Pediatrics Study Guide

Quaid-e-Azam medical college,Bahawalpur

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Introduction

This study guide is meant to assist students as they study for the final professional MBBS examination. It is not a replacement for a textbook; it is meant to give you an idea of the extent of knowledge that is expected from an undergraduate. We hope it will guide you in how much of your energies should be invested in learning Pediatrics and how to go about acquiring the necessary knowledge and basic clinical skills.

This study guide would give you Learning Objectives for important topics, and reference books.As regards to the Clinical skills, desired level of expertise and step wise approach to learn them is also outlined.

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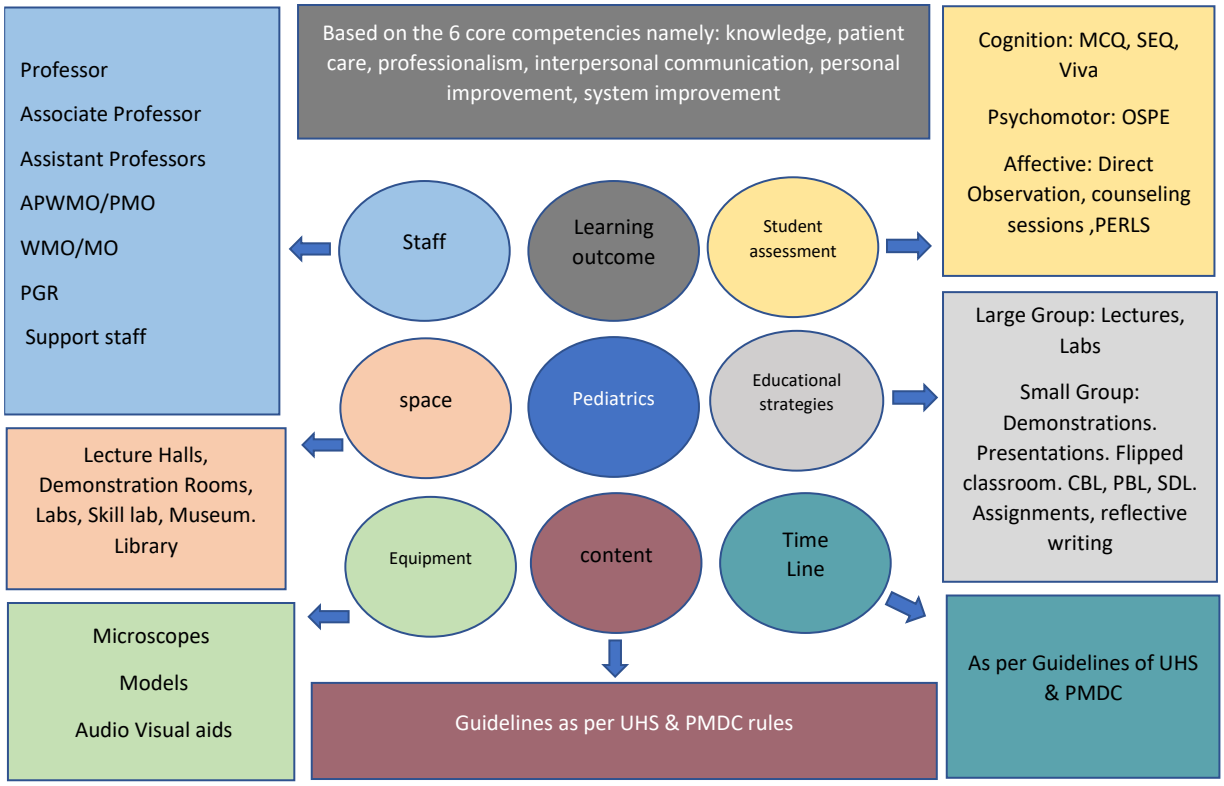
Curriculum map of Department of Pediatrics



General Pediatrics

To understand a subject well it is imperative that we are familiar with the basics of its domain, therefore it is essential for the student to familiarize themselves with

a) Range of terminologies used for different age groups in Pediatrics
b) Reasons for dividing Pediatrics into different age groups
c) Importance of monitoring growth parameters
d) Factors affecting different aspects of growth and their implications
e) How to assess milestones of development and factors affecting them
f) Patterns of inheritance and common diseases resulting from them
g) Nutrition and specific requirements of feeding in different age groups
h) Special role of communication in pediatrics and ways of doing it

Child Development Chart - First Five Years

AGE	SOCIAL	SELF-HELP	GROSS MOTOR	FINE MOTOR	LANGUAGE
BIRTH	Social smile	Reacts to sight of bottle or breast	Lifts head and chest when lying on stomach	Looks at and reaches for faces and toys	Reacts to voices - Vocalizes coos, chuckles
	Distinguishes mother from others	Comforts self with thumb or pacifier	Turns around when lying on stomach	Picks up toy with one hand	Vocalizes spontaneously - social
6	Reaches for familiar persons	Feeds self cracker	Rolls over from back to stomach	Transfers toy from one hand to the other	Responds to name-turns and looks
	Pushes things away he/she doesn't like		Sits alone...steady without support	Picks up object with thumb and finger grasp	Wide range of vocalizations (vowel sounds, consonant-vowel combination)
9	Plays social games, peek-a-boo, bye-bye	Picks up a spoon by the handle	Crawls around on hands and knees	Picks up small objects - precise thumb and finger grasp	Word sounds - says "Ma-ma" or "Da-da"
	Plays patty-cake		Walks around furniture or crib while holding on		Understands words like "No", "Stop" or "All gone"
12	Wants stuffed animal, doll or blanket in bed	Lifts cup to mouth and drinks	Stands without support	Stacks two or more blocks	Uses one or two words as name of things or actions
	Gives kisses or hugs	Feeds self with spoon	Walks without help	Picks up two small toys in one hand	Talks in single words
	Greets people with "Hi" or similar	Insists on doing things by self such as feeding	Runs	Scribbles with crayon	Asks for food or drink with words
18	Sometimes says "No" when interferred with	Eats with fork	Kicks a ball forward	Builds towers of four or more blocks	Follows simple instructions
	Show sympathy to other children - tries to comfort them	Eats with spoon, spilling little	Runs well, seldom falls		Uses at least ten words
	Usually responds to correction - stops	Takes off open coat or shirt without help	Walks up and down stairs alone	Turns pages of picture books, one at at time	Follows two-part instructions
2-0	"Helps" with simple household tasks	Opens door by turning knob	Climbs on play equipment - ladders, slides	Scribbles with circular motion	Talks in two-three word phrases or sentences
	Plays with other children - cars, dolls, building	Washes and dries hands	Stands on one foot without support	Draws or copies vertical (l) lines	Talks clearly is understandable most of the time
2-6	Plays a role in "pretend" games - mom-dad, teacher, space pilot		Walks up and down stairs-one foot per step	Cuts with small scissors	Understands four prepositions - in, on, under, beside
3-0	Gives direction to other children	Toilet trained	Rides around on a tricycle, using petals	Draws or copies a complete circle	Combines sentences with the words "and" "or," or "but"
3-6	Plays cooperatively, with minimum conflict and supervision	Washes face without help	Hops on one foot without support	Cuts across paper with small scissors	Identifies four colors correctly
	Protective toward younger children	Dresses and undresses without help except for shoelaces			Counts five or more objects when asked "How Many"?
4-0					Understands concepts - size, number, shape
		Buttons one or more buttons		Draws recognizable pictures	Follows a series of three simple instructions
4-6			Skips or makes running "broad jumps"	Draws a person that has at least three parts - head, eyes, nose, etc.	Reads a few letters (five+)
	Follows simple rules in board or card games	Usually looks both ways before crossing street	Swings on swing, pumping by self		
5-0	Shows leadership among children	Goes to the toilet without help		Prints first name (four letters)	Tells meaning of familiar words

Nutrition

a) Nutrition plays pivotal role in child's growth and development.
b) Nutritional intakes should provide for maintenance of current weight and support normal growth and development.
c) Nutrition in first 3 years of life predicts adult stature and health outcomes.
d) It is important to identify nutrient deficiencies and treat them early as they have lasting effects on growth.
e) Early feeding and nutrition have important roles in the origin of adult diseases such as type 2 diabetes, hypertension and obesity.
f) Nutritional requirements vary for different diseases e.g.: Child with diabetes should limit intake of simple carbohydrates and sugar but his diet should include complex carbohydrates to meet the nutritional requirements.
g) Malnutrition can be avoided with early assessment of child's growth and proper feeding advice.
h) Micronutrient deficiencies are very common in developing countries.

Vitamins

Vitamin D:

a) Sources of vitamin D
b) What are signs of vitamin D deficiency
c) Different types of rickets

d) Investigations for various forms of rickets
e) Identify clinical scenario and X-ray findings of rickets
f) How to treat nutritional rickets
g) Supplementation of vitamin D in breastfed infants
h) Identify signs of vitamin D toxicity
i) How to treat toxicity

Vitamin A:

a) Sources of vitamin A
b) What are signs of vitamin A deficiency
c) What are bitot's spots
d) Investigations for vitamin A deficiency
e) How to treat deficiency
f) Role of vitamin A in measles
g) Identify vitamin A toxicity
h) How to treat toxicity
i) Role of vitamin A in chemotherapy

Vitamin C:

a) Sources of vitamin C
b) What are signs of vitamin C deficiency
c) What is scurvy and its manifestations
d) Investigations for vitamin C deficiency
e) How to treat its deficiency
f) Identify clinical scenario and X-ray findings of scurvy.

Vitamin K:

a) Sources of vitamin K
b) What are signs of vitamin K deficiency
c) Role of vitamin K in coagulation
d) Effect of vitamin K deficiency in liver disease
e) What is hemorrhagic disease of newborn
f) Investigations for vitamin deficiency
g) How to treat it.
h) Identify clinical scenario.

