Reversing the Trends
The Second National Health Sector Strategic Plan

CLINICAL MANAGEMENT AND
REFERRAL GUIDELINES
Volume II

Clinical Guidelines for Management
and Referral of Common Conditions
at Levels 2–3: Primary Care

Ministry of Medical Services
Afya House
PO Box 30016 – GPO
Nairobi 00100, Kenya
Email: ps@health.go.ke

Ministry of Public Health & Sanitation
Afya House
PO Box 3469 – City Square
Nairobi 00200, Kenya
Email: psph@health.go.ke

www.health.go.ke

World Health Organization

2009
THIS DOCUMENT was produced with the support of the World Health Organization (WHO) Kenya Country Office, and all reasonable precautions have been taken to verify the information it contains. The published material does not imply the expression of any opinion whatsoever on the part of the World Health Organization, and is being distributed without warranty of any kind – either expressed or implied. The responsibility for interpretation and use of the material lies with the reader. In no event shall the World Health Organization be liable for damages arising from its use.

Any part of this document may be freely reviewed, quoted, reproduced, or translated in full or in part, provided the source is acknowledged. It may not be sold or used in conjunction with commercial purposes or for profit.

The Ministry welcomes comments and queries from users of this publication. Please send feedback to:
Office of the Director of Medical Services
Afya House
PO Box 3469 – City Square
Nairobi 00200, Kenya

Clinical Management and Referral Guidelines – Volume II:
Clinical Guidelines for Management and Referral of Common Conditions at Levels 2–3: Primary Care

Published by: Ministry of Medical Services and Ministry of Public Health and Sanitation
Afya House
PO Box 3469 – City Square
Nairobi 00200, Kenya
http://www.health.go.ke
Email: dms@health.go.ke; dps@health.go.ke

Edited by: Margaret Crouch

Designed and Printed by: Soloh Worldwide Inter-Enterprises Ltd.
P.O. Box 1868 00100
Tel: 22247191/317871
Email: soloworld@wananchi.com
Contents

List of Tables xviii
List of Figures xxi
List of Abbreviations xxiii
Contributors to This Volume xxv
Foreword xxix
Preface xxxi

Introduction xxxiii

PART I – INTERNAL MEDICINE AND RELATED DISCIPLINES 1

1. Acute Injuries, Trauma, and Selected Emergencies 3
   1.1 Anaphylaxis 3
   1.2 Cardiac Arrest 3
      1.2.1 Management 4
   1.3 Shock 4
      1.3.1 Hypovolaemic Shock 4
      1.3.2 Septic Shock 5
   1.4 Stings and Bites 6
      1.4.1 Bee Sting 6
      1.4.2 Bite by a Suspected Rabid Animal (Rabies) 7
   1.5 Poisoning 8

2. AIDS and Sexually Transmitted Infections 11
   2.1 HIV/AIDS 11
      2.1.1 Clinical Manifestations 11
      2.1.2 HIV Testing and Patient Education 13
      2.1.3 Staging of HIV/AIDS 14
      2.1.4 Management of HIV/AIDS 14
      2.1.5 Prevention of Mother to Child Transmission 15
      2.1.6 Post-Exposure Prophylaxis 15
      2.1.7 Opportunistic Infections and Other Manifestations 15
2.2 Sexually Transmitted Infections (STIs) 15
   2.2.1 Gonorrhoea and Urethral Discharge 16
   2.2.2 Genital Discharge in the Female 17

3. Cardiovascular Diseases 25
   3.1 Introduction 25
   3.2 Acute Myocardial Infarction (AMI) 25
   3.3 Acute Rheumatic Fever 26
   3.4 Rheumatic Valvular Heart Disease 26
   3.5 Hypertension 27
   3.6 Hypertensive Crisis 29
   3.7 Pulmonary Oedema 30
   3.8 Deep Vein Thrombosis 30

4. Central Nervous System 31
   4.1 Headache 31
   4.2 Seizure Disorders 32
   4.3 Status Epilepticus 34
   4.4 Stroke 34
   4.4.1 Ischaemic Stroke 34
   4.4.2 Haemorrhagic Stroke 35

5. Endocrine System 35
   5.1 Diabetes Mellitus 35
   5.1.1 Type 1 Diabetes Mellitus 37
   5.1.2 Complications of Diabetes Mellitus 38
   5.2 Diseases of the Pituitary Gland and Adrenals 38
   5.2.1 Goitre 38
   5.3 Adrenocortical Disorders 39
   5.3.1 Glucocorticoid Excess (Cushings Syndrome/Disease) 39
   5.3.2 Adrenal Insufficiency 39

6. Gastrointestinal Conditions 40
   6.1 Diarrhoeal Diseases 40
   6.2 Gastritis 42
   6.3 Gastro-Oesophageal Reflux Disease (GORD) 43
   6.4 Peptic Ulcer Disease 43
   6.5 Upper GIT Bleeding 44
   6.6 Lower GIT Bleeding 45
   6.7 Viral Hepatitis 45
   6.8 GIT Parasitic Infestations 46
   6.8.1 Amoebiasis 46
   6.8.2 Intestinal Worms 46

