

GHAI Essential Pediatrics

For over four decades Ghai Essential Pediatrics has been this subcontinent's most trusted resource for undergraduate and postgraduate teaching in pediatrics. The book has shaped the competencies of generations of health professionals in child healthcare. With contributions from more than 40 experts, the tenth edition is thoroughly updated and revised to ensure that the reader has access to the latest information on diagnoses and therapies.

- Unique features of this edition**
- Alignment with the competency-based undergraduate curriculum prescribed by the National Medical Commission
 - Focus on child nutrition, growth and development
 - Emphasis on recognition and management of common pediatric conditions
 - Liberal use of algorithms and tables emphasizing differential diagnosis, and integrating strategies for evaluation and management
 - Updated guidelines on diagnosis and management of COVID-19, tuberculosis and other infections; care of healthy and sick newborns, and management of systemic diseases
 - Extensive revision of chapters on immunization, infections, genetics and inborn errors of metabolism, and kidney diseases
 - Fresh perspectives from new contributing authors on fluid and electrolyte disorders, critical care, and medical procedures
 - Up-to-date and detailed IMNCI guidelines for managing sick young children
 - Easy to locate key content through unique color design
 - References to relevant websites and updated resources for suggested reading
 - Access to dedicated App that provides resource of clinical photographs, radiographs, tables and algorithms to enhance student-learning and support class-teaching

Editors

Vinod K Paul MD, PhD, FAMS, FNAsc, FASc, FNA

is former Professor and Head, Department of Pediatrics, All India Institute of Medical Sciences, New Delhi. He is currently a full-time Member of the NITI Aayog, the National Institution for Transforming India, Government of India, where he anchors the health, women and child development, and education sectors.



Dr Paul is an internationally recognized neonatologist, researcher, public health exponent and teacher, with pivotal contributions to national health policy and programs. He is a fellow of National Academy of Medical Sciences and the three national science academies, and recipient of Dr BR Ambedkar Centenary Award for Excellence in Biomedical Research as well as the Public Health Champion Award. He has been conferred the prestigious Ihsan Doigramaci Family Health Foundation Prize (2018) by the WHO for global contributions to the field of family health.

Arvind Bagga MD, FIAP, FISN, FAMS

is Professor and Head, Department of Pediatrics, All India Institute of Medical Sciences, New Delhi. He is recognized for his contributions to clinical care, translational research and education in pediatrics, especially in pediatric nephrology. He has been the editor of *Pediatric Research*, *Indian Pediatrics*, *Cochrane Kidney and Transplant*, and *Asian Journal of Pediatric Nephrology*. He is a fellow of the National Academy of Medical Sciences and multiple medical academies. He was conferred the Education Award (2019) by the International Pediatric Nephrology Association for outstanding educational and academic contributions.



Dedicated to Education



CBS Publishers & Distributors Pvt Ltd

4819/XI, Prahlad Street, 24 Ansari Road, Daryaganj, New Delhi 110 002, India
E-mail: delhi@cbspd.com, customercare@cbspd.com; Website: www.cbspd.com
New Delhi | Bengaluru | Chennai | Kochi | Kolkata | Lucknow | Mumbai
Hyderabad | Jharkhand | Nagpur | Patna | Pune | Uttarakhand



Scan for the price of this book and catalogue

ISBN: 978-93-5466-507-3



9 789354 665073



Tenth
Edition

Tenth
Edition

GHAI

Essential Pediatrics

Editors

Paul
Bagga

Tenth
Edition

GHAI Essential Pediatrics

As per the latest CBME Guidelines | Competency Based Undergraduate Curriculum for the Indian Medical Graduate



Available free on **CBSiCentral App**

A rich resource of clinical photographs, radiographs, graphic illustrations and algorithms included in this book.

Editors

Vinod K Paul
Arvind Bagga



CBSPD Dedicated to Education

CBS Publishers & Distributors Pvt Ltd



Contributors

Vinod K Paul

Member (Health), NITI Aayog
Government of India, and
Former Professor and Head, Department of Pediatrics
All India Institute of Medical Sciences, New Delhi

Arvind Bagga

Professor and Head, Department of Pediatrics
Chief, Division of Pediatric Nephrology
All India Institute of Medical Sciences, New Delhi

Ramesh Agarwal

Professor, Division of Neonatology
Department of Pediatrics
All India Institute of Medical Sciences, New Delhi

Anuja Agarwala

Hon. Senior Advisor (Nutrition), INCLEN
Nutrition Consultant, Blossom Children Clinic
Former Senior Dietitian, Department of Pediatrics
All India Institute of Medical Sciences, New Delhi

P Ashok Babu

Joint Secretary (RCH)
Ministry of Health and Family Welfare
Government of India, New Delhi

Anurag Bajpai

Consultant Pediatrics and Adolescent Endocrinology
Regency Hospital Limited, Kanpur
Fortis Memorial Research Institute, Gurgaon

Neetu Bhari

Associate Professor
Department of Dermatology and Venereology
All India Institute of Medical Sciences, New Delhi

Vijayalakshmi Bhatia

Professor of Pediatric Endocrinology
Department of Endocrinology
Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow

Biswaroop Chakrabarty

Additional Professor, Division of Neurology
Department of Pediatrics
All India Institute of Medical Sciences, New Delhi

Nitin Dhochak

Assistant Professor, Division of Pulmonology and Intensive Care
Department of Pediatrics
All India Institute of Medical Sciences, New Delhi

Sumita Ghosh

Additional Commissioner (Child Health)
Ministry of Health and Family Welfare
Government of India, New Delhi

Tushar R Godbole

Associate Professor, Dr Vasantrao Pawar Medical College, Nashik
Pediatric Endocrinologist
Harmony Health Specialty Clinic, Nashik

Neerja Gupta

Additional Professor, Division of Genetics
Department of Pediatrics
All India Institute of Medical Sciences, New Delhi

Sheffali Gulati

Professor, Division of Neurology
Department of Pediatrics
All India Institute of Medical Sciences, New Delhi

Barath Jagadisan

Pediatric Hepatologist
King's College Hospital
Denmark Hill, London, UK

Vandana Jain

Professor, Division of Endocrinology
Department of Pediatrics
All India Institute of Medical Sciences, New Delhi

Kana Ram Jat

Additional Professor, Division of Pulmonology and Intensive Care
Department of Pediatrics
All India Institute of Medical Sciences, New Delhi

Madhulika Kabra

Professor, Division of Genetics
Department of Pediatrics
All India Institute of Medical Sciences, New Delhi

Sushil K Kabra

Professor, Division of Pulmonology and Intensive Care
Department of Pediatrics
All India Institute of Medical Sciences, New Delhi

Neena Khanna

Professor and Head
Department of Dermatology
Amrita Hospitals & Amrita Institute of Medical Sciences & Research
Faridabad

R Krishna Kumar

Clinical Professor and Head
Department of Pediatric Cardiology
Amrita Institute of Medical Sciences and Research Centre, Kochi

Rashmi Kumar

Consultant Pediatrician
Professor of Pediatrics and Former Head
King George Medical University, Lucknow

Rakesh Lodha

Professor, Division of Pulmonology and Intensive Care
Department of Pediatrics
All India Institute of Medical Sciences, New Delhi

Georgie Mathew

Associate Professor, Division of Nephrology
Department of Child Health
Christian Medical College and Hospital, Vellore

PSN Menon

Consultant and Head
Department of Pediatrics
Jaber Al-Ahmad Armed Forces Hospital, Kuwait

Rakesh Kumar Pilonia

Associate Professor, Allergy Immunology Unit
Department of Pediatrics, Advanced Pediatrics Centre
Post Graduate Institute of Medical Education and Research, Chandigarh
WHO Collaborating Centre for Education, Research and Training in
Pediatric Immunology

Anu Thukral

Additional Professor, Division of Neonatology
Department of Pediatrics
All India Institute of Medical Sciences, New Delhi

Prem Sagar

Additional Professor
Department of Otolaryngology and Head Neck Surgery
All India Institute of Medical Sciences, New Delhi

Sandeep Samant

Professor, Department of Otolaryngology and Head-Neck Surgery
Feinberg School of Medicine, Northwestern Memorial Hospital
Greater Chicago, IL, USA

Jhuma Sankar

Additional Professor, Division of Pulmonology and Intensive Care
Department of Pediatrics
All India Institute of Medical Sciences, New Delhi

