



ZAMBIA COLLEGE OF MEDICINE & SURGERY

Advancing Specialist Care & Professional Growth

Specialty Training Programme
Curriculum & learning guide
for
PAEDIATRICS AND CHILD HEALTH

Contents

<u>INTRODUCTION</u>	4
<u>STP PCH CURRICULUM</u>	5
<u>VISION</u>	5
<u>MISSION STATEMENT</u>	5
<u>Values:</u>	5
<u>ADMISSION CRITERIA TO THE SPECIALTY TRAINING PROGRAMME IN PAEDIATRICS AND CHILD HEALTH</u>	10
<u>TEACHING METHODS IN THE SPECIALTY TRAINING PROGRAMME IN PAEDIATRICS AND CHILD HEALTH</u>	11
<u>SPECIALTY TRAINING PROGRAMME IN PAEDIATRICS AND CHILD HEALTH CURRICULUM STRUCTURE AND MAP</u>	12
<u>Curriculum Map for the STP PCH Programme</u>	12
<u>PROGRESSION OF A PAEDIATRICS STP TRAINEE</u>	14
Curriculum Outcomes Categories	Error! Bookmark not defined.
<u>Part 2</u>	18
<u>ASSESSMENT</u>	18
<u>Formative assessment</u>	18
<u>Summative assessment</u>	19
<u>Part 1 (Year 1)</u>	19
<u>Part 2 (Year 2)</u>	19
<u>Part 3 (Year 3)</u>	19
<u>PART 1: COURSES FOR PAEDIATRICS AND CHILD HEALTH SPECIALTY TRAINING PROGRAMME</u>	22
<u>Basic & Biomedical Sciences Applied to Practice of Paediatrics and Child Health</u>	22
<u>Unit 1: CARDIOVASCULAR SYSTEM</u>	22
<u>Unit 2: RESPIRATORY SYSTEM</u>	22
<u>Unit 3: GASTROINTESTINAL AND HEPATO-BILIARY SYSTEM</u>	22
<u>Unit 4: NUTRITION</u>	22
<u>Unit 5: NEUROLOGICAL SYSTEM</u>	22
<u>Unit 6: GENITOURINARY SYSTEM</u>	23
<u>Unit 7: MUSCULOSKELETAL AND SKIN</u>	23
<u>Unit 8: HAEMATOLOGICAL SYSTEM</u>	23
<u>Unit 9: ENDOCRINOLOGY</u>	23
<u>Unit 8: GROWTH AND DEVELOPMENT</u>	24
<u>Unit 9: GENETICS</u>	24
<u>Unit 10: IMMUNOLOGY</u>	24
<u>Unit 11: MICROBIOLOGY</u>	24
<u>Unit 12: BASIC PATHOLOGY</u>	24
<u>Unit 13: BASIC PRINCIPLES OF PHARMACOLOGY</u>	24
<u>Unit 14: INTRODUCTION TO ELEMENTARY BIOPHYSICS</u>	24
<u>Unit 15: HEALTH CARE ETHICS AND PROFESSIONALISM</u>	24

<u>PART 2: COURSES FOR PAEDIATRICS AND CHILD HEALTH SPECIALTY TRAINING PROGRAMME</u>	25
<u>General & Themed Clinical Paediatrics and Child Health</u>	25
<u>Unit 1: INFECTIOUS DISEASES</u>	25
<u>Unit 2: GENETICS</u>	25
<u>Unit 3: NEONATOLOGY</u>	25
<u>Unit 4: GROWTH AND DEVELOPMENT</u>	26
<u>Unit 5: BEHAVIORAL AND PSYCHOLOGICAL DISORDERS</u>	26
<u>Unit 6: COMMUNITY & SOCIAL PEDIATRICS</u>	26
<u>Unit 7: RESPIRATORY</u>	26
<u>Unit 8: CARDIOVASCULAR</u>	27
<u>Unit 9: GASTROINTESTINAL AND LIVER DISEASES</u>	27
<u>Unit 10: RENAL DISORDERS</u>	28
<u>Unit 11: EMERGENCY AND CRITICAL CARE</u>	29
<u>Unit 12: SKIN DISEASES</u>	29
<u>Unit 13: ENT</u>	29
<u>Unit 14: EYE PROBLEMS</u>	29
<u>Unit 15: NEUROLOGIC DISORDERS</u>	30
<u>Unit 16: HEMATOLOGY AND ONCOLOGY</u>	30
<u>Unit 17: ENDOCRINOLOGY, METABOLIC DISORDERS</u>	31
<u>Unit 18: IMMUNOLOGY AND RHEUMATOLOGY</u>	31
<u>APPROACH TO IMPORTANT CLINICAL PROBLEMS:</u>	32
<u>Growth and development</u>	32
<u>Neonatology</u>	32
<u>Nutrition</u>	32
<u>Cardiovascular</u>	32
<u>GIT and liver</u>	32
<u>Respiratory</u>	32
<u>Infections</u>	32
<u>Renal</u>	32
<u>Hemato-oncology</u>	32
<u>Neurology</u>	32
<u>Endocrine</u>	32
<u>Skin/Eye/ENT</u>	32
<u>Miscellaneous</u>	32
<u>PRACTICAL CLINICAL SKILLS</u>	33
<u>History and examination</u>	33
<u>BEDSIDE PROCEDURES</u>	33
<u>Monitoring skills</u>	33
<u>Must know</u>	33
<u>Should know</u>	33
<u>Therapeutic skills</u>	33

<u>Must know</u>	33
<u>Should know</u>	33
<u>Investigative skills</u>	33
<u>Must know</u>	33
<u>Should know</u>	33
<u>Should know</u>	33

INTRODUCTION

This Curriculum describes the work-based competence-based professional training programme for the Specialty Training Programme (STP) in Paediatrics and Child Health (PCH) in Zambia. The intended readership for the curriculum and guideline includes the following:

- Trainees, host departments and managers of PCH healthcare services;
- STP PCH trainers, which includes all those involved in supervising, coordinating, assessing and delivering specialist education and training in Paediatrics and Child Health;
- Academic, administrative and professional staff within Higher Education Institutions Higher Education Institutions (HEIs), the Higher Education Authority (HEA), and the Zambia Qualifications Authority (ZAQA);
- Strategic partners involved in supporting reproductive, maternal, and newborn care, 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 of 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 Paediatrics and Child Health specialists working through the Zambia Paediatrics Association (ZPA).

The STP Paediatrics and Child Health (PCH) aims to enable doctors to attain the knowledge and skills required to manage diseases in infants, children, adolescents and young people.

Paediatrics and Child Health encompasses the diagnosis, assessment and medical management of various disorders in children. The STP PCH training provides specialist training in Paediatrics and Child Health. This is a relevant programme because of the critical shortage of Paediatricians. The STP PCH will equip trainees with core competencies reflecting the wide array of subspecialties in Paediatrics. This will mean for every trainee who completes this programme, the population they serve will have gained access to various competencies in Paediatrics. Furthermore, the graduate of this programme will offer support to the various Paediatric subspecialties, improving outcomes in the management of a broad spectrum of pathology in paediatrics.