7. Infections (Selected) and Related Conditions 48
   7.1 Parasitic Infections 48
   7.1.1 Malaria 48
   7.1.2 Trypanosomiasis (Sleeping Sickness) 52
   7.1.3 Leishmaniasis 52
   7.1.4 Toxoplasmosis 52
7.1.5 Schistosomiasis 53
7.1.6 Filariasis 53
7.2 Viral Diseases 54
7.2.1 Measles 54
7.2.2 Viral Haemorrhagic Fevers 54
7.3 Bacterial Infections 55
7.3.1 Meningitis 55
7.3.2 Tetanus 55
7.3.3 Tuberculosis 56
7.3.4 Salmonella Infections 59
7.4 Other Selected Infections and Related Conditions 60

8. Musculoskeletal Conditions 61
8.1 Arthralgia, Non-Specific 61
8.2 Gout/Acute Gout 61
8.3 Osteoarthritis 61
8.4 Rheumatoid Arthritis 62
8.4.1 Juvenile Rheumatoid Arthritis (JRA) 62

9. Neoplasms 63

10. Haematologic Conditions 63
10.1 Anaemia 63
10.2 Sickle Cell Disease (Anaemia) 64

11. Conditions in Pregnancy 65
11.1 Anaemia in Pregnancy 65
11.2 Cardiac Disease in Pregnancy 66
11.3 Diabetes in Pregnancy 67
11.4 Malaria in Pregnancy 67
11.5 Puerperal Psychosis 68

12. Lower Respiratory Tract Conditions 68
12.1 Pneumonia – Adults 68
12.2 Asthma (Adults) 69
12.3 Chronic Obstructive Pulmonary Disease 70

13. Other Common Conditions 71
13.1 Coma 71
13.2 Fever 72
13.3 Jaundice 72
13.3.1 Obstructive Jaundice 73
13.4 Lymphadenopathy 74

14. Skin Diseases 74
14.1 Eczema 74
14.1.1 Atopic Dermatitis 74
14.1.2 Contact Dermatitis 75
14.2 Psoriasis 75
14.3 Bacterial Infections 76
14.3.1 Impetigo Contagiosum 76
17.2 Causes of Cardiorespiratory Arrest after Neonatal Period 99
17.3 Summary of Steps Taken: ABCD of Resuscitation 99
17.4 Shock 102
17.5 Anaphylaxis 102
17.6 Choking 103

18. **Diarrhoeal Diseases** 104
18.1 Acute Watery Diarrhoea 105
18.2 Diarrhoea/GE Protocol (Excluding Severe Malnutrition) 106
18.3 Persistent Diarrhoea 109
18.4 Prevention of Gastrointestinal Tract (GIT) Infections 110

19. **Fever** 110

20. **Malaria** 112
20.1 Diagnosis of Malaria 112
20.2 First Line Treatment of Uncomplicated Malaria 113
20.3 Counselling, Supportive Treatment, and Follow Up 113
20.4 Second Line Treatment for All Age Groups 114
20.5 Management of Complicated Malaria 116
20.6 Prevention of Malaria 117

21. **Measles** 118

22. **Meningitis** 119

23. **Altered Consciousness or Convulsions** 120

24. **Respiratory Diseases** 123
24.1 Acute Upper Respiratory Tract Infections 123
24.2 Pharyngitis and Tonsillitis 123
24.3 Deep Neck Infection 124
24.4 Diseases of the Adenoids 124
24.5 Sinusitis 125
24.6 Conditions Presenting with Stridor 125
24.7 Lower Respiratory Tract Infections: Pneumonia 126
   24.7.1 Pneumonia in Children Aged below 5 Years 126
   24.7.2 Pneumonia in Children Older than 5 Years 129
24.8 Conditions Presenting with Wheeze 130
24.9 Status Asthmaticus 131
24.10 Long-Term and Home Care of Asthma 132
24.11 Children Presenting with Chronic Cough 132

25. **Poisoning** 133
25.1 Principles of Management 133
25.2 Paracetamol Poisoning 134
25.3 Kerosene (Paraffin) Poisoning 134
25.4 Organophosphate (e.g., Diazinon) Poisoning 134
25.5 Prevention of Home Accidents and Poisoning 134

26. **Neonate and Young Infant (0–2 Months)** 135
26.1 Routine Care at Delivery 135
26.2 Postpartum Care of the Normal Newborn 135
26.3 Neonatal Asphyxia and Resuscitation 135
26.4 Birth Injuries 137
26.5 Born before Arrival (BBA) 138
26.6 Organizing Care of Sick Baby 0–2 Months 139
26.7 Serious Bacterial Infections and Meningitis 140
26.8 Other Infections 140
26.9 Respiratory Distress 141
26.10 Apnoeic Attacks 141
26.11 Low Birth Weight and Preterm Infant 142
  26.11.1 Kangaroo Mother Care (KMC) 142
  26.11.2 Fluid and Feed Management 143
26.12 Anaemia of Prematurity 144
26.13 Infants of Diabetic Mothers 144
26.14 Disorders of Glucose Metabolism 144
26.15 Neonatal Jaundice 145
  26.15.1 Physiological Jaundice 145
  26.15.2 Acute Non-Physiological Jaundice 145
  26.15.3 Prolonged Neonatal Jaundice 146
26.16 Congenital Anomalies 146
  26.16.1 Hydrocephalus 146
  26.16.2 Neurotube Defects 146
  26.16.3 Cleft Lip and Palate 147
  26.16.4 Tracheo-Oesophageal Fistula (TOF) 148
  26.16.5 Anorectal Malformations 149