Naveen Sankhyan

Professor, Pediatric Neurology Unit
Department of Pediatrics, Advanced Pediatrics Centre
Post Graduate Institute of Medical Education and Research, Chandigarh

Rachna Seth

Professor, Division of Oncology
Department of Pediatrics
All India Institute of Medical Sciences, New Delhi

Rajeev Seth

Medical Director, Child Health and Development Center
Chair, International Society for Prevention of Child Abuse and Neglect
New Delhi

Tulika Seth

Professor, Department of Hematology
All India Institute of Medical Sciences, New Delhi

Amanpreet Sethi

Assistant Professor, Neonatology
Department of Pediatrics
Guru Gobind Singh Medical College, Faridkot

Rajni Sharma

Additional Professor, Division of Endocrinology
Department of Pediatrics
All India Institute of Medical Sciences, New Delhi

Surjit Singh

Head, Department of Pediatrics and Chief, Allergy Immunology Unit
Advanced Pediatrics Centre
Post Graduate Institute of Medical Education and Research, Chandigarh
WHO Collaborating Centre for Education, Research and Training in
Pediatric Immunology

Tanu Singhal

Consultant, Departments of Pediatrics and Infectious Disease
Kokilaben Dhirubhai Ambani Hospital and Medical Research Institute
Mumbai

Aditi Sinha

Additional Professor, Division of Nephrology
Department of Pediatrics
All India Institute of Medical Sciences, New Delhi

Anshu Srivastava

Professor, Department of Pediatric Gastroenterology
Sanjay Gandhi Postgraduate Institute of Medical Sciences
Lucknow, Uttar Pradesh

RN Srivastava

Senior Consultant, Pediatric Nephrology
Indraprastha Apollo Hospitals, New Delhi

Radhika Tandon

Professor, Department of Ophthalmology
Dr. Rajendra Prasad Centre for Ophthalmic Sciences
All India Institute of Medical Sciences, New Delhi

Alok Thakar

Professor and Head
Department of Otolaryngology and Head Neck Surgery
All India Institute of Medical Sciences, New Delhi

Surender K Yachha

Director and Head
Department of Pediatric Gastroenterology, Hepatology and
Liver Transplantation
Sakra World Hospital, Bengaluru

Contents

| | | | |
|--|-----------|---|------------|
| <i>Preface to the Tenth Edition</i> | | | <i>vii</i> |
| <i>Preface to the First Edition</i> | | | <i>ix</i> |
| <i>Contributors</i> | | | <i>xi</i> |
| 1. Introduction to Pediatrics | 1 | 7. Nutrition | 75 |
| <i>Vinod K Paul</i> | | <i>Rakesh Lodha, Anuja Agarwala</i> | |
| Historical perspective 1 | | Food 75 | |
| Challenge of child health 2 | | Dietary standards 77 | |
| National programs on child health 3 | | Balanced diet 81 | |
| | | Normal balanced diet for various age groups 81 | |
| 2. Growth | 6 | Undernutrition 85 | |
| <i>Ramesh Agarwal, Naveen Sankhyan, Vandana Jain</i> | | Management of malnutrition 88 | |
| Concept of growth 6 | | Overnutrition and obesity 98 | |
| Biology of growth 6 | | | |
| Factors affecting growth 8 | | 8. Micronutrients in Health and Disease | 100 |
| Assessment of physical growth 9 | | <i>Rajni Sharma</i> | |
| Growth charts 12 | | Fat-soluble vitamins 100 | |
| Disorders of growth 16 | | Rickets 104 | |
| Failure of thrive 21 | | Water-soluble vitamins 110 | |
| | | Minerals and trace elements 114 | |
| 3. Development | 22 | 9. Newborn Care | 118 |
| <i>Ramesh Agarwal, Naveen Sankhyan</i> | | <i>Ramesh Agarwal, Amanpreet Sethi</i> | |
| Normal development 22 | | Definitions 118 | |
| Domains of development 24 | | Resuscitation 119 | |
| Developmental assessment 36 | | Level of newborn care 126 | |
| Nurturing care 39 | | Care of normal neonates 127 | |
| | | Evaluation of newborn 131 | |
| 4. Developmental and Behavioral Disorders | 42 | Thermal protection 139 | |
| <i>Biswaroop Chakrabarty, Sheffali Gulati</i> | | Breastfeeding 142 | |
| Global developmental delay, intellectual disability 42 | | Care of low birth weight neonates 147 | |
| Developmental deviance and dissociation 42 | | Kangaroo mother care 149 | |
| Autism spectrum disorder 42 | | Fluid and electrolyte management 151 | |
| Attention deficit hyperactivity disorder 44 | | Feeding of LBW neonates 152 | |
| Specific learning disability 44 | | Respiratory distress 156 | |
| Tic disorder and stereotypies 44 | | Cyanosis in newborn 160 | |
| Other developmental and behavioral disorders 45 | | Perinatal asphyxia 161 | |
| Mental health in children and adolescents 47 | | Neonatal seizures 164 | |
| | | Infections in neonates 166 | |
| 5. Adolescent Health and Development | 48 | Necrotizing enterocolitis 170 | |
| <i>Tushar R Godbole, Vijayalakshmi Bhatia</i> | | Jaundice 170 | |
| Physical aspects 48 | | Neonatal cholestasis 175 | |
| Problems faced by adolescents 50 | | Birth injury 175 | |
| Role of the health care provider 52 | | Congenital malformations 175 | |
| Government interventions in adolescent health care 54 | | Transport of neonates 179 | |
| | | Follow-up of high-risk neonates 179 | |
| 6. Fluid and Electrolyte Disturbances | 55 | Metabolic disorders 180 | |
| <i>Georgie Mathew, Arvind Bagga</i> | | Effect of maternal conditions on fetus and neonates 181 | |
| Composition of body fluids 55 | | Specialized newborn screening before discharge 183 | |
| Normal maintenance fluid and electrolyte requirements 57 | | | |
| Sodium 59 | | 10. Immunization | 185 |
| Potassium 62 | | <i>Aditi Sinha</i> | |
| Calcium 65 | | Definitions and principles 185 | |
| Magnesium 68 | | Vaccination schedules and immunization programs 187 | |
| Acid-base disorders 69 | | Commonly used vaccines 190 | |
| | | Adverse events following immunization (AEFI) 212 | |
| | | Immunization in special circumstances 215 | |

11. Infections and Infestations 220*Tanu Singh, Rakesh Lodha, Sushil K Kabra*

Fever 220
 Common viral infections 225
 Common bacterial infections 254
 Other bacterial infections 261
 Fungal infections 272
 Protozoal infections 274
 Congenital and perinatal infections 284
 Helminthic infections 286
 Health care-associated infections 292
 Rational antimicrobial therapy 293

12. Diseases of Gastrointestinal System and Liver 294*Anshu Srivastava, Barath Jagadisan, Surender K Yachha*

Vomiting 294
 Dysphagia 298
 Constipation 300
 Abdominal pain 303
 Acute diarrhea 309
 Persistent diarrhea 315
 Chronic diarrhea 317
 Gastrointestinal bleeding 325
 Disorders of the hepatobiliary system 328
 Jaundice 331
 Liver failure 333
 Chronic liver disease 334
 Ascites 336
 Portal hypertension 338
 Autoimmune liver disease 340
 Chronic hepatitis B infection 340
 Hepatitis C infection 341
 Metabolic liver disease 342
 Hepatic manifestations of systemic diseases 344
 Neonatal cholestasis 345
 Liver transplantation 349

13. Hematological Disorders 350*Tulika Seth*

Approach to anemia 350
 Approach to hemolytic anemias 357
 Hereditary spherocytosis 358
 Abnormalities in red cell glycolysis 359
 Autoimmune hemolytic anemia 359
 Thalassemias 360
 Sickle cell disease 364
 Aplastic anemia 365
 Hematopoietic stem cell transplantation 367
 Approach to a bleeding child 369
 Approach to thrombosis 375
 White blood cells 377

14. Otorhinolaryngology 379*Prem Sagar, Alok Thakar, Sandeep Samant*

Diseases of the ear 379
 Diseases of nose and sinuses 385
 Diseases of oral cavity and pharynx 389
 Diseases of the larynx and trachea 391
 Diseases of the salivary glands 394

15. Disorders of Respiratory System 395*Sushil K Kabra*

Developmental physiology 395
 Common respiratory symptoms 396
 Diagnosis of respiratory illnesses 399
 Respiratory tract infections 400