At the end of the programme, STP PCH trainees will become Paediatricians and will be expected to manage various medical conditions in children; teach students and other health workers in the care of children and the various conditions that affect them; participate in and coordinate various aspects of community child health; administratively manage different departments within a hospital or a hospital; and work with other professionals from within and outside the medical field to promote the wellbeing of children. They will also be advocates for equity of health care for

children, improved wellbeing of all children and particularly those with special needs (e.g. children with disabilities, abused children, child marriages) and the protection of human rights of children.

STP PCH CURRICULUM

This curriculum refers to the overall knowledge, skills and competences that trainees are supposed to learn during their training on the STP PCH.

The STP PCH curriculum consists of learning objectives trainees are expected to meet; the course content and the methods of learning; the books and other material used in the course; and modes of assessment.

The STP PCH Curriculum is a work-based professional competence-based training situated in an accredited training facility managed by specialists in Paediatrics and Child Health with oversight by the Zambia College of Medicine and Surgery (ZACOMS) working through ZPA. The curriculum is informed by the training requirements of the Health Professions Council of Zambia (HPCZ) and the professional creed of the Zambia Paediatrics Association (ZPA). The training programme encourages self-directed learning, life-long learning, and student-centred approaches while providing robust and structured guidance.

VISION

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

MISSION STATEMENT

The mission of the STP PCH training in Zambia is to train specialists who shall endeavour to improve the health care services to the infants, children and adolescents by providing safe, evidence-based, humanistic specialist care in the field of Paediatrics and Child Health in an efficient and proficient manner to meet the needs of the Zambian community, and contribute to the field of children's health 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 THE SPECIALTY TRAINING PROGRAMME IN PAEDIATRICS AND CHILD HEALTH

The STP PCH aims to train specialists in Paediatrics and Child Health in order to prepare them for specialist service in the healthcare service. The STP PCH aims to bridge the critical shortage of Paediatricians by advancing professional training of Paediatricians 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 a Paediatrics practice has the basic requirements to train a Paediatrician.

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 Paediatrics and Child Health

1. The graduate should be able to apply to Paediatrics and Child Health 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 Paediatrics and Child Health.
 - b) Explain the scientific bases for common diseases and conditions' signs, symptoms and treatment relevant to Paediatrics and Child Health.
 - c) Justify and explain the scientific bases of common investigations for diseases and conditions relevant to Paediatrics and Child Health.
 - d) Demonstrate knowledge of drugs, drug actions, side effects, and interactions relevant to Paediatrics and Child Health.

2. Apply Behavioural and Sociology Principles to the Practice of Paediatrics and Child Health
 - a) Explain normal human behavior relevant to Paediatrics and Child Health.
 - b) Discuss psychological and social concepts of health, illness and disease relevant to Paediatrics and Child Health.
 - c) Apply theoretical frameworks of psychology and sociology to explain the varied responses of individuals, groups and societies to disease relevant to Paediatrics and Child Health.
 - d) Explain psychological and social factors that contribute to illness, the course of the disease and the success of treatment relevant to Paediatrics and Child Health.

3. Apply Population Health to the Practice of Paediatrics and Child Health
 - a) Discuss population health principles related to determinants of health, health inequalities, health risks and surveillance relevant to Paediatrics and Child Health.
 - b) Discuss the principles underlying the development of health and health service policy, including issues related to health financing, and clinical guidelines relevant to Paediatrics and Child Health.

- c) Evaluate and apply basic principles of infectious and non-communicable disease control at community and hospital level relevant to Paediatrics and Child Health.
 - d) Discuss and apply the principles of primary, secondary, and tertiary prevention of disease relevant to Paediatrics and Child Health.
4. Apply Scientific Method and Approaches to Paediatrics and Child Health Research.
- a) Evaluate research outcomes of qualitative and quantitative studies in the medical and scientific literature relevant to Paediatrics and Child Health.
 - b) Formulate research questions, study designs or experiments to address the research questions relevant to Paediatrics and Child Health.
 - c) Discuss and apply appropriate research ethics to a research study relevant to Paediatrics and Child Health.

Outcome 2. Competence, at mastery level, in Paediatrics and Child Health Clinical Practice. On successful completion of the work-based STP trainees:

1. The trainees should have clinical and specialist expertise in Paediatrics and Child Health, underpinned by broader knowledge, skills, experience and professional attributes necessary for independent practice;
2. The trainees should be able to undertake complex clinical roles, defining and choosing investigative and clinical options, and making key judgements about complex facts and clinical situations.
3. The trainees should contribute to reduction of under-five and infant mortality and improves children's health in the context of the national health priorities, by means of outstanding scientific research and 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 Paediatrics and Child Health 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 Paediatrics and Child Health 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;
 - Scientific and clinical leadership based on the continual advancement of their knowledge, skills and understanding through the independent learning required for continuing professional development.
5. Once registered as a specialist in Paediatrics and Child Health, 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. Specialist paediatricians who have successfully completed the STP PCH will be eligible to compete for available Consultant positions in Paediatrics and Child Health.

The outcomes of the STP PCH training are affiliated to the following curriculum outcome categories:

Curriculum Outcomes Categories

Category I: Scientific foundations

- Goal 1:** Understand the normal structure and function of the human body, at levels from molecules to cells to organs, to the whole organism.
- Goal 2:** Understand the major pathological processes and their biological alterations.
- Goal 3:** Understand how the major pathologic processes affect the organ systems.
- Goal 4:** Integrate basic science and epidemiological knowledge with clinical reasoning.
- Goal 5:** Understand the principles of scientific method and evidence-based medicine including critical thinking.
- Goal 6:** Analyse the relationship between social determinants of health and population health with special focus on the paediatric population.

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.

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 paediatric and child health 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 behaviours 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 THE SPECIALTY TRAINING PROGRAMME IN PAEDIATRICS AND CHILD HEALTH

Applicants to the STP PCH 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 practising licence 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 THE SPECIALTY TRAINING PROGRAMME IN PAEDIATRICS AND CHILD HEALTH

The STP PCH Curriculum is a work and competence-based professional training situated in an accredited training facility managed by specialists in Paediatrics and Child Health with oversight by the Zambia College of Medicine and Surgery (ZACOMS) working through Zambia Paediatrics Association (ZPA). 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 PCH 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. The STP PCH programme is a work based professional competence-based 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 Register in Paediatrics and Child Health.

TEACHING METHODS IN THE SPECIALTY TRAINING PROGRAMME IN PAEDIATRICS AND CHILD HEALTH

The STP PCH training is a work-based professional competence-based programme situated in an accredited training facility managed by specialists in Paediatrics and Child Health with oversight by the Zambia College of Medicine and Surgery (ZACOMS) working through Zambia Paediatrics Association (ZPA). The STP PCH curriculum encompasses diverse teaching and learning approaches that are appropriate for the target educational domain, i.e., cognitive (knowledge), psychomotor (practical), or affective (attitude) domain.