27. Ear, Nose, and Throat Conditions 149
27.1 Acute Otitis Media 149
27.2 Chronic Suppurative Otitis Media (CSOM) 150
27.3 Mastoiditis 151
27.4 Otitis Externa 151
27.5 Epistaxis 152
27.6 Foreign Bodies in Nose and Ears 152
  27.6.1 Foreign Bodies in the Ears 152
  27.6.2 Foreign Bodies in the Nose 153
27.6 Wax in the Ear 153
27.7 Foreign Body in the Oesophagus 154
27.8 Laryngotracheal Trauma 154
27.9 Allergic Rhinitis 154
27.10 Parotid Masses 154
27.11 ENT Manifestations of HIV/AIDS 155
  27.11.1 Chronic Ear Infections 155
  27.11.2 Hearing Impairment 155

28. Selected Infections and Related Conditions 156
28.1 Septicaemia 156
28.2 Septic Arthritis and Osteomyelitis 156
28.3 Salmonella Infections: Typhoid Fever 156
28.4 Fever of Unknown Origin 157
28.5 Antibiotic Guide to Bacterial Infections 158
28.6 Paralysis (Acute Flaccid)
   28.6.1 Poliomyelitis 159
28.7 Tetanus 160
28.8 Tuberculosis 160
28.9 Rabies 166
28.10 HIV Infection in Children
   28.10.1 Prevention of Mother to Child Transmission (PMTCT) 166
   28.10.2 Feeding Options for HIV Infected Women 167
   28.10.3 Care of HIV Exposed Infants 167
   28.10.4 Care of HIV Infected Children 168
   28.10.5 Prevention of HIV Transmission in Health Facilities 172
29. Nutrition, Growth, and Development 173
29.1 Foetal Nutrition 173
29.2 Infant and Young Child Feeding
   29.2.1 Recommended Feeding for Young Children 175
   29.2.2 National Policy on Infant and Young Child Feeding Practices:
      Summary Statement 175
29.3 Healthy Feeding through Childhood 175
30. Growth Monitoring and Growth Promotion 177
31. Development 179
32. Nutritional Disorders 180
   32.1 Micronutrient Deficiency
      32.1.1 Iron Deficiency 180
      32.1.2 Iodine Deficiency 180
      32.1.3 Vitamin A Deficiency 180
      32.1.4 Vitamin D Deficiency 181
   32.2 Macronutrient Malnutrition 182
33. Children with Special Health Needs 184
   33.1 Failure to Thrive 184
   33.2 Child Abuse and Neglect 184
34. Gastrointestinal Conditions Other than Diarrhoea 186
   34.1 Infestation with Worms 186
   34.2 Amoebiasis 188
   34.3 Schistosomiasis 188
   34.4 Gastrointestinal Bleeding 190
   34.5 Vomiting 190
   34.6 Peptic Ulcer Disease 191
   34.7 Constipation and Encopresis 192
35. Disorders of the Liver and Spleen 192
   35.1 Hepatosplenomegaly 192
   35.2 Jaundice after the Neonatal Period 192
   35.3 Obstructive Jaundice beyond Neonatal Period 194
36. Haematologic Conditions 194
36.1 Anaemia 194
36.2 Sickle Cell Anaemia (Disease) 196
37. Neoplasms in Childhood 197
38. Cardiovascular Diseases in Children 198
38.1 Heart Failure (Congestive Cardiac Failure) 199
38.2 Pulmonary Oedema 199
38.3 Congenital Heart Disease with Cyanosis 200
  38.3.1 Tetralogy of Fallot 200
38.4 Congenital Heart Disease without Cyanosis 201
  38.4.1 Ventricular Septal Defect (VSD) 201
  38.4.2 Patent Ductus Arteriosus (PDA) 201
38.5 General Management of Congenital Heart Disease 202
38.6 Acquired Heart Disease 202
  38.6.1 Acute Rheumatic Fever 202
38.7 Rheumatic Heart Disease 203
38.8 Infective Endocarditis 204
38.9 Pericardial Disease 204
  38.9.1 Acute Pericarditis 204
  38.9.2 Pericardial Effusion 205
  38.9.3 Cardiac Tamponade 205
  38.9.4 Constrictive Pericarditis 205
38.10 Hypertension in Children 205
39. Urinary Tract and Renal Conditions 206
39.1 Features of Renal Disease 206
39.2 Urinary Tract Infections (UTI) 207
39.3 Glomerular Disorders 208
  39.3.1 Acute Glomerulonephritis (AGN) 208
39.5 Tubular Disorders 209
39.6 Acute Renal Failure 209
39.7 Chronic Renal Failure 210
39.8 Hypokalaemia 211
39.9 Genito-Urinary Anomalies 211
40. Central Nervous System 211
40.1 Seizure Disorders 211
  40.1.1 Types of Seizures 212
  40.1.2 Management During an Epileptic Attack 213
40.2 Status Epilepticus 214
40.3 Febrile Convulsions 215
40.4 Cerebral Palsy 215
40.5 Mental Retardation 217
40.6 Hydrocephalus 217
41. Skin Diseases 217
41.1 Eczema 217
## 41. Primary Care

