Master of Medicine (Paediatric)

Entrance Exam Syllabus

The entrance examination consists of 2 papers.

- Paper 1
    - 40 True False multiple choice questions (MCQ).
    - 1 hour 45 min
- Paper 2
    - 40 questions with 20 One Best Answer MCQ and 20 EMI
    - 1 hour 15 min

Please refer to the syllabus for a complete scope of knowledge.

Revised 29/01/2024

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ACUTE CLINICAL MEDICINE

Syllabus	Learning outcomes	Content
The seriously ill child	Able to recognise a seriously ill child	Clinical features of serious illness – respiratory distress, shock, decreased level of consciousness Symptoms and signs of impending cardiorespiratory arrest Pathophysiological consequences of serious illness
Fluid and electrolyte balance	Able to discuss fluid and electrolyte homeostasis Able to manage fluid and electrolyte imbalances	Physiology of body fluids Fluid and electrolyte requirements in well and unwell infants and children of different ages Assesment of fluid status / dehydration Principles of fluid and electrolyte maintenance and replacement Knowledge on content of commonly available replacement fluids
Respiratory failure (also refer to Section on Respiratory)	Knows the causes, pathophysiology and signs of respiratory failure Able to discuss the use of oxygen therapy	Causes of respiratory distress/ failure (upper airway obstruction, lower airway obstruction, lung parenchyma disease, and disordered control of breathing) Pathophysiology of respiratory failure in the above situations Signs of respiratory failure Indications, methods of delivery, monitoring and adverse effects of oxygen therapy

		Principles of SPO2 monitoring
Shock	Able to recognise the child with shock and provide initial resuscitation	Definition of shock Differentiation of compensated and decompensated shock Different types of shock (hypovolaemic, cardiogenic, distributive and obstructive) and their pathophysiology Types of fluid for resuscitation including advantages and disadvantages of crystalloids and colloids Utilisation fluid resuscitation as initial management
Coma	Able to recognise and evaluate a comatose child	Common causes of coma in children Age- related Glasgow coma score
Arrhythmias and rhythm disturbances	Able to recognize and manage common rhythm disturbances	Read and interpret a normal electrocardiogram Features of the following rhythm disturbances: • Heart block • Sinus bradycardia • Asystole • Pulseless electrical activity • Supraventricular tachycardia • Ventricular tachycardia • Ventricular fibrillation

Poisoning/drug overdose Envenomation Drowning Burns	Knows common poisonings and envenomation	Clinical pharmacology of the common and serious poisonings/drug overdose: • Paracetamol • Kerosene Presentation of common envenomation: • Bee stings • Snake bites Salt and freshwater drowning Assessment of burns (rule of 9) and fluid resuscitation
Transportation and use of retrieval services	Knows principles involved in the transportation of an ill child	Anticipates patients in whom rapid deterioration can occur and provide necessary management plan Recognises the need and able to discuss the case with the more senior staff if transportation or retrieval to another facility is required Preparation of a patient for transfer to another facility

CARDIOLOGY

Syllabus	Learning Outcomes	Content
Anatomy and physiology of circulation	Able to describe anatomy and physiology of normal circulation Able to describe anatomy and physiology of foetal circulation Knows the embryology of the heart – normal development of the heart	Anatomy of the heart and great vessels Understanding of cardiac cycle Circulatory changes at birth in health and disease
Common cardiac signs	Able to understand cyanosis Able to describe different types of cardiac murmurs	Cyanosis: definition & differential diagnosis Cardiac murmurs: innocent and pathological Heart failure
Conducting system and arrythmia	Able to understand the conducting system of the heart and its relation to electrocardiogram (ECG)	Basic knowledge and interpretation of ECG ECG changes from birth to adolescence ECG for sinus rhythm, arrhythmias, heart block
Heart Failure	Able to describe the pathophysiology and clinical presentation and principles of management of heart failure	Heart failure: pathophysiology, clinical presentation and principles of management
Acyanotic Heart Defects	Able to describe the pathophysiology and clinical presentation of acyanotic heart defects	Concept of left to right shunt Knowledge on common conditions with similar shunting including VSD, ASD, PDA, AVSD