Acute lower respiratory tract infections 401
 Acute bronchiolitis 406
 Bronchial asthma 407
 Management of acute exacerbation of asthma 415
 Foreign body aspiration 416
 Lung abscess 416
 Bronchiectasis 416
 Empyema thoracis 417
 Cystic fibrosis 417
 Acute respiratory distress syndrome (ARDS) 418
 Chronic cough 419
 Pulmonary manifestations of HIV infection 420

16. Disorders of Cardiovascular System 422*R Krishna Kumar*

Epidemiology and disease burden of pediatric heart disease in India 422
 Congestive cardiac failure 423
 Congenital heart disease 427
 Acyanotic congenital heart defects 437
 Cyanotic heart disease 444
 Obstructive lesions 453
 Rheumatic fever and rheumatic heart disease 457
 Infective endocarditis 466
 Myocardial diseases 469
 Cardiovascular manifestations of SARS-CoV-2 infection 473
 Pericardial disease 473
 Systemic hypertension 474
 Pulmonary arterial hypertension 477
 Rhythm disorders 480
 Preventing adult cardiovascular disease 485

17. Disorders of Kidney and Urinary Tract 486*Arvind Bagga, Aditi Sinha, RN Srivastava*

Renal anatomy and physiology 486
 Diagnostic evaluation 489
 Hematuria 493
 Proteinuria 496
 Acute glomerulonephritis 496
 Nephrotic syndrome 500
 Steroid-sensitive nephrotic syndrome 500
 Steroid-resistant nephrotic syndrome 505
 Chronic glomerulonephritis 506
 Interstitial nephritis 507
 Urinary tract infections 507
 Vesicoureteric reflux 510
 Acute kidney injury 511
 Hemolytic uremic syndrome 517
 Chronic kidney disease 518
 Kidney replacement therapy 520
 Disorders of tubular transport 521
 Nephrolithiasis and nephrocalcinosis 525
 Enuresis 527
 Congenital abnormalities of kidney and urinary tract 528
 Antenatal hydronephrosis 530
 Cystic kidney diseases 531

18. Endocrine and Metabolic Disorders 533*PSN Menon, Anurag Bajpai, Vandana Jain, Rajni Sharma*

General principles 533
 Disorders of the pituitary gland 533
 Disorders of the thyroid gland 537
 Disorders of bone and mineral metabolism 541
 Disorders of adrenal glands 543
 Obesity 547
 Disorders of the gonads 552
 Differences in sex development 558
 Diabetes mellitus 562

| | |
|---|--|
| <p>19. Diseases of Central Nervous System 571 <i>Rashmi Kumar</i> Neurological diagnosis 571 Congenital malformations 574 Neurocutaneous syndromes 576 Cerebral palsy 578 Seizures and epilepsy 579 Epilepsy 580 Headache 583 Infections and acute encephalitis syndrome 583 Raised intracranial pressure, space occupying lesions and hydrocephalus 589 Coma 592 Hemiplegia 594 Paraplegia and quadriplegia 597 Ataxia 598 Movement disorders 600 Neurological regression 602</p> | <p>24. Inborn Errors of Metabolism 677 <i>Neerja Gupta, Madhulika Kabra</i> Classification 677 Principles of management 681 Specific disorders 681</p> |
| <p>20. Neuromuscular Disorders 605 <i>Sheffali Gulati</i> Approach to evaluation 605 Disorders affecting anterior horn cells 607 Peripheral neuropathies 609 Acute flaccid paralysis 611 Neuromuscular junction disorders 612 Muscle disorders 614</p> | <p>25. Inborn Errors of Immunity 696 <i>Rakesh Kumar Pilonia, Surjit Singh</i> Immunity 696 Inborn errors of immunity 697 Treatment of IEI 701</p> |
| <p>21. Childhood Malignancies 618 <i>Rachna Seth</i> Acute leukemia 619 Chronic myeloid leukemia 627 Lymphoma 628 Retinoblastoma 634 Wilms tumor 636 Neuroblastoma 638 Malignant tumors of the liver 640 Soft tissue sarcoma 640 Bone tumors 641 Germ cell tumors 642 Brain tumors 642 Histiocytoses 644 Oncologic emergencies 646 Late effects and survivorship 647 Bone marrow transplantation (BMT) 649</p> | <p>26. Ophthalmic Disorders 702 <i>Radhika Tandon</i> Pediatric eye screening 702 Congenital and developmental abnormalities 704 Acquired eye diseases 704</p> |
| <p>22. Rheumatological Disorders 650 <i>Rakesh Kumar Pilonia, Surjit Singh</i> Arthritis 650 Systemic lupus erythematosus 654 Juvenile dermatomyositis 656 Scleroderma 657 Mixed connective tissue disease 658 Vasculitides 658</p> | <p>27. Skin Disorders 711 <i>Neena Khanna, Neetu Bhari</i> Basic principles 711 Genodermatoses 714 Nevi 720 Dermatitis 723 Disorders of skin appendages 725 Papulosquamous disorders 727 Bullous disorders 730 Disorders of pigmentation 731 Abnormal vascular responses 732 Infections 733 Diseases caused by arthropods 741 Miscellaneous dermatoses 742</p> |
| <p>23. Genetic Disorders 662 <i>Neerja Gupta, Madhulika Kabra</i> Chromosomes and genes 662 Chromosomal disorders 663 Down syndrome 666 Turner syndrome 668 Single gene disorders 670 Polygenic inheritance 674 Therapy for genetic disorders 674 Prevention of genetic disorders 675</p> | <p>28. Poisonings, Injuries and Accidents 745 <i>Jhuma Sankar</i> Road traffic accidents and falls 745 Burns, electrical and inhalational injuries 746 Drowning and near drowning 748 Choking and suffocation 748 Poisoning 749 Common poisonings 753 Envenomations 757 Injury control 760</p> |
| <p>29. Pediatric Critical Care 761 <i>Nitin Dhochak, Rakesh Lodha</i> Assessment of a seriously ill child 761 Pediatric basic and advanced life support 762 Shock 767 Nutrition in the critically ill 770 Sedation, analgesia, paralysis 771 Healthcare-associated infections 772 Blood transfusions 772</p> | <p>30. Important Medical Procedures 776 <i>Nitin Dhochak, Arvind Bagga</i></p> |
| <p>31. Rights of Children 787 <i>Rajeev Seth</i> Child rights 787 Child maltreatment (abuse and neglect) 788 Adoption 791 Foster care 792</p> | |