### 41.1.1 Atopic Eczema 217
### 41.1.2 Contact Dermatitis 218
### 41.1.3 Seborrhoeic Dermatitis 219
### 41.2 Bacterial Infections 219
#### 41.2.1 Impetigo Contagiosum 219
#### 41.2.2 Bullous Impetigo 219
### 41.3 Fungal Infections 220
### 41.4 Parasitic Infestations 220
#### 41.4.1 Scabies 220
##### 41.4.2 Jiggers/Tunga Penetrans 221
### 41.5 Pellagra (Niacin Deficiency) 222
### 41.6 Dermatological Emergencies 222
#### 41.6.1 Staphylococcal Scalded Skin Syndrome (SSSS) or Ritter’s Disease 222
#### 41.6.2 Erythema Multi Forme Syndrome 223
#### 41.6.3 Exfoliative Dermatitis 223

## 42. Endocrine System Conditions 224
### 42.1 Diabetes Mellitus 224
#### 42.1.1 General Information 224
#### 42.1.2 Type 1 Diabetes Mellitus 225
#### 42.1.3 Type 2 Diabetes Mellitus 226
### 42.2 Thyroid Diseases 227
#### 42.2.1 Goitre 227
#### 42.2.2 Hyperthyroidism 227
#### 42.2.3 Hypothyroidism 227
### 42.3 Adrenal Disorders 228
#### 42.3.1 Adrenal Insufficiency 228

## 43. Musculoskeletal Conditions 229
### 43.1 Arthralgia (Non-Specific) 229
### 43.2 Juvenile Rheumatoid Arthritis 229

## 44. Mental Disorders 230
### 44.1 Vegetative Disorders 230
#### 44.1.1 Enuresis (Bed Wetting) 230
### 44.2 Anxiety Disorders 230
### 44.3 Mood Disorders: Depression 231
### 44.4 Conversion Syndromes (Hysteria) 231
### 44.5 Disruptive Behaviour Disorders 231
#### 44.5.1 Attention Deficit/Hyperactivity Disorder 231
#### 44.5.2 Conduct Disorders 232
#### 44.5.3 Pervasive Development Disorders – Autism 232
#### 44.5.4 Childhood Psychoses 232
#### 44.5.5 Substance Abuse Related Disorders 232
#### 44.5.6 Suicide Attempts 233

## 45. Child Health 233
### 45.1 Immunization 233
#### 45.1.1 Immunization Guidelines 234
45.1.2 Vaccine Administration 234
45.1.3 Age at Vaccination 234
45.1.4 Specific Instructions 235
45.1.5 Contraindications 235
45.1.6 Immunization in Special Situations 235
45.1.7 Childhood Immunization Schedule in Kenya (KEPI) 236
45.1.8 Vaccines Available but Not Yet in Kepi Programme 237
45.1.9 Tetanus Toxoid (TT2+) Immunization Schedule for Pregnant Mothers 238
45.1.10 Vitamin A Supplement 238
45.1.11 Immune Globulins (Passive Immunization) 239
45.1.12 Rabies 239

PART III – SURGERY AND RELATED DISCIPLINES 241

46. Acute Trauma and Selected Emergencies 243
46.1 Abdominal Trauma 243
46.2 Animal and Snake Bites 244
46.3 Burns 244
   46.3.1 Evaluation of the Extent of Burns Using the Wallace Rules of Nine for Adults 246
   46.3.2 Amount of Fluids to Be Administered 246
46.4 The Multiply Injured Patient 248
   46.4.1 Chest Injury 248
   46.1.2 Maxillofacial Injury 251
   46.1.3 Head Injury 251
   46.1.4 Spinal Injury 252

47. General Surgery 253
47.1 Abdominal Conditions 253
   47.1.1 Acute Abdomen 253
   47.1.2 Intestinal Obstruction 254
   47.1.3 Peritonitis 255
   47.1.4 Appendicitis 255
   47.1.5 Tracheoesophageal Fistula 256
   47.1.6 Intestinal Atresia 256
   47.1.7 Childhood Hemias 257
   47.1.8 Imperforate Anus 258
   47.1.9 Inguinal Hernia (Adult) 258
   47.1.10 Lower Gastrointestinal Bleed 259

47.2 Anorectal Conditions 259
   47.2.1 Anal Incontinence 259
   47.2.2 Rectal Prolapse 260
   47.2.3 Pruritis Ani 260
   47.2.4 Fissure in Ano 261
   47.2.5 Haemorrhoids 261
   47.2.6 Anorectal Abscess 261
   47.2.7 Rectal Trauma 262
   47.2.8 Fistula in Ano 262
47.2.9 Distal Colon and Rectal Carcinoma 262
47.3 Abscesses 263
47.4 Breast Conditions 264
  47.4.1 Breast Abscess 264
  47.4.2 Breast Lumps 264
47.5 Central Nervous System 264
  47.5.1 Hydrocephalus 265
  47.5.2 Increased Intracranial Pressure and Space Occupying Lesions 265
  47.5.3 Intracranial Infections 265
47.6 Chest Conditions 266
  47.6.1 Congenital Heart Disease 266
  47.6.2 Empyema Thoracis 266
  47.6.3 Achalasia Cardia 267
  47.6.4 Malignant Dysphagia 267
  47.6.5 Lung Neoplasm 267
47.7 Genitourinary System 268
  47.7.1 Posterior Urethal Valves 268
  47.7.2 Childhood Hydrocele 268
  47.7.3 Testicular Torsion 269
  47.7.4 Circumcision 269
  47.7.5 Adolescent Haematuria 270
  47.7.6 Haematuria in the Adult 270
  47.7.7 Urinary Retention 270
  47.7.8 Urethral Stricture 271
  47.7.9 Urethral Injuries 271
  47.7.10 Ruptured Bladder 272
  47.7.11 Benign Prostate Enlargement (BPE) 272
  47.7.12 Prostate Carcinoma 274
47.8 Ulcers and Tumours of the Skin 274