Cyanotic Heart Defects	Able to describe the pathophysiology, clinical presentation and principles of management of cyanotic heart conditions	Describe common ductal & non-ductal dependent conditions Indications for prostaglandin (PG) in ductal dependent heart lesions Hypercyanotic spells
Obstructive Heart Lesions	Able to describe the pathophysiology and clinical presentation of the common obstructive heart lesions	Clinical presentation - left and right-sided heart lesions
Acquired Heart Diseases	Able to understand the common acquired heart disease	Diagnosis and principles of management of: • Rheumatic heart disease • Kawasaki disease • MISC • Myocarditis • Infective endocarditis • Cardiomyopathy
Pharmacotherapy	Able to describe the common medications used in cardiology	• Diuretics • Prostaglandin • Antifailures (diuretics, ACE-I, digoxin) • Antiarryhtmia (Adenosine, amiodarone) • Prostaglandin • Common inotropes (dopamine, dobutamine, noradrenaline, adrenalin, vasopressin)

COMMUNITY PAEDIATRICS

Syllabus	Learning outcome	Content
Preventive health care & health promotion	Knows the role of community health services in preventive health care & health promotion	Emerging and lifestyle diseases e.g. obesity Common community paediatric problems eg. sleep, eating, encopresis, enuresis, school refusal, ADHD, ASD, depression and oppositional disorders Development of understanding of emotions, behaviour, at different age groups Immunization
Advocacy	Knows child rights as the basis for advocacy	Concepts of child rights Categories of rights under *UN Convention on the Rights of the Child*
Child Protection and child maltreatment (Safeguarding)	Knows the different forms of child abuse and an approach to management	Clinical presentation of different forms of child abuse (physical, sexual & emotional abuse, child neglect) Principles of management – including multidisciplines eg OSCC Complexity of cases related to Munchausen by proxy, child grooming, corporal punishment etc
Injury Prevention	Knows of unintentional injuries in young children	Types & common causes of unintentional injuries in young children road, drowning, falls, etc Strategies for prevention Current trend of unintentional neglect – baby left in car, unsupervised children at

		home, homeless children
Children in disadvantaged communities	Knows categories of disadvantaged children & their associated problems	Categories: Urban poor/slums, Rural poor, Estates, Indigenous, Migrants Associated problems: malnutrition, failure to immunize, infectious disease, risk of injury, development & schooling problems Health exploitation and social deprivation – undocumented, refugee, young carers and orang asli community Understanding the impact of psychosocial elements such as domestic violence, substance misuse, chronic physical illness to children
Screening	Knows of screening programmes conducted for infants and children	WHO criteria for implementing a screening programme Umbilical cord blood screening for hypothyroidism & G6PD deficiency, hearing assessment – rationale & implementation Screening for faltering growth, behaviour symptoms and psychosocial impacts
Routine Health Surveillance	Knows the importance of health surveillance as a preventive health strategy	Monitoring of Growth Normal growth patterns Indices to measure growth Developmental delay: screening, types, causes & indications for referral

The child in school	Knows of problems encountered by children in schools	School bullying School & examination pressure Sexual health Trend of self-harm, smoking, illicit behaviour, risk takers and mental health issues
Epidemiology / Child public health	Knows health indicators for children and collaboration with organizations and agencies associated with health promotion and prevention	Indicators of child health in a population (under 5 mortality, infant mortality rate, perinatal MR, neonatal MR) Implications and management of acute public crisis eg COVID-19 outbreak Local health organizations to tackle specific issues

DERMATOLOGY

Syllabus	Learning outcome	Content
Anatomy and physiology of skin	Able to describe structure and function of the skin	Anatomy and physiology of skin
Skin infections	Able to recognise clinical features Knows basic principles in the management of skin infections Understands the infective agents • Bacterial • Fungal (superficial) • viral	<u>BACTERIAL</u> *Impetigo* *Ecthyma* *Cellulitis* *Folliculitis* *SSSS* <u>FUNGAL</u> *Tinea infection/candida* <u>VIRAL</u> *Molluscum* *Viral warts*
Skin Infestations	Able to recognize clinical features Knows basic principles in the management of skin infestations	Scabies Lice
Inflammatory Dermatoses	Able to recognise clinical features Knows basic principles in the management of common inflammatory dermatoses	Seborrheic dermatitis Atopic dermatitis
Neonatal Dermatoses	Able to recognize manage common physiological skin changes in newborn Able to recognise common birthmarks Able to recognize congenital bullous disorders Able to recognize congenital icthyosis	Milliaria Erythema toxicum neonatorum Port wine Stain Infantile haemangiomas Infantile haemangioma – Kasabach Merritt syndrome Epidermolysis bullosa Collodian baby
Principles of skin treatment	Understands the common topical preparations in dermatology	Potencies of topical steroids and complications of topical steroids