32. Integrated Management of Neonatal and Childhood Illness **793**

P Ashok Babu, Sumita Ghosh

Integrated management of neonatal and childhood illness strategy 793

Outpatient management of young infants age up to 2 months 794

Outpatient management of sick child age 2 months to 5 years 797

IMNCI charts, 2022 802

33. Rational Drug Therapy **840**

Anu Thukral, Kana Ram Jat

Introduction 840

Analgesics, antipyretics, non-steroidal 840

Anti-inflammatory drugs (NSAIDs) 840

Antiarrhythmics 841

Agents for myasthenia 842

Antimicrobials 842

Anticancer drugs 848

Anticoagulants 848

Anticonvulsants 848

Antidotes 848

Antiemetics and gastrointestinal medications 848

Antihistaminics 849

Antihypertensives 850

Antitoxins and immunoglobulins 850

Bronchodilators, respiratory stimulants and anti-asthma agents 851

Inotropic agents 852

Diuretics 852

Hormones 853

Micronutrients 855

Sedatives, hypnotics, antidepressants and antiepileptics 856

Vasodilators 858

Annexures **859**

Index **877**

Index of Competencies

Competency based Undergraduate Curriculum for the Indian Medical Graduate

| <i>Code</i> | <i>Competency</i> | <i>Chapter</i> | <i>Page no</i> |
|-------------|--|----------------|----------------|
| PE1.1 | Define the terminologies growth and development and discuss the factors affecting normal growth and development | 2 | 6, 8 |
| PE1.2 | Discuss and describe the patterns of growth in infants, children and adolescents | 2 | 6 |
| PE1.3 | Discuss and describe the methods of assessment of growth including use of WHO and Indian national standards. Enumerate the parameters used for assessment of physical growth in infants, children and adolescents | 2 | 8, 12 |
| PE1.4 | Perform anthropometric measurements, document in growth charts and interpret | 2 | 8, 12 |
| PE1.5 | Define development and discuss the normal developmental mile stones with respect to motor, behaviour, social, adaptive and language | 3 | 22 |
| PE1.6 | Discuss the methods of assessment of development | 3 | 24 |
| PE1.7 | Perform developmental assessment and interpret | 3 | 24, 36 |
| PE2.1 | Discuss the etiopathogenesis, clinical features and management of a child who fails to thrive | 2 | 21 |
| PE2.2 | Assessment of a child with failing to thrive including eliciting an appropriate history and examination | 2 | 21 |
| PE2.3 | Counselling a parent with failing to thrive child | 2 | 21 |
| PE2.4 | Discuss the etiopathogenesis, clinical features and management of a child with short stature | 2 | 16 |
| PE2.5 | Assessment of a child with short stature: Elicit history, perform examination, document and present | 2 | 16 |
| PE2.6 | Enumerate the referral criteria for growth related problems | 2 | 16, 21 |
| PE3.1 | Define, enumerate and discuss the causes of developmental delay and disability including intellectual disability in children | 4 | 42 |
| PE3.2 | Discuss the approach to a child with developmental delay | 3 | 36 |
| PE3.3 | Assessment of a child with developmental delay—elicit document and present history | 3 | 36 |
| PE3.4 | Counsel a parent of a child with developmental delay | 3 | 36 |
| PE3.5 | Discuss the role of the child developmental unit in management of developmental delay | 3 | 36 |
| PE3.6 | Discuss the referral criteria for children with developmental delay | 3 | 36 |
| PE3.8 | Discuss the etiopathogenesis, clinical presentation and multidisciplinary approach in the management of cerebral palsy | 19 | 578 |
| PE4.1 | Discuss the causes and approach to a child with scholastic backwardness | 4 | 42 |
| PE4.2 | Discuss the etiology, clinical features, diagnosis and management of a child with learning disabilities | 4 | 44 |
| PE4.3 | Discuss the etiology, clinical features, diagnosis and management of a child with attention deficit hyperactivity disorder (ADHD) | 4 | 44 |
| PE4.4 | Discuss the etiology, clinical features, diagnosis and management of a child with autism | 4 | 42 |
| PE4.5 | Discuss the role of child guidance clinic in children with developmental problems | 3 | 38 |
| PE4.6 | Visit to the child guidance clinic | 3 | 38 |
| PE5.1 | Describe the clinical features, diagnosis and management of thumb sucking | 4 | 45 |
| PE5.2 | Describe the clinical features, diagnosis and management of feeding problems | 4 | 45 |
| PE5.4 | Describe the clinical features, diagnosis and management of breath holding spells | 4 | 45 |
| PE5.5 | Describe the clinical features, diagnosis and management of temper tantrums | 4 | 45 |
| PE5.6 | Describe the clinical features, diagnosis and management of pica | 4 | 45 |
| PE5.8 | Discuss the etiology, clinical features and management of enuresis | 4 | 45 |
| PE5.9 | Discuss the etiology, clinical features and management of encopresis | 4 | 45 |
| PE5.10 | Discuss the role of child guidance clinic in children with behavioural problems and the referral criteria | 3 | 38 |
| PE5.11 | Visit to child guidance clinic and observe functioning | 3 | 38 |
| PE6.1 | Define adolescence and stages of adolescence | 5 | 48 |
| PE6.2 | Describe the physical, physiological and psychological changes during adolescence (Puberty) | 5 | 48 |
| PE6.3 | Discuss the general health problems during adolescence | 5 | 50 |
| PE6.4 | Describe adolescent sexuality and common problems related to it | 5 | 50 |
| PE6.5 | Explain the adolescent nutrition and common nutritional problems | 5 | 50 |
| PE6.6 | Discuss the common adolescent eating disorders (anorexia nervosa, bulimia) | 4, 5 | 45, 50 |
| PE6.7 | Describe the common mental health problems during adolescence | 5 | 50 |
| PE6.8 | Respecting patient privacy and maintaining confidentiality while dealing with adolescence | 5 | 52 |
| PE6.9 | Perform routine adolescent health check up including eliciting history, performing examination including SMR (sexual maturity rating), growth assessments (using growth charts) and systemic exam including thyroid and breast exam and the HEADSS screening | 5 | 48, 52 |
| PE6.10 | Discuss the objectives and functions of AFHS (adolescent friendly health services) and the referral criteria | 5 | 52 |

| Code | Competency | Chapter | Page no |
|---------|---|---------|----------|
| PE6.11 | Visit to the adolescent clinic | 5 | 52 |
| PE6.12 | Enumerate the importance of obesity and other NCD in adolescents | 5 | 50 |
| PE6.13 | Enumerate the prevalence and the importance of recognition of sexual, drug abuse in adolescents and children | 5 | 50 |
| PE7.1 | Awareness on the cultural beliefs and practices of breastfeeding | 7, 9 | 81, 142 |
| PE7.2 | Explain the physiology of lactation | 9 | 142 |
| PE7.3 | Describe the composition and types of breast milk and discuss the differences between cow's milk and human milk | 9 | 142 |
| PE7.4 | Discuss the advantages of breast milk | 9 | 142 |
| PE7.5 | Observe the correct technique of breastfeeding and distinguish wrong right from techniques | 9 | 142 |
| PE7.7 | Perform breast examination and identify common problems during lactation such as retracted nipples, cracked nipples, breast engorgement, breast abscess | 9 | 142 |
| PE7.8 | Educate mothers on antenatal breast care and prepare mothers for lactation | 9 | 142 |
| PE7.9 | Educate and counsel mothers for best practices in breastfeeding | 9 | 142 |
| PE7.10 | Respects patient privacy | 9 | 142 |
| PE8.1 | Define the term complementary feeding | 7 | 81 |
| PE8.2 | Discuss the principles, the initiation, attributes, frequency, techniques and hygiene related to complementary feeding including IYCF | 7 | 81 |
| PE8.3 | Enumerate the common complimentary foods | 7 | 81 |
| PE8.4 | Elicit history on the complementary feeding habits | 7 | 81 |
| PE8.5 | Counsel and educate mothers on the best practices in complimentary feeding | 7 | 81 |
| PE9.1 | Describe the age related nutritional needs of infants, children and adolescents including micronutrients and vitamins | 7 | 75 |
| PE9.2 | Describe the tools and methods for assessment and classification of nutritional status of infants, children and adolescents | 7 | 77 |
| PE9.3 | Explain the calorific value of common Indian foods | 7 | 77 |
| PE9.4 | Elicit document and present an appropriate nutritional history and perform a dietary recall | 7 | 77 |
| PE9.5 | Calculate the age related calorie requirement in health and disease and identify gap | 7 | 77, 81 |
| PE9.6 | Assess and classify the nutrition status of infants, children and adolescents and recognize deviations | 7 | 85, 98 |
| PE9.7 | Plan an appropriate diet in health and disease | 7 | 85, 88 |
| PE10.1 | Define and describe the etiopathogenesis, classify including WHO classification, clinical features, complication and management severe acute malnourishment (SAM) and moderate acute malnutrition (MAM) | 7 | 88 |
| PE10.2 | Outline the clinical approach to a child with SAM and MAM | 7 | 88 |
| PE10.3 | Assessment of a patient with SAM and MAM, diagnosis, classification and planning management including hospital and community based intervention, rehabilitation and prevention | 7 | 88 |
| PE10.4 | Identify children with under nutrition as per IMNCI criteria and plan referral | 7, 32 | 88, 797 |
| PE10.5 | Counsel parents of children with SAM and MAM | 7 | 88 |
| PE10.6 | Enumerate the role of locally prepared therapeutic diets and ready to use therapeutic diets | 7 | 88 |
| PE11.1 | Describe the common etiology, clinical features and management of obesity in children | 7, 18 | 98, 547 |
| PE11.2 | Discuss the risk approach for obesity and discuss the prevention strategies | 18 | 547 |
| PE11.3 | Assessment of a child with obesity with regard to eliciting history including physical activity, charting and dietary recall | 18 | 547 |
| PE11.4 | Examination including calculation of BMI, measurement of waist hip ratio, identifying external markers like acanthosis, striae, pseudogynaecomastia, etc. | 18 | 547 |
| PE11.5 | Calculate BMI, document in BMI chart and interpret | 18 | 547 |
| PE11.6 | Discuss criteria for referral | 18 | 547 |
| PE12.1 | Discuss the RDA, dietary sources of vitamin A and their role in health and disease | 7, 8 | 77, 100 |
| PE12.2 | Describe the causes, clinical features, diagnosis and management of deficiency/excess of vitamin A | 8 | 100 |
| PE12.3 | Identify the clinical features of dietary deficiency / excess of vitamin A | 8 | 100 |
| PE12.4 | Diagnose patients with vitamin A deficiency, classify and plan management | 8 | 100 |
| PE12.5 | Discuss the vitamin A prophylaxis program and their recommendations | 8 | 100 |
| PE12.6 | Discuss the RDA, dietary sources of vitamin D and their role in health and disease | 7, 8 | 77, 102 |
| PE12.7 | Describe the causes, clinical features, diagnosis and management of deficiency/excess of vitamin D (rickets and hypervitaminosis D) | 8 | 102, 104 |
| PE12.8 | Identify the clinical features of dietary deficiency of vitamin D | 8 | 102, 104 |
| PE12.9 | Assess patients with vitamin D deficiency, diagnose, classify and plan management | 8 | 102, 104 |
| PE12.10 | Discuss the role of screening for vitamin D deficiency | 8 | 102 |
| PE12.11 | Discuss the RDA, dietary sources of vitamin E and their role in health and disease | 7, 8 | 77, 109 |
| PE12.12 | Describe the causes, clinical features, diagnosis and management of deficiency of vitamin E | 8 | 109 |
| PE12.13 | Discuss the RDA, dietary sources of vitamin K and their role in health and disease | 7, 8 | 77, 109 |
| PE12.14 | Describe the causes, clinical features, diagnosis management and prevention of deficiency of vitamin K | 8 | 109 |
| PE12.15 | Discuss the RDA, dietary sources of vitamin B and their role in health and disease | 7, 8 | 77, 110 |