48. Dental and Oral Conditions 275
48.1 Bacterial Infections 276
  48.1.2 Dental Caries and Pulpitis 276
  48.1.3 Cellulitis and Abscess Formation 276
  48.1.4 Cervicofacial Necrotizing Fasciitis 277
  48.1.5 Periodontal (Gum) Infections 277
  48.1.6 Acute Ulcerative Gingivitis 278
  48.1.7 Gangrenous Stomatitis (Cancrum Oris, Noma) 278
  48.1.8 Bone Infections 278
48.2 Trauma of the Orofacial Tissues 279
  48.2.1 Orofacial Congenital and Dysplastic Conditions 279
  48.2.3 Cysts and Benign Tumours of the Orofacial Region 280
  48.2.4 Malignant Neoplasms of the Orofacial Region 280
48.3 Neuropathies of the Orofacial Region 280
  48.3.1 Paroxysmal Trigeminal Neuralgia 280
  48.3.2 Facial Palsy 281
  48.3.3 Herpetic Infections 281
48.4 Temperomandibular Joint (TMJ) Disorders 281
49. Ophthalmology 282
49.1 Ophthalmia Neonatorum (Conjunctivitis of the Newborn) 282
49.2 Congenital Cataract 282
49.3 Senile Cataract 283
49.4 Childhood Blindness 283
49.5 Retinoblastoma 283
49.6 Common Blinding Conditions 284
49.7 Trachoma 284
49.8 Glaucoma 284
49.9 Refractive Errors 285
49.10 Vitamin A Deficiency 285
49.11 Herpes Zoster Ophthalmicus (HZO) 285
49.12 Chalazion 286
49.13 Painful Red Eye 286
49.14 Unexplained Vision Loss 286
49.15 Allergic Conjunctivitis 286
49.16 Viral and Purulent Conjunctivitis 287
49.17 Asthenopia (Eye Strain) 287
49.18 Corneal Ulcers 287
49.19 Stye 288
49.20 Eye Trauma 288

50. Orthopaedics 289
50.1 Fractures 289
   50.1.1 Open/Compound Fracture 289
   50.1.2 Closed Fractures 290
50.2 Joint and Tendon Injuries 290
50.3 Club Foot 291
50.4 Acute Osteomyelitis 291
50.5 Chronic Osteomyelitis 292
50.6 Septic Arthritis 292
50.7 Osteosarcoma 293
50.8 Lower Back Pain 293

51. Ear, Nose, and Throat Conditions 294
51.1 Epistaxis 294
51.2 Foreign Bodies in the Ears 294
51.3 Foreign Bodies in the Nose 295
51.4 Foreign Bodies in the Oesophagus 295
51.5 Wax in the Ears 295
51.6 Hearing Impairment 295
51.7 Mastoiditis 296
51.8 Laryngeal Trauma 296
51.9 Allergic Rhinitis 296
51.10 Parotid Mass 297
51.11 Acute Otitis Media 297
51.12 Chronic Suppurative Otitis Media (CSOM) 297
   51.12.1 Tubo-Tympanic Type 297
   51.12.2 Attico Antral 298
51.13 Ear Nose and Throat Manifestations of HIV/AIDS 298
51.14 Nasopharangeal Carcinoma 298
51.15 Carcinoma of the Larynx 298

PART IV – OBSTETRICS AND GYNAECOLOGY AND RELATED DISCIPLINES 299

52. Gynaecology 301
52.1 Abortion (Miscarriage) 301
  52.1.1 Therapeutic Abortion 301
  52.1.2 Unsafe Abortion 301
  52.1.3 Threatened Abortion 301
  52.1.4 Complete Abortion 304
  52.1.5 Incomplete Abortion 304
  52.1.6 Septic Abortion 305
  52.1.7 Missed Abortion 305
  52.1.8 Habitual Abortion 306
  52.1.9 Post-Abortion Care (PAC) at Level 2–3 306
  52.1.10 Molar Abortion (Hydatidiform Mole) 306
52.2 Ectopic Pregnancy 306
52.3 Infertility 307
52.4 Pelvic Masses 308
  52.4.1 Normal Pregnancy 308
  52.4.2 Distended Urinary Bladder 308
  52.4.3 Uterine Fibroids 308
  52.4.4 Pelvic Abscess and Tubo-Ovarian Mass 309
  52.4.5 Ovarian Cysts 309
  52.4.6 Neoplasms (Malignant Growths) 309
52.5 Menstrual Disturbances 309
  52.5.1 Amenorrhoea 309
  52.5.2 Dysfunctional Uterine Bleeding (DUB) 310
  52.5.3 Dysmenorrhoea 311
  52.5.4 Premenstrual Tension Syndrome 312
52.6 Neoplasms (Potentially Malignant Conditions) 312
  52.6.1 Ovarian Cancer 312
  52.6.2 Cancer of the Cervix 312
  52.6.3 Carcinoma of the Endometrium 313
  52.6.4 Carcinoma of the Vulva 313
  52.6.5 Carcinoma of the Vagina 314
52.7 Pelvic Inflammatory Disease (PID) 314
52.8 Abscesses and Fistulae 314
  52.8.1 Bartholin’s Abscess 314
  52.8.2 Genital Fistula 315
52.9 Sexual Assault 315