During the STP PCH programme the specialty trainee is an integral member of the clinical work of the department in which they are training to gain the required clinical experience and competence. The work experiences should help a trainee achieve the competencies outlined in the curriculum.

Self-directed learning is an important aspect of learning in the STP PCH and trainees should manage their time efficiently to accomplish this. This involves reading around patients; reading topics raised during various discussions with senior doctors and colleagues and from the curriculum; preparing for presentations at various fora and when teaching junior staff.

Learning should occur during various work-related activities such as:

1. ward rounds and bedside teaching
 - minimum of one major ward round per week
 - daily ward rounds
2. on-call duties
 - 24-hour calls as part of a team of doctors (unit) with nights spent in the hospital
3. handovers
 - Handover of patients from one on-call unit to another
4. general and specialist clinics
 - minimum of one clinic per week
5. expository lectures
 - lectures will be in Part 1 only
 - Pre-recorded audio and video lectures of all the topics for Part 1 will be given to the trainees at the beginning of the academic year. The trainee is should have gone through all the lectures before the end of the academic year
 - questions and clarification arising from lectures can be raised with training site coordinators during other learning fora
6. clinical meetings
 - minimum of one clinical meeting per week
7. tutorials
 - minimum of one tutorial per week
8. journal clubs
 - minimum of one journal club meeting per week
9. morbidity and mortality audits
 - minimum of one audit per month

10. interdepartmental meetings

- as need arises based on patients seen in the department

11. mandatory courses

- e.g. neonatal life support, advanced paediatric life support, ECG, Echo courses etc

12. ICT supported learning experiences

- Part 1 lectures on the lecture schedule will be recorded in audio or video format by experts in the particular field and made available to all trainees
- A learning group on a social platform e.g. WhatsApp will be made for all coordinators, lecturers and trainees. Coordinators and lecturers will post a question for a particular training site once a week and the trainees at the site will post answers to the question after two days. One day will be open for discussions by all trainees at the end of which the coordinator/lecturers will provide the answers and summary of the topic.

13. Field and community-based learning

14. Administrative and management meetings

- Attendance of administrative meetings such as management meeting, finance meeting, medicines and therapeutic meeting, disciplinary meetings etc.
- Participation in the planning cycle of a hospital (Action Plan)
- Reading the administrative handbooks for Public Service e.g. Conditions of Service for Public Service book, Disciplinary Code of Conduct, Code of Ethics etc.

Certain concepts and skills are taught every year, from early years of undergraduate training to final and then through several years of STP PCH 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.

SPECIALTY TRAINING PROGRAMME IN PAEDIATRICS AND CHILD HEALTH CURRICULUM STRUCTURE AND MAP

Curriculum Map for the STP PCH Programme

STP YEAR 1 PED 1090	ZACOMS PT 1 ARCP	STP YEAR 2 PED 2090	ARCP	STP YEAR 3 PED 3090	ARCP	STP YEAR 4 PED 4090	ZACOMS CCST Exams
Basic Sciences in PCH (4 months)		Principles of Clinical PCH II (3 months)		Management in Clinical PCH (3 months)		PCH Specialist Rotation 6	

			(3 months)
Principles of Clinical PCH (4 months)	PCH Specialist Rotation 1 (3 months)	Research Methods (3 months)	Elective Rotation (3 months)
Ongoing Clinical Management Practice (4 months)	PCH Specialist Rotation 2 (3 months)	PCH Specialist Rotation 4 (3 months)	Health systems management (3 months)
	PCH Specialist Rotation 3 (3 months)	PCH Specialist Rotation 5 (3 months)	Leadership & Management (3 months)
Part 1: Generic Education & Training (1 year)	Part 2: Themed & Specialist Education & Training (3 years)		

ARCP – Annual Review of Competence Progression; CCST – Certificate of Completion of Specialist Training Examination

Specialist rotations will be for three months for each rotation and will be in the following fields and facilities:

Specialist field	Facility offering specialist training
Cardiology	Arthur Davison Hospital UTH Children's Hospital
Haemato-oncology	UTH Cancer Diseases Hospital UTH Children's Hospital
Hospital management and child health	Chipata Central Hospital Livingstone General Hospital Mansa General Hospital
Neonatology	Arthur Davison Hospital UTH Maternal and Newborn Hospital
Nephrology	Kitwe Central Hospital Livingstone General Hospital UTH Children's Hospital
Paediatric ICU and emergency care	Arthur Davison Hospital with Ndola Central Hospital UTH Children's Hospital

UTH – University Teaching Hospital

In Part 2 of the training programme, trainees should apply to the hospitals offering specialist training through the STP PCH Programme Director for a placement for three months. In each of the academic years of Part 2. All trainees will be required to rotate through a minimum of two specialist units in the hospitals indicated above. This will amount to a minimum of six months of attachment outside their training sites. The rest of the academic year should be spent at the primary training site.

The STP PCH Programme Director will coordinate placement of trainees based on applications received, the total number of trainees on the programme and the maximum number of trainees a facility can take at a time. Trainees thus have a responsibility to apply on time and to ensure that they have a minimum of two rotations per year and complete all mandatory rotations before attempting to sit for the ZACOMS CCST Exam.

PROGRESSION ON THE PAEDIATRICS AND CHILD HEALTH STP

Training on the STP PCH programme will take a minimum of four years. The period will be divided into two parts: Part 1 and Part 2. Part 1 will consist of one year; the first year of training. Part 2 will consist of three years which will be the second, third and fourth years of training.

A candidate shall be allowed a maximum of three attempts for ZACOMS Part 1 and/or Part 2 Examinations. The minimum period that a trainee can complete the programme is four years and the maximum period is Six years. A trainee can be allowed an additional one year to attempt Part 1 and an additional two to attempt Part 2 after which s/he cannot remain in the programme.

For ease of tracking progress and planning for Paediatrics and Child Health care, all STP PCH trainees will be registered with ZACOMS and ZPA for the duration of their training and will be allocated a unique ZACOMS Student Number.

On successful completion of the programme, the trainee will obtain an 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 Paediatrics and Child Health. They can occupy a consultant position based on availability of position by the Ministry of Health or other employers.

The STP-trained paediatrician can obtain a Masters of Medicine in Paediatrics and Child Health qualification from a university by undertaking a research as per specification of the awarding university.

The outcomes of the STP PCH training are based on the curriculum outcome categories attainable according to the stage of the training as follows:

CURRICULUM OUTCOMES CATEGORIES	PART 1	PART 2
Patient management	Understands relevant principles of physiology, anatomy,	Demonstrate sound clinical reasoning.