Vitamin E:

a) Sources of vitamin E
b) Role of vitamin E as an antioxidant
c) How to treat its deficiency

Vitamin B:

a) Types of vitamin in B-complex
b) Sources of various vitamin B
c) Different signs of vitamin B complex deficiency
d) What is Pellagra, Beri beri, pernicious anemia, megaloblastic anemia
e) Investigations for deficiency
f) How to treat its deficiency
g) Identify clinical scenarios
h) Role of vitamin A in chemotherapy

Folate:

a) Sources of folate
b) What are signs of folate deficiency
c) Role of folate in spina bifida and megaloblastic anemia
d) Investigations for its deficiency
e) How to treat its deficiency
f) Identify clinical scenario

Iron:

a) Sources of iron
b) What are signs of iron deficiency
c) Identify iron deficiency anemia
d) Investigations for iron deficiency anemia
e) How to treat iron deficiency anemia
f) Identify clinical scenario

Iodine:

a) Sources of iodine
b) Role of iodine in goiter
c) How to treat its deficiency

Zinc:

a) Sources of zinc
b) How to treat its deficiency

Learning Objectives:

Students should be able:

a) To understand the importance of nutrition in child's growth and development
b) To understand different types of feeding practices
c) Different types of feeding (breastfeeding, infant feeding and weaning)
d) Able to calculate calorie count
e) Role of nutrition in various disease treatments
f) Able to advise appropriate nutritional measures for healthy and sick children (Breast feeding, avoidance of bottle, proper weaning)
g) To differentiate between micronutrients and macronutrients
h) Identify marasmus and kwashiorkor, and how to treat
i) Identify various micronutrients toxicity and deficiency
j) Importance of minerals and effects of their deficiency

Expanded Program Of Immunization/Vaccines

- Immunization is a proven tool for controlling and elimination life-threatening infectious disease.
- The Expanded Program on Immunization (EPI) was established in 1974 through a World Health Assembly resolution to build on the success of the global smallpox eradication program, and to ensure that all children in all countries benefited from life-saving vaccines.
- EPI covers ten diseases thru six visits for vaccination.

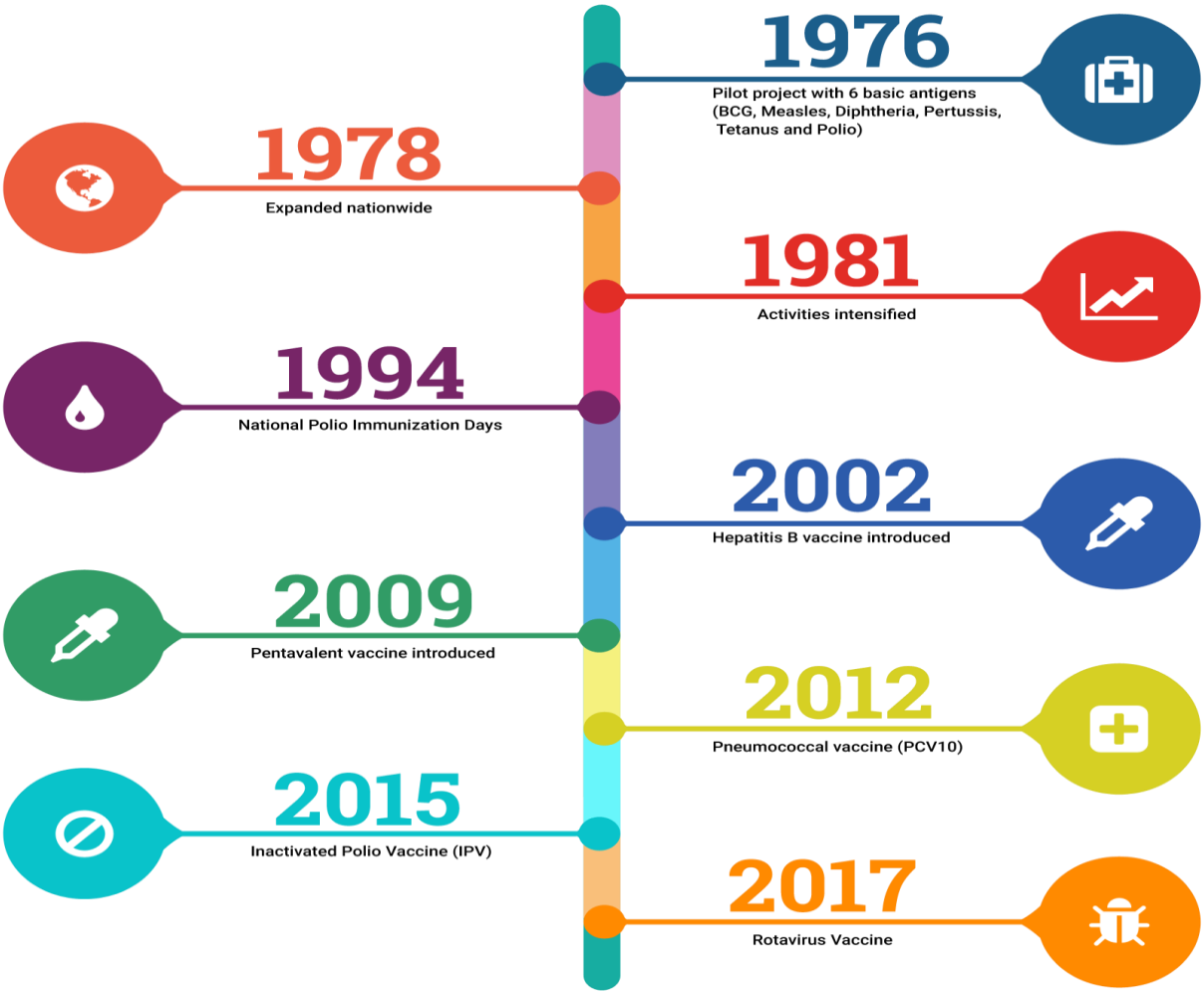
- Diseases covered are Childhood TB, Polio, Hepatitis B, Rota virus diarrhea, Pneumonia, Diphtheria, Tetanus, Pertussis, Meningitis and Measles.

Students should have some knowledge of other vaccines that are not part of the EPI, but can be used,e.g., chicken pox, typhoid, hepatitis A, meningitis.

Learning Objectives:

a) What is EPI?
b) Understand the need for this programme, its impact.
c) Which vaccine preventable diseases EPI covers.
d) Correlate case based scenarios on diseases and vaccine.
e) Identify the vaccine.
f) Route of administration of each vaccine.
g) Dose of each vaccine.
h) Type of vaccine.
i) EPI Schedule.
j) Side Effects.
k) General and specific contra indications to vaccination.
l) Timeline for addition of new vaccines.
m) Able to counsel the parents on health promotive and disease preventive strategies for the child e.g. immunization procedures.

Timeline for the history of EPI, Pakistan



Reference:http://www.epi.gov.pk

Genetics

Learning Objectives:

Students should know the basic modes of transmission / inheritance of genetic disorders.

Students should be able to draw and recognize pedigree charts for autosomal dominant, autosomal recessive and x-linked recessive inheritance. The student should know a few examples of diseases inherited in each of these ways. Students should know the inheritance patterns of common diseases. For example, thalassemia is inherited in an autosomal recessive way. So if both parents are carriers of the gene for thalassemia, there is a 25% chance that the offspring will have the disease, 50% chance of being a carrier, and 25% chance of not inheriting the gene.

Down Syndrome

a) Must know about Down Syndrome in detail (any of the standard recommended Paediatric Textbooks should have enough detail)

b) Should be able to recognize a picture

c) Method of inheritance; should be able to recognize Trisomy 21 on a chromosome picture, and should know that there are other ways, although less common, like Robertsonian Translocation

d) Risk factors

e) Physical features

f) Clinical and Psychological implications; at birth and long term through life

g) Health maintenance (short and long term follow up)

Turner Syndrome

a) Mode of inheritance

b) Physical and clinical features

c) Should be able to recognize a picture

Noonan Syndrome

a) Often confused with Turner (share many physical features)

b) Sometimes referred to as a "male Turner"

c) Briefly know how to differentiate from Turner Syndrome

Neonatology

Neonates have very wide range of symptoms at presentation. Students should know about basic definitions (preterm, low birth weight etc), frequently observed benign conditions (acrocyanosis, periodic breathing etc) and temporary phenomenon such as withdrawal bleed and erythema toxicum. The focus remains on common problems that we encounter on daily basis such as respiratory distress syndrome, neonatal sepsis, necrotizing enterocolitis, neonatal jaundice, prematurity, birth asphyxia.

Learning Objectives:

Students must learn about:

a) Common problems faced by term and preterm neonates

b) Etiologies and risk factors of important diseases

c) Important clinical features that distinguish them from other disorders

d) Complications of diseases
e) Investigations that help in diagnosing the disease
f) Management of disease and its complications

Prematurity

Learning Objectives:

a) Students should know the definition of preterm and full term neonates, low birth weight, very low birth weight and extremely low birth weight neonates
a) Should be able to Enumerate causes of prematurity (maternal, uterine and fetal causes)
b) Enlist immediate and long term complications of prematurity
c) Management of these babies (such as feeding, temperature maintenance)

Respiratory Distress Syndrome (RDS) Learning Objectives:

The students should be able to

a) Understand the pathophysiology of RDS and role of surfactant
b) Recognize the clinical features of patients with RDS
c) Identify risk factors which can lead to RDS such as prematurity
d) Differentiate among different diseases with similar presentations, such as pneumonia, transient tachypnea of newborn

e) Enlist investigations to confirm diagnosis, X ray presentation and grades of RDS

f) Enumerate steps for prevention (role of steroids) and management of disease

Reference: Sweet DG, Carnielli V, Greisen G, et al. European Consensus Guidelines on the Management of Respiratory Distress Syndrome - 2019Update. *Neonatology*.2019;115 (4):432-450. Doi: 10.1159/000499361

Neonatal Sepsis

Learning Objectives:

Students must learn about

a) Definition of sepsis along with differences among early and late onset sepsis
b) Criteria of Systemic inflammatory response (SIRS)
c) Predisposing factors and pathogenesis of early and late onset sepsis
d) Investigations to screen sepsis and the interpretation
e) Management including both supportive and specific example; when to use antibiotics, G-CSF and immunoglobulin
f) Preventive methods to reduce incidence of sepsis

Neonatal Jaundice

It's a common problem faced by neonates.

