

Contents

Contributors.....	vii
Preface to the Third Edition.....	ix
Preface to the First Edition.....	xi
Index of Competencies.....	xxiii

1. Child Health in India 1

Mukesh Agrawal

- 1.1 Indicators of Child Health 1
- 1.2 Changing Profile of Diseases 2
- 1.3 Determinants of Child Health 2
- 1.4 Interventional Strategies in Child Health 3

2. Normal Growth and Development 5

Surbhi Rathi, Priyanka Bote, Mukesh Agrawal

- 2.1 Determinants of Growth and Development 5
- 2.2 Laws and Patterns of Growth 6
- 2.3 Normal Childhood Growth 7
 - 2.3.1 Somatic (Anthropometric Growth) 8
 - 2.3.2 Dental Development (Dentition) 9
 - 2.3.3 Skeletal Maturation 10
 - 2.3.4 Body Composition 10
- 2.4 Growth Norms and Growth Charts 11
- 2.5 Growth Assessment and Monitoring 13
- 2.6 Normal Childhood Development 18
 - 2.6.1 General Laws (Principles) of Development 18
 - 2.6.2 Developmental Milestones 19
- 2.7 Developmental Assessment 21

3. Growth and Development Disorders 33

Samir H Dalwai, Surbhi Rathi, Mukesh Agrawal

- 3.1 Failure to Thrive 33
- 3.2 Obesity 34
- 3.3 Short Stature 37
- 3.4 Tall Stature 40
- 3.5 Developmental Delay 41
- 3.6 Intellectual Disability 43
- 3.7 Learning Disorders 45
- 3.8 Hearing Disorders 47
- 3.9 Speech and Language Disorders 48
- 3.10 Scholastic Backwardness 49

- 3.11 Autistic Spectrum Disorders 50
- 3.12 Attention-Deficit Hyperactivity Disorder 52

4. Behavioral Disorders 56

Jane JE David, Mukesh Agrawal

- 4.1 Fussy Infant 56
- 4.2 Eating Disorders 57
 - 4.2.1 Picky-Eating 57
 - 4.2.2 Pica 58
- 4.3 Elimination Disorders 58
 - 4.3.1 Enuresis 58
 - 4.3.2 Encopresis 59
- 4.4 Habit Disorders 60
- 4.5 Sleep Disorders 62
- 4.6 Conduct Disorders 62
 - 4.6.1 Breath-Holding Spells 63
 - 4.6.2 Temper Tantrums 63
- 4.7 Anxiety Disorders 63
- 4.8 Psychosomatic Disorders 64
- 4.9 Child Guidance Clinic 65

5. Normal Nutrition 66

Radha Ghildiyal, Mukesh Agrawal

- 5.1 Basic Considerations 66
 - 5.1.1 Nutritional Requirements 66
 - 5.1.2 Essential Nutrients 67
- 5.2 Breastfeeding 69
 - 5.2.1 Composition of Breast Milk 69
 - 5.2.2 Advantages of Breastfeeding 69
 - 5.2.3 Physiology of Lactation 70
 - 5.2.4 Correct Breastfeeding Techniques and Practices 71
 - 5.2.5 Common Breastfeeding Problems 73
 - 5.2.6 Lactation Counseling 75
- 5.3 Baby Friendly Hospital Initiative 76
- 5.4 Alternative Infant Feeding 77
 - 5.4.1 Expressed Breast Milk 77
 - 5.4.2 Human Milk Banking 77
 - 5.4.3 Top Feeding 77
- 5.5 Complementary Feeding 78
- 5.6 Infant and Young Child Feeding Guidelines 80
- 5.7 Balanced Diet 80

5.8 Nutritional Profile of Indian Foods 81

5.9 Nutritional Assessment 84

6. Nutritional Disorders 86

Radha Ghildiyal, Mukesh Agrawal

- 6.1 Childhood Undernutrition 86
 - 6.1.1 Etiopathogenesis 86
 - 6.1.2 Clinical Spectrum 87
 - 6.1.3 Diagnostic Assessment 89
 - 6.1.4 Severe and Moderate Acute Malnutrition 91
 - 6.1.5 Management of Severe Acute Malnutrition 91
 - 6.1.6 Severe Acute Malnutrition in Infants < 6 Months 96
 - 6.1.7 Moderate Acute Malnutrition 97
 - 6.1.8 Prevention of Undernutrition 97
- 6.2 Vitamin A Deficiency 98
- 6.3 Vitamin B Complex Disorders 100
- 6.4 Vitamin C Deficiency (Scurvy) 104
- 6.5 Vitamin D Deficiency (Rickets) 105
 - 6.5.1 Vitamin D Deficiency Rickets 106
 - 6.5.2 Vitamin D Resistant Rickets 108
 - 6.5.3 Hypervitaminosis D 109
- 6.6 Vitamin E Deficiency 109
- 6.7 Vitamin K Deficiency 109
- 6.8 Mineral Disorders and Trace Elements 110
- 6.9 Free Radicals in Health and Disease 112