<p>(diagnosis and treatment)</p>	<p>pharmacology and pathology to the care of the children and their diseases</p> <p>Elicit and correctly interpret symptoms and signs of paediatric and child health conditions.</p> <p>Diagnose and demonstrate basic understanding of common disease and conditions.</p> <p>Identify, initiate as well as interpret laboratory and bedside investigations required to make a diagnosis and manage the paediatric conditions.</p> <p>Recognize acute life-threatening medical problems and initiate appropriate care</p>	<p>Understand therapeutic options and participate in the multidisciplinary care of patients with complex problems.</p> <p>Acquire the knowledge and skills necessary to assist in the management and rehabilitation of chronic diseases.</p> <p>Participate in care in a variety of settings; including knowledge about palliative care.</p>
<p>Clinical Skills</p>	<p>Obtain a sensitive, thorough medical history.</p> <p>Perform a sensitive and accurate physical exam including mental state examination.</p> <p>Undertake basic clinical procedures</p> <p>Recognises emergencies and carries out advanced life support</p>	<p>Demonstrates advanced skills in history taking and clinical examination of children</p> <p>Undertakes advanced paediatric clinical procedures</p> <p>Provides advanced management for emergencies</p>
<p>Communication and Interpersonal Skills</p>	<p>Develops the knowledge, skills, and attitudes needed for culturally-competent care.</p> <p>To demonstrate the skills and attitudes appropriate for the care of</p>	<p>Coordinates and participates in discussion and decision-making with patients and families</p> <p>Work effectively with other providers in the health system.</p>

	children including communication with patients, their family and colleagues	Clearly communicate medical information in spoken and written form.
Disease prevention and health promotion	Develop knowledge, skills, and attitudes to practice the basic principles of prevention.	Practice personalized health planning for long-range goals. Understand the planning for communities and populations.
Patient Safety	Identify and remove common sources of medical errors.	Identify and remove common sources of medical errors. Understand and apply models of Quality Improvement. Appreciate the challenges associated with reporting and disclosure.
Information Management	Use information and educational technology to facilitate research, education, and patient care.	Use information and educational technology to facilitate research, education, and patient care.
Ethics, Humanities, and the Law	<p>Develop a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to diversity.</p> <p>Incorporate ethical principles in clinical practice and research.</p> <p>To appreciate and apply evidence-based clinical Paediatrics and Child Health practice and basic technical skills.</p> <p>To understand the importance and principles of scientific research skills and to emphasize the importance of an evidence-base for contemporary Paediatrics & Child Health practice.</p> <p>To access and analyze scientific publications and research in the field of child health care.</p>	<p>Develop a critical understanding of the multiple factors that affect the practice of medicine, public health and research.</p> <p>Incorporate ethical principles in clinical practice and research.</p> <p>To 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</p>

X: Professionalism	<p>Develop healthy self-care behaviours and coping skills.</p> <p>To portrait as a role model and demonstrate professional behaviours, including understanding one's professional limitations.</p>	<p>Develop healthy self-care behaviours and coping skills.</p> <p>Model service to patients and community.</p> <p>To portrait as a role model and demonstrate professional behaviours.</p>
XI: Leadership & Management	<p>Develop interpersonal and communication skills that result in leadership in patient health service delivery and health human resource management.</p> <p>Supervision of interns and other junior health workers</p> <p>Demonstrate leadership and role modelling to junior doctors and medical trainees.</p>	<p>Develop interpersonal and communication skills that result in leadership in patient health service delivery and health human resource management.</p> <p>Supervision of interns and other junior health workers</p>
XII: Child protection (safe guarding) and advocacy	<p>Recognises and consults appropriately in cases where children and adolescents who are at risk of harm or need protection for harm</p>	<p>Works with other professionals in assessing, reporting and taking appropriate action to protect children and adolescents from harm</p>
XIII: Education and training	<p>Teaches junior medical staff under guidance</p>	<p>Plans, coordinates and participates in teaching of junior STP trainees and other medical staff</p> <p>Mentors junior medical staff</p> <p>Teaching of undergraduates, interns and junior health workers</p>

Part 1 trainees should 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

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

Part 2

To function as senior registrars within the department with clinical duties including:

- Participation in daily ward work
- participating in outpatient clinics
- Taking on-calls at senior registrar level
- Supervision of interns and other junior health workers
- Teaching of undergraduates, interns and junior health workers

To 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.

ASSESSMENT

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.

The ZACOMS PCH training committee has valid, reliable and appropriate methods for assessing the knowledge, clinical skills and attitude domains that should be applied in all training sites. 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 are both formative and summative.

Formative assessment

Formative assessments are on-going evaluations of the performance of the trainee during the learning process to modify teaching and learning activities to improve trainee attainment. It is not graded.

Learning must be demonstrated in all the learning outcome categories. A trainee must document these learning events in a log book.

Summative assessment

Summative assessments are conducted at the end of the academic year to determine the performance of the trainees and their eligibility to progress to the next stage of training or career.

This will take the following forms:

Part 1 (Year 1)

- ZACOMS Part 1 Exams after recommendation by a coordinator for suitability to sit for the exams
- Exams will comprise a theory paper of multiple choice best answer questions and viva voce

Part 2 (Years 2 and 3)

- At the end of each year, the Log books should be completed for each of the specialist rotations and/ or the general paediatrics rotation undertaken during a given year. All the log books should be submitted to the ZACOMS STP PCH training committee through the training-site STP PCH Head of Training at the end of each academic year.
- ZACOMS PCH training committee will convene to conduct Annual Review of Competence Progression (ARCP) based on the log book and the training site Head of Training's report on the performance of the trainee. The committee will determine whether a trainee can proceed to the subsequent year, repeat a rotation, repeat the academic year or be dismissed from the programme altogether.

Part 2 (Year 4)

- The ZACOMS Part 2 examinations, to be taken at the end of a minimum of four years of training on the STP PCH, will serve as the exit examinations for the programme.
- Trainees must have submitted a completed log book to be eligible to attempt the ZACOMS Part 2 examination.
- Trainees will be eligible to sit for the ZACOMS Part 2 examination after meeting the basic requirements for progression as outlined under Part 2 (Years 2 and 3) above and following recommendation by the Head of Training at the primary training site for suitability to sit for the examination.
- Examinations will comprise a theory paper of multiple choice best answer questions and objective structured clinical examination (OSCE) and/or Viva Voce examination.

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: 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.

Assessment	Knowledge, Skill and Attitude Domain	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 working through ZPA
ZACOMS Certificate of Completion of Specialist Registration Examinations	Outcome 2	ZACOMS working through ZPA

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 eligible to attempt the ZACOMS Part 2 Examination.

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

Grading Scheme

The STP PCH 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 Association of Child Health and Paediatrics (ZPA) 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.