| Code | Competency | Chapter | Page no |
|---------|--|----------|--------------|
| PE12.16 | Describe the causes, clinical features, diagnosis and management of deficiency of B complex Vitamins | 8 | 110 |
| PE12.17 | Identify the clinical features of vitamin B complex deficiency | 8 | 110 |
| PE12.18 | Diagnose patients with vitamin B complex deficiency and plan management | 8 | 110 |
| PE12.19 | Discuss the RDA, dietary sources of vitamin C and their role in health and disease | 7, 8 | 77, 110 |
| PE12.20 | Describe the causes, clinical features, diagnosis and management of deficiency of vitamin C (scurvy) | 8 | 110 |
| PE12.21 | Identify the clinical features of vitamin C deficiency | 8 | 110 |
| PE13.1 | Discuss the RDA, dietary sources of iron and their role in health and disease | 7, 8 | 77, 115 |
| PE13.2 | Describe the causes, diagnosis and management of Fe deficiency | 13 | 354 |
| PE13.3 | Identify the clinical features of dietary deficiency of iron and make a diagnosis | 13 | 354 |
| PE13.4 | Interpret hemogram and iron panel | 13 | 354 |
| PE13.5 | Propose a management plan for Fe deficiency anemia | 13 | 354 |
| PE13.7 | Discuss the RDA, dietary sources of iodine and their role in health and disease | 7, 8 | 77, 116 |
| PE13.8 | Describe the causes, diagnosis and management of deficiency of Iodine | 8, 18 | 116, 540 |
| PE13.9 | Identify the clinical features of iodine deficiency disorders | 8, 18 | 116, 540 |
| PE13.11 | Discuss the RDA, dietary sources of calcium and their role in health and disease | 6, 7, 8 | 65, 70, 114 |
| PE13.12 | Describe the causes, clinical features, diagnosis and management of Ca deficiency | 6, 8, 18 | 65, 114, 541 |
| PE13.13 | Discuss the RDA, dietary sources of magnesium and their role in health and disease | 6, 7, 8 | 68, 77, 114 |
| PE13.14 | Describe the causes, clinical features, diagnosis and management of magnesium deficiency | 6, 8 | 68, 114 |
| PE14.2 | Discuss the risk factors, clinical features, diagnosis and management of kerosene ingestion | 28 | 753 |
| PE14.3 | Discuss the risk factors, clinical features, diagnosis and management of organophosphorus poisoning | 28 | 755 |
| PE14.4 | Discuss the risk factors, clinical features, diagnosis and management of paracetamol poisoning | 28 | 756 |
| PE15.1 | Discuss the fluid and electrolyte requirement in health and disease | 6 | 57 |
| PE15.2 | Discuss the clinical features and complications of fluid and electrolyte imbalance and outline the management | 6 | 57, 59, 62 |
| PE15.3 | Calculate the fluid and electrolyte requirement in health | 6 | 57, 59, 62 |
| PE15.4 | Interpret electrolyte report | 6 | 57, 59, 62 |
| PE15.5 | Calculate fluid and electrolyte imbalance | 6 | 57, 59, 62 |
| PE16.1 | Explain the components of Integrated Management of Neonatal and Childhood Illnesses (IMNCI) guidelines and method of risk stratification | 32 | 793 |
| PE16.2 | Assess children <2 months using IMNCI guidelines | 32 | 794 |
| PE16.3 | Assess children >2 to 5 years using IMNCI guidelines and stratify risk | 32 | 797 |
| PE17.1 | State the vision and outline the goals, strategies and plan of action of NHM and other important national programs pertaining to maternal and child health including RMNCH A+, RBSK, RKSK, JSSK, mission Indradhanush and ICDS | 1 | 3 |
| PE17.2 | Analyse the outcomes and appraise the monitoring and evaluation of NHM | 1 | 3 |
| PE18.1 | List and explain the components, plan, outcome of Reproductive Child Health (RCH) program and appraise its monitoring and evaluation | 1 | 3 |
| PE18.2 | Explain preventive interventions for child survival and safe motherhood | 1 | 3 |
| PE19.1 | Explain the components of the Universal Immunization Program and the National Immunization Program | 10 | 187 |
| PE19.2 | Explain the epidemiology of vaccine preventable diseases | 10 | 190 |
| PE19.3 | Vaccine description with regard to classification of vaccines, strain used, dose, route, schedule, risks, benefits and side effects, indications and contraindications | 10 | 190 |
| PE19.4 | Define cold chain and discuss the methods of safe storage and handling of vaccines | 10 | 213 |
| PE19.5 | Discuss immunization in special situations – HIV positive children, immunodeficiency, pre-term, organ transplants, those who received blood and blood products, splenectomised children, adolescents, travellers | 10 | 215 |
| PE19.16 | Enumerate available newer vaccines and their indications including pentavalent pneumococcal, rotavirus, JE, typhoid IPV & HPV | 10 | 190, 211 |
| PE19.6 | Assess patient for fitness for immunization and prescribe an age appropriate immunization schedule | 10 | 187 |
| PE20.1 | Define the common neonatal nomenclatures including the classification and describe the characteristics of a normal term neonate and high risk neonates | 9 | 118 |
| PE20.2 | Explain the care of a normal neonate | 9 | 127 |
| PE20.3 | Perform neonatal resuscitation in a manikin | 9 | 119 |
| PE20.4 | Assessment of a normal neonate | 9 | 131 |
| PE20.5 | Counsel/educate mothers on the care of neonates | 9 | 127 |
| PE20.6 | Explain the follow up care for neonates including breastfeeding, temperature maintenance, immunization, importance of growth monitoring and red flags | 9 | 127 |

