none"> ▪ Antibiotics/antimicrobials ▪ Antibiotic resistance ▪ anti-tuberculous drugs, ▪ anti-fungals, ▪ anti-malarials, ▪ anti-helminthics, ▪ anti-virals <hr/> <p>HIV Medicine</p> <ul style="list-style-type: none"> ▪ History, Epidemiology, and Pathophysiology of HIV Infection ▪ Immunology and Virology of HIV ▪ Acute HIV infection and HIV infection ▪ Treatment Preparation, Initiation and Adherence ▪ Antiretroviral Pharmacology, Pharmacokinetics and Toxicity

- Antiretroviral Resistance
- Management and Monitoring of ART
- Treatment Failure and When to Switch
- Opportunistic Diseases and other complications of HIV Infection
- Immune Reconstitution Inflammatory Syndrome (IRIS)
- HIV – Tuberculosis Co-Infection
- Other Co-infections
- HIV and Sexually Transmitted Infections
- Treatment Models and Care Delivery Systems including Prevention
- Prevention of Mother to Child Transmission and Infant Survival
- Pediatric HIV Management
- Palliative Care and HIV Ethics
- HIV and malnutrition/micronutrient deficiencies
- Tuberculosis
- Drug resistant TB

General Infectious Diseases

- Fever
- Bloodstream infections
- Sepsis and shock
- Fever of unknown origin
- Pneumonia
- Other respiratory infections
- Cardiovascular infections
 - i. Infective endocarditis
 - ii. Pericarditis
 - iii. Myocarditis
 - iv. Catheter related infections
- CNS infections

- i. Acute meningitis
- ii. Chronic meningitis
- iii. Brain abscesses
- iv. Other CNS infections

- Gastrointestinal and intraabdominal infections
- Neurosurgical infections
- Skin and soft tissue infections
- Tickborne diseases
- Urinary tract infections
- Sexually transmitted infections
- Bone and joint infections

General Infectious Diseases

- Health care associated infections (nosocomial infections)
- Infections of the head and neck
- Eye infections
- Infections of prosthetic devices
- Infections related to trauma
- Mechanisms of antimicrobial resistance
- Infection control
- Vaccinations
- Tropical Diseases and other diseases of special interest to Africa
- Bites/Stings/Toxins Guinea worm
- Trichinosis
- Leishmaniasis
- African/American trypanosomiasis
- Amoebiasis
- Intestinal protozoa
- Leprosy
- Intestinal helminths
- Cysticercosis

- Hydatid disease
- Schistosomiasis
- Paragonimiasis
- Loiasis
- Onchocerciasis
- Lymphatic filariasis
- Tetanus
- Rickettsial infections
- Relapsing fever
- Yaws and endemic syphilis
- Cholera
- Typhoid and other salmonellas
- Shigella
- Brucellosis
- Leptospirosis
- Plague
- Anthrax
- Dengue
- Viral Haemorrhagic fevers (yellow fever, Valley, Ebola Marburg, Crimean-Congo)
- Poliomyelitis
- Hepatitis viruses
- Lassa, Rift
- Rabies

Immunosuppression

- Opportunistic infections in malignancies
- Infections in transplant patients
- Infections in transplant patients

Infection prevention and control/Antibiotics stewardship

- Antibiotic rounds
- Bench rounds

	<p>Facility based Mentorship</p> <ul style="list-style-type: none"> ▪ Bed-side teaching ▪ Case presentations ▪ Side -by- side teaching ▪ Case studies
<p>Contact Hours:</p>	<ul style="list-style-type: none"> ▪ Lectures (25% in-person 75 % ECHO™) 1hr/week ▪ Tutorial 1 hour per week or mentorship site visit 1 day per week ▪ Self-Directed Student-Centred Learning Activity 6 hr/week ▪ Clerkship Rotations (as per department’s work schedule).
<p>Teaching Methods:</p>	<p>The teaching methods may include, but not limited to, the following: Telehealth using the ECHO™ platform·expository lectures (students should have at least 75% contact time), tutorials, seminars, practical classes, skills laboratories, clinical demonstrations, clinical clerkships (bedside teaching, ward rounds, ambulatory care teaching, operating theatre experience, post- mortem, and on-call duties), field and community based learning, and other ICT supported learning experiences.</p>
<p>Assessment methods and weighting</p>	<p>Log of experiences and procedures completed, case reports, portfolios, project reports, multiple choice questions, essay questions, short answer questions, modified essay questions, short and long cases, objective structured clinical examinations (OSCE), practical examinations, objective structured practical examinations (OSPE), Mini-clinical Examination (MiniCEX), Viva Voce,</p> <p>Annual Review of Competence Progression</p> <ul style="list-style-type: none"> (a) Continuous Assessment - 40% (b) Final Examinations - 60% <p>ZACOMS Administered Examinations</p> <p>Taken according to ZACOMS Examinations Schedule</p>

<p>Prescribed Readings</p>	<ol style="list-style-type: none"> 1. Mandell, GL et al, Mandell, Douglas, and Bennet's Principles and Practice of Infectious Diseases, volume 1 and 2. Churchill Livingstone. 7th edition. 2009. ISBN-13: 978-0443068393 2. Cohen J., Powderly, W., Opal, SM., Infectious Diseases. Mosby. 3rd edition. 2010. ISBN-13: 978-0723435037 3. Cook, GC., Zumla, A., Manson's Tropical Diseases. Saunders Ltd., 22nd edition. 2008. ISBN-13: 978-1416044703
<p>Recommended Readings</p>	<ol style="list-style-type: none"> 1. Torok, E., Moran, E., Cooke, F., Oxford Handbook of Infectious Diseases and Microbiology. 1st edition. Oxford University Press. 2009. ISBN-13: 978-0198569251 2. Versalovic, J., Carrol, KC., Punke, G., Manual of Clinical Microbiology. Volume 1 and 2, 10th Edition. ASM Press. 2011. ISBN-13: 978-1555814632