53. Obstetrics 317
53.1 Antenatal Care and Complications 317
  53.1.1 Antenatal Care 317
  53.1.2 Anaemia in Pregnancy 320
53.1.3 Antepartum Haemorrhage (APH) 322
53.1.3 Cardiac Disease in Pregnancy 322
53.1.4 Diabetes in Pregnancy 323
53.1.5 Drugs in Pregnancy 323
53.1.6 Malaria in Pregnancy 323
53.1.7 Multiple Pregnancy 325
53.1.8 Pre-Eclampsia and Eclampsia 326
53.1.9 Rhesus (Rh) Incompatibility 327
53.1.10 Urinary Tract Infection (UTI) in Pregnancy 328

53.2 Intrapartum Care and Complications 328
53.2.1 Normal Labour 328
53.2.2 Normal Delivery 330
53.2.3 Complicated Labour and Delivery 331
53.2.4 Cephalopelvic Disproportion (CPD) 331
53.2.5 Obstructed Labour 331
53.2.6 Ruptured Uterus 332
53.2.7 Induction of Labour 332
53.2.8 Operative Vaginal Delivery 333

53.3 Postpartum Care and Complications 333
53.3.1 Postnatal Care 333
53.3.2 Complications of Puerperium 334
53.3.3 Puerperal Infections 337
53.3.4 Septic Pelvic Thrombophlebitis 338
53.3.5 Extra-Genital Differential Diagnoses 338
53.3.6 Breast Conditions 339
53.3.7 Deep Vein Thrombosis (DVT) 339
53.3.8 Puerperal Psychosis 339

54. Family Planning (FP) 340
54.1 Hormonal Contraceptives 342
54.1.1 Combined Oral Contraceptive Pill 342
54.1.2 Progestogen-Only Pill (Mini Pill) 343
54.1.3 Emergency Contraceptives 344
54.1.4 Injectable Contraceptives 344
54.1.5 Sub-Dermal Implants 345
54.2 Intrauterine Contraceptive Device (IUCD) 345
54.3 Barrier Methods 346
54.3.1 The Male Condom 346
54.3.2 The Female Condom 347
54.3.3 Spermicides 347
54.3.4 Diaphragm and Cervical Cap 347
54.4 Surgical Contraception 348
54.4.1 Tubal Ligation 348
54.4.2 Vasectomy 349
54.5 Periodic Abstinence (Natural Family Planning) 349
PART V – GUIDELINES ON APPROPRIATE USE OF BLOOD AND BLOOD PRODUCTS 351

55. Introduction 353

56. General Guidelines for the Use of Red Blood Cell Products 353
56.1 Acute Blood Loss, Including Preoperative Transfusion and Chronic Anaemia 354
    56.1.1 Acute Blood Loss 354
    56.1.2 Perioperative Transfusion 355
    56.1.3 Chronic Anaemia 356
    56.1.4 Red Blood Cell Transfusion Guidelines 356
56.2 Blood Transfusion in Pregnancy 356
56.3 Paediatric and Neonatal Transfusions 358
    56.3.1 Guidelines for Paediatric Transfusion 358
    56.3.2 Congenital Anaemias 358
    56.3.3 Unique Issues in the Neonate 359
56.4 Guidelines for Plasma Transfusions 359
56.5 Guidelines for Platelet Transfusions 360
56.6 Autologous Transfusions 360

57. Transfusion Reactions 361
57.1 Types of Transfusion Reactions 361
57.2 Transfusion Reaction Work-up 362

58. Implementation of Guidelines 362

PART VI – REFERRAL SYSTEMS 365

59. The Referral Framework 367

60. General Guidelines 368
60.1 Procedure for Upward Referral 369
60.2 Procedure for Downward Referral 369
60.3 Guidelines for an Institutional Referral System 370

61. Dangers and Barriers to a Coordinated Referral System 371

Index 373
# List of Tables

A: KEPH strategic Interventions, by level and life-cycle cohort xxxvii

## PART I – Internal Medicine and Related Disciplines

1.1: Clinical features and treatment of common acute poisonings 8

2.1: Modes of transmission and preventive measures for HIV infection 11

2.2: WHO classification of HIV and AIDS clinical stages (adults and adolescents) 14

2.3: ARV standardized regimes In Kenya (adults and adolescents) 15

2.4: Management – Gonorrhoea and other urethritis (levels 2–4) 16

2.5: Clinical features and probable causes of genital ulcers 22

2.6: Treatment of selected STIs, including GUD 24

3.1: Classification of hypertension 28

3.2: Drug regimens for hypertension 28

4.1: Drugs of choice for common seizures 33

4.2: Drug regimens for seizure disorders 33

6.1: Clinical signs of dehydration 40

6.2: Rehydration protocol 41

6.3: Antibiotics used in the treatment of diarrhoea 42

6.4: Common intestinal worms – Features and investigations 47

6.5: Management of intestinal worm infections 48

7.1: Uncomplicated malaria in children 49

7.2: Dosage of intra-muscular injection of quinine hydrochloride 51

7.3: Summary of species, vectors, and pathologies for filariasis disease 54

7.4: Summary of viral haemorrhagic fevers 54

7.5: 2RHZE/4RH regimen for new/seriously ill TB patients 57

7.6: 2SRHZE/1RHZE/5RHE regimen for relapsed, failed, and resumed TB patients 58

7.7: Drug dosages for varying pretreatment weights and drug formulations 58

7.8: Antibiotics for selected common infections 60
11.1: Management of anaemia in pregnancy 66
15.1: Aetiologies of acute renal failure 85