| Code | Competency | Chapter | Page no |
|---------|--|---------|----------------------|
| PE20.7 | Discuss the etiology, clinical features and management of birth asphyxia | 9 | 161 |
| PE20.8 | Discuss the etiology, clinical features and management of respiratory distress in newborn including meconium aspiration and transient tachypnea of newborn | 9 | 156 |
| PE20.9 | Discuss the etiology, clinical features and management of birth injuries | 9 | 175 |
| PE20.10 | Discuss the etiology, clinical features and management of hemorrhagic disease of newborn | 8 | 109 |
| PE20.11 | Discuss the clinical characteristics, complications and management of low birth weight (preterm and small for gestation) | 9 | 147, 149 152 |
| PE20.12 | Discuss the temperature regulation in neonates, clinical features and management of neonatal hypothermia | 9 | 139 |
| PE20.13 | Discuss the temperature regulation in neonates, clinical features and management of neonatal hypoglycemia | 9 | 180 |
| PE20.14 | Discuss the etiology, clinical features and management of neonatal hypocalcemia | 6, 9 | 65, 180 |
| PE20.15 | Discuss the etiology, clinical features and management of neonatal seizures | 9 | 164 |
| PE20.16 | Discuss the etiology, clinical features and management of neonatal sepsis | 9 | 166 |
| PE20.17 | Discuss the etiology, clinical features and management of perinatal infections | 9 | 166 |
| PE20.18 | Identify and stratify risk in a sick neonate using IMNCI guidelines | 32 | 794 |
| PE20.19 | Discuss the etiology, clinical features and management of neonatal hyperbilirubinemia | 9 | 170 |
| PE20.20 | Identify clinical presentations of common surgical conditions in the newborn including TEF, esophageal atresia, anal atresia, cleft lip and palate, congenital diaphragmatic hernia and causes of acute abdomen | 9 | 175 |
| PE21.1 | Enumerate the etiopathogenesis, clinical features, complications and management of urinary tract infection in children | 17 | 507 |
| PE21.2 | Enumerate the etiopathogenesis, clinical features, complications and management of acute post-streptococcal glomerular nephritis in children | 17 | 496 |
| PE21.3 | Discuss the approach and referral criteria to a child with proteinuria | | |
| PE21.4 | Discuss the approach and referral criteria to a child with hematuria | 17 | 493 |
| PE21.5 | Enumerate the etiopathogenesis, clinical features, complications and management of acute renal failure in children | 17 | 511 |
| PE21.6 | Enumerate the etiopathogenesis, clinical features, complications and management of chronic renal failure in children | 17 | 518 |
| PE21.7 | Enumerate the etiopathogenesis, clinical features, complications and management of Wilms tumor | 21 | 636 |
| PE21.8 | Elicit, document and present a history pertaining to diseases of the genitourinary tract | 17 | 489, 527 |
| PE21.9 | Identify external markers for kidney disease, like failing to thrive, hypertension, pallor, icthyosis, anasarca | 17 | 489 |
| PE21.10 | Analyse symptom and interpret the physical findings and arrive at an appropriate provisional/differential diagnosis | 17 | 489 |
| PE21.11 | Perform and interpret the common analytes in a urine examination | 17 | 489 |
| PE21.12 | Interpret report of plain X-ray of KUB | 17 | 491 |
| PE21.13 | Enumerate the indications for and interpret the written report of ultrasonogram of KUB | 17 | 489 |
| PE21.14 | Recognize common surgical conditions of the abdomen and genitourinary system and enumerate the indications for referral including acute and subacute intestinal obstruction, appendicitis, pancreatitis, perforation intussusception, phimosis, undescended testis, chordee, hypospadias, torsion testis, hernia hydrocele, vulval synechiae | 12 | 303 |
| PE21.15 | Discuss and enumerate the referral criteria for children with genitourinary disorder | 17 | 493–531 |
| PE21.16 | Counsel/educate a patient for referral appropriately | 17 | 493–531 |
| PE21.17 | Describe the etiopathogenesis, grading, clinical features and management of hypertension in children | | |
| PE22.1 | Enumerate the common rheumatological problems in children. Discuss the clinical approach to recognition and referral of a child with rheumatological problem | 22 | 650, 654 656, 658 |
| PE22.3 | Describe the diagnosis and management of common vasculitic disorders including Henoch-Schonlein purpura, Kawasaki disease, SLE, JIA | 22 | 654, 658 |
| PE23.1 | Discuss the hemodynamic changes, clinical presentation, complications and management of acyanotic heart diseases—VSD, ASD and PDA | 16 | 427, 437 |
| PE23.2 | Discuss the hemodynamic changes, clinical presentation, complications and management of cyanotic heart diseases—Fallot's physiology | 16 | 444 |
| PE23.3 | Discuss the etiopathogenesis, clinical presentation and management of cardiac failure in infant and children | 16 | 423 |
| PE23.4 | Discuss the etiopathogenesis, clinical presentation and management of acute rheumatic fever in children | 16 | 457 |
| PE23.5 | Discuss the clinical features, complications, diagnosis, management and prevention of acute rheumatic fever | 16 | 457 |
| PE23.6 | Discuss the etiopathogenesis, clinical features and management of infective endocarditis in children | 16 | 466 |
| PE23.7 | Elicit appropriate history for a cardiac disease, analyse the symptoms, e.g. breathlessness, chest pain, tachycardia, feeding difficulty, failing to thrive, reduced urinary output, swelling, syncope, cyanotic spells, Suck rest cycle, frontal swelling in infants. Document and present | 16 | 423, 427 |

| Code | Competency | Chapter | Page no |
|---------|---|---------|--|
| PE23.8 | Identify external markers of a cardiac disease, e.g. cyanosis, clubbing, dependent edema, dental caries, arthritis, erythema rash, chorea, subcutaneous nodules, Osler's node, Janeway lesions and document | 16 | 423, 427 |
| PE23.9 | Record pulse, blood pressure, temperature and respiratory rate and interpret as per the age | 16 | 423, 427 |
| PE23.11 | Develop a treatment plan and prescribe appropriate drugs including fluids in cardiac diseases, anti-failure drugs, and inotropic agents | 16 | 423 |
| PE23.13 | Choose and interpret blood reports in cardiac illness | 16 | 457, 466 |
| PE23.14 | Interpret pediatric ECG | 16 | 437, 444, 453, 457, 469, 480 |
| PE23.15 | Use the ECHO reports in management of cases | 16 | 437, 444, 453, 457, 466, 469, 473, 477 |
| PE23.16 | Discuss the indications and limitations of cardiac catheterization | 16 | 427 |
| PE23.17 | Enumerate some common cardiac surgeries like BT shunt, Potts and Waterston's and corrective surgeries | 16 | 427, 474 |
| PE24.1 | Discuss the etiopathogenesis, classification, clinical presentation and management of diarrheal diseases in children | 12 | 309 |
| PE24.2 | Discuss the classification and clinical presentation of various types of diarrheal dehydration | 12 | 309 |
| PE24.3 | Discuss the physiological basis of ORT, types of ORS and the composition of various types of ORS | 12 | 309 |
| PE24.4 | Discuss the types of fluid used in pediatric diarrheal diseases and their composition | 12 | 309 |
| PE24.5 | Discuss the role of antibiotics, antispasmodics, antisecretory drugs, probiotics, antiemetics in acute diarrheal diseases | 12 | 309, 777 |
| PE24.6 | Discuss the causes, clinical presentation and management of persistent diarrhoea in children | 12 | 315 |
| PE24.7 | Discuss the causes, clinical presentation and management of chronic diarrhoea in children | 12 | 317 |
| PE24.8 | Discuss the causes, clinical presentation and management of dysentery in children | 12 | 309 |
| PE24.9 | Elicit, document and present history pertaining to diarrheal diseases | 12 | 309 |
| PE24.10 | Assess for signs of dehydration, document and present | 12 | 309 |
| PE24.11 | Apply the IMNCI guidelines in risk stratification of children with diarrheal dehydration and refer | 32 | 794, 797 |
| PE24.13 | Interpret RFT and electrolyte report | 6 | 57, 59, 62 |
| PE24.14 | Plan fluid management as per the WHO criteria | 12 | 309 |
| PE24.15 | Perform NG tube insertion in a manikin | 30 | 779 |
| PE24.17 | Perform interosseous insertion model | | |
| PE25.1 | Discuss the etiopathogenesis, clinical presentation and management of malabsorption in children and its causes including celiac disease | 12 | 317 |
| PE26.1 | Discuss the etiopathogenesis, clinical features and management of acute hepatitis in children | 11 | 237, 332 |
| PE26.2 | Discuss the etiopathogenesis, clinical features and management of fulminant hepatic failure in children | 12 | 333 |
| PE26.3 | Discuss the etiopathogenesis, clinical features and management of chronic liver diseases in children | 12 | 334 |
| PE26.4 | Discuss the etiopathogenesis, clinical features and management of portal hypertension in children | 12 | 334 |
| PE26.5 | Elicit document and present the history related to diseases of gastrointestinal system | 12 | 294, 298, 300, 303, 325, 328, 336 |
| PE26.6 | Identify external markers for GI and liver disorders, e.g. jaundice, pallor, gynecomastia, spider angioma, palmar erythema, ichthyosis, caput medusa, clubbing, failing to thrive, vitamin A and D deficiency | 12 | 294, 298, 336 |
| PE26.7 | Perform examination of the abdomen, demonstrate organomegaly, ascites, etc. | 12 | 294, 304 |
| PE26.8 | Analyse symptoms and interpret physical signs to make a provisional/ differential diagnosis | 12 | 294, 328 |
| PE26.9 | Interpret liver function tests, viral markers, ultrasonogram report | 12 | 328 |
| PE26.11 | Enumerate the indications for upper GI endoscopy | 12 | 325 |
| PE26.12 | Discuss the prevention of Hep B infection—universal precautions and immunisation | 11 | 238 |
| PE27.1 | List the common causes of morbidity and mortality in the under five children | 29 | 761 |
| PE27.2 | Describe the etiopathogenesis, clinical approach and management of cardiorespiratory arrest in children | 1, 29 | 2, 761 |
| PE27.3 | Describe the etiopathogenesis of respiratory distress in children | 29 | 761 |
| PE27.4 | Describe the clinical approach and management of respiratory distress in children | 29 | 761 |
| PE27.5 | Describe the etiopathogenesis, clinical approach and management of shock in children | 29 | 767 |
| PE27.6 | Describe the etiopathogenesis, clinical approach and management of status epilepticus | 19 | 579 |
| PE27.7 | Describe the etiopathogenesis, clinical approach and management of an unconscious child | 19 | 583, 592 |
| PE27.8 | Discuss the common types, clinical presentations and management of poisoning in children | 28 | 749 |
| PE27.9 | Discuss oxygen therapy, in pediatric emergencies and modes of administration | 30 | 780 |
| PE27.10 | Observe the various methods of administering oxygen | 30 | 780 |