Learning Objectives:

Students must know the following aspects of this topic:

a) Concept of direct/conjugated and indirect/unconjugated hyperbilirubinemia

b) The difference between physiological, pathological and persistent jaundice

c) Time of onset and causes according to time of presentation; for example jaundice appearing within first 24 hours of life

   is always pathological and mostly represents hemolytic process and breast feeding jaundice presents mostly in second week of life

d) Pathophysiology of jaundice and development of kernicterus

e) Risk factors of developing jaundice and kernicterus

f) Clinical findings (Kramer's rule) and investigations to rule out different causes

g) Students should know about Danger signs in a neonate indicating impending kernicterus and stages of kernicterus

h) Management including phototherapy and exchange transfusion

i) Complications of jaundice and its treatment for instance phototherapy causes dehydration and bronze baby syndrome.

j) Details about exchange transfusion and its complications

k) Role of IVIG

l) Prognosis

Necrotizing Enterocolitis (NEC)

It's a complication that is faced frequently especially by premature babies.

Learning Objectives:

Students must learn about:

a) Etiology, pathophysiology and salient clinical features
b) Staging of NEC
c) Important investigations and X-ray findings (pneumatosis intestinalis and air under diaphragm)
d) Differential diagnosis
e) Management conservative and surgical
f) Complications, prevention and prognosis

Birth Asphyxia / Hypoxic Ischemic Encephalitis (HIE)

Learning Objectives:

Students should know important aspects of this topic as follows:

a) Etiology
b) Pathophysiology
c) Clinical features (Modified Sarnat scoring), Multiorgan system effects of asphyxia
d) How to diagnose, findings on MRI and EEG
e) Treatment (supportive, total body and selective head cooling)
f) Complications and prognosis

Common Neonatal Problem / Miscellaneous

It's crucial to know few important conditions, which we encounter on regular basis in our neonatal setups.

Learning Objectives:

a) Values of normal vitals (RR, HR, BP, temp and capillary refill time) of a neonate
b) Hypothermia, its complications and management
c) APGAR score
d) Recent guidelines of neonatal resuscitation program (NRP)
e) Birth injuries (Erb's palsy)
f) Caput succedaneum and cephalhematoma
g) Oral thrush
h) Seborrheic dermatitis (cradle cap)
i) Erythema toxicum

Paediatric Infectious Diseases

Infectious Diseases form a large part of the Paediatric syllabus. You can think of infectious diseases either with the specific microorganism in mind, for eg.*Staphylococcus aureus*, or *measles* virus; or you may think of it as a disease process, like abscesses, measles, enteric fever etc.

A good background of microbiology forms the basis for understanding infectious diseases. Start each disease process by thinking about the organism in particular. For example, when you think of tuberculosis, you need to identify in your mind that it is caused by a bacteria called *Mycobcaterium tuberculosis*; it's microbiological property that it is acid fast and needs special medium to grow will help you remember the diagnostic testing. It is a slow growing organism; this fact will help you understand that the disease usually progresses slowly, and there is generally time to make an accurate diagnosis. The slow growing nature of this bacteria will help you understand that the laboratory may take up to 6 weeks to grow the organism.

This study guide focuses on diseases based on their microbiological divisions: bacteria, viruses, parasites and fungi. The learning objectives are listed. For most of the learning objectives, there are details outlining what points to remember in particular, and what pitfalls to avoid. Use the prescribed textbooks to study these sections. Some sections end with references to a particularly relevant journal article. The suggested articles are good reviews, which will enable to you to understand that topic better.

Viruses

Common Childhood Viral Infections:

Learning Objectives:

These include Measles, Mumps, Rubella, Varicella, Roseola

The following are points that students should know:

a) Causative organisms

b) Incubation periods

c) Clinical Presentations. For common childhood infections, it is important to know the sequence of clinical presentations. For example, if a fever appears with loss of appetite, and a rash appears upon resolving of the rash after 3-5 days, it is probably roseola and not measles. On the other hand, fever, coryza, conjunctivitis, and loss of appetite for about 2-3 days, leading up to a maculopapular rash that begins on the face and slowly proceeds down the body, (fever persisting through this time) is more likely measles.

d) Diagnostic tests

e) Treatment. For most of these viral illnesses, treatment is supportive. Know details like Vitamin A being given in measles

f) Prevention and post exposure prophylaxis, if any (this will be covered in more detail in the section on vaccines)

Other viral infections:

Rotavirus

a) Organism: Rotavirus is a virus that is a common cause of diarrhea in children.

b) Vaccine. Students must know that there is vaccine in the EPI that covers Rotavirus. [More will be covered in the section on EPI]

c) Treatment: Antibiotics are not required. Supportive care, especially assessment of hydration. Zinc could be added as per IMCI tables and criteria.

Poliomyelitis

Poliomyelitis (or polio as it is more commonly called) is a viral infection. Polio is an important disease to learn about. After small pox, which was eradicated in 1977, polio is the only other disease/ infection that has *almost* been eradicated from the world. It is possible to foresee the eradication of polio as it only has a human reservoir (no animal reservoir) and an effective vaccine. Most of the world has managed to eradicate this illness, except two countries of the world where polio remains endemic: Afghanistan and Pakistan.

Learning objectives:

a) Causative organism

b) Incubation period

c) Clinical features. Remember that it has a biphasic clinical presentation.

Also, differentiate between the acute presentation of the illness, and the longterm physical debilitation of the illness

a) Diagnosis

b) Treatment

c) Prevention. This will be covered in more detail in the section on vaccines. Students must know about OPV and IPV, advantages and disadvantages of each along with their schedule details.

Hepatitis A and B

Learning objectives:

Hepatitis viruses are important causes of hepatitis. Hepatitis A is an important cause of Acute Hepatitis.

Hepatitis A is a common cause of acute hepatitis. Hepatitis B and C are important causes of chronic hepatitis. Learning objectives:

a) Students should know the causative organism

b) Mode of acquisition

c) Incubation period

d) Clinical manifestations

e) Diagnostic tests

f) Treatment

g) Prevention

[These will be covered in further detail in the section of Hepatic Diseases].

HIV

HIV was first diagnosed in a patient in the 1980s. It is a viral infection which is responsible for the Acquired Immune Deficiency Syndrome (AIDS). HIV is mostly endemic is sub Saharan Africa, and is spreading through South East and South Asia. Pediatric HIV, still in low numbers in Pakistan, is on the upswing. There was a big outbreak of Paediatric HIV in Ratadero, Larkana (Sindh), where about 900 children were found to be infected with the HIV virus.

Learning objectives:

a) Causative organism

b) Pathophysiology. Having a basic understanding of how the HIV virus infects a cell (mainly CD4 Helper T cells), will help you remember how the retrovirus works (reverse transcriptase of the HIV) and the mechanisms of action of the various many antiretroviral drugs

c) Transmission of HIV. Students should be able to list the ways in which HIV is transmitted/ acquired. In children, the most common mode of transmission in vertical transmission (MTCT: Mother to Child Transmission)

d) Clinical Presentation. Students should be able to recognize the various clinical presentations of HIV. Understanding that HIV infects and destroys mainly CD4 Helper T cells, will help comprehend how the depleting immune system gives rise to opportunistic infections

e) Diagnosis: HIV Serology (after 18 months of age; less than 18 months of age with HIV DNA PCR)

f) Monitoring: CD4 % (in adults CD4 level is monitored. In small children CD4 count is higher than that of adults and slowly reaches the adult level. Therefore percent is used).

g) Treatment: Know the common antiretroviral groups, and the first line drugs for children. As more antiretrovirals get invented, first line regimens recommended by WHO or locally, keep changing. You should know the latest first line drugs, and that at least 3 drugs are used at one time.

h) MTCT: Students should know that MTCT can be prevented and that it can significantly decrease the incidence of paediatric HIV. Students should know how to prevent MTCT and the basic outline of how to manage newborns of infected mothers. They are tested by HIV DNA PCR (not HIV serology, as serology prior to 18 months of age could reflect the mother's positive status)

Parasite

Parasitology encompasses single celled organism protozoa and helminthes.

Protozoa

Entameba Histolytica (Amebiasis and amebic liver abscess)

Giardia

For Amebiasis and Giardiasis, you should know how:

a) Causative organism

b) Mode of acquisition

c) Clinical features

d) Treatment

e) Prevention

For Amebiasis, know that it can cause simple amebiasis, but can also lead to more severe complications like fulminant colitis, and amebic liver abcess. Remember that amebic liver abscess (more common in teen and adult years than in little children) can occur a long time after the initial infection with entameba.

Malaria

Malaria is a common infection in Pakistan. Students must know the following

Learning objectives:

a) Epidemiology and mode of transmission of malaria

b) Basic knowledge of the life cycle, both in the mosquito and in the human. (Although you will not be expected to remember every detail of the life cycle, it is imperative to understand the pathogenesis of this parasitic infection)

c) Must know the names of the 5 species of malarial *plasmodium*; know that Pakistan has both *Plasmodium Vivax and Plasmodium Falciparum*

d) Signs and symptoms of the infection

e) Complications (like cerebral malaria)

f) Treatment options (must know that hypnozoites of *P Vivax* can only be eradicated from the body with Primaquine. Remember to get a G6PD test prior to giving someone Primaquine)

g) Prevention (drugs that are used to prevent malaria are many; you do not need to know the details of how each is administered,

but do know names of the main ones. Other things you should remember are that in order to prevent an arthropod borne infection, once has to avoid going out at dawn and dusk, wear clothes that cover arms and legs, mosquito repellents, etc.)

Helminths

-Ascaris

-Enterobius Vermicularis

-Hookworm

-Echinococcus

Learning objectives:

a) Causative organism

b) Brief knowledge on the life cycle of these helminths. For example, the student should know that the ascaris larva travels through the lungs, which could cause an eosinophilic allergic cough, called Loeffler's Syndrome.

c) Mode of acquisition

d) Clinical Features

e) Diagnosis

f) Treatment

g) Prevention

Dengue

Learning objectives:

a) Causative organism

b) Mode of acquisition

c) Incubation period

d) Clinical features

e) Diagnosis. Remember that Dengue serology is not usually positive prior to 5-7 days after the start of infection

f) Treatment

g) Prevention

Bacteria:

Bacterial infections make up a large portion of infections occurring in children. Some of the important bacteria are as follows:

- Streptocouspenumoniae - Haemophilus Influenza
- Mycoplasma Pneumonia
- Enteric Fever/ Salmonella Typhi
- Tuberculosis
- Shigella, Salmonella (nontyphoidal): covered in GI section
- Neisseria Meningitidis
- Diphtheria
- Tetanus
- Pertussis

General learning objectives for each of these bacterial illnesses:

a) Mode of acquisition

b) Pathogenesis

c) Different clinical illnesses that each organism cause; for example, *Streptococcus pneumoniae* can cause pneumonia, meningitis, otitis media etc.

d) Diagnosis

e) Treatment

f) Prevention (this is especially important for the vaccine preventable diseases, most importantly those covered in the EPI

g) Complications

Meningitis is covered in further detail in the CNS section Acute diarrhea encompasses viral causes, along with *Shigella*, and *Non Typhoidal Salmonella.*

Typhoid/Enteric Feve

Enteric fever/ Typhoid is caused by *Salmonella typhi* and *paratyphi*. The learning objectives are similar to those for other bacterial infections, with some specific points to remember.