7. Fluid and Electrolyte Balance 114

Milind S Tullu, Mukesh Agrawal

- 7.1 Water Homeostasis 114
 - 7.1.1 Physiology of Water Balance 114
 - 7.1.2 Edema 116
 - 7.1.3 Dehydration 116
- 7.2 Sodium Disorders 117
- 7.3 Potassium Disorders 119
- 7.4 Calcium Disorders 120
- 7.5 Magnesium Disorders 122
- 7.6 Acid–Base Disorders 123
 - 7.6.1 Normal Acid–Base Regulation 123
 - 7.6.2 Evaluation of Acid–Base Status 124
 - 7.6.3 Specific Acid–Base Disorders 125
- 7.7 Parenteral Fluid Therapy 127
 - 7.7.1 Principles of Fluid Therapy 127
 - 7.7.2 Fluid Therapy in Clinical Practice 128
 - 7.7.3 Fluid Therapy in Specific Situations 129

8. Immunological Disorders 131

Mukesh Agrawal

- 8.1 Basic Considerations 131
- 8.2 Immunodeficiency Disorders 135
- 8.3 Opportunistic Infections 137
- 8.4 Hypersensitivity Disorders 140
 - 8.4.1 General Concepts in Allergy 140
 - 8.4.2 Anaphylaxis 142

9. Immunization 144

Mukesh Agrawal, Niranjana Shendurnikar

- 9.1 Basic Considerations 144
 - 9.1.1 Physiology of Immunization 144
 - 9.1.2 Determinants of Immune Response 145
 - 9.1.3 Immunization Agents 146
- 9.2 Individual Vaccines 147
 - 9.2.1 Vaccines in National Immunization Schedule 147
 - 9.2.2 Additional Vaccines Recommended By IAP 154
 - 9.2.3 Vaccines for Selective Use 156
 - 9.2.4 Newer Vaccines 157
 - 9.2.5 Combination Vaccines 158
- 9.3 Immunization Schedules 158
 - 9.3.1 National Immunization Schedule 158
 - 9.3.2 Indian Academy of Pediatrics Schedule 159
 - 9.3.3 Missed (Catch-Up) Immunization 159
 - 9.3.4 Adolescent Immunization 160
- 9.4 Immunization in Specific Situations 160
- 9.5 Immunization Programs 162
 - 9.5.1 Universal Immunization Program 162
 - 9.5.2 Mission Indradhanush 163
- 9.6 Cold Chain System 164
- 9.7 Adverse Events following Immunization 165
- 9.8 Safe Immunization Practices 166
 - 9.8.1 Counseling and Vaccine Hesitancy 167
 - 9.8.2 Safe Immunization Practices 167
 - 9.8.3 Pain and Anxiety Reduction 169
- 9.9 Passive Immunization 170

10. Infections 172

Yahswant R Gabhale, Nikita Shah, Mukesh Agrawal

- 10.1 Fever in Children 172
 - 10.1.1 Basic Considerations 172

10.1.2	Pyrexia of Unknown Origin (Prolonged Pyrexia)	174
10.1.3	Exanthematous Fevers (Fever with Rash)	175
10.1.4	Hemorrhagic Fevers (Fever with Petechiae/Purpura)	175
10.1.5	Febrile Neutropenia (Fever in a Neutropenic Child)	176
10.1.6	Drug Fever	177
10.2	Staphylococcal Infections	178
10.3	Streptococcal Infections	179
10.4	Pneumococcal Infections	180
10.5	Diphtheria	180
10.6	Whooping Cough	182
10.7	Enteric Fever	183
10.8	Shigellosis	185
10.9	<i>H. influenzae</i> B Disease	186
10.10	Meningococcal Infections	187
10.11	Cholera	188
10.12	Brucellosis	189
10.13	Childhood Tuberculosis	189
10.14	Leprosy	201
10.15	Tetanus	203
10.16	Non-clostridial Anaerobic Infections	207
10.17	Rickettsial Fevers	208
10.18	Measles	209
10.19	Chickenpox	212
10.20	Mumps	213
10.21	Acute Poliomyelitis	214
10.22	Enteroviral Infections (Non-Polio)	217
10.23	Dengue	218
10.24	Herpetic Viral Infections	223
10.24.1	Herpes Simplex	223
10.24.2	Infectious Mononucleosis	224
10.24.3	Cytomegalovirus Disease	224
10.25	COVID-19 Infection	225
10.26	Influenza	228
10.27	Rabies	230
10.28	Pediatric HIV Infection	232
10.29	Leptospirosis	242
10.30	Fungal Infections	243
10.31	Chlamydial Infections	244
10.32	Mycoplasma Infections	244
10.33	Malaria	245
10.34	Kala-azar	252