PART II – Paediatrics and Related Disciplines
18.1: Assessment, classification, and management of diarrhoea in children below 5 years 105
18.2: Rehydration protocol for young children 105
18.3: Clinical evaluation of dehydration in older children 106
18.4: Rehydration protocol for older children 106
18.5: Antibiotics used in the treatment of diarrhoea 109
19.1: Paediatric paracetamol doses, every 6 hours 111
20.1: Dosing schedule for artemether-lumefantrine 113
20.2: Dosing schedule for quinine tablets 114
20.3: Dosage of intra-muscular injection of quinine dihydrochloride after dilution to 50mg/ml (for younger children up to 30kg) 116
20.4: Dosage of intra-muscular injection of quinine dihydrochloride after dilution to 100mg/ml (older children above 30kg) 116
20.5: Dosage schedule for proguanil (daily PO) 117
24.1: Fast breathing cut off points 129
24.2: Treatment of child with wheeze 131
26.1: APGAR scoring 137
26.2: Feeding chart for preterm and low birth weight babies: Amount of milk to give every 3 hours (ml) 143
28.1: Paediatric tuberculosis score chart 162
28.2: Treatment regimen for new/seriously ill adult TB patients: 2ERHZ/6EH 163
28.3: Re-treatment regimen for relapse (R), treatment failure (F), or treatment resumed (TR): 2SRHZE/1RHZE/5RHE 164
28.4: Treatment regimen for new TB patients younger than 15 years: 2RHZ/4RH 164
28.5: Treatment dosages for children under 15 years of age 164
28.6: Immunological stages: Based on age specific CD4 counts 170
28.7: Daily cotrimoxazole dosages to prevent Pneumocystis carinii pneumonia 170
28.8: First line ARVs 171
28.9: Second line therapy 172
30.1: When a child does not grow well: Assess nutritional status 178
30.2: Feeding recommendations children with poor growth or lack of growth 178
32.1: Indications of severe malnutrition 182
34.1: Specific worm infestations, their clinical features, and investigations required for diagnosis 186
34.2: Drugs and their dosages for worm infestations 188
35.1: Causes of hepatosplenomegaly 193
36.1: Normal childhood haemoglobin levels 194
37.1: Common childhood malignancies, their clinical features, useful investigations, and line of management 197
38.1: Upper limits of normal blood pressure values for both sexes at different ages (in mmHg) 206
40.1: Drugs of choice for common seizures 214
40.2: Paediatric dosages of common drugs for convulsive disorders 214
42.1: Presentation of juvenile rheumatoid arthritis, by type 229
45.1: Childhood immunization schedule in Kenya (KEPI) 236
45.2: Vaccine dosage and route of administration 237
45.3: Tetanus toxoid schedule for pregnant mothers 238
45.4: Vitamin A supplementation schedule 238

PART III – Surgery and Related Disciplines
46.1: Change in body surface area with growth 247
46.2: Glasgow coma scale 252
47.2: International prostate symptom score (IPSS) 273

PART IV – Obstetrics and Gynaecology and Related Disciplines
52.2: Recommended emergency abortion care activities by level of health care facility and staff 303
53.1: Common complaints in pregnancy 320
53.2: Management of anaemia in pregnancy 321
53.3: Drug use in pregnancy 324
53.4: PET grading 326
54.1: Family planning methods and their suitability for various types of users 340
54.2: Guide to family planning methods 341
54.3: Types of IUCDs 346
# List of Figures

| A: | The comprehensive approach to health care service delivery | xxxv |
| B: | The KEPH system | xxxvi |

## PART I – Internal Medicine and Related Disciplines

| 2.1: | Decision flow chart for urethral discharge | 17 |
| 2.2: | Flow chart for vaginal discharge | 20 |
| 2.3: | Decision chart for lower abdominal pain in women | 21 |
| 2.4: | Flow chart for genital ulcer disease (GUD) | 23 |

## PART II – Paediatrics and Related Disciplines

| 17.1: | Triage of sick children | 100 |
| 17.2: | Basic life support – Cardio-respiratory collapse | 101 |
| 17.3: | How to manage the choking infant | 103 |
| 17.4: | How to manage the choking child | 104 |
| 18.1: | Diarrhoea management protocol for young children | 107 |
| 20.1: | Management of complicated malaria | 115 |
| 22.1: | Flowchart for assessment and management of meningitis | 121 |
| 23.1: | Flowchart for management of convulsing child | 122 |
| 24.1: | ARI/Pneumonia protocol for children aged 2 months to 4 years | 128 |
| 24.2: | Inhaler with a spacer. If unaffordable, use a plastic 750ml or 1 litre soft drink bottle | 130 |
| 26.1: | ABC’s of neonatal resuscitation – Call for help! | 136 |
| 29.1: | Summary of national infant and child feeding policy | 176 |
| 29.2: | Information links between VCT and infant feeding | 176 |

## PART III – Surgery and Related Disciplines

| 46.1: | Evaluating the extent of burns using the Wallace Rules of Nine | 246 |
| 46.2: | Body surface area estimation in children | 247 |
PART IV – Obstetrics and Gynaecology and Related Disciplines

53.1: The new WHO antenatal care model 318
53.2: Criteria for classifying women in the basic components of the new antenatal care model 319