Learning objectives:

a) Causative organism

b) Mode of acquisition

c) Pathogenesis

d) Clinical manifestations

e) Diagnosis: remember that serology is no longer recommended. Culture is the gold standar

f) Treatment. Here it is important to remember that antibiotic resistance is becoming increasingly common with typhoid infections. A culture will yield drug sensitivities.

g) Complication

h) Prevention

Tuberculosis (TB)

Learning Objectives

a) To understanding the pathogenesis of tuberculous infection; Exposure, infection (latent state) and disease, as three entities.

b) Understand risk factors for acquiring TB; for eg, being immunocompromised (which in children could include malnutrition, measles, steroid therapy etc.).

c) The hallmark differences between adult and paediatric TB. For example, children have paucibacillary disease, because of which the hallmark cavitary apical lesions of adults is often missing, and diagnosis by smear and culture is difficult. Remember that lymphadenopathy is an important feature of pediatric pulmonary tuberculosis.

d) Know that tuberculosis can affect many organs / systems of the body. You must know about the clinical presentation of this disease, mainly pulmonary tuberculosis. From the others, the main ones are TB Meningitis, and Abdominal TB.

e) Must know diagnostic tests; screening tests and the confirmatory tests. Pitfalls of Mantoux test (false positives and false negatives), and comparison with the IGRA.

f) Drugs to treat TB. First line drugs: know the side effects. Know the names of the second line drugs, at least the ones commonly used in the treatment of MDR and XDR TB. Know the indications for using corticosteroids.

g) Know the definitions of MDR and XDR TB.

h) Duration of treatment of TB. The important of DOTS and ensuring compliance.

i) Prevention of TB. BCG vaccine.

Reference:

Holmberg PJ, Temesgen Z, Banerjee R. Tuberculosis in Children. Pediatrics in Review 2019;40;168. Doi: 10.1542/pir.2018-0093 https://pedsinreview.aappublications.org/content/pedsinreview/40/4/168.full.pdf

A brief overview of antibiotics

Students should have basic knowledge and understanding about antibiotics.

a) Know that antibiotics only act against bacteria, and not viruses.

b) Basic groups, like Penicillin, Cephalosporins, Quinolones, Macrolides etc., with knowledge of their spectrum of coverage.

Vaccine preventable disease (in EPI):

Students should know these diseases. Know how they are acquired, their clinical presentation, treatment and prevention (details of vaccines covered under “vaccines”).

IMCI

Integrated Management of Childhood Illnesses (IMCI) is a WHO initiative, and is tailored to a country’s specific needs. Basic childhood illnesses, ones which are a common cause of childhood mortality are covered in this document. It is mainly focused on rural or under served areas, where access to tertiary care health care centers may be almost impossible. The guidelines are simple enough to be followed by non-doctors, and other people on the front lines, like LHWs etc.

Learning objectives:

a) Know the danger signs. These are the same, no matter which illness the chart if for.

b) Students should memorize and understand the charts for classifying and managing illnesses, especially pneumonia (fever and cough), malnutrition, and diarrhea.

Students should be able to read a scenario, and using the knowledge of the tables, figure out the classification of the disease, and the management plan.

Reference:

WHO. Integrated Management of Childhood Illnesses; chart booklet 2014. Available from: https://www.who.int/maternal_child_adolescent/documents/IMCI_chartbooklet/en/

Respiratory System

Asthma

Learning Objectives:

Definition of asthma

a) Epidemiology
b) Pathogenesis
c) Pathophysiology
d) Describe the impact of asthma on society, and the individual and family in terms of:
    1) prevalence,
    2) morbidity,
    3) mortality,
    4) economic costs,
    5) psychological functioning,
    6) social functioning, 7) quality of life, and 8) Family life.
e) Explain how family history and personal history determine the natural history of asthma in an individual.
f) Explain the pathogenesis of asthma.
g) Explain the pathophysiology of asthma.
h) Explain the relevance of asthma triggers:
    1) aeroallergens,
    2) viral respiratory infections,
    3) tobacco smoke,
    4) air pollutants,
i) Differentiate among the lung function tests that may be used to help confirm an asthma diagnosis.
j) Distinguish between asthma severity and asthma control
k) Assess the severity of a client's asthma.
l) Explain:
    1) peak expiratory flow (PEF), 2) how to use a Peak Flow Meter.
m) Explain spirometry assessment in terms of:
    1) indications

2) interpretation of results (FEV1, FVC, FEV1, FVC)

n) Explain:
   1) how skin-testing is performed in an allergy assessment
   2) the results of skin testing.

o) Describe differential diagnoses

Asthma Management

a) Asthma control
b) Discuss the criteria that indicate the best results for asthma control.
c) Assess for indicators of loss of control of asthma.
d) Pharmacotherapy
e) Classify asthma medications according ato their action.
f) Explain the indications for the medications used in asthma management.
g) Describe the side effects of the medications used in asthma management.
h) Identify the methods of administration of the medications used in asthma management.
i) Identify which inhaled delivery devices are used with specific medications in asthma management.
j) Immunotherap

Acute Asthma

a) Assess acute asthma in emergency care.
b) Explain how to treat acute asthma in emergency care.

Follow-up

How to conduct an effective follow-up visit

Cystic Fibrosis (CF)

Learning Objectives:

a) Cystic fibrosis definition
b) Epidemiology
c) Pathogenesis
d) Pathophysiology Define CF.

Describe the impact of cystic fibrosis on society, and the individual and family in terms of:

1) prevalence,
2) morbidity, mortality,

3) economic costs,
4) psychological functioning,
5) social functioning, quality of life,
6) 6) Family life.

a) Explain how family history and personal history determine the natural history of CF in an individual.
b) Explain the pathogenesis of CF.
c) Explain the pathophysiology of CF.
d) Should know about the type of genetic disorder
e) Introduce CFTR and its classes of genetic defects

CF Diagnosis and Evaluation

a) Discuss clinical CF features
b) Should know about the symptoms according to each system effected by the disease
c) How to monitor the symptoms of the disease on the basis of history, examination
d) Identify signs and symptoms that are indicative of CF.
e) Specify the essential components of a client history for CF. Determine the components of a physical examination for CF.
f) Interpret the findings of a physical examination of a person with asthma.
g) List methods of CF diagnosis
h) Should know about the diagnostic criterion for CF.
i) Should know about labs to be done for the monitoring of the progression of the disease in all the organs effected by CF

CF management

How will you manage the child on the basis of symptomatic and causative treatment

Components of the symptomatic treatment. Should know about

a) Chest physiotherapy (VEST, vigorous exercise)
b) Nebulization with acetyl cysteine, hypertonic saline
c) Antimicrobial (I/V, Oral, inhalational)

a) What are the available causative treatment you can offer to the child.
b) Review common CF therapeutic agents
c) Describe a typical CF exacerbation & management
d) Introduce “new” CF therapy options
e) Newborn Screening
f) Follow up

Pneumonia

Learning Objectives

Definition

a) Describe the epidemiology, pathogenesis, pathophysiology of pneumonia
b) Different types of pneumonia
c) Define and describe the conceptualization of "typical" and "atypical" pneumonia and its limitations.
d) Define and describe common pneumonia pathogens (viral, bacterial, mycobacterial, and fungal) in immunocompetent and immunocompromised hosts.
e) Symptoms, signs, and typical clinical course of communityacquired, nosocomial, and aspiration pneumonia and pneumonia in the immunocompromised host
f) Define and identify patients who are at risk for impaired immunity.
g) Define and describe indications for hospitalization and ICU admission of patients with pneumonia.
h) Ascertain the pertinent history, including exposure, occupation, TB, travel and pets
i) Determine if the patient is immunocompromised or at risk for TB or PCP - in order to initiate respiratory isolation in the ER;
j) Rule out non-infectious mimics of pneumonia .
k) Differentiate consolidation from pleural effusion.
l) Recognize bronchial breath sounds, rales (crackles), rhonchi and wheezes, signs of pulmonary consolidation, and pleural effusion on physical exam.
m) Differential diagnosis to distinguish the various etiologies of community acquired and nosocomial pneumonia; and distinguish pneumonia from its non-infectious mimics.
n) Should know the sensitivity and specificity of sputum culture and the proper way of obtaining sputum for gram stain and culture.
o) Recommend when to order diagnostic laboratory tests--including complete blood counts, sputum gram stain and culture, blood cultures, pleural effusion analysis, and arterial blood gases--how to

interpret those tests, and how to recommend treatment based on these interpretations.

p) Students should be aware of the correlation of positive blood and pleural fluid cultures with lung pathogens.

q) Define and describe the antimicrobial treatments (e.g. antiviral, antibacterial, anti mycobacterial, and antifungal) for communityacquired, nosocomial, and aspiration pneumonia, and pneumonia in the immunocompromised host.

r) Define and describe the pathogenesis, symptoms, and signs of the complications of acute bacterial pneumonia including: bacteremia, sepsis, para pneumonic effusion, empyema, meningitis, and metastatic micro abscesses.

s) Define and describe the indications for and efficacy of influenza and pneumococcal vaccinations.

Gastro-Intestinal System

Malabsorption syndromes/chronic diarrhea

Here it is important to realize that most of the malabsorption disorders are accompanied by chronic diarrhea which is defined as a diarrheal episode that lasts for ≥14 days and failure to thrive. These disorders can be congenital or acquired.

Common disorders taught here are gluten enteropathy, lactose intolerance and cystic fibrosis.