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"> <input type="checkbox"/> Has poor and inaccurate command of the subject vocabulary <input type="checkbox"/> Has poor and inaccurate command of the concepts 	44.9% & Below
	(knowledge, skills and attitudes) of the subject across a broad range of topics.	
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"> <input type="checkbox"/> 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"> <input type="checkbox"/> Displays masterly of complex and specialised areas of knowledge, skills and attitudes in a broad range of topics of the subject. 	75% & Above

PART 1: COURSES FOR PAEDIATRICS AND CHILD HEALTH SPECIALTY TRAINING PROGRAMME

Basic & Biomedical Sciences Applied to Practice of Paediatrics and Child Health

Unit 1: CARDIOVASCULAR SYSTEM

- 1.1 Embryology and anatomy of the heart
- 1.2 Normal foetal, neonatal circulation and transition to external life
- 1.3 Common cardiac malformations
- 1.4 Normal cardiovascular physiology and changes in disease states eg CCF, shock
- 1.5 Electrophysiology
- 1.6 Cardiac studies – catheter lab readings, ECG, Echo etc.

Unit 2: RESPIRATORY SYSTEM

- 2.1 Normal embryological development of respiratory system
- 2.2 Common congenital respiratory malformations e.g. laryngomalacia, Congenital cystic Adenomatoid malformations (CCAM)
- 2.3 Respiratory physiology and flow and volume parameters
- 2.4 Respiration, oxygen and carbon dioxide transport mechanisms and how they altered in disease states
- 2.5 Types of respiratory failure and interpretation of blood gases
- 2.6 Pathophysiology of common childhood respiratory illnesses

Unit 3: GASTROINTESTINAL AND HEPATO-BILIARY SYSTEM

- 3.1 Normal embryological development of GIT
- 3.2 Common gastrointestinal malformations e.g. tracheoesophageal fistula, pyloric stenosis
- 3.3 Normal digestion and absorption of nutrients
- 3.4 Bilirubin metabolism and its abnormalities
- 3.5 Gastrointestinal diseases and malabsorption syndromes

Unit 4: NUTRITION

- 4.1 Nutritional/caloric requirements for normal growth and development in children of various ages
- 4.2 Breastfeeding and breast milk and breast milk substitutes
- 4.3 Principles of nutrition for premature babies
- 4.4 Infant and young child feeding /complementary feeding
- 4.5 Vitamins and minerals – normal requirements, sources, its role and deficiencies.
- 4.6 Fundamentals to nutrition of a sick child
- 4.7 Acute and chronic malnutrition including obesity
- 4.8 Parenteral nutrition in neonates and children

Unit 5: NEUROLOGICAL SYSTEM

- 5.1 Normal embryological development of the CNS and common CNS malformations
- 5.2 Normal CSF circulation and composition and changes in disease
- 5.3 Monroe-Kellie theory and relationship to intracranial pathology
- 5.4 Electrophysiology of the nervous system

5.5 Anatomy and physiology of central and peripheral nervous systems

Unit 6: GENITOURINARY SYSTEM

6.1 Normal embryological development of genitourinary systems

6.2 Common genitourinary malformations

6.3 Normal physiology and effect of disease of:

6.3.1 Electrolyte and water homeostasis

6.3.2 Acid –base balance

6.3.3 Renin-angiotensin-aldosterone system

Unit 7: MUSCULOSKELETAL AND SKIN

7.1 Normal embryological development of MSS

7.2 Introduction to rheumatology

Unit 8: HAEMATOLOGICAL SYSTEM

8.1 Haematopoiesis and disorders

8.2 Bleeding and coagulation

8.3 Haemoglobinopathies

Unit 9: ENDOCRINOLOGY

9.1: Hypothalamus and pituitary

9.1.1 Embryology of hypothalamus and pituitary glands, normal control and physiological effects of hormones

9.1.2 Disorders of hypothalamus and pituitary glands e.g. growth hormone deficiency

9.2: Adrenal glands

9.2.1 The adrenal gland embryology, action of ACTH, aldosterone, cortisone and catecholamines and an understanding of the metabolic pathways involved in the production of these hormones.

9.2.2 Disorders of hormone function e.g. CAH

9.3: Sex hormones and sexual development

9.3.1 Ovarian hormones: Embryology, production and actions of ovarian steroidal hormones and their pathway. Process of menarche and menstruation

9.3.2 The Testis: Embryology, production of various hormones produced by the testes, their secretory control, metabolic processes, and effects.

9.3.3 Disorders of Sex Differentiation

9.4 Thyroid and parathyroid glands function and disorders

9.4.1 Normal development of thyroid and parathyroid glands and common malformations

9.4.2 Control and secretion of thyroid and parathyroid hormones and their action

9.4.3 Disorders of thyroid hormone function

9.5 Pancreas endocrine gland development and disorder.

9.5.1 The Pancreatic insulin production, and effects of insulin

9.5.2 Disorders of insulin function

Unit 10: GROWTH AND DEVELOPMENT

10.1 Normal growth, development and assessment

10.2 Abnormalities in growth and development e.g. short stature, tall stature

Unit 11: GENETICS

11.1 Introduction to genetics and inheritance

11.2 Chromosomal and genetic anomalies

11.3 Basics of genetic counselling

Unit 12: IMMUNOLOGY

12.1 The principles of immunology

12.2 The development of immunity to infection – active and passive

12.3 Primary and acquired immune-deficiencies

12.4 Hypersensitivity reactions

12.5 Principles of auto-immune and immune-mediated diseases

Unit 13: MICROBIOLOGY

13.1 Introduction to common pathogens causing diseases of children

13.2 The principles of infection control

13.3 Notifiable diseases

13.4 The principles underlying the use of chemotherapeutic antimicrobial agents

Unit 14: BASIC PATHOLOGY

14.1 The general pathological and histological patterns of inflammation and degeneration.

14.2 The pathogenesis and pathophysiology of paediatric neoplasia both benign and malignant.

Unit 15: BASIC PRINCIPLES OF PHARMACOLOGY

15.1 The principles underlying the mode of action and side effects of the commonly used drugs used in children

15.2 Safe prescribing

15.3 Antimicrobial resistance

15.4 Drugs and breastfeeding

Unit 16: INTRODUCTION TO ELEMENTARY BIOPHYSICS

16.1 The basic principles and application to various systems of:

16.2 Ionising radiation - diagnostic and therapeutic radiology and environmental radiation exposure

16.3 Ultrasonography

16.4 MRI

Unit 17: HEALTH CARE ETHICS AND PROFESSIONALISM

17.1 Principles and values in healthcare ethics

17.2 International and national ethical codes

PART 2: COURSES FOR PAEDIATRICS AND CHILD HEALTH SPECIALTY TRAINING PROGRAMME

General & Themed Clinical Paediatrics and Child Health

Unit 1: INFECTIOUS DISEASES

- 1.1 Bacterial, viral, fungal, parasitic, rickettsial, mycoplasma, Pneumo-cystiscarinii infections, chlamydia, protozoal and parasitic, tuberculosis
- 1.2 HIV- transmission, universal precaution, post-exposure prophylaxis, prevention of infection.
- 1.3 Nosocomial infections, infection prevention, HIV- PMTCT, feeding recommendations, Early Infant Diagnosis, WHO staging, management of HIV exposed infant, ART

Unit 2: GENETICS

- 2.1 Terminology and symbols used in genetics, Chromosomal disorders, single gene disorders, multifactorial/polygenic disorders, pedigree analysis.
- 2.2 Cytogenetics, Genetic diagnosis and prenatal diagnosis, genetic counselling.
- 2.3 Human genome, Gene therapy