10.35	Filariasis	253
10.36	Intestinal Protozoal Infections	255
10.36.1	Amebiasis	255
10.36.2	Giardiasis	255
10.37	Intestinal Worm Infestations	256
10.38	Nosocomial Infections	260

11. Genetic Disorders 264

Kshitija R Patil, Mukesh Agrawal

11.1	Basic Considerations	264
11.2	Modes of Genetic Inheritance	265
11.3	Chromosomal Disorders	269
11.3.1	Down Syndrome	270
11.3.2	Turner Syndrome	273
11.3.3	Klinefelter Syndrome	274
11.4	Evaluation of Genetic Disorders	275
11.5	Management of Genetic Disorders	277
11.5.1	Treatment of Index Case	277
11.5.2	Genetic Counseling	278
11.5.3	Prenatal Diagnosis	279
11.6	Inborn Errors of Metabolism	280
11.6.1	Disorders of Amino Acid Metabolism	281
11.6.2	Disorders of Lipid Metabolism	285
11.6.3	Disorders of Carbohydrate Metabolism	287
11.6.4	Mucopolysaccharides	289
11.6.5	Porphyria	290

12. Newborn 292

Anitha Haribalakrishna, Jyotsna Shrivastava, Alpa Bhosale, Mukesh Agrawal

12.1	General Terminology	292
12.2	Perinatal Health Indicators	292
12.3	Prenatal Pediatrics	293
12.3.1	Essential Antenatal Care	294
12.3.2	High-risk Pregnancy	294
12.3.3	Fetal Monitoring	294
12.3.4	Fetal Therapy	296
12.3.5	Multiple Pregnancy	297
12.4	Delivery Room Care and Neonatal Resuscitation	298
12.4.1	Essential Delivery Room Care	298
12.4.2	Neonatal Resuscitation	299
12.5	Examination of A Newborn	304
12.6	Care of Normal Newborn	310

- 12.7 Minor Problems in Newborns 311
- 12.8 High-risk Newborn 314
- 12.9 Transport of a Sick Newborn 315
- 12.10 Birth Injuries 316
 - 12.10.1 Birth Asphyxia 316
 - 12.10.2 Mechanical Birth Injuries 319
- 12.11 Gestation and Birth Weight Disorders 321
 - 12.11.1 Prematurity (Preterm-LBW) 321
 - 12.11.2 Intrauterine Growth Retardation 326
 - 12.11.3 Large for Date Babies 327
 - 12.11.4 Post-maturity 328
- 12.12 Thermoregulation Disorders 328
 - 12.12.1 Hypothermia 329
 - 12.12.2 Kangaroo Mother Care 330
 - 12.12.3 Hyperthermia 331
- 12.13 Respiratory Disorders in Newborn 331
 - 12.13.1 D/D Respiratory Distress 331
 - 12.13.2 Common Respiratory Problems 332
- 12.14 Neonatal Jaundice 337
 - 12.14.1 Physiological Jaundice 337
 - 12.14.2 Diagnostic Approach in Neonatal Jaundice 338
 - 12.14.3 Unconjugated Hyperbilirubinemia 339
 - 12.14.4 Kernicterus 342
 - 12.14.5 Neonatal Cholestasis 344
- 12.15 Perinatal Infections 345
 - 12.15.1 Superficial Neonatal Infections 345
 - 12.15.2 Neonatal Septicemia 347
 - 12.15.3 Neonatal Necrotizing Enterocolitis 348
 - 12.15.4 Intrauterine Infections 349
- 12.16 Neonatal Seizures 354
- 12.17 Hematological Disorders in Newborn 355
 - 12.17.1 Bleeding Neonate 355
 - 12.17.2 Anemia in Newborn 357
 - 12.17.3 Neonatal Polycythemia 358
- 12.18 Metabolic Disorders in Newborn 358
- 12.19 Congenital Malformations 360