MICROBIOLOGY ROTATION FOR STP ID TRAINEES

<p>Course Name Code STP ID MICRO</p>	<p>MEDICAL MICROBIOLOGY FOR INFECTIOUS DISEASES PRACTICE</p>
<p>Aim/Purpose:</p>	<p>This course aims at training doctors knowledgeable in all areas of microbiology and develop skills that will help them function as infectious disease physicians and enhance the links between microbiology laboratory personnel and clinicians.</p>
<p>Learning Outcomes:</p>	<p>Knowledge</p> <p>At the end of the training, the trainee shall be able to:</p> <ol style="list-style-type: none"> 1. Describe laboratory biosafety procedures 2. Describe infection control principles in the laboratory and the rest of the hospital 3. Describe the taxonomy of viruses, bacteria, parasites and fungi 4. Recall transmission modes of pathogenic microorganisms 5. Be familiar with commensals and pathogens 6. Understand the science underlying diagnostic testing for infectious diseases 7. Understand the sensitivity and specificity of various tests used in the microbiology laboratory 8. Describe methods of sample collection transportation and storage for specimens routinely tested in the microbiology laboratory (blood, urine, respiratory specimens, stool, cerebral spinal fluid, lymph node aspirates, pus, tissue, ascitic fluid, pleural fluid, and other fluids) 9. Understand the methods of antimicrobial susceptibility testing and interpretation 10. Understand infectious disease serology

	<p>11. Understand the role of the laboratory in Public Health and Communicable Disease Control</p> <p>12. Understand the role of the microbiology laboratory in disease outbreak investigation</p> <p>13. Know the agents of bioterrorism</p> <p>14. Know agents of food-borne and water-borne infectious diseases</p> <p>Skills</p> <p>At the end of the training, the training shall be able to:</p> <p>15. Develop good communication skills to facilitate links between microbiology personnel and clinicians</p> <p>16. Integrate laboratory test data with clinical information</p> <p>17. Make recommendations for further testing in a microbiology laboratory</p> <p>18. Demonstrate how to perform a gram stain, malaria smear</p> <p>19. Demonstrate how to read culture plates</p> <p>20. Demonstrate how to perform rapid diagnostics tests and point of care tests (malaria, HIV etc.)</p> <p>21. Present data using oral and written techniques (including use of computer software)</p> <p>Behaviors</p> <p>At the end of the training, the trainee shall be able to:</p> <p>22. Act with respect towards all team members in the laboratory irrespective of gender, race, religion or position</p> <p>23. Value the opinion of all team members in the laboratory</p> <p>24. Participate constructively in groups and work independently</p> <p>25. Be teachable</p>
	<p>Course Content Bacteriology lab activities/manual</p>

	Parasitology lab activities/manual
	TB lab activities/manual
	Virology lab activities/manual
Contact Hours:	<p>Trainees will spend a total of 6 weeks in the microbiology labs as follows:</p> <ul style="list-style-type: none"> ▪ 3 weeks in microbiology ▪ 1 week in parasitology ▪ 1 week in TB lab ▪ 1 week in Virology
Teaching Methods:	<p>The teaching methods may include, but not limited to, the following:</p> <ul style="list-style-type: none"> ▪ Direct observation of laboratory procedures ▪ Performance of procedures ▪ Didactic lectures (basic science lectures in first year) ▪ Case based discussions (Lab rounds) ▪ Self-study
Assessment methods and weighting	<ul style="list-style-type: none"> ▪ Oral examination ▪ Theory examination ▪ End of rotation evaluation by Supervisor in the laboratory ▪ 360° Evaluations from laboratory staff <p>Annual Review of Competence Progression</p> <p>(c) Continuous Assessment - 40%</p> <p>(d) Final Examinations - 60%</p> <p>ZACOMS Administered Examinations</p> <p>Taken according to ZACOMS Examinations Schedule</p>
Prescribed Reading	<p>1. Versalovic, J., Carrol, KC.,Punke, G., Manual of Clinical Microbiology. Volume 1 and 2, 10th Edition. ASM press. 2011. ISBN-13: 978-1555814632</p>

2. Mandell, GL., Mandell, Douglas and Bennet's Principles and Practice of Infectious Diseases. Volume 1 and 2. Churchill Livinstone, 7th Edition. 2009. ISBN-13: 978-0443068393

11.0 CASE MIX

The patients that ID trainees will see will include the following types of consults: general ID consults, oncology consults, ICU consults, orthopedic consults, neurosurgery consults and HIV patients on nonmedical wards. General ID consults will include the following: skin and soft tissue infections, community acquired pneumonia, hospital acquired pneumonia, MRSA infections, MDR gram negatives, fungal infections, pyrexia of unknown origin (PUO), meningitis, endocarditis, salmonella infections enterococcal infections, bacteremia, fungemia, central line infections, peritoneal dialysis (PD) catheter and hemodialysis (HD) line infections, CNS infections, viral infections such as varicella zoster infections, post exposure prophylaxis for Neisseria meningitides etc. Surgical consults-intraabdominal infections, serious post op infections, brain abscesses, infections related to ortho hardware and other surgical devices, prosthetic joint infections, osteomyelitis, necrotizing fasciitis, septic arthritis, diabetic foot infections, management of ARVs during perioperative period, obstructive uropathy with urosepsis, complicated pleuropulmonary infections, tropical diseases such as trypanosomiasis, strongyloidiasis, schistosomiasis, and other parasitic infections.