Unit 3: NEONATOLOGY

- 3.1 Perinatal care, normal newborn
- 3.2 Care in the labour room and resuscitation
- 3.3 Essential newborn care, high risk neonates, low birth weight, pre- maturity,
- 3.4 Newborn feeding, common transient phenomena,
- 3.5 Respiratory disorders- respiratory distress, RDS, MAS, apnoea;
- 3.6 Infections,
- 3.7 Cardiac disorders- CHF, cyanosis, shock;
- 3.8 Haematological- anaemia and bleeding disorders;
- 3.9 Neurologic disorders- encephalopathy, HIE, seizure, intracranial haemorrhage;
- 3.10 Gastrointestinal disorders- meconium, NEC, jaundice,
- 3.11 Renal disorders, malformations,
- 3.12 Thermoregulation and its disorders,
- 3.13 Neonatal surgical emergencies,
- 3.14 Understanding of perinatal medicine,
 - 3.14.1 Fetus, fetal monitoring, high risk pregnancies,
 - 3.14.2 Dysmorphism,

- 3.14.3 Monitoring of sick neonate, CPAP, Mechanical ventilation,
- 3.14.4 Refractory/ persistent hypoglycaemia,
- 3.14.5 Refractory seizure,
- 3.14.6 Surfactant therapy,
- 3.14.7 Follow-up of NICU graduates;
- 3.14.8 FBNC, SNCU,
- 3.14.9 Cardiac stabilization, functional echocardiography,
- 3.14.10 High frequency ventilation, ECMO, IEM presenting in neonates.

Unit 4: GROWTH AND DEVELOPMENT

- 4.1 Growth and development at different ages, puberty and its regulation.
- 4.2 Principles of growth and development
 - 4.2.1 Normal growth and development in infancy
 - 4.2.2 Childhood and adolescence
 - 4.2.3. Deviations in growth and development
 - 4.2.4. Sexual maturation and its disturbances
- 4.3 Failure to thrive
- 4.4 Growth charts.

Unit 5: BEHAVIORAL AND PSYCHOLOGICAL DISORDERS

- 5.1 Rumination, pica, enuresis, encopresis, sleep disorders, habit disorders, breath holding spells
- 5.2 Anxiety disorders, mood disorders, temper tantrums, attention deficit hyperactivity disorder
- 5.3 Autism spectrum disorder.
- 5.4 Childhood psychosis, suicide. Psychological treatment

Unit 6: COMMUNITY & SOCIAL PEDIATRICS

- 6.1 National health programs, nutrition screening of community, prevention of blindness.
- 6.2 School health programs.
- 6.3 Adolescent health, adoption, child labour, juvenile delinquency.
- 6.4 Investigation of adverse events following immunization in the community.
- 6.5 Government and non-government support services for children.
- 6.6 General principles of prevention and control of infections including food borne, waterborne.
- 6.7 Soil borne and vector borne diseases.
- 6.8 Investigation of an outbreak in a community.
- 6.9 Prevention of sexually transmitted diseases, contraception.
- 6.10 Health legislation, national policy on children.

Unit 7: RESPIRATORY

- 7.1 Congenital and acquired disorders of nose
- 7.2 Infections of upper respiratory tract
- 7.3 Tonsils and adenoids, obstructive sleep apnea

- 7.4 Congenital anomalies of lower respiratory tract
- 7.5 Bronchomalacia, tracheomalacia
- 7.6 Acute inflammatory upper airway obstruction, foreign body in larynx, trachea and bronchi
- 7.7 subglottic stenosis (acute and chronic)
- 7.8 trauma to larynx,
- 7.9 bronchitis, bronchiolitis
- 7.10 aspiration pneumonia, GER, acute pneumonia, recurrent and interstitial pneumonia
- 7.11 suppurative lung disease, atelectasis,
- 7.12 bronchial asthma
- 7.13 pulmonary edema
- 7.14 bronchiectasis
- 7.15 pleural effusion, hemothorax, chylothorax, pulmonary leaks, mediastinal mass.
- 7.16 Congenital disorders of lung, lung cysts
- 7.17 Emphysema and hyper-inflation
- 7.18 neoplasm of larynx, trachea, bronchi and lung
- 7.19 Aspiration syndromes
- 7.20 Immune and inflammatory lung diseases, cystic fibrosis, alpha-1 antitrypsin deficiency
- 7.21 PFT Hemosiderosis, diffuse lung diseases,
- 7.22 skeletal diseases influencing pulmonary function
- 7.23 extrapulmonary diseases with pulmonary manifestation, chronic respiratory insufficiency, pulmonary embolism, hemorrhage

Unit 8: CARDIOVASCULAR

- 8.1 Evaluation of CVS
- 8.2 Congenital heart diseases (cyanotic and acyanotic)
- 8.3 Rheumatic fever and rheumatic heart disease
- 8.4 Infective endocarditis
- 8.5 Cardiac arrhythmias, diseases of myocardium (cardio-myopathy, myocarditis), diseases of pericardium, systemic hypertension.
- 8.6 Treatment of congenital heart diseases
- 8.7 Cardiac therapeutics, cardioversion, defibrillation
- 8.8 Pulmonary hypertension
- 8.9 Interpretation of ECG, Echocardiography.
- 8.10 Diseases of peripheral vascular system
- 8.11 Tumors of heart
- 8.12 hyperlipidemia in children
- 8.13 heart and heart –lung transplantation

Unit 9: GASTROINTESTINAL AND LIVER DISEASES

- 9.1 Diseases of mouth, oral cavity and tongue
- 9.2 disorders of deglutition and esophagus
- 9.3 peptic ulcer disease, H. pylori infection
- 9.4 foreign body
- 9.5 pyloric stenosis
- 9.6 intestinal obstruction
- 9.7 peritonitis,

- 9.8 ascitis
- 9.9 acute and chronic diarrhea, constipation
- 9.10 chronic abdominal pain
- 9.11 Liver disorders:
 - 9.11.1 manifestations of liver disease
 - 9.11.2 hepatitis
 - 9.11.3 cholestasis
 - 9.11.4 hepatic failure
 - 9.11.5 chronic liver disease
 - 9.11.6 Wilson's disease
 - 9.11.7 Cirrhosis and portal hypertension
- 9.12 Motility disorders of oesophagus, intestine, colon; Hirsch-sprung's disease, foreign bodies/
Bezors
- 9.13 anorectal mal-formations
- 9.14 surgical conditions of anus and rectum
- 9.15 hernia
- 9.16 malabsorption syndrome, celiac disease, CMPA, IBS
- 9.17 drug and toxin induced liver disease
- 9.18 biliary tract diseases
- 9.19 Eosinophilic gastroenteritis
- 9.20 appendicitis
- 9.21 intestinal transplantation
- 9.22 Budd-Chiari syndrome
- 9.23 Metabolic diseases of liver
- 9.24 liver diseases associated with systemic disorders
- 9.25 liver transplantation
- 9.26 Pancreatic disorders.