13. Adolescence and Adolescence Disorders 363

Surbhi Rathi, Mukesh Agrawal

- 13.1 Adolescent Growth and Development 363
- 13.2 Common Health Problems in Adolescence 364
- 13.3 Psychosocial Problems in Adolescence 368
- 13.4 Adolescent Health Check-up 369
- 13.5 Adolescent Friendly Health Services 370

14. Gastrointestinal Disorders 372

Prachi S Karnik, Aditi Dharap, Mukesh Agrawal

- 14.1 Basic Considerations 372
- 14.2 Clinical Evaluation of GIT Disease 373
- 14.3 Laboratory Evaluation of GIT Disease 374
- 14.4 Common Presentations in GIT Disease 375
 - 14.4.1 Dysphagia 376
 - 14.4.2 Vomiting 376
 - 14.4.3 Abdominal Pain 378
 - 14.4.4 Constipation 380
 - 14.4.5 GIT Bleeding 381
 - 14.4.6 Abdominal Distension 382
 - 14.4.7 Abdominal Mass/Lump 382
- 14.5 Disorders of Oral Cavity 382
 - 14.5.1 Cleft Lip and Cleft Palate 382
 - 14.5.2 Dental Caries 383
 - 14.5.3 Oral Cavity Inflammations 384
 - 14.5.4 Tongue Disorders 385
 - 14.5.5 Salivary Gland Disorders 385
- 14.6 Esophageal Disorders 385
 - 14.6.1 Tracheoesophageal Fistula 385
 - 14.6.2 Gastroesophageal Reflux Disease 386
- 14.7 Diaphragmatic Disorders 387
 - 14.7.1 Congenital Diaphragmatic Hernia 387
- 14.8 Gastric Disorders 389
 - 14.8.1 Infantile Hypertrophic Pyloric Stenosis 389
- 14.9 Intestinal Malformations 391
 - 14.9.1 Small Bowel Malformations 391
 - 14.9.2 Hirschsprung's Disease 392
 - 14.9.3 Anorectal Malformations 394
 - 14.9.4 Abdominal Wall Defects 395
- 14.10 Acute Diarrhea 396
- 14.11 Persistent Diarrhea 401
- 14.12 Malabsorption Syndromes (Chronic Diarrhea) 404
- 14.13 Acute Intestinal Obstruction 409
- 14.14 Acute Appendicitis 410
- 14.15 Perianal Disorders 411
- 14.16 Pancreatic Disorders 412
- 14.17 Disorders of Gallbladder 413
- 14.18 Disorders of Peritoneum 413

15. Disorders of Hepatobiliary System 416

Aditi Dharap, Prachi S Karnik, Mukesh Agrawal

- 15.1 Basic Considerations 416

- 15.2 Hepatomegaly 417
- 15.3 Jaundice 418
- 15.4 Viral Hepatitis 419
- 15.5 Acute Hepatic Failure 422
- 15.6 Liver Abscess 423
- 15.7 Chronic Liver Disease 424
- 15.8 Portal Hypertension 428

16. Respiratory Disorders 430

Chandrabhas T Deshmukh, Mukesh Agrawal

- 16.1 Basic Considerations 430
- 16.2 Clinical Evaluation of Respiratory Disease 433
- 16.3 Laboratory Investigations in Lung Disease 436
- 16.4 Common Clinical Presentations 438
 - 16.4.1 Recurrent/Persistent Cough 438
 - 16.4.2 Respiratory Distress 440
 - 16.4.3 Stridor 440
 - 16.4.4 Wheezing 441
- 16.5 Ear, Nose and Throat Disorders 442
 - 16.5.1 Nasal Disorders 443
 - 16.5.2 Sinusitis 445
 - 16.5.3 Throat Disorders 445
 - 16.5.4 Ear Disorders 447
- 16.6 Acute Croup 449
- 16.7 Acute Bronchiolitis 451
- 16.8 Bronchial Asthma 452
- 16.9 Pneumonia 460
 - 16.9.1 Infective Pneumonia 460
 - 16.9.2 Non-infective Pneumonia 464
- 16.10 Chronic Lung Diseases 466
 - 16.10.1 Bronchiectasis 466
 - 16.10.2 Lung Abscess 467
 - 16.10.3 Cystic Fibrosis 468
 - 16.10.4 Interstitial Lung Diseases 469
 - 16.10.5 Congenital Lung Malformations 470
- 16.11 Miscellaneous Lung Disorders 471
- 16.12 Pleural Disorders 473
 - 16.12.1 Empyema Thoracis 473
 - 16.12.2 Pneumothorax 475