Learning objectives

Student should know that

a) All disorders of malabsorption are associated with a defect in the nutrient digestion in the intestinal lumen

b) From defective mucosal absorption of either multiple nutrients as in short bowel syndrome

c) Or specific nutrients like carbohydrate, fat, protein, vitamins, minerals, and trace elements for example lactose intolerance, cystic fibrosis, protein losing enteropathy, pernicious anemia, rickets.

In a case of chronic diarrhea mechanism of secretory and osmotic diarrhea should be known and following points are catered for

a) Detailed clinical history which directs the student towards a more structured and rational approach.
b) The nature of diarrhea is helpful in diagnosing certain causes of chronic diarrhea such as greasy and foul smelling stools in cystic fibrosis.
c) The common presenting features, especially in toddlers with malabsorption, are
    1) diarrhea,
    2) abdominal distention
    3) failure to thrive.

It is important to know that the nutritional consequences of malabsorption are more dramatic in toddlers because of the limited energy reserves and higher proportion of calorie intake being used for weight gain and linear growth

In older children, malnutrition can result in growth retardation, as is commonly seen in children with late diagnosis of celiac disease.

d) Physical findings include
    1) muscle wasting
    2) disappearance of the subcutaneous fat
    3) subsequent loose skinfolds
    4)growth retardation

Nutritional assessmentis an important part of clinical evaluation in children with malabsorptive disorders. Students should know how to consult the height and weight percentile charts and to find out the Zscore.

e)Other findings of micronutrient deficiencies should be sought for like signs of rickets in vit. D deficiency due to fat malabsorption and extraintestinal presentation of malabsorptive disorders.

Gluten enteropathy (Celiac Disease

This is an important mucosal abnormality and it appears in genetically susceptible individuals who sustain an auto immune reaction to the gliadin protein fraction of gluten which is present in wheat, rye and barley.

Learning objectives:

a) Identify its presentation in various clinical forms
b) How to differentiate it from other malabsorptive states
c) The sequence of investigations for its definitive diagnosis/prognosis

1)Screening blood tests: anti tissue transglutaminase Ig A antibodies and antiendomysial antibodies in absence of Ig A deficiency

2)Current gold standard, small intestinal biopsy

d) The basic step of management is life long gluten free diet
e) Increased risk of patients for gastrointestinal cancers and extraintestinal medical problems such as delayed puberty
f) Counselling of patient and parents

Recurrent abdominal pain

At least three bouts of pain over a period of at least three months duration and severe enough to affect daily activities is considered as recurrent or chronic abdominal pain in children.

Learning objective

a) An appropriate history including a detailed psychosocial history to differentiate organic from functional abdominal pain

b) To recognize red flag signs in this respect such as weight loss, unexplained fever, chronic diarrhea or deceleration of growth velocity.

c) To manage and treat organic or functional pain accordingly once diagnosed

A child cannot be diagnosed to be having functional abdominal pain unless he/she's investigated to rule out organic causes no matter how suggestive the history is.

Student should be able to rule out common organic causes by investigating:

a)H Pylori infection

b)Reflux esophagitis

c)Lactose intolerance

d)Surgical conditions such as recurrent intussusceptions, malrotation of gut or choledochal cyst.

Students should know common causes of functional abdominal pain

a)Functional dyspepsia(H pylori)

b)Irritable bowel syndrome

c)Childhood functional abdominal pain

d)Abdominal migraine

Investigations/Management to be done according to assessment of cause.

Dysentery

Invasive diarrhea (synonymous with dysentery) is diagnosed by visualizing frank blood in the stool accompanied by fever.

It is usually the result of exudative inflammation of the distal small bowel and colonic mucosa in response to bacterial/amoebic invasion. Clinically these 2 types are indistinguishable.

Learning objectives

a) For bacillary dysentery

1)Etiologic agent and its types (Shigella and its 4 species *S. dysenteriae, S. flexneri*

S.boydii, and *S. sonnei*.)

2)Presentation(Blood in stools,tenesmus,fever)

3)Complications(Bacteremia,seizures,hemolytic uremic syndrome)

4)Investigations(Stool R/E and stool C/S)

5)Treatment(Ciprofloxacin, Ceftriaxone)

b)For amoebic dysentery

1) Etiologic agent and its types(Entamoeba histolytica)

2)Presentation(Blood in stools,tenesmus)

3)Complications(liver abscess,intussusception,bowel perforation)

4)Investigations(Direct stool microscopy)

5)Treatment(Metronidazole 35 to 50 mg/kg per day in three divided doses for 7 to 10 days)

Acute viral hepatitis

Viral hepatitis is a major health problem in both developing and developed countries. This disorder is caused by at least 5 pathogenic hepatotropic viruses recognized to date; Hepatitis A, B, C, D, and E viruses.

While examining a case with jaundice of short duration student should know

a) Hepatitis A is prevalent in children of developing countries.

b) In most pediatric patients, the acute phase of hepatitis A causes no or mild clinical disease.

c) Its mode of transmission is through ingestion of contaminated food and water or direct contact with an infectious person while hepatitis B and C are transmitted through blood products.

d)Symptoms of Hepatitis A include nausea,vomiting,yellowish discoloration of skin and sclera,dark urine,fever and abdominal pain.

f) Non-viral liver infections, like amoebiasis and brucellosis,and autoimmune hepatitis in an older age group can cause similar signs and symptoms.

g)In investigations the most important marker of liver injury is its altered synthetic function and serial estimation of PT and INR is used as a prognostic indicator.Specific investigation is IgM for Hepatitis A,HBsAg for hepatitis B and HCV antibody for hepatitis C.

h) Acute liver failure with coagulopathy, encephalopathy, and cerebral edema occurs more frequently with HBV.

i)Hepatitis A and B are vaccine preventable.General steps of prevention should be known alongwith prevention in babies born to hepatitis B infected mothers

j)No specific treatment of hepatitis A

Chronic liver disease

Chronicity is determined either by

a)duration of liver disease (typically >3–6 months),

b)biochemical evidence of severe liver disease or

c) physical stigmata of chronic liver disease (clubbing,spider telangiectasia, hepatosplenomegaly)

Here it is important to realize that the affected child may have only biochemical evidence of liver dysfunction, may have stigmata of chronic liver disease, or may present in hepatic failure.

Learning objectives

a)Etiology of persistent viral infection

1) due to HBV (Approx 15–20% of cases)

2)HCV(0.2% in <11 yr and 0.4% in≥11 yr)

3)certain drugs like isoniazid,nitrofurantoin

4) metabolic diseases likeWilson's disease.

b)Chronic liver disease is kept in differentials if patient presents with

1)variceal bleeding

2) ascites

3)portal hypertension

4) hepatic encephalopathy.

c)Diagnosis is based upon

1) deranged liver function tests(serum bilirubin raised,ALT raised)

2)prolonged PT, PTTK

3) hypoalbuminemia

4)serum ammonia levels and

5) in certain cases, findings of liver biopsy.

d)Treatment is done according to the cause and stag hepatocellular damage as reflected in these investigations. e)Indications for liver transplant

Hematology

Two topics specifically covered are

Anemia and Bleeding disorders

Anemias

Learning objectives

Student should be able to

a) Identify different types of anemia on basis of
   1) Red cell morphology e.g. microcytic
   2) Pathophysiology e.g. hemolytic
   3) Etiology e.g. hemoglobinopathy, enzyme defect

b) Identify specific clinical features associated with different types of anemia
   1) pallor & jaundice with Hemolytic anemia
   2) visceromegaly with hemolytic anemia
   3) Typical facies ---- Thalassemia

C) Enumerate lab investigations needed to evaluate the patient

d) Enlist complications due to
   1) Anemia

2) Treatment of anemia

e) Give rational differential diagnosis

f) Outline different treatment strategies for each kind of anemia

While examining a child with anemia student should concentrate on

a) Growth parameters

b) Vital signs esp. pulse and blood pressure

c) Degree of pallor

d) Presence or absence of jaundice

e) Visceromegaly

Bleeding disorders

Learning objectives

Student should

a) Identify the likely cause of bleeding based on

1) Site of bleeding

Skin & subcutaneous tissue

Cavity bleed

Joint bleed

2) Characteristics of bleeding

Petechiae

Purpura

Ecchymosis

3) Age of patient

4) Family history

5) Gender

6) Mode of onset & pattern of presentation

b) Enumerate common causes of bleeding tendencies

c) Enlist investigations required for workup of these patients

d) Identify complications frequently encountered

e) Enumerate relevant differential diagnosis

f) Outline different treatment strategies for each disorder

While examining the child with suspected bleeding diathesis, concentrate on

Patterns of bleeding

Sites involved

Presence or absence of joint involvement

Presence or absence of lymphadenopathy

Presence or absence of visceromegaly

Oncology

Most important topic in this section is ALL, though some insight into other forms of leukemia is also required.

Other malignancies to remember are Neuroblastoma, lymphoma and Wilms tumor.

Learning objectives

Student should

a) Identify the risk factors for leukemia
b) Enumerate common symptoms & signs of a malignant disorder
c) Learn how to classify leukemias
d) Grading &staging system of malignant disorders
e) Describe investigation workup
f) Tabulate treatment protocols

g) Enumerate complications due to the disease and due to treatment.

Important examination points

a) Assess effect on growth parameters
b) In suspected cases of leukemia look for evidence of bone marrow involvement like pallor, petechiae, purpura.
c) Lymphadenopathy
d) Visceromegaly

Cardiology

Important topics under this heading are

Acyanotic& cyanotic congenital heart disease
Rheumatic heart disease
Rheumatic fever/ Infective endocarditis
Arrhythmias
Congestive cardiac failure

Acyanotic& cyanotic congenital heart disease

Learning objectives

Student should

a) Enumerate common congenital heart lesions

b) Describe how cyanosis develops

c) Enlist common symptoms & signs of congenital heart lesions

d) Tabulate relevant investigations

e) Outline treatment options for each lesion

f) Enlist complications of congenital heart lesions

Rheumatic heart disease

Learning objectives

Student should know

a) Frequency of different types of Rheumatic heart disease
b) Symptoms & signs of each type of lesion
c) How to investigate each lesion
d) Enlist treatment options

Rheumatic fever / Infective Endocarditis

Learning objectives

Students should

a) Familiarize with pathophysiology of each
b) Enlist signs and symptoms of each
c) Devise management plan and follow-up of each

d) Understand the concept of Primary, Secondary and tertiary prophylaxis in Rh fever.
e) Identify cardiac lesions requiring prophylaxis for infective endocarditis.