Unit 10: RENAL DISORDERS

- 10.1 Acute and chronic glomerulonephritis
- 10.2 proteinuria, nephrotic syndrome
- 10.3 hematuria, hemolytic uremic syndrome
- 10.4 Urinary tract infection
- 10.5 VUR and renal scarring
- 10.6 Renal and bladder stones
- 10.7 posterior urethral valves
- 10.8 Hydronephrosis
- 10.9 Voiding dysfunction, enuresis
- 10.10 Undescended testis
- 10.11 Congenital and hereditary renal disorders
- 10.12 Acute kidney injury, chronic kidney disease, renal tubular disorders, renal tubular acidosis
- 10.13 Diabetes insipidus
- 10.14 obstructive uropathy
- 10.15 neurogenic bladder
- 10.16 Renal Function Test, MCU
- 10.17 Renal involvement in systemic diseases

- 10.18 Renal replacement therapy
- 10.19 Renal transplantation
- 10.20 Trauma to genitourinary tract
- 10.21 Renal scan
- 10.22 Gynaecological problems of childhood.

Unit 11: EMERGENCY AND CRITICAL CARE

- 11.1 Emergency care of shock, cardio-respiratory arrest, respiratory failure, congestive cardiac failure, acute renal failure, status epilepticus
- 11.2 fluid and electrolyte disturbances and its therapy, acid-base disturbances
- 11.3 poisoning, accidents, scorpion and snake bites
- 11.4 Choice of Inotropes
- 11.5 BLS, PALS, CVP monitoring, ARDS, Mechanical ventilation, ECMO

Unit 12: SKIN DISEASES

- 12.1 Exanthematous illnesses
- 12.2 vascular lesions
- 12.3 infections & infestations: pyogenic, fungal and parasitic
- 12.4 eczema, seborrheic dermatitis, drug rash, urticaria,
- 12.5 Vesicobullous disorders, Steven-Johnson syndrome.
- 12.6 Nutritional dermatosis
- 12.7 pigment disorders
- 12.8 alopecia,
- 12.9 ichthyosis,
- 12.10 Viral infections
- 12.11 Ectodermal dysplasia
- 12.12 Diseases of epidermis
- 12.13 Lipodystrophy
- 12.14 disorders of hairs.

Unit 13: ENT

- 13.1 Acute and chronic otitis media
- 13.2 conductive/sensorineural hearing loss
- 13.3 post-diphtheritic palatal palsy
- 13.4 sinusitis
- 13.5 epistaxis
- 13.6 acute/chronic tonsillitis/adenoids
- 13.7 allergic rhinitis/sinusitis
- 13.8 foreign body
- 13.9 Hearing assessment, audiometry

Unit 14: EYE PROBLEMS

- 14.1 Cataract, night blindness
- 14.2 conjunctival and corneal disorders
- 14.3 Retinopathy of pre-maturity
- 14.4 retinoblastoma

- 14.5 optic atrophy
- 14.6 papilledema
- 14.7 Refraction and accommodation
- 14.8 partial/total loss of vision
- 14.9 chorio-retinitis
- 14.10 strabismus.

Unit 15: NEUROLOGIC DISORDERS

- 15.1 Congenital anomalies of CNS
- 15.2 Seizure and non-seizure paroxysmal events
- 15.3 epilepsy and epileptic syndromes of childhood
- 15.4 Headache
- 15.5 stroke
- 15.6 meningitis, brain abscess, coma, acute encephalitis and febrile encephalopathies
- 15.7 Guillain-Barre syndrome,
- 15.8 neurocysticercosis and other neuro- infestations
- 15.9 HIV encephalopathy
- 15.10 SSPE
- 15.11 cerebral palsy, mental retardation, learning disabilities
- 15.12 muscular dystrophies, acute flaccid paralysis and AFP surveillance, ataxia
- 15.13 Developmental assessment scales
- 15.14 neurodegenerative/ neuro-metabolic disorders
- 15.15 Demyelinating disorders
- 15.16 neuro-cutaneous syndromes
- 15.17 movement disorders of childhood, Myasthenia gravis, SMA.
- 15.18 Developmental disorders of muscle, metabolic myopathies, HMSN, Toxic and autonomic neuropathy
- 15.19 EMG, NCV, EEG, Neuroimaging.

Unit 16: HEMATOLOGY AND ONCOLOGY

- 16.1 Anemia of inadequate production:
 - 16.1.1 Iron deficiency anemia
 - 16.1.2 Aplastic anemia;
 - 16.1.3 Hemolytic anemia,
 - 16.1.4 pancytopenia
 - 16.1.5 disorders of hemostasis, thrombocytopenia
- 16.2 Blood component therapy
- 16.3 Transfusion related events and infections
- 16.4 Acute and chronic leukemia
- 16.5 Hodgkin disease, non-Hodgkin's lymphoma.
- 16.6 Polycythemia
- 16.7 Sarcomas
- 16.8 Bone tumors, brain tumors
- 16.9 Neuroblastoma, Wilm's tumor, nephroblastoma, Retinoblastoma
- 16.10 Gonadal & germ cell tumors
- 16.11 Spleen disorders

- 16.12 Molecular and cellular biology of cancer
- 16.13 Principles of cancer treatment, regimens for common cancers, oncologic emergencies.
- 16.14 Hyper-coagulable states, thrombotic diseases
- 16.15 Myelodysplastic syndrome, histiocytosis syndromes
- 16.16 Lymphatic system disorders,
- 16.17 Bone marrow transplant/ stem cell transplant
- 16.18 Rare tumors: thyroid tumors, melanoma, nasopharyngeal carcinoma, adenocarcinoma colon rectum, desmoplastic small round cell tumors

Unit 17: ENDOCRINOLOGY, METABOLIC DISORDERS

- 17.1 Hypopituitarism/ hyperpituitarism
- 17.2 Diabetes insipidus
- 17.3 Pubertal disorders
- 17.4 Hypo- and hyper-thyroidism
- 17.5 Hypo- and hyperparathyroidism
- 17.6 Adrenal insufficiency, Cushing's syndrome
- 17.7 Adrenogenital syndromes
- 17.8 Diabetes mellitus
- 17.9 Hypoglycemia
- 17.10 Short stature
- 17.11 Gonadal dysfunction and intersexuality
- 17.12 Pubertal changes and gynecological disorders.
- 17.13 Defect in metabolism of Amino acids, Lipids, Carbohydrates, MPS, Nucleic acids.
- 17.14 Porphyrias, Progeria

Unit 18: IMMUNOLOGY AND RHEUMATOLOGY

- 18.1 Immune system
- 18.2 Disorders of immunoglobulins
- 18.3 T and B cell disorders
- 18.4 Immunodeficiency syndromes
- 18.5 Allergic disorders
- 18.6 Arthritis (acute and chronic)
- 18.7 Connective tissue disorders
- 18.8 Phagocytic system, complement system
- 18.9 Vasculitis syndromes
- 18.10 Approach to immune disorder
- 18.11 Musculoskeletal pain syndrome
- 18.12 Immunotherapy

Unit 19: PEDIATRIC ORTHOPEDICS

- 19.1 Major congenital and developmental bone and joint disorders
- 19.2 bone and joint infections: pyogenic, tubercular
- 19.3 Skeletal dysplasias
- 19.4 Metabolic bone disease

19.5 Sport medicine

19.6 Rehabilitation medicine

APPROACH TO IMPORTANT CLINICAL PROBLEMS:

Growth and development. Short stature, obesity, precocious and delayed puberty, developmental delay, impaired learning.