| Code | Competency | Chapter | Page no |
|----------|---|---------|-------------------------|
| PE27.11 | Explain the need and process of triage of sick children brought to health facility | 28, 29 | 749, 761 |
| PE27.12 | Enumerate emergency signs and priority signs | 28, 29 | 749, 761 |
| PE27.13 | List the sequential approach of assessment of emergency and priority signs | 28, 29 | 749, 761 |
| PE27.14 | Assess emergency signs and prioritize | 28, 29 | 749, 761 |
| PE27.15 | Assess airway and breathing: recognise signs of severe respiratory distress. Check for cyanosis, severe chest indrawing, grunting | 28, 29 | 749, 761 |
| PE27.16 | Assess airway and breathing. Demonstrate the method of positioning of an infant and child to open airway in a simulated environment | 29 | 762 |
| PE27.17 | Assess airway and breathing: administer oxygen using correct technique and appropriate flow rate | 29 | 762 |
| PE27.18 | Assess airway and breathing: perform assisted ventilation by bag and mask in a simulated environment | 29 | 762 |
| PE27.19 | Check for signs of shock i.e. pulse, blood pressure, CRT | 29 | 762 |
| PF27.21 | Choose the type of fluid and calculate the fluid requirement in shock | 6 | 57 |
| PE27.23 | Assess for signs of severe dehydration | 6, 12 | 57, 309 |
| PE27.24 | Monitoring and maintaining temperature: define hypothermia. Describe the clinical features, complications and management of hypothermia | 9 | 139 |
| PE27.25 | Describe the advantages and correct method of keeping an infant warm by skin to skin contact | 9 | 139, 149 |
| PE27.26 | Describe the environmental measures to maintain temperature | 9 | 139 |
| PE27.27 | Assess for hypothermia and maintain temperature | 9 | 139 |
| PE27.28 | Provide BLS for children in manikin | 29 | 762 |
| PE.27.29 | Discuss the common causes, clinical presentation, medicolegal implications of abuse | 31 | 788 |
| PE27.30 | Demonstrate confidentiality with regard to abuse | 31 | 788 |
| PE27.31 | Assess child for signs of abuse | 31 | 788 |
| PE28.1 | Discuss the etiopathogenesis, clinical features and management of nasopharyngitis | 14, 15 | 389, 400 |
| PE28.2 | Discuss the etiopathogenesis of pharyngotonsillitis | 14, 15 | 389, 400 |
| PE28.3 | Discuss the clinical features and management of pharyngotonsillitis | 14, 15 | 389, 400 |
| PE28.4 | Discuss the etiopathogenesis, clinical features and management of acute otitis media (AOM) | 14 | 379 |
| PE28.5 | Discuss the etiopathogenesis, clinical features and management of epiglottitis | 14 | 391 |
| PE28.6 | Discuss the etiopathogenesis, clinical features and management of acute laryngotracheobronchitis | 14, 15 | 391, 401 |
| PE28.7 | Discuss the etiology, clinical features and management of stridor in children | 14, 15 | 391, 397 |
| PE28.8 | Discuss the types, clinical presentation, and management of foreign body aspiration in infants and children | 14 | 391 |
| PE28.9 | Elicit, document and present age appropriate history of a child with upper respiratory problem including stridor | 14, 15 | 391, 396 |
| PE28.13 | Analyse the clinical symptoms and interpret physical findings and make a provisional/differential diagnosis in a child with ENT symptoms | 14, 15 | 385, 396 |
| PE28.14 | Develop a treatment plan and document appropriately in a child with upper respiratory symptoms | 14, 15 | 385, 400 |
| PE28.15 | Stratify risk in children with stridor using IMNCI guidelines | 32 | 797 |
| PE28.16 | Interpret blood tests relevant to upper respiratory problems | 15 | 399 |
| PE28.17 | Interpret X-ray of the paranasal sinuses and mastoid; and/or use written report in case of management Interpret CXR in foreign body aspiration and lower respiratory tract infection, understand the significance of thymic shadow in pediatric chest X-rays | 14, 15 | 385, 391, 399 |
| PE28.18 | Describe the etiopathogenesis, diagnosis, clinical features, management and prevention of lower respiratory infections including bronchiolitis, wheeze associated LRTI pneumonia and empyema | 15 | 399 |
| PE28.19 | Describe the etiopathogenesis, diagnosis, clinical features, management and prevention of asthma in children | 15 | 407 |
| PE28.20 | Counsel the child with asthma on the correct use of inhalers in a simulated environment | 15 | 407 |
| PE29.1 | Discuss the etiopathogenesis, clinical features, classification and approach to a child with anemia | 13 | 350 |
| PE29.2 | Discuss the etiopathogenesis, clinical features and management of iron deficiency anemia | 13 | 354 |
| PE29.3 | Discuss the etiopathogenesis, clinical features and management of vitamin B ₁₂ , folate deficiency anemia | 13 | 355 |
| PE29.4 | Discuss the etiopathogenesis, clinical features and management of Hemolytic anemia, Thalassemia Major, sickle cell anemia, hereditary spherocytosis, autoimmune hemolytic anemia and hemolytic uremic syndrome | 13 | 357 |
| PE29.6 | Discuss the cause of thrombocytopenia in children: describe the clinical features and management of idiopathic thrombocytopenic purpura (ITP) | 13 | 369, 371 |
| PE29.7 | Discuss the etiology, classification, pathogenesis and clinical features of hemophilia in children | 13 | 372 |
| PE29.8 | Discuss the etiology, clinical presentation and management of acute lymphoblastic leukemia in children | 21 | 619 |
| PE29.9 | Discuss the etiology, clinical presentation and management of lymphoma in children | 21 | 628 |
| PE29.10 | Elicit, document and present the history related to hematology | 13 | 350, 357, 369, 372, 375 |