Arrhythmias

Learning objectives

Students should

a) Identify specific ECG findings of common arrhythmias encountered in children
b) Enlist treatment options for each

Congestive cardiac failure

Frequently an association of cardiac lesions & rhythm disturbances, is also encountered in some non-cardiac diseases e.g. severe anemia.

Learning objectives

Student should

a) Identify symptoms and signs of CCF
b) Enumerate common causes of CCF in children
c) Devise treatment plan according to underlying cause

While doing CVS examination students should make an effort to correlate findings on General physical examination with Precordial signs to make a correct clinical diagnosis.

Thorough general physical examination is important as many signs e.g. clubbing, cyanosis, pedal edema, and tachycardia point to underlying cardiac disease.

Students should also familiarize themselves with efficient auscultation technique, identifying first & second heart sounds, as this would facilitate their recognition of systole and diastole and hence respective murmurs.

Central Nervous System

Diseases of the nervous system have a profound impact on the lives of infants, children, and their families. These disorders include epilepsy, cerebral palsy, mental retardation, learning disabilities, complex

metabolic diseases, nerve and muscle diseases, and a host of other highly challenging conditions.

Students should learn:

a) Recognition of impaired neurologic function through careful history and physical examination
b) Identification of the specific part of the nervous system that has been affected
c) Definition of the most likely etiologies, using mode and speed of onset, evolution of illness, and involvement of other organ systems, as well as relevant past and family histories
d) Use of laboratory tests and other diagnostic technologies to determine which of the different possible etiologies is present
e) Assessment of the degree of disability
f) Management
g) Prognosis

Meningitis

Students should be able to discuss meningitis as follows

a) Define meningitis.
b) Define the most prevalent organism that causes bacterial meningitis in individuals 15-24.
c) Discuss the effects of meningitis on various body systems.
d) Discuss the toxin produced in meningococcal pneumonia and its effect on the body.
e) Discuss how bacterial organisms gain access to the central nervous system.

f) Discuss the differences between bacterial and viral meningitis. Describe diagnostic testing methods used to diagnose meningitis and determine the effect of the disease to include:

    a) Lumbar puncture
    b) Laboratory procedures including spinal fluid and blood analysis.
    c) CAT scan

Define the key laboratory parameters (in spinal fluid and blood) that patient care individuals need for the diagnosis and treatment of meningitis. Which results are necessary for the physician to select appropriate treatment? Define normal as well as abnormal values

Describe the advantages and disadvantages of a CAT scan over a standard X-ray.

Describe the signs and symptoms of bacterial meningitis

Define the following as they apply to acute meningitis:

    a) petechiae
    b) septicemia
    c) Gram stain
    d) blood culture

Describe common vaccines used for the prevention of meningitis.

Describe the modes of transmission of bacterial meningitis and why it poses such a public health hazard.

Briefly outline the protocol for managing people contacts that have associated with a patient that has acquired acute bacterial meningitis.

Define the roles of the health care workers in diagnoses, treatment, and prevention of meningitis to include:

    a) Nursing

b) Physician
c) Medical Laboratory Technologist
d) Radiology technician
e) Epidemiologist

Define treatment protocol for patients with bacterial meningitis including the purpose of steroid drugs such as dexamethasone

Describe the possible consequences of a missed or delayed diagnosis of a case such as the one we are studying. Include consequences for the patient and the community.

Epilepsy / Febrile Seizures

a) While learning seizure, students should

b) Accurately diagnose epilepsy in view of the new practical definition and distinguish epileptic seizures from other episodic disorders by history, examination, and appropriate application of electroencephalographic and imaging
investigations

c) Assess patients presenting with their first seizure, determine their risk of having a second seizure, and use this information to guide treatment decisions

d) Discuss the epidemiology, causes, and management of febrile seizures

e) Recognize common electro clinical syndromes in children and understand how these guide investigations and therapy

f) Describe the common seizure presentations, etiologies, EEG patterns, and imaging findings associated with focal epilepsy

g) Describe the diagnostic evaluation and management for patients with nonepileptic seizures

h) Discuss the spectrum of efficacy, clinical pharmacology, and modes of use for individual antiepileptic drugs

i) Discuss the evaluation of a patient with drug-resistant epilepsy and recognize the role and inications for surgical and nonsurgical options for patients with drug-resistant epilepsy

j) Recognize and manage epilepsy emergencies. Should know about status epilepticus, its causes and management.

k) Describe the common comorbid conditions that occur in individuals with seizures and epilepsy and outline the key management options and strategies for mitigating these conditions to maximize quality of life

l) Recognize and treat inflammatory causes of seizures and epilepsy

m) Recognize the challenges in epilepsy treatment specific to patients over 60 years of age and potential etiologies for seizures in the setting of an immunocompromised patient, and discuss issues related to bone health in patients with epilepsy

n) Identify ethical principles raised by a parent's request for a prescription that is not the recommended medical treatment for a child

o) Discuss cultural barriers that contribute to medication nonadherence in patients with epilepsy

Acute Flaccid Paralysis

Definition of AFP

Epidemiology

Clinical approach to children with AFP

How to differentiate among (Polio, Guillain-Barré syndrome, Traumatic neuritis, Transverse Myelitis)

Type of motor neuron lesion

Differential diagnosis of AFP according to location of lesion

a) Spinal cord

b) Anterior horn cell disease

c) Peripheral nerve

d) Disorder of neuromuscular transmission

e) Systemic disease

Investigations

a) Spinal cord MRI.

b) CSF study.

c) Nerve conduction study.

d) OTHERS

AFP surveillance in children

a) report enough cases,
b) send stools for enterovirus isolation using a standardized protocol
c) follow up children with AFP to determine the outcome.

Protocol for AFP surveillance

Clinical approach to children with AFP

How to differentiate among • Polio • Guillain-Barre syndrome • Traumatic neuritis • Transverse Myelitis

Clinical Questions

a) Demonstrable Lower limb Motor Weakness
b) Sphincters Preserved/ Affected
c) Sensory loss
d) Reflexes.. Reduced or normal Absent

Investigations Required a)

AFP workup

b) CSF: cells, protein, sugar, culture, TB PCR, oligo clonal bands
c) creatine kinase
d) Nerve conduction study
e) MRI Required
f) urine myoglobin Required
g) Forced vital capacity
h) TB workup
i) serum electrolytes

Guillain-Barre Syndrome

GBS is the most common cause of acute flaccid paralysis

Epidemiology, pathophysiology

Clinical features

Findings on physical examination

What is the clinical course

Forms of GBS

Diagnosis

GBS Management

GBS Management Risk factors for respiratory failure in GBS

Special Therapy Immune modulatory therapy

IVIG Regimens, Plasmapheresis

Complications

Prognosis

Poliomyelitis

Polio is the preventable cause of life long disability.

Epidemiology, pathophysiology

Clinical features

Findings on physical examination

What is the clinical course

Different forms of polio

Diagnosis

Management

Prevention

Vaccination as a part of EPI and NIDs

Complications

Prognosis

Approach to a child with involuntary movements

Students should be able to tell about

Introduction

Can be the primary or secondary manifestation of numerous neurologic disorder

Pathophysiology

Movement disorder according to

Lesion in globus pallidus – athetosis

a) Lesion in subthalamic nucleus – hemiballismus
b) Multiple small lesion in putamen – s.chorea
c) Lesion in caudate nucleus – huntington chorea
d) Lesion in substantia nigra – Parkinson disease

Biochemistry

Movement disorder according to

Definition and causes of common abnormal movements

a) Tics
b) Chorea
c) Athetosis
d) Tremors
e) Dystonia
f) Ballismus
g) Myoclonus
h) Ataxia
i) Hypokinesia

Approach to a patient with movement disorder

Key questions

a) Is the pattern of movements normal or abnormal?
b) Is the number of movements excessive or diminished?
c) Is the movement paroxysmal, continual, or continuous?
d) Has the movement disorder changed over time?
e) Do environmental stimuli or emotional states modulate it
f) Can the movements be suppressed voluntarily?
g) suggestive of focal neurologic deficit or systemic disease?
h) Is there a family history of a similar or related condition?
i) Does the movement disorder abate with sleep?

History, general physical examination

CNS examination findings

Systemic examination

Should be able to tell about investigations to be conducted for the diagnosis, evaluation and complications of the disease

a) CBC, ESR
b) RFT, LFT,RBS, Electrolytes
c) Throat culture
d) Imaging: CT SCAN, MRI, USG, ECHO
e) Electrophysiological studies: EMG, EEG, ECG
f) Serological assay
g) Test for metabolic disorder

Principle of Management

a) Symptomatic treatment
b) Treatment of the cause
c) Counselling

Duchenne Muscular Dystrophy

Learning Objectives

Introduction

a) Inheritance
b) Gender predisposition
c) Prevalence and frequency

Dystrophinopathy

Etiology and pathogenesis

Genetics

Clinical features

b) Typical history
c) Physical examination particularly motor and musculoskeletal system examination
d) Importance of Gower's sign

How to diagnose DMD on the basis of

a) Characteristic age and sex
b) Presence of symptoms and signs suggestive of a myopathic process
c) A positive family history suggesting X-linked recessive inheritance.
d) Molecular Genetic Testing

e) Muscle MRI

Investigations

Both for the diagnosis and complication of the disease

Complications

Cardiac, respiratory, intellectual, orthopedic, malignant hyperthermia

Management

a) Cardiac disease
b) Respiratory disease
c) Orthopedic problems
d) Corticosteroid Therapy
e) Gene Therapy
f) Life style modifications

Prognosis

Cerebral Palsy

Definition

Etiology

Causes of cerebral palsy involve of prenatal, perinatal and postnatal

Type of cerebral palsy

A. Spastic (Pyramidal) Type of spastic cerebral palsy:
   a) Hemiplegia
   b) Diplegia
   c) Tetraplegia (quadriplegia)
   d) Triplegia
   e) Monoplegia
   f) Paraplegia

B. Dyskinetic (Nonspecific, extrapyramidal)
   a) Athetoid
   b) Dystonic
C. Ataxic (Nonspastic, extrapyramidal
D. Atonic
E. Mixed