Skin and systemic diseases	Able to recognize common skin manifestations of systemic diseases including emergencies	Neurofibromatosis Tuberous Sclerosis Sturge Weber Systemic Lupus erythematosus Steven Johnson Scalded Skin

DEVELOPMENT PAEDIATRICS

Syllabus	Learning Outcomes	Content
Child development	Able to describe the anatomical basis of development Able to describe principles of normal child development Able to recognise abnormal developmental milestones.	Concept of: • Neurulation process • Synaptic pruning Normal development including gross motor, fine motor, speech and language, emotional, cognitive Normal visual and hearing development Factors influencing child development Normal variation and deviation and abnormality in developmental assessment Red flags in normal development
Developmental Delay and intellectual disability (ID)	Able to identify a child with developmental delay Able to discuss the aetiology of developmental delay. Able to identify a child with ID Able to discuss the aetiology of ID	Global developmental delay • Definitions • Aetiology Specific developmental delay – motor, speech delay Intellectual disabilities • Definition • Aetiology
Developmental regression	Able to define and identify developmental regression and its causes	Developmental regression • definition • aetiology
Learning disability	Able to define and identify learning disability and its causes	Definition Learning disability Specific learning disorder - dyslexia

Behavioural problems	Able to identify common behavioural problems in children	Autism spectrum disorder ADHD • clinical features • comorbidities

ENDOCRINOLOGY

Syllabus	Learning Outcomes	Content
The Hypothalamic Pituitary Axis	Able to describe the embryology and physiology of the hypothalamic pituitary and target organ axis.	Physiology of hypothalamic pituitary thyroid, gonadal and growth axes. Synthesis, transport, biochemical actions and control of hormones.
Growth	Understands normal growth; physical and endocrinological changes. Factors determining physical growth ie genetic, hormonal, environmental (prenatal and postnatal). Method of correct and accurate method of measuring growth. Able to identify and diagnose short stature.	Physiology of hypothalamic pituitary growth axis. Normal growth pattern: from prenatal growth to puberty. Principles of growth charts: normal distribution, understanding of mid-parental height, target height. Growth monitoring: accurate auxology measurement. Causes and approach to short stature.
Normal Puberty & Pubertal Disorder	Able to describe the physical and hormonal changes of normal puberty. Able to detect disorders of precocious puberty	Physiology of puberty. Assessment of puberty: Tanner staging (boys and girls) Precocious Puberty: • Central vs peripheral: characteristics and investigations • Variants of normal development (premature thelarche, premature pubarche)
Childhood diabetes	Able to describe the homeostasis of blood sugar and physiology of insulin. Understands the principles of diagnosis and types (Type 1 vs Type 2) of diabetes. Knows diabetic ketoacidosis.	Glucose homeostasis. Criteria to diagnose diabetes in children. Characteristics of diabetes in children: Type 1 vs Type 2. Diabetic ketoacidosis: clinical features, pathophysiology and principles of management

Vitamin D and Calcium Metabolism	Able to describe vitamin D and calcium homeostasis. Knows disorders of calcium metabolism and vitamin D abnormalities. Able to diagnose and manage hypocalcaemia	Calcium homeostasis. Vitamin D metabolism. Clinical features and causes of vitamin D and calcium abnormalities. Assessment/investigation and principles of management of childhood hypocalcaemia.
Congenital Hypothyroidism	Understands and explains the development and physiology of the thyroid gland. Knows the synthesis, transport, biochemical actions and control of thyroid hormones. Able to discuss aetiology and principles of management of congenital hypothyroidism.	Physiology of hypothalamic pituitary thyroid axis. Cord blood TSH screening; importance of screening, interpretation of screening results. Congenital hypothyroidism: clinical presentation and investigation, principles of management
Ambiguous genitalia	Understands steroid biosynthesis and the effect of 21-hydroxylase deficiency Able to detect and evaluate ambiguous genitalia	Embryology and development of genitalia. Approach to ambiguous genitalia and salt-losing crisis in 21-hydroxylase deficiency.