17. Disorders of Cardiovascular System 477

Radha Ghildiyal, Mukesh Agrawal

- 17.1 Developmental Cardiology 477
 - 17.1.1 Development of Heart 477
 - 17.1.2 Fetal Circulation 478

- 17.1.3 Fetal to Neonatal Transition 478
- 17.1.4 Postnatal Circulation 479
- 17.2 Clinical Evaluation for Cardiac Disease 480
- 17.3 Investigations in Cardiac Disease 486
- 17.4 Congestive Cardiac Failure 490
- 17.5 Congenital Heart Disease 494
 - 17.5.1 General Considerations 494
 - 17.5.2 Acyanotic CHDS 495
 - 17.5.3 Cyanotic CHDS 503
 - 17.5.4 Diagnostic Approach in CHD 506
- 17.6 Rheumatic Fever 507
- 17.7 Rheumatic Heart Disease 511
- 17.8 Infective Endocarditis 515
- 17.9 Myocardial Disorders 516
 - 17.9.1 Myocarditis 516
 - 17.9.2 Cardiomyopathies 517
- 17.10 Arrhythmia 519
- 17.11 Pericarditis 522
- 17.12 Childhood Hypertension 523

18. Disorders of Central Nervous System 528

*P Keerthi Kundana, Mona Gajre, Alpna Kondekar
Mukesh Agrawal*

- 18.1 Clinical Evaluation in Neurological Disease 528
- 18.2 Laboratory Evaluation in CNS Disease 532
- 18.3 Comatose Child 534
- 18.4 Raised Intracranial Pressure 537
- 18.5 Headache 539
- 18.6 Seizure Disorders 540
 - 18.6.1 General Considerations 540
 - 18.6.2 Status Epilepticus 545
 - 18.6.3 Febrile Seizures 545
 - 18.6.4 Epilepsy in Childhood 547
 - 18.6.5 Seizure-Like Disorders (Seizure Mimics) 550
- 18.7 Cerebrovascular Strokes 551
- 18.8 Hemiplegia 553
- 18.9 Movement Disorders 554
- 18.10 Congenital CNS Malformations 557
 - 18.10.1 Neural Tube Defects 557
 - 18.10.2 Hydrocephalus 560
- 18.11 Cerebral Palsy 563
- 18.12 Intracranial Infections 565
 - 18.12.1 Bacterial Meningitis 565

- 18.12.2 Tubercular Meningitis 567
- 18.12.3 Viral Encephalitis 569
- 18.12.4 Autoimmune Encephalitis 571
- 18.12.5 Reye Syndrome 572
- 18.12.6 Cerebral Malaria 572
- 18.12.7 Brain Abscess 573
- 18.12.8 Tuberculoma 574
- 18.12.9 Neurocysticercosis 574
- 18.13 Brain Tumors 575
- 18.14 Neurocutaneous Syndromes 577
- 18.15 Neurodegenerative Disorders 580
- 18.16 Spinal Cord Disorders 583
 - 18.16.1 Acute Transverse Myelitis 583
 - 18.16.2 Spinal Cord Injuries 583
 - 18.16.3 Spinal Cord Malformations 584
 - 18.16.4 Spinal Cord Tumors 584
- 18.17 Paraplegia 584
- 18.18 Neuromuscular Disorders 586
 - 18.18.1 Anterior Horn Cell Disorders 587
 - 18.18.2 Peripheral Neuropathies 588
 - 18.18.3 Neuromuscular Junction Disorders 590
 - 18.18.4 Myopathies 591
- 18.19 Floppy Infant 594
- 18.20 Disorders of Autonomic System 595

19. Hematological Disorders 597

Sujata Sharma, Priyashree Mukherjee, Purvi Kadakia Kuty

Mukesh Agrawal

- 19.1 Basic Considerations 597
- 19.2 Anemia-General Concepts 599
- 19.3 Physiological Anemia of Infancy 602
- 19.4 Nutritional Anemia 602
 - 19.4.1 Iron Deficiency Anemia 602
 - 19.4.2 Megaloblastic Anemia 605
- 19.5 Hemolytic Anemia 606
 - 19.5.1 Hereditary Spherocytosis 607
 - 19.5.2 G6PD Deficiency Anemia 608
 - 19.5.3 Thalassemia 609
 - 19.5.4 Sick Cell Disease 612
 - 19.5.5 Autoimmune Hemolytic Anemia 614
- 19.6 Aplastic Anemia 614
- 19.7 Polycythemia 616
- 19.8 Leukocyte Disorders 616
- 19.9 Physiology of Hemostasis 619