Clinical Manifestation

   a) Physical
   b) Behavioral sign
   c) Diagnostic test
      1. Physical examination
      2. History taking
      3. Neurologic assessment

Magnetic resonance imaging (MRI)

Ultrasound

Computerised tomography (CT) scan

A. Medical Therapy

a) To establish locomotion, communication and self help

b) To gain optimum appearance and integration of motor functions

c) To correct associated defects as early and effectively

d) To provide educational opportunities adapted to the individual child's needs

e) To promote socialization experiences with other affected unaffected children

A. Physical therapy
B. Occupational therapy
C. Speech and language therapy
D. Pharmacological
    1. Analgesic drug, to reduce intense pain or muscle spasm.
    2. Botulinum toxin type A, used to reduce spasticity in targeted muscle of the upper and lower extremities
    3. Inhaled nitrous / oral midazolam used for sedation
    4. Dantrolene sodium, baclofen, and diazepam to improve muscle relaxation.
    5. Anticonvulsants drug, to relieve or stop seizure

Surgical therapy

1. Selective dorsal rhizotomy
2. Selective Posterior Rhizotomy
3. Gastrostomy
4. Recent Advance
5. Nursing responsibility

Endocrinology

Three topics are required to be covered in this section

Diabetes Mellitus

Learning objectives

Student should be able to

a) Classify Diabetes Mellitus
b) Describe the underlying pathology
c) Recognize signs & symptoms of the disease

d) Outline the investigations

e) Enumerate complications due to the disease & due to treatment

f) Enlist different aspects of management of the disease

g) Devise a logical follow-up plan

While reading this topic a clear understanding needs to be developed about the metabolic disturbance of Carbohydrate, Fat & Protein that is the reason for all the manifestations of the disease and would help in devising the management strategy as well. A clear concept should be developed about the multifaceted management plan including diet, exercise and insulin regimens. During examination of a child with Diabetes focus should be on Growth parameters & evaluation for macro vascular and microvascular complications.

Diabetic ketoacidosis

A frequently encountered complication of type 1 Diabetes mellitus

Learning objectives

Student should be able to

a) Explain how it occurs

b) Enlist major components of this condition

c) Enumerate relevant investigations

d) Describe mechanism of cerebral edema & its management

e) Tabulate the flowchart of treatment & monitoring

Short stature

Learning objectives

Student should be familiar with the

a) Criteria for diagnosing short stature
b) Concept of growth velocity
c) Causes of short stature
d) Difference between proportionate and disproportionate short stature
e) Work up of a child with short stature

f) How and when to treat with growth hormone

It is important for the student to develop the concept of when to say a child has short stature and why it is important to differentiate between proportionate and disproportionate short stature

While examining a child with short stature concentrate on

a) Growth parameters
b) Upper and lower segment ratio
c) Arm span
d) Dysmorphism
e) Vital signs
f) Cutaneous stigmata of Endocrine disorders

Hypothyroidism

Learning objectives

Students should

a) Familiarize themselves with the concept of congenital & acquired Hypothyroidism
b) Remember that congenital Hypothyroidism is the most common treatable cause of Mental retardation
c) Tabulate signs & symptoms of Hypothyroidism
d) Analyze the impact on growth & development
e) Outline investigation plan
f) Devise treatment and follow-up plan
g) Be aware of the need for neonatal screening

While examining a child with Hypothyroidism evaluate a) Growth & Development

b) Features of other autoimmune disorders in case of acquired Hypothyroidism
c) Dysmorphism

Nephrology

Kidneys perform many critical functions and in order to identify and manage its disorders we need to understand primary kidney diseases as well as systemic consequences of kidney dysfunction.

The areas of our main focus are hematuria, primary kidney disorders such as glomerular diseases (glomerulonephritis and nephrotic syndrome), effects of toxins (hemolytic uremic syndrome) and acute and chronic kidney disease.

Learning Objectives

The students should be able to

a) Identify different causes of red urine through history and examination
b) Define hematuria, its possible etiologies and interpret results of urine R/E and other relevant investigations.
c) Distinguish between nephrotic and nephritic syndromes.
d) Learn differentiating points between different types of glomerulonephritis
e) Determine the etiology of different kidney disorders on basis of history, clinical features and investigations
f) Asses complications associated with the disease and as well as its treatment
g) Management of acute and chronic kidney disorders
h) Explain prognosis of different disease

Hematuris

Learning Objectives

Students should be able to

a) Define hematuria

b) Differentiate hematuria from other causes of red urine
c) Enumerate symptoms that suggest a specific kidney disorder; for e.g. cola colored urine, hypertension and oliguria are classic symptoms of acute post streptococcal glomerulonephritis
d) Evaluate glomerular and extra glomerular hematuria with specific laboratory and radiological investigations
e) Treatment and follow up according to etiology.

Acute Post Streptococcal Glomerulonephritis

It is very common in children and can lead to complications.

Learning Objectives

The students must know

a) Age of onset
b) Causative organism
c) Incubation period (for example; skin infection takes 4 to 6 weeks and throat infections up to two weeks to manifest)
d) Pathogenesis
e) Clinical manifestations of disease and associated symptoms
f) Enlist complications
g) Investigations to confirm your diagnosis
h) Differential diagnosis (as IgA Nephropathy has similar clinical features; cola colored urine with hypertension but shorter incubation period of 3 to 5 days)
i) Prevention of disease
j) Treatment of disease and its complications
k) Prognosis

Proteinuria and nephrotic syndrome

Most important topic of this section.

Learning Objectives:

Students should learn all the aspects of this disease in terms of

a) Pathophysiology of proteinuria (glomerular or tubular)
b) Causes of proteinuria
c) Methods available to test proteinuria (urine dipstick testing, urine protein to creatinine ratio etc.)
d) Nephrotic syndrome definition
e) Etiology (primary, secondary or hereditary)
f) Pathogenesis and its clinical consequences (like edema, hypercoauguble state)
g) What is Idiopathic nephrotic syndrome
h) Different Pathological types (minimal change)
i) Salient clinical features and there progression
j) Common age of presentation
k) Differential diagnosis
l) Atypical nephrotic syndrome features
m) How will you diagnose/investigate
n) Indications of renal biopsy
o) Treatment of minimal change nephrotic syndrome. (Use of steroids, pre-requisites of steroid therapy)
p) How to treat initial episode
q) Know the definitions of response and remission

r) How to give steroids, for how long should a child be treated and how to taper steroids
s) Management of associated problems (edema, infection; subacute bacterial peritonitis etc.)
t) What is relapse and how to treat it
u) Steroid resistant nephrotic syndrome
v) Alternate therapies to replace or to be used alongside steroids
w) Immunization of children with nephrotic syndrome (as most of them have proteinuria and on steroids thus immune compromised)
x) Side effects of steroid use
y) Prognosis and follow up of children with nephrotic syndrome

Hemolytic Uremic Syndrome

It is a common cause of community acquired acute kidney injury.

Learning Objectives:

Students must learn

a) Characteristic clinical presentation
b) Etiology
c) Diagnosis and differential diagnosis
d) Investigations
e) Treatment and prognosis

Renal Failure

Acute kidney injury and chronic kidney disease Learning Objectives:

Students should be able to describe both entities under following headings

a) Definitions of acute and chronic kidney diseases
b) Etiology (pre renal, renal and post renal causes or according to age<5 years and >5yrs)
c) Clinical features according to different etiologies
d) Laboratory findings to confirm diagnosis and predict complications
e) Management of disease and associated complications
f) Prognosis of disease
g) Indications for dialysis

UTI and Obstructive Uropathies

This includes posterior urethral valves, UPJ obstruction and vesicoureteric reflux (VUR)

Learning Objectives:

Students must learn

a) Definitions and types of UTI and grading of VUR
b) Risk factors for UTI
c) Pathogenesis
d) Clinical features

e) Laboratory and radiological investigations needed and learn how to interpret them
f) Management (medical or surgical)
g) Follow up examination and investigations
h) Prophylactic treatment for UT

Accidental Poisoning

Important Poisons to know about

Kerosene
Organophosphate
Acetaminophen
Iron
Caustics/corrosives (household supplies: e.g. bleach, drain-openers)

Learning Objectives

a) Familiarize with common presentation of each type of poisoning
b) Enlist step wise approach to treat a patient with each of these poisons
c) Enumerate the antidote(s) of each poison
d) Tabulate treatment strategies

Paediatric Surgery

Important topics

Intestinal Obstruction
Hypertrophic pyloric stenosis
Vesico-ureteric Reflux (VUR)
Hydrocephalus
Neural Tube Defects (Meningomyelocele, TEV)

Learning Objectives

a) Learn to distinguish the surgical nature of the underlying problem
b) Common signs and symptoms of the different diseases
c) Investigation plan
d) Brief detail of the surgical procedure required
e) Prevention where applicable, e.g. Neural Tube Defects
f) Complications likely to be encountered

SUMMARY OF COURSE CONTENT

SKILLS:

a) Students will demonstrate his ability to obtain a relevant clinical history from a parent or an older child.
b) Student will demonstrate his ability to perform adequate clinical examination of a child of any age (including newborn).
c) Student will be able to interpret clinical and laboratory data to arrive at a diagnosis.
d) Student will be able to advise appropriate nutritional measures for healthy and sick children (Breast feeding, avoidance of bottle, proper weaning)
e) Student will be able to counsel the parents on health promotive and disease preventive strategies for the child e.g. immunization procedures; hand washing)
f) Student will be able to recognize and manage common health problems of children.
g) Student will recognize the danger signs of disease in children and be able to appropriately refer children with severe disease to appropriate specialists/hospitals.
h) Student will demonstrate his ability to perform essential clinical procedures relevant to children e.g.
    - Resuscitation of newborn
    - Basic cardio-pulmonary resuscitation
    - Anthropometric measurements
    - Measuring blood pressure
    - Starting intravenous lines/ draw blood sample
    - Administration of oxygen therapy
    - Giving nebulizer therapy [bronchodilator]
    - Use of growth chart

Observe the following skills:

a) Lumbar puncture
b) Bone marrow aspiration
c) Supra pubic puncture
d) Subdural tap
e) Thoracentesis

f) Pericardiocentesis
g) Liver biopsy
h) Renal biopsy
i) Observe passing of catheter
j) Observe pericardial tap