Neonatology. Normal newborn, low birth weight newborn, sick newborn.

Nutrition. Lactation management and complementary feeding, protein energy malnutrition (underweight, wasting, stunting) and micronutrient deficiencies, failure to thrive.

Cardiovascular. Murmur, cyanosis, congestive heart failure, systemic hypertension, arrhythmia, shock.

GIT and liver. Acute, persistent and chronic diarrhea, abdominal pain and distension, ascitis, vomiting, constipation, gastrointestinal bleeding, jaundice, hepatosplenomegaly and chronic liver disease, hepatic failure and encephalopathy.

Respiratory. Cough/chronic cough, noisy breathing, wheezy child, respiratory distress, hemoptysis.

Infections. Acute onset pyrexia, prolonged pyrexia with and without localizing sign, recurrent infections, nosocomial infections.

Renal. Hematuria/dysuria, bladder/bowel incontinence, voiding dysfunctions, inguinoscrotal swelling, renal failure (acute and chronic).

Hemato-oncology. Lymphadenopathy, anemia, bleeding.

Neurology. Limping child, convulsions, abnormality of gait, intracranial space occupying lesion, paraplegia, quadriplegia, large head, small head, floppy infant, acute flaccid paralysis, cerebral palsy and other neuromotor disability, headache.

Endocrine. Thyroid swelling, ambiguous genitalia, obesity, short stature.

Skin/Eye/ENT. Skin rash, pigmentary lesions, pain/discharge from ear, hearing loss, epistaxis, refractory errors, blindness, cataract, eye discharge, redness, squint, proptosis.

Miscellaneous. Habit disorders, hyperactivity and attention deficit syndrome, arthralgia, arthritis, multiple congenital anomalies.

PRACTICAL CLINICAL SKILLS

History and examination. History taking including psychosocial history, physical examination including fundus examination, newborn examination, including gestation assessment; thermal protection of young infants, nutritional anthropometry and its assessment, assessment of growth, use of growth chart, SMR rating, developmental evaluation, communication with children, parents, health functionaries and social support groups; and genetic counseling.

BEDSIDE PROCEDURES

Monitoring skills:

Must know: Temperature recording, capillary blood sampling, monitoring on multi-parameter monitor, arterial blood sampling, and hand wash, wearing gloves.

Should know: CVP monitoring, brain function monitoring

Therapeutic skills:

Must know: Gastric lavage, nasogastric feeding, endotracheal intubation, cardiopulmonary resuscitation (pediatric and neonatal), providing respiratory support: CPAP & mechanical ventilation, exchange transfusion, administration of oxygen, aerosol therapy, venepuncture and establishment of vascular access, umbilical venous cannulation, administration of fluids, blood, blood components, parenteral nutrition, intraosseous fluid administration, intrathecal administration of drugs, common dressings, abscess drainage and basic principles of rehabilitation.

Should know: umbilical arterial access, peripheral arterial line, central vascular access, peritoneal dialysis, ventricular tap.

Investigative skills:

Must know: Lumbar puncture, bone marrow aspiration, pleural, peritoneal, and subdural tap, collection of urine for culture, urethral catheterization, supra-pubic aspiration.

Should know: ventricular tap, pericardial tap.

Bedside investigations. Hemoglobin, TLC, ESR, peripheral smear staining, sepsis screen and examination, urine: routine and microscopic examination, stool microscopy including hanging drop preparation, examination of CSF and other body fluids.

Should know: Gram stain, ZN stain, shake test on gastric aspirate.

Interpretation of X-rays of chest, abdomen, bone and head; ECG; ABG findings; PFT, Echocardiography, CT scan & MRI scan (**must know**).

Understanding of common EEG patterns, audiograms, ultrasonographic abnormalities and isotope studies (**Should know**).

INDICATIVE RESOURCES

Anne R. Hansen, Eric C. Eichenwald, Ann R. Stark and Camilia R. Martin (2016). *Cloherly and Stark's Manual of Neonatal Care (Edition 8)*. Wolters Kluwer, ISBN 9781496343611

Bernard Rosner. *The Fundamentals of Biostatistics*. Duxbury Press, Belmont CA 5th edition 1995

Browner WS. *Publishing and Presenting Clinical Research*. 2nd ed. Philadelphia: Lippincott Williams & Wilkins; 2006.

Daniels, (1991). *Biostatistics: A Foundation for Analysis in Health Sciences (6th Edition)*. John Wiley and Sons Inc, New York.

Gleason, C. and Juul, S (2016). *Avery's Diseases of the Newborn (Edition 9)*. Elsevier, ISBN: 978-0-323-40139-5

Goering R V, H M, Zuckerman M, Wakelin D, Roitt I, Mims C and Chiodini P (2007). *Mims' Medical Microbiology (4th edition)*. Mosby. . ISBN: 978-0-32304475-2.

Hulley SB, Cummings SR, Browner WS, et al. *Designing Clinical Research*. 3rd ed. Philadelphia: Lippincott Williams & Wilkins; 2007.

Kenneth J Rothman: *Epidemiology: An introduction* Oxford University press 2002

Kliegman, R., Stanton, B., St. Geme, J. W., Schor, N. F., & Behrman, R. E. (2016). *Nelson textbook of pediatrics (Edition 20)*. Philadelphia, PA: Elsevier.

Murray R, Granner D, Mayes P and Rodwell V (2006). *Harper's Illustrated Biochemistry*. McGraw-Hill. ISBN: 978-0-07-146197-9

Schoenwolf G C, Bleyl B S, Brauer P R and Francis-West P H. (2008). *Larsen's Human Embryology (4th edition)*. Churchill. ISBN: 978-0-443-06811-9

Sinnatamby C S (2006). *Last's Anatomy - Regional and Applied (11th edition)*. Churchill. ISBN: 978-0-443-10033-8

Underwood JCE (2009). *General and Systemic Pathology (5th edition)*. Churchill. ISBN: 978-0443-06888-

1. Subspecialty Books:

- Menkes Pediatric neurology
- Swaiman's Pediatric Neurology
- Pediatric cardiology by Park
- Rogers Pediatric intensive care

2. Journals

- Journal of Pediatrics
- Pediatric Clinics of North America
- Seminar in Neonatology
- Seminar in Perinatology
- Archives of Diseases of Childhood