- 19.10 Hemorrhagic Disorders 620
- 19.11 Platelet Disorders 622
 - 19.11.1 Immune Thrombocytopenic Purpura 622
- 19.12 Coagulation Disorders 625
 - 19.12.1 Hemophilia 625
- 19.13 Disseminated Intravascular Coagulation 627
- 19.14 Hypercoagulable States 628
- 19.15 Specific Therapeutic Modalities in Hematology 629
 - 19.15.1 Blood-product Transfusions 629
 - 19.15.2 Hematopoietic Stem-cell Transplantation 631
 - 19.15.3 Hematopoietic Growth Factors 632
- 19.16 Disorders of Spleen 632
 - 19.16.1 Splenomegaly 632
 - 19.16.2 Hyposplenic States 634
- 19.17 Disorders of Lymphatic System 634

20. Oncological Disorders 637

Purvi Kadakia Kuty, Sujata Sharma, Mukesh Agrawal

- 20.1 Basic Considerations 637
- 20.2 Leukemia 639
 - 20.2.1 Acute Lymphoblastic Leukemia 639
 - 20.2.2 Acute Myelogenous Leukemia 642
 - 20.2.3 Chronic Myelogenous Leukemia 643
- 20.3 Lymphoma 643
 - 20.3.1 Hodgkin Lymphoma 643
 - 20.3.2 Non-Hodgkin's Lymphoma 644
- 20.4 Neuroblastoma 646
- 20.5 Wilms Tumor 647
- 20.6 Retinoblastoma 648
- 20.7 Skeletal Malignancies 648
- 20.8 Soft Tissue Sarcoma 649
- 20.9 Hepatic Tumors 650
- 20.10 Histiocytosis 650

21. Renal Disorders 653

Varsha D Phadke, Apurva Shah, Neha Pandey Mukesh Agrawal

- 21.1 Basic Considerations 653
- 21.2 Evaluation in Renal Disease 655
- 21.3 Congenital Renal Malformations 658
- 21.4 Hereditary Nephropathies 660
- 21.5 Hematuria 660

- 21.6 Glomerulonephritis 661
 - 21.6.1 Acute Glomerulonephritis 662
 - 21.6.2 Rapidly Progressive Glomerulonephritis 663
 - 21.6.3 Chronic Glomerulonephritis 663
 - 21.6.4 Hemolytic Uremic Syndrome 664
 - 21.6.5 Renal Vein Thrombosis 665
- 21.7 Proteinuria 666
- 21.8 Nephrotic Syndrome 666
- 21.9 Acute Kidney Injury 671
- 21.10 Chronic Kidney Disease 675
- 21.11 Tubular Disorders 677
 - 21.11.1 Renal Tubular Acidosis 677
 - 21.11.2 Hereditary Tubular Disorders 679
 - 21.11.3 Acute Tubular Necrosis 680
- 21.12 Acute Interstitial Nephritis 680
- 21.13 Urinary Tract Malformations 680
- 21.14 Obstructive Uropathy 683
- 21.15 Urinary Tract Infections 685
- 21.16 Penoscrotal Disorders 688

22. Disorders of Endocrine System 691

Shruti A Mondkar, Mukesh Agrawal

- 22.1 Basic Considerations 691
- 22.2 Pituitary Disorders 691
 - 22.2.1 Hypopituitarism 692
 - 22.2.2 Growth Hormone Deficiency 692
 - 22.2.3 Hyperpituitarism 693
 - 22.2.4 Diabetes Insipidus 694
 - 22.2.5 Syndrome of Inappropriate ADH Secretion 694
- 22.3 Thyroid Disorders 695
 - 22.3.1 Hypothyroidism 695
 - 22.3.2 Goiter 697
 - 22.3.3 Iodine Deficiency Disorders 698
 - 22.3.4 Hyperthyroidism 699
- 22.4 Parathyroid Disorders 699
- 22.5 Adrenal Disorders 700
 - 22.5.1 Adrenocortical Insufficiency 701
 - 22.5.2 Congenital Adrenal Hyperplasia 702
 - 22.5.3 Addison Disease 703
 - 22.5.4 Cushing Syndrome 703
 - 22.5.5 Hyperaldosteronism 704
 - 22.5.6 Adrenal Sex-steroid Producing Tumours (Adrenogenital Syndrome) 705
 - 22.5.7 Pheochromocytoma 705