| <i>Code</i> | <i>Competency</i> | <i>Chapter</i> | <i>Page no</i> |
|-------------|--|----------------|---|
| PE29.11 | Identify external markers for hematological disorders, e.g. jaundice, pallor, petechiae purpura, ecchymosis, lymphadenopathy, bone tenderness, loss of weight, mucosal and large joint bleed | 13, 21 | 350, 357, 360, 364, 365, 369, 375, 619, 628 |
| PE29.12 | Perform examination of the abdomen, demonstrate organomegaly | 21 | 619, 628, 640 |
| PE29.13 | Analyse symptoms and interpret physical signs to make a provisional/differential diagnosis | 13, 21 | 360, 364, 619, 628 |
| PE29.15 | Perform and interpret peripheral smear | 13 | 357 |
| PE29.16 | Discuss the indications for hemoglobin electrophoresis and interpret report | 13 | 360, 364 |
| PE29.18 | Enumerate the referral criteria for hematological conditions | 13 | 364 |
| PE30.1 | Discuss the etiopathogenesis, clinical features, complications, management and prevention of meningitis in children | 19 | 583 |
| PE30.2 | Distinguish bacterial, viral and tuberculous meningitis | 19 | 583 |
| PE30.3 | Discuss the etiopathogenesis, classification, clinical features, complication and management of hydrocephalus in children | 19 | 574, 589 |
| PE30.4 | Discuss the etiopathogenesis, classification, clinical features, and management of microcephaly in children | 19 | 574 |
| PE30.5 | Enumerate the neural tube defects. Discuss the causes, clinical features, types, and management of neural tube defect | 19 | 574 |
| PE30.6 | Discuss the etiopathogenesis, clinical features, and management of infantile hemiplegia | 19 | 594 |
| PE30.7 | Discuss the etiopathogenesis, clinical features, complications and management of febrile seizures in children | 19 | 580 |
| PE30.8 | Define epilepsy. Discuss the pathogenesis, clinical types, presentation and management of epilepsy in children | 19 | 579, 580 |
| PE30.9 | Define status epilepticus. Discuss the clinical presentation and management | 19 | 579 |
| PE30.10 | Discuss the etiopathogenesis, clinical features and management of mental retardation in children | 4, 19 | 42, 602 |
| PE30.11 | Discuss the etiopathogenesis, clinical features and management of children with cerebral palsy | 19 | 578 |
| PE30.12 | Enumerate the causes of floppiness in an infant and discuss the clinical features, differential diagnosis and management | 20 | 607 |
| PE30.13 | Discuss the etiopathogenesis, clinical features, management and prevention of poliomyelitis in children | 11, 20 | 235, 611 |
| PE30.14 | Discuss the etiopathogenesis, clinical features and management of Duchene muscular dystrophy | 20 | 614 |
| PE30.15 | Discuss the etiopathogenesis, clinical features and management of ataxia in children | 19 | 598 |
| PE30.16 | Discuss the approach to and management of a child with headache | 19 | 583 |
| PE30.17 | Elicit document and present an age appropriate history pertaining to the CNS | 19 | 571 |
| PE30.18 | Demonstrate the correct method for physical examination of CNS including identification of external markers. Document and present clinical findings | 19 | 571 |
| PE30.19 | Analyse symptoms and interpret physical findings and propose a provisional/differential diagnosis | 19 | 571 |
| PE30.20 | Interpret and explain the findings in a CSF analysis | 19 | 573, 583 |
| PE30.21 | Enumerate the indication and discuss the limitations of EEG, CT, MRI | 19 | 573, 582 |
| PE30.22 | Interpret the reports of EEG, CT, MRI | 19 | 573, 582 |
| PE30.23 | Perform in a mannequin lumbar puncture. Discuss the indications, contraindication of the procedure | 30 | 781 |
| PE31.1 | Describe the etiopathogenesis, management and prevention of allergic rhinitis in children | 14 | 386 |
| PE31.2 | Recognize the clinical signs of allergic rhinitis | 14 | 386 |
| PE31.3 | Describe the etiopathogenesis, clinical features and management of atopic dermatitis in children | 27 | 723 |
| PE31.4 | Identify atopic dermatitis and manage | 27 | 723 |
| PE31.5 | Discuss the etiopathogenesis, clinical types, presentations, management and prevention of childhood asthma | 15 | 407 |
| PE31.6 | Recognise symptoms and signs of asthma | 15 | 407 |
| PE31.7 | Develop a treatment plan for asthma appropriate to clinical presentation and severity | 15 | 407 |
| PE31.8 | Enumerate criteria for referral | 15 | 407 |
| PE31.9 | Interpret CBC and CX-ray in asthma | 15 | 407 |
| PE31.10 | Enumerate the indications for PFT | 15 | 409 |
| PE31.12 | Discuss etiopathogenesis, clinical features and complications and management of urticaria angioedema | 27 | 732 |
| PE32.1 | Discuss the genetic basis, risk factors, complications, prenatal diagnosis, management and genetic counselling in Down's syndrome | 23 | 666 |
| PE32.2 | Identify the clinical features of Down's syndrome | 23 | 666 |
| PE32.3 | Interpret normal karyotype and recognize Trisomy 21 | 23 | 663, 666 |
| PE32.4 | Discuss the referral criteria and multidisciplinary approach to management | 23 | 666 |
| PE32.5 | Counsel parents regarding: 1. Present child; 2. Risk in the next pregnancy | 23 | 666 |

| Code | Competency | Chapter | Page no |
|---------|---|---------|-------------------------|
| PE32.6 | Discuss the genetic basis, risk factors, clinical features, complications, prenatal diagnosis, management and genetic counselling in Turner's syndrome | 23 | 668 |
| PE32.7 | Identify the clinical features of Turner syndrome | 23 | 668 |
| PE32.8 | Interpret normal karyotype and recognize the Turner karyotype | 23 | 668 |
| PE32.9 | Discuss the referral criteria and multidisciplinary approach to management of Turner syndrome | 23 | 668 |
| PE32.10 | Counsel parents regarding: 1. Present child; 2. Risk in the next pregnancy | 23 | 668 |
| PE32.12 | Identify the clinical features of Klinefelter syndrome | 23 | 669 |
| PE33.1 | Describe the etiopathogenesis clinical features, management of hypothyroidism in children | 18 | 538 |
| PE33.2 | Recognize the clinical signs of hypothyroidism and refer | 18 | 538 |
| PE33.3 | Interpret and explain neonatal thyroid screening report | 9, 18 | 183, 538 |
| PE33.4 | Discuss the etiopathogenesis, clinical types, presentations, complication and management of diabetes mellitus in children | 18 | 562 |
| PE33.5 | Interpret blood sugar reports and explain the diagnostic criteria for type 1 diabetes | 18 | 562 |
| PE33.7 | Perform genital examination and recognize ambiguous genitalia and refer appropriately | 18 | 558 |
| PE33.8 | Define precocious and delayed puberty | 18 | 552, 558 |
| PE33.9 | Perform sexual maturity rating (SMR) and interpret | 5 | 48 |
| PE33.10 | Recognize precocious and delayed puberty and refer | 18 | 552 |
| PE33.11 | Identify deviations in growth and plan appropriate referral | 2 | 8, 16 |
| PE34.1 | Discuss the epidemiology, clinical features, clinical types, complications of tuberculosis in children and adolescents | 11 | 254 |
| PE34.2 | Discuss the various diagnostic tools for childhood tuberculosis | 11 | 254 |
| PE34.3 | Discuss the various regimens for management of tuberculosis as per National Guidelines | 11 | 254 |
| PE34.4 | Discuss the preventive strategies adopted and the objectives and outcome of the National Tuberculosis Control Program | 11 | 254 |
| PE34.5 | Able to elicit, document and present history of contact with tuberculosis in every patient encounter | 11 | 254 |
| PE34.7 | Interpret a Mantoux test | 11 | 254 |
| PE34.8 | Interpret a chest radiograph | 11 | 254 |
| PE34.9 | Interpret blood tests in the context of laboratory evidence for tuberculosis | 11 | 254 |
| PE34.10 | Discuss the various samples for demonstrating the organism, e.g. gastric aspirate, sputum, CSF, FNAC | 11 | 254 |
| PE34.13 | Enumerate the newer diagnostic tools for tuberculosis including BACTEC CBNAAT and their indications | 11 | 254 |
| PE34.14 | Enumerate the common causes of fever and discuss the etiopathogenesis, clinical features, complications and management of fever in children | 11 | 220 |
| PE34.15 | Enumerate the common causes of fever and discuss the etiopathogenesis, clinical features, complications and management of child with exanthematous illnesses like measles, mumps, rubella and chickenpox | 11 | 220, 224, 230, 232, 235 |
| PE34.16 | Enumerate the common causes of fever and discuss the etiopathogenesis, clinical features, complications and management of child with diphtheria, pertussis, tetanus | 11 | 220, 264, 265, 269 |
| PE34.17 | Enumerate the common causes of fever and discuss the etiopathogenesis, clinical features, complications and management of child with typhoid | 11 | 220, 266 |
| PE34.18 | Enumerate the common causes of fever and discuss the etiopathogenesis, clinical features, complications and management of child with dengue, chikungunya and other vector-borne diseases | 11 | 240, 241 |
| PE34.19 | Enumerate the common causes of fever and discuss the etiopathogenesis, clinical features, complications and management of children with common parasitic infections, malaria, leishmaniasis, filariasis, helminthic infestations, amebiasis, giardiasis | 11 | 274 |
| PE34.20 | Enumerate the common causes of fever and discuss the etiopathogenesis, clinical features, complications and management of child with rickettsial diseases | 11 | 270 |
| PE35.1 | Identify, discuss and defend medicolegal, socio-cultural and ethical issues as they pertain to health care in children (including parental rights and right to refuse treatment) | 31 | 788, 791 |