Box 52.1: Abortion and the Law 303
List of Abbreviations

ACT  Artemesinin combination treatment  
AGN  Acute glomerulonephritis  
AIDS  Acquired immune deficiency syndrome  
AMI  Acute myocardial infarction  
APH  Antepartum haemorrhage  
ART  Anti-retroviral therapy  
ARV  Anti-retroviral drug  
BBA  Born before arrival  
BPE  Benign prostate enlargement  
CPD  Cephalopelvic disproportion  
CHEW  Community health extension worker  
CHW  Community health worker  
CPD  Cephalopelvic disproportion  
CSOM  Chronic suppurative otitis media  
DIC  Disseminated intravascular coagulopathy  
DOTS  Directly observed therapy, short course  
DUB  Dysfunctional uterine bleeding  
DVT  Deep vein thrombosis  
EFA  Education for All  
FFP  Fresh frozen plasma  
FP  Family planning  
GIT  Gastrointestinal tract  
GOK  Government of Kenya  
GORD  Gastro-oesophageal reflux disease  
HBC  Home-based care  
HIV  Human immunodeficiency virus  
HZO  Herpes zoster ophthalmicus  
IEC  Information, education and communication  
ITN  Insecticide treated net  
IUCD  Intrauterine contraceptive device  
JRA  Juvenile rheumatoid arthritis  
KEPH  Kenya Essential Package for Health
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>KEPI</td>
<td>Kenyan Expanded Programme of Immunization</td>
</tr>
<tr>
<td>KMC</td>
<td>Kangaroo mother care</td>
</tr>
<tr>
<td>LLIN</td>
<td>Long-lasting insecticidal net</td>
</tr>
<tr>
<td>MDGs</td>
<td>Millennium Development Goals</td>
</tr>
<tr>
<td>MDR</td>
<td>Multiple drug resistant (TB)</td>
</tr>
<tr>
<td>MOH</td>
<td>Ministry of Health</td>
</tr>
<tr>
<td>MOMS</td>
<td>Ministry of Medical Services</td>
</tr>
<tr>
<td>MOPHS</td>
<td>Ministry of Public Health and Sanitation</td>
</tr>
<tr>
<td>MVA</td>
<td>Manual vacuum aspiration</td>
</tr>
<tr>
<td>NGI</td>
<td>Non-gonococcal infection</td>
</tr>
<tr>
<td>NHSSP II</td>
<td>Second National Health Sector Strategic Plan 2005–2010</td>
</tr>
<tr>
<td>OSCC</td>
<td>Oral squamous cell carcinoma</td>
</tr>
<tr>
<td>PAC</td>
<td>Post-abortion care</td>
</tr>
<tr>
<td>PDA</td>
<td>Patent ductus arteriosus</td>
</tr>
<tr>
<td>PEP</td>
<td>Post-exposure prophylaxis</td>
</tr>
<tr>
<td>PID</td>
<td>Pelvic inflammatory disease</td>
</tr>
<tr>
<td>PLWHA</td>
<td>Person/people living with HIV/AIDS</td>
</tr>
<tr>
<td>PMTCT</td>
<td>Prevention of mother to child transmission (of HIV)</td>
</tr>
<tr>
<td>PPH</td>
<td>Postpartum haemorrhage</td>
</tr>
<tr>
<td>RVF</td>
<td>Recto-vesical fistula</td>
</tr>
<tr>
<td>SSSS</td>
<td>Staphylococcal scalded skin syndrome (Ritter's disease)</td>
</tr>
<tr>
<td>STI</td>
<td>Sexually transmitted infections</td>
</tr>
<tr>
<td>TB</td>
<td>Tuberculosis</td>
</tr>
<tr>
<td>TBA</td>
<td>Traditional birth attendant</td>
</tr>
<tr>
<td>TMJ</td>
<td>Temperomandibular joint</td>
</tr>
<tr>
<td>TOF</td>
<td>Tracheo-oesophageal fistula</td>
</tr>
<tr>
<td>TT2</td>
<td>Tetanus toxoid</td>
</tr>
<tr>
<td>UNICEF</td>
<td>United Nations Children’s Fund</td>
</tr>
<tr>
<td>UTI</td>
<td>Urinary tract infections</td>
</tr>
<tr>
<td>VCT</td>
<td>Voluntary counselling and testing</td>
</tr>
<tr>
<td>VSD</td>
<td>Ventricular septal defect</td>
</tr>
<tr>
<td>VVF</td>
<td>Vesico-vaginal fistula</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
</tr>
<tr>
<td>WRA</td>
<td>Woman of reproductive age</td>
</tr>
</tbody>
</table>
Contributors to This Volume

CONTRIBUTORS

Prof. Ezekiel M. Wafula, MB.ChB (Nairobi), M.Med (Nairobi), Associate Professor and Consultant Paediatrician, Department of Paediatric and Child Health, University of Nairobi, project editor

Prof. Nicholas A. Othieno Abinya, MB.ChB (Nairobi), M.Med (Nairobi), Associate Professor, Department of Medicine, Section of Oncology, Aga Khan University Hospital

Prof. Joseph G. Karanja, MB.ChB (Nairobi), M.Med (Nairobi), Associate Professor and Consultant Obstetrician and Gynaecologist, Department of Obstetrics and Gynaecology, University of Nairobi

Prof. Dan C.O. Kaseje, MB.ChB (Nairobi), MPH, PhD, Professor of Community Health, Great Lakes University, Kisumu