- 22.6 Disorders of Sex-steroids 705
 - 22.6.1 Disorders of Sex Development (Ambiguous Genitalia) 706
 - 22.6.2 Disorders of Puberty 708
- 22.7 Diabetes Mellitus 710
 - 22.7.1 Type I Diabetes Mellitus (T1DM) 711
- 22.8 Hypoglycemia 716

23. Disorders of Bones and Joints 719

Mukesh Agrawal

- 23.1 Basic Considerations 719
- 23.2 Developmental Bone Disorders 719
 - 23.2.1 Craniofacial Malformations 720
 - 23.2.2 Developmental Limb Disorders 721
 - 23.2.3 Spinothoracic Disorders 726
- 23.3 Limping Child 728
- 23.4 Skeletal Dysplasia 728
- 23.5 Bone and Joint Infections 731
 - 23.5.1 Acute Osteomyelitis 731
 - 23.5.2 Septic Arthritis 732
 - 23.5.3 Osteoarticular Tuberculosis 733
- 23.6 Osteochondroses 734
- 23.7 Bone Masses and Tumors 735
- 23.8 Fractures in Childhood 736

24. Rheumatic Disorders 738

Divya Ramadoss, Mukesh Agrawal

- 24.1 Basic Considerations 738
- 24.2 Juvenile Idiopathic Arthritis 739
- 24.3 Systemic Connective Tissue Disorders 743
 - 24.3.1 Systemic Lupus Erythematosus 743
 - 24.3.2 Juvenile Dermatomyositis 745
 - 24.3.3 Scleroderma 746
- 24.4 Vasculitis Syndromes 747
 - 24.4.1 Henoch-Schönlein Purpura (IGA Vasculitis) 747
 - 24.4.2 Wegener Granulomatosis 748
 - 24.4.3 Kawasaki Disease 748
 - 24.4.4 Polyarteritis Nodosa 749
 - 24.4.5 Takayasu Disease 750

25. Skin Disorders 751

Mukesh Agrawal

- 25.1 Basic Considerations 751
- 25.2 Developmental Skin Disorders 753
- 25.3 Common Skin Infections 756

- 25.3.1 Bacterial Infections 756
- 25.3.2 Fungal Infections 758
- 25.3.3 Viral Infections 759
- 25.3.4 Parasitic Infestations 759
- 25.4 Pigmentary Skin Disorders 760
 - 25.4.1 Hyperpigmented Lesions 760
 - 25.4.2 Hypopigmented Lesions 761
- 25.5 Maculopapular Disorders 762
- 25.6 Vesiculobullous Disorders 765
- 25.7 Papulosquamous Disorders 768
- 25.8 Eczematous Skin Disorders 770
- 25.9 Disorders of Dermis 772
- 25.10 Disorders of Subcutaneous Fat 772
- 25.11 Disorders of Skin Appendages 773
 - 25.11.1 Hair Disorders 773
 - 25.11.2 Sebaceous Gland Disorders 773
 - 25.11.3 Sweat Gland Disorders 774
 - 25.11.4 Nail Disorders 775

26. Ophthalmic Disorders

776

Mukesh Agrawal

- 26.1 General Considerations 776
- 26.2 Ocular Disorders 776
 - 26.2.1 Disorders of Orbit 776
 - 26.2.2 Disorders of Eyelids 777
 - 26.2.3 Disorders of Lacrimal System 778
 - 26.2.4 Conjunctival Disorders 778
 - 26.2.5 Scleral Disorders 780
 - 26.2.6 Corneal Disorders 780
 - 26.2.7 Uveal Tract Disorders 781
 - 26.2.8 Pupillary Disorders 782
 - 26.2.9 Glaucoma 782
 - 26.2.10 Lens Disorders 783
 - 26.2.11 Retinal Disorders 783
 - 26.2.12 Optic Nerve Disorders 785
 - 26.2.13 Ocular Injuries 785
- 26.3 Vision Disorders 786
 - 26.3.1 Amaurosis (Blindness) 786
 - 26.3.2 Amblyopia 787
 - 26.3.3 Refractive Errors 787
 - 26.3.4 Strabismus (SQUINT) 788
 - 26.3.5 Nystagmus 789