Topics:

a) Immunization: EPI schedule, vaccine administration

b) Nutrition: protein energy malnutrition, rickets, basis of paediatric nutrition

c) Development: development milestones, anthropometry

d) Respiratory diseases: stridor, diphtheria, pertussis, ARI, IMNCI guidelines, asthma, pulmonary tuberculosis

e) Infections: measles, mumps, chicken pox, rheumatic fever, infective endocarditis, malaria, enteric fever, meningitis, encephalitis, poliomyelitis, croup, tetanus, AGE, ear infections

f) Gastroenterology: AGE, recurrent abdominal pain, chronic liver disease, chronic diarrhea, celiac disease, malabsorption

g) Neonatology: normal newborn, breast feeding, neonatal jaundice, neonatal sepsis, LBW/prematurity, neonatal convulsions, vomiting in newborn, birth asphyxia, resuscitation, vitamin K deficiency, RDS, NEC, HIE

h) Cardiology: Acynotic heart diseases, Tetralogy of Fallot, CCF in children, Rheumatic heart disease

i) Neurology: febrile seizures, epilepsy, meningitis, cerebral palsy, acute flaccid paralysis, ataxia and movement disorder, neurodegenerative disorders.

j) Endocrinology: diabetes mellitus, DKA, hypothyroidism, short stature, disorders of puberty

k) Hematology: IDA, Thalassemia, hemolytic anemia, G6PD, hereditary spherocytosis, bleeding disorders, aplastic anemia

l) Malignancies: ALL, AML, CML, CLL

Nephrology: UTI, nephrotic syndrome, AKI, CKD, APSGN, neuroblastoma, Wilms tumor

Childhood poisoning

Examination Schedule

a) Ward test is conducted for all clinical batches in form of bedside examinations followed by viva.
b) End of ward rotation evaluation is done for Final year in form of short cases, viva and OSPE.
c) 3 term exams is taken for Final year MBBS.
d) Send up exam is held for Final year MBBS at end of academic session.

Examination Procedure

a) All the written papers are taken on the pattern of University exam.
b) For Final Year There are
c) 3 Class tests
d) Send up exam, written paper, OSPE & Short cases.
e) Questions for the written paper are always made afresh by the Paediatric faculty.
f) Paper is printed 1-2 days prior to exam
g) Questions are shuffled.
h) Auditorium is used so students are seated wide apart.
i) Mobile phones are collected before exam.
j) Invigilation is done by P.G Trainees, and exam is supervised by Senior Registrar and Assistant Professor.
k) Question papers are taken back at the end of exam.
l) Feedback and discussion about the paper is carried out soon after the exam.

TimeTable

REVISED TIME TABLE FOR FINAL YEAR MBBS CLASS FOR THE SESSION 2022-2023
QUAID-E-AZAM MEDICAL COLLEGE BAHAWALPUR
WITH EFFECT FROM 13-03-2023.

DAYS	08:00 to 08:50 AM	08:50 to 09:40 AM	09:40 to 10:00 AM	10:00 to 02:00 PM	
MONDAY	Surgery (S1)	Gynae & Obst	Recess	Ward Teaching	
TUESDAY	Surgery (S2)	Gynae & Obst		Ward Teaching	
WEDNESDAY	Surgery (S3)	Medicine (M1)		Ward Teaching	
THURSDAY	CPC	Medicine (M2)		Ward Teaching	
FRIDAY	Surgery (S4)	Medicine (M3)		10:00 to 12:00 NOON Ward Teaching	FRIDAY
SATURDAY	Paediatrics	Medicine (M4)		10:00 to 02:00 PM Ward Teaching	

NOTE: There will be a joint CPC for 3rd , 4th & Final Year.
75% attendance is mandatory in lectures,Practicals & Ward attendance.
No scholarship or other benefits would be permissible without 75% attendance.
25% margin in attendance is only reserved for sick leaves or genuine problems with proper application and approval by the Director Students Affairs.

No.6687-97 /QAMC/SS/23 Dated: 08-03- -2023.
1. The Director Medical Education (DME) Department QAMC, Bahawalpur.
2. The Head of Clinical Departments (Concerned) QAMC, Bahawalpur.
3. College & Hostel Notice Board, QAMC, Bahawalpur.

PRINCIPAL
Quaid-e-Azam Medical College
Bahawalpur

Teaching Routine

a) lectures of final year MBBS classes. These lectures are interactive and focused on scenario-based learning.

b) Problem based learning (PBL) is conducted for final year students.

c) Clinicopathological conferences are held on regular basis where students prepare CPC under the supervision of faculty members. All presentations are made by students.

d) Workshops are held for Final year MBBS for each clinical batch on Fluid and Electrolytes, Neonatal resuscitation and Oxygen Therapy.

e) Clinical teaching is carried out in wards daily (morning & evening classes) in form of history taking, bedside examinations & case presentations.

f) term exams are held to evaluate undergraduate students.

g) Clinical assessment of undergraduate students is done in form of Ward test including TOACs & short cases.

Clinicopathological conference (CPC)

a) CPC is presented by Paediatrics Department in every academic year .

b) Selection of the topics for CPC is done by Head of Department and supervisor of CPC.

c) Usually tendency is to select a topic that is a frequent and common Paediatric problem, so that resulting discussion is informative for majority of young Doctors who would be handling such patients.

d) Students are guided on how to prepare the slides; references are suggested and students are required to do practice sessions in front of supervisor and Head of Department.

e) Students are given a period of 4-6 weeks for preparation.

Problem- Based Learning PBL
Procedure:

a) PBL sessions are conducted once a week for 4-5 months in Final year.

b) Two to three case scenarios are discussed during each sessions and students are informed to come prepared with the topic for each group.

c) Each session is totally interactive, student directed & lasts for 50 mins.

d) Pre & Post PBL quiz is occasionally the formative evaluation procedure.

(PBL)Topics:

May-june 2023:

1. Child with fever and neck stiffness
2. Child with Hepatosplenomegaly
3. Child with red urine
4. Cyanotic/ Acyanotic heart disease
1. Joint Swelling
2. Frequent bruises/ nose bleeds
3. Why does my child have developmental delay
4. Fever with a rash

1. Child with fever (without a focus)
2. Child with seizures
3. Child with prolonged diarrhea
4. Why is my child weak?

Aug-sept 2023:

1. Short cases
2. Acute flaccid paralysis
3. Developmental delay
4. Micronutrient deficiencies

Oct-nov 2023:

1. Respiratory distress in a newborn (RDS/ birth asphyxia/ Neonatal sepsis)
2. Recurrent abdominal pain
3. Why is my child pale 4. Child with respiratory distress

Clinical Rotation Plan Final Year

REVISED WARD TEACHING PROGRAMME FINAL YEAR MBBS CLASS FOR THE SESSION 2022-2023
QUAID-E-AZAM MEDICAL COLLEGE BAHAWALPUR
WITH EFFECT FROM 14-10-2023.

UNIT	BATCH A to L											
	13-03-23 to 31-03-23	01-04-23 to 28-04-23 included 08-days spring vacations	29-04-23 to 18-05-23	19-05-23 to 07-06-23	08-06-23 to 02-08-23 included 30-days summer vacations	03-08-23 to 22-08-23	23-08-23 to 11-09-23	12-09-23 to 01-10-23	02-10-23 to 18-10-23	19-10-23 to 04-11-23	05-11-23 to 21-11-23	22-11-23 to 08-12-23
Medical Unit-I,	A	B	C	D	E	F	G	H	I	J	K	L
Medical Unit-II,	B	C	D	A	F	G	H	E	J	K	L	I
Medical Unit-III,	C	D	A	B	G	H	E	F	K	L	I	J
Medical Unit-IV,	D	A	B	C	H	E	F	G	L	I	J	K
Surgical Unit-I,	I	J	K	L	A	B	C	D	E	F	G	H
Surgical Unit-II,	J	K	L	I	B	C	D	A	F	G	H	E
Surgical Unit-III,	K	L	I	J	C	D	A	B	G	H	E	F
Surgical Unit-IV,	L	I	J	K	D	A	B	C	H	E	F	G
Gynaecology-I,	E	F	G	H	I	J	K	L	A	B	C	D
Gynaecology-II,	F	G	H	E	J	K	L	I	B	C	D	A
Paediatric Unit-I,	G	H	E	F	K	L	I	J	C	D	A	B
Paediatric Unit-II,	H	E	F	G	L	I	J	K	D	A	B	C

No. 26567 – 75 /QAMC/SS/23 Dated: 13 – 10 -2023.

A copy is forwarded for information and necessary action to:-

1. The Director Medical Education (DME) Department QAMC, Bahawalpur.
2. The Head of Clinical Departments (Concerned) QAMC, Bahawalpur.
3. College & Hostel Notice Boards, QAMC, Bahawalpur.

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Bahawalpur

Topics revised during clinical rotation are:

Thalassemia
ARI
Malnutrition
Febrile fits
Epilepsy
Diarrhea & Vomiting
Anemia (other than iron deficiency)
Iron deficiency Anemia
Developmental delay
Cerebral Palsy
CLD

Nephrotic Syndrome
Fever without a source
ITP
Abdominal pain
UTI
Sepsis
Meningitis
Fever with a rash
Malaria
Enteric fever
Bronchiolitis
Asthma

Teaching Resources

- Lecture Halls for lectures in college with audio-visual aid.
- PBL room for problem-based learning with audio-visual aid.
- Departmental Conference room in college for small group discussions.
- Teaching Classroom/Demo room in ward for case discussions and examinations.

- Departmental Conference room in hospital OPD for case presentations and CPC with audio-visual aid.
- College library for reference books.
- Departmental library both in college and hospital.
- Video library for different procedures.
- Campus Internet for e-learning.
- Skills Lab with mannequins.

Prescribed Textbooks and Reference Websites

These are the textbooks recommended for the students. The websites suggested may be used for further studying.

Textbooks

a) Illustrated textbook of pediatrics. 5th edition. Tom Lissauer, Will Carroll

b) Current pediatric diagnosis and treatment. 25th edition. William W.Hay

c) Basis of Pediatrics.Pervaiz Akbar Khan.

d) Harriet and Lane Handbook of Pediatrics

Websites

a) Up to date research publications. www.uptodate.com

b) Pediatrics in review. http://www.aappublications.org