GASTRO-HEPATOLOGY

Syllabus	Learning outcomes	Content
Embryology	Able to describe the embryology and development of the gastrointestinal system	Embryology of the gastrointestinal and hepatobiliary systems
Acute presentations – Gastro-intestinal		
Acute abdominal pain	Knows the causes of acute abdominal pain and their presentation	Causes of acute abdomen (medical and surgical) Conditions which require urgent intervention e.g. intussusception
Acute diarrhoea and/or vomiting	Knows the causes of acute diarrhoea and/or vomiting and assessment of dehydration Knows about oral and intravenous fluid therapy	Pathophysiology Causes of acute diarrhoea and/or vomiting Mechanisms of diarrhoea Assessment of dehydration Local isolation policies Principles of oral and intravenous fluid therapy
Upper and lower gastrointestinal bleeding	Knows the approach to upper and lower gastrointestinal bleeding Able to assess the severity and the potentially life-threatening nature of this condition	Causes of gastrointestinal bleeding Emergency treatment
Acute presentations – Hepatobiliary system		

Congenital abnormalities of the gastrointestinal tract	Knows the presenting features of congenital abnormalities	Causes, clinical features, pathophysiology including tracheo-oesophageal fistula, malrotation, bowel atresias, Hirschsprung's disease, abdominal wall defects, diaphragmatic hernia Potential associated abnormalities
Acute liver failure	Knows the pathophysiology and approach to acute liver failure	Causes of acute liver failure Pathophysiology Clinical features and laboratory parameters Complications of acute liver failure
Acute jaundice	Evaluation of childhood jaundice i.e. pre-hepatic, hepatic and post-hepatic causes	Investigations to evaluate cause of jaundice and hepatitis Viral hepatitis A, B, C, D, E

Outpatient presentations		
Recurrent vomiting	Knows the presenting features of gastro-esophageal reflux (GER) and GER disease	Range of signs and symptoms associated with GER and GERD
Chronic or recurrent abdominal pain	Knows the causes and presentations of chronic or recurrent abdominal pain	Causes and features that suggest functional and underlying pathological conditions
Chronic diarrhoea	Knows the causes and presentation of chronic diarrhoea	Causes of chronic diarrhoea Pathophysiology/mechanism of chronic diarrhoea and features eg osmotic/malabsorption secretory, motility, inflammatory
Constipation	Knows the approach to chronic constipation	Features that suggest functional and underlying pathological conditions predisposing conditions e.g. hypothyroidism, neurodisability, psychosocial problems

Jaundice	Approach to prolonged jaundice in neonates/infants	Recognise the causes of cholestatic and non-cholestatic jaundice in neonates/infants

GENETICS – INHERITED ERRORS AND METABOLISM

Syllabus	Learning Outcomes	Content
Basic Genetics	Understands the scientific basis of inherited disorders	Basic cell biology-physiology, function Chromosomes and genes
	Understand basis of patterns of inheritance	Constructing a pedigree Interpretation of modes of inheritance
	Understand the basis of molecular genetics disorders	Gene structure and function Mutations and diseases
Birth defects and common chromosomal conditions	Know about birth defects and the features of some common chromosomal conditions	Basic principles of embryology Birth defects – major and minor Multiple birth defects and chromosomal disorders Common chromosomal conditions eg. • Down syndrome • Edward syndrome • Patau syndrome • Turner and associated problems
Inherited metabolic diseases	Knows the basis of inherited metabolic disease Recognises a child at risk for inherited metabolic disease Knows the appropriate screening investigations that should be performed when a metabolic disorder is suspected	Genes and enzymes Metabolites: • Acidosis • Lactate • Ammonia • Glucose • Ketones Pathogenesis Clinical presentation Basic screening for inborn errors of metabolism

HAEMATO-ONCOLOGY

Syllabus	Learning Outcomes	Content
Haematology		
Haemopoiesis	Knows the differentiation of the pluripotent stem cells	Development, structure and function of 3 cell lines
Haemoglobin	Changes of haemoglobin chain from embryo , after birth to adolescence	Normal and abnormal haemoglobin types Red cell indices Components of FBC, differentials
Haemostasis	Knows the approach to a child with bleeding tendencies	Physiology of normal and abnormal haemostasis Inherited & acquired haemostatic disorders: Haemophilia A/B, von Willebrand disease, Idiopathic immune thrombocytopenia Coagulation pathway, PT/APTT Clinical and laboratory diagnosis of bleeding disorders
Anaemia	Knows the differential diagnosis, classification and basic investigations of childhood anaemia Able to explain mMetabolism of iron	IDA Megaloblastic Anaemia Haemolytic Anaemia Diagnosis, prevention and management of iron deficiency anaemia
Blood products	Has basic knowledge on types of blood products and side effects of blood products	Whole blood Packed RBC Platelets FFP
Thalassaemia and other haemoglobinopathies	Diagnosis & management: • Transfusion dependent • Non-transfusion dependent	Principles of hypertransfusion Complications of chronic iron overload Screening Genetic counselling

Oncology		
Common childhood malignancies	Knows the clinical presentation, differential diagnosis, laboratory findings of common childhood malignancies	Acute Leukaemias Lymphomas Brain tumours: eg medulloblastoma Neuroblastoma Wilms tumour Hepatoblastoma
Oncological emergencies	Able to recognize and diagnose oncological emergencies Knows the clinical presentation Able to interpret laboratory findings Knows the principles of management	Tumour lysis syndrome Hyperleukocytosis Febrile neutropenia SVC obstruction

IMMUNOLOGY AND ALLERGY

Syllabus	Learning Outcomes	Content
Normal body defense mechanisms	Able to compare and contrast innate and adaptive immunity	Differences between innate and adaptive immunity Components of innate immunity Characteristics of adaptive immunity – specificity, diversity, discrimination between self and non-self, memory The 4 types of adaptive immunity
Cellular and humoral immunity	Able to outline the general steps involved in adaptive immune response	Components of adaptive immunity – humoral immunity and cell-mediated immunity Humoral and cellular immune responses Primary and secondary immune responses
Hypersensitivity	Knows the different types of hypersensitivity reactions Recognises a child with anaphylaxis and initiate basic emergency and supportive care	Gell and Coombs classification of hypersensitivity reactions and give examples Basic mechanisms involved in 4 types of hypersensitivity Pathophysiology of anaphylaxis Clinical presentations of anaphylaxis Diagnosis and management of anaphylaxis The indications for auto-injector epinephrine

Immunodeficiencies/ Primary immunodeficiencies (PID)	Able to identify clinical manifestation of immunodeficiency Able to outline the indications for investigating for PID	Clinical predictors of PID -and secondary immunodeficiency Common basic screening tests in suspected patients with PID – full blood count, humoral, cellular, phagocytic

INFECTIOUS DISEASE

Syllabus	Learning outcome	Content
Immunisation	Knows the physiological basis and principles of immunisation Able to counsel and advise parents on common immunisation issues like vaccine hesitancy or refusal, timing and spacing of immunisations Reporting of AEFIs to relevant authorities	Physiology of vaccination Concept of herd immunity Active and passive immunisations Live attenuated and inactivated vaccines Adverse events following immunisation (AEFIs) Contraindications and precautions to routine childhood immunisation Malaysian NIP and policy
Fever of unknown origin	Able to approach a child with FUO	Definition –classical FUO, and evolving definitions Simple classification – classical FUO and fever due to nosocomial infections, cyclical neutropenia and periodic fever syndromes, neutropenic fever, fever in HIV infections Causes of FUO and their investigations
Sepsis and septic shock	Recognises early features of septic shock Able to initiate resuscitation and early management	Pathophysiology and its complications Predisposing conditions – immunocompromised, central lines, etc Principles of management
Prescribing common anti-infectives	Able to rationalize the use of anti- microbials in different clinical settings	Commonly used classes of anti-infectives – penicillins, macrolides, cephaolsporins, aminoglycosides, carbapenems Basic principles in selection of an anti-microbial in treating common infections Anti-microbial stewardship – concepts Concept of MIC and therapeutic drug monitoring Drug interactions Hospital and National Antibiotics Guidelines

MUSCULOSKELETAL

Syllabus	Learning outcome	Content
Anatomy of bone and joints	Knows basic clinical embryology, anatomy and physiology of bone and joints	Types of bones & bone growth Anatomy of joints and surrounding structures
Musculoskeletal (MSK) symptoms, signs and investigation	Able to interpret MSK symptoms, signs and investigations	Causes of MSK symptoms according to pathophysiology - Inflammatory, mechanical and psychosomatic Red flags to suggest serious pathology –e.g. inflammatory , malignancy, infection, vasculitis, NAI
Joint swelling	Knows common causes of joint swelling Knows clinical features, investigation and diagnosis	Causes of arthritis/joint swellings in children Septic arthritis Juvenile idiopathic arthritis
Limp	Knows differential diagnosis of limping at different ages	Infections Trauma Arthritis Developmental problems e.g. DDH Orthopedic conditions e.g SUFE, Perthes
Limb pain	Knows differential diagnosis of limb pain	Growing pains Benign hypermobility
Scoliosis	Knows causes of scoliosis	Congenital Neuromuscular Idiopathic Others (e.g. tumours, infections)
Leg alignments and foot postures	Knows normal variants	Bow legs Knock knees In-toeing and out-toeing Flat feet

Multisystem disease	Able to differentiate between inflammatory and non-inflammatory systemic diseases Knows clinical presentation, investigation and diagnosis	Clinical features and investigations supporting an inflammatory aetiology Systemic lupus erythematosus, Juvenile Dermatomyositis

NEONATOLOGY

Syllabus	Learning Outcomes	Content
Basic science and fundamentals	Able to describe the foetal circulation Able to describe the physiological changes after birth and transition to extra-uterine life Knows the physiological adaptation/changes in postnatal life Knows the concept of neutral thermal environment Describe the oxygen dissociation curve and factors that shift this curve • Glucose homeostasis • Hypo & hyperglycaemia • Anaemia/ polycythaemia Knows the clinical importance of placenta eg. Placenta weight, swabs, calcifications	The components that make up the foetal circulation Contrast between the foetal circulation and the postnatal circulation Principles of thermoregulation and mechanisms of heat and transepidermal water loss Prem, SGA, IDA, sepsis

Newborn screening and newborn care	Knows the principles and meaning of newborn screening	National programme for universal cord blood screening (G6PD deficiency and congenital hypothyroidism) Other tests e.g. universal newborn hearing screening and critical congenital heart disease (CCHD) screening
	Knows the principles of Vitamin K prophylaxis against haemorrhagic disease of the newborn	
	Knows about the national programme for vaccination at birth	BCG and Hepatitis B; indications for Hepatitis B Immunoglobulin
	Knows the importance of early initiation of breast feeding and kangaroo mother care	Components of the WHO Baby Friendly Hospital Initiative
	Know the importance of umbilical cord stump hygiene	Principles in umbilical cord care and recognition of omphalitis

Neonatal resuscitation and transitional care	Knows the principles and steps of newborn resuscitation	The content of the current NRP guidelines
	Knows the cause and effects of oxygen-related toxicity	Principles in avoiding toxicity with the use of air or blended oxygen during resuscitation and monitoring oxygen saturation using pulse oximetry
	Knows the definition and practice of delayed umbilical cord clamping or umbilical cord milking	Recommendations by the WHO and NRP

Nutrition and growth monitoring	Able to describe the importance and advantages of breastfeeding and recognise problems in lactation Knows the constituents of human breast milk and benefits to the infant Knows about kangaroo mother care Able to describe small, appropriate and large for gestational age	The basic physiology of lactation Nutrition in the newborn – calories, macronutrients, micronutrients Causes and complications of SGA and LGA
Fluid therapy	Knows the principles of fluid balance and therapy in the newborn period	Definitions and physiology of insensible and transepidermal water loss. Normal urine output and fluid requirements.
Prematurity	Able to define the various degrees of prematurity Knows the physical characteristics and appearance of preterm infants Knows the various causes of prematurity Knows the definitions and problems of low birth weight (LBW), including very and extremely LBW infants	Gestational periods for severe, very, moderate and late preterm Assessment of gestational age using the Ballard and Dubowitz scores Commonly associated medical conditions and complications related to prematurity and its pathophysiology eg. RDS, PDA, IVH, NEC, ROP, metabolic bone disease, sepsis

Respiratory distress in the newborn	Able to describe the signs of respiratory distress	Silverman scoring for the various degrees of respiratory distress

	Knows the common respiratory disorders affecting the newborn infant	The underlying causes, clinical features and principles of management of: • Respiratory distress syndrome, • Meconium aspiration syndrome, • Transient tachypnea of the newborn, • Pneumothorax and air leak syndrome, • Persistent pulmonary hypertension of the newborn • Upper airway abnormalities
	Able to define and know the common causes of pneumonia	Clinical features and principles of management of congenital, early-onset and nosocomial pneumonia
	Knows the physiology of surfactant Knows the principles and complications of mechanical ventilation and continuous positive airway pressure therapy	The basis of surfactant replacement therapy for respiratory distress syndrome and principles of ventilation
	Able to analyse and interpret blood gas results	Normal, abnormal and differences between capillary, arterial and venous blood gas

NEUROLOGY

Syllabus	Learning Outcomes	Content
Development of the brain	Able to describe the normal development of the central nervous system	Embryology Congenital brain malformations -Aetiology Spinal dysraphism
Febrile seizures	Able to diagnose, manage and stratify risk of recurrence	Acute management Risk of recurrence Counselling of parents
Intracranial infections	Knowledge of LP Able to interpret cerebrospinal fluid (CSF) results	Lumbar puncture • Indications • Contraindications Interpret CSF results
Cerebral palsy	Able to identify the antecedents, classify and describe clinical features	Definition Aetiology Risk factors Classification Clinical features
Seizures and epilepsy	Able to describe seizure semiology, classify, identify aetiology and institute acute management	Seizure semiology Classification Aetiology Acute management including status epilepticus Common anti-seizure medicine, mechanism of action and side effects (e.g. phenobarbitone, phenytoin, carbamazepine, midazolam, levetiracetam, sodium valproate)

Neuromuscular disorders	Able to describe clinical features, identify aetiology based on a systematic approach	Floppy infant syndrome • Classification • Aetiology • Investigations Dystrophinopathy Eg. Duchenne, Becker Spinal muscular atrophy
Raised intracranial pressure and hydrocephalus	Able to describe pathophysiology, identify its presence, aetiology and institute acute management	Clinical features Aetiology Acute management

Clinical presentation of neurological conditions	Able to interpret abnormal neurological signs	Localisation of site of neurological lesion Differentiation between upper and lower motor lesions Cerebellar and extrapyramidal signs

NEPHROLOGY

Syllabus	Learning Outcomes	Content
Basic Sciences • Renal and Bladder Anatomy • Embryology of genitourinary system • Renal physiological changes from neonate to adult • Bladder innervation and controls	Able to describe the basic renal and bladder function anatomically and physiologically. Understands how normal renal and bladder development (in order to understand pathogenesis of CAKUT)	Anatomy – landmark, adjacent structures Physiology –glomerular and tubular function Bladder innervation and control Renal physiological changes that occur from neonates to adult Regulation of electrolyte balances and clinical manifestation Concept of Renin-Angiotensin-Aldosterone System Concept of acid base disturbances and interpretation of blood gas Congenital anomalies of the kidney and urinary tract (CAKUT) – eg. PUV, PUJO, VUJO.
Clinical conditions	Able to describe the pathophysiology, clinical features, investigations and basic management of common conditions	Idiopathic vs secondary nephrotic syndrome (NS) Pathogenesis of oedema (underfilled vs overfilled) Management of NS Glomerulonephritis – acute post streptococcal glomerulonephritis, Henoch Schonlein Purpura Principles of managing paediatric UTI Acute kidney injury- manifestation and basic management approach

		Hypertensive crisis – recognition and management Corticosteroids-mechanism and side effects
		Common drugs associated with nephrotoxic- antibiotic/chemo agents/ analgesic Hypertension - causes, pathophysiology and investigations Common antihypertensives
Relevant genitourinary system investigations (when to request/how to perform and interpret)	Able to explain the basis of relevant investigations, and interpret the findings	Basis of specific test- clinical significance • Urinalysis • USS KUB • MCUG • Radionuclide scan (DMSA/DTPA/MAG3)

NUTRITION

Syllabus	Learning Outcomes	Content
Nutrition & growth	Knows basic nutritional requirement	Basic nutrition requirement for all paediatric age groups
Infant feeding	Has thorough knowledge on breastfeeding Knows about breast milk substitutes • Choices • Types • Indications	Benefits to mother and child Contraindication: absolute and relative Baby-friendly initiative: the 13 steps Issues surrounding breastfeeding
Complementary feeding & weaning	Able to counsel on weaning and choice of complementary feeds	What is weaning Timing of weaning Appropriate choices and ways in complementary feeds
Nutritional assessment	Able to perform appropriate nutritional assessment for all age group Able to monitor growth appropriately	Different techniques of measuring nutritional parameters Different types of growth charts Eg. down syndrome, Turner, CDC, WHO, BMI
Malnutrition & malabsorption	Understands physiology of nutrient digestion, absorption, metabolism, and elimination	Able to anticipate potential deficiency of specific nutrition group in different clinical scenarios Able to recognise protein energy malnutrition & kwashiorkor

Obesity	Able to recognize obesity and its potential complications	Important parameters and clinical signs during assessment of overweight and obese Potential complications of obesity
Food allergies	Knows the pathophysiology of food allergies in children Knows the common food allergens	Different presentation of food allergies Common allergies such as cow's milk protein allergy.

RESPIRATORY

Syllabus	Learning Outcomes	Content
Lung development	Able to describe the embryological development of the lung	Different stages of lung development
Pulmonary physiology and control of breathing	Able to describe structure and function of the respiratory system Able to describe the breathing mechanism and its control Able to describe the mechanism of gas exchange.	Respiratory muscles Chest wall Airway (upper & lower) Lungs Pulmonary circulation Central controller Brainstem, Medulla and Pons Effectors - Muscles of respiration Sensors - Central & peripheral chemoreceptors & Lung receptors Oxygen-haemoglobin dissociation curve Mechanism and causes of Hypoxia and hypoventilation
Differences between infant and adult respiratory system	Able to describe the anatomical differences between infants and adults Able to describe the physiological differences between infants and adults	Upper and lower airway and lung anatomy Low lung volumes Limited respiratory reserve Poor lung elastic recoil High lung compliance High airway resistance
Lung defense mechanism	Able to describe the lung defense mechanism • Mechanical responses • Non-immunologic responses	Cilia function and its role in the defense system Cough reflex Mucus secretion and clearance Pulmonary macrophages Airway epithelial cells Mast cells

Lung function	Able to describe and interpret lung function.	PEFR Bronchodilator response Spirometry Obstructive vs restrictive lung disease
Respiratory failure	Able to understand and explain the features and development of respiratory failure	Type 1 and type 2 respiratory failure – pathophysiology and causes Clinical signs and symptoms of respiratory failure Interpretation of blood gas
Common respiratory noises	Able to explain and understand the pathophysiology and causes of common respiratory noises Approach to wheezing, stridor and snoring	Wheezing Acute and chronic stridor. Grunting Snoring Clinical history, physical examination, differential diagnosis, and management.
Upper respiratory tract infections	Able to describe the pathophysiology, clinical features, investigations and principles of management.	Rhinitis Pharyngitis Tonsillitis Otitis media Sinusitis Epiglottitis Croup Bacterial tracheitis
Lower respiratory tract infections	Able to describe the pathophysiology, clinical features, investigations and management.	Bronchiolitis Community Acquired pneumonia - different organisms according to age groups.

Asthma	Able to describe the pathophysiology, clinical features, investigations and management.	Acute Asthma Classification and assessment of asthma severity Pharmacology in acute asthma. Chronic Asthma Classification of Intermittent & Persistent Asthma

		Pharmacology in chronic asthma and the devices used Asthma action plan Asthma education * reference to Malaysian CPG on childhood asthma
Chronic cough	Able to describe the pathophysiology, principles of investigations and management	Causes, principles of investigations and management in Eg. Tuberculosis, chronic suppurative lung disease