27. Critical Care

790

Sushma Save, Pritha Das, Mukesh Agrawal

- 27.1 Cardiopulmonary Resuscitation 790

- 27.1.1 Pediatric Basic Life Support 790
- 27.1.2 Transport of Sick Child 794
- 27.1.3 Pediatric Advanced Life Support 795
- 27.2 Acute Respiratory Failure 798
- 27.3 Shock 802
- 27.4 Pediatric Intensive Care 806
 - 27.4.1 Consensus Guidelines for PICU 806
 - 27.4.2 Admission Criteria for PICU 806
 - 27.4.3 Vascular Access in Sick Children 806
 - 27.4.4 Monitoring of Critically Sick Child 807
 - 27.4.5 Nutrition In Critically Sick Child 808
 - 27.4.6 Sedation and Analgesia in Intensive Care 808
 - 27.4.7 Prediction of Outcome (Prism Score) 809
 - 27.4.8 Counseling Parents of Serious/Terminally Ill Child 809
 - 27.4.9 Death Criteria and Brain Death 809
- 27.5 Accidents in Childhood 810
 - 27.5.1 Childhood Trauma 810
 - 27.5.2 Burns and Scalds 814
 - 27.5.3 Drowning and Near Drowning 815
 - 27.5.4 Foreign Body Accidents 816
 - 27.5.5 Snake Bite 817
 - 27.5.6 Scorpion Sting 818
 - 27.5.7 Heat Injuries 819
- 27.6 Poisoning in Children 820
 - 27.6.1 General Principles of Management 820
 - 27.6.2 Common Specific Poisonings 823
- 27.7 Sudden Infant Death Syndrome 827

28. Social Pediatrics

829

Mukesh Agrawal

- 28.1 National Health Objectives 829
- 28.2 Child Health Indicators in India 829
- 28.3 National Health Programmes 832
 - 28.3.1 National Health Mission 832
 - 28.3.2 Reproductive, Maternal, Newborn, Child and Adolescent Health (RMNCH+A) Approach 833
 - 28.3.3 Integrated Child Development Services 833
 - 28.3.4 Rashtriya Bal Swasthya Karyakram 834
 - 28.3.5 Navjaat Shishu Suraksha Karyakram 835
 - 28.3.6 India Newborn Action Plan 835

- 28.3.7 Janani Shishu Suraksha Karyakaram 835
- 28.3.8 Home-based Newborn Care 836
- 28.3.9 Rashtriya Kishor Swasthya Karyakram 836
- 28.3.10 National Vector Borne Disease Control Programme 836
- 28.3.11 Under-Fives' Clinics 837
- 28.3.12 School Health Service 837
- 28.4 Socially At-Risk Children 837
 - 28.4.1 Child Abuse and Neglect (Child Maltreatment) 838
 - 28.4.2 Child Labour 839
 - 28.4.3 Street Children 839
 - 28.4.4 Girl Child 839
 - 28.4.5 Handicapped Child 840
 - 28.4.6 Juvenile Delinquency 840

29. Integrated Management of Neonatal and Childhood Illnesses 842

Mukesh Agrawal

- 29.1 Outpatient Management of Children from 2 Months up to 5 Years 844
- 29.2 Outpatient Management of Children below 2 Months (Sick Young Infants) 847

30. History Taking in Pediatrics 850

Mukesh Agrawal

31. General Physical Examination 856

Mukesh Agrawal

32. Procedures and Equipments 867

Mukesh Agrawal

- 32.1 General Principles 867
- 32.2 Injection Devices and Routes 867
- 32.3 Vascular Access Procedures 868
- 32.4 Resuscitation Procedures and Devices 873
- 32.5 Aerosol Devices and Techniques 876
- 32.6 Aspiration and Biopsy Procedures 879
- 32.7 Feeding Support Procedures and Devices 884
- 32.8 Urinary Catheters and Drainage Devices 884
- 32.9 General Monitoring Equipment 886

33. Drugs and Medications 888

Mukesh Agrawal, Snehal Keni, Aparanta Chandra

- 33.1 Anti-bacterial Therapy 888
- 33.2 Anti-tubercular Agents 893
- 33.3 Anti-viral Agents 894
- 33.4 Anti-fungal Agents 896
- 33.5 Anti-malarial Agents 896
- 33.6 Anti-protozoal and Anti-parasitic Agents 897
- 33.7 General Medications 899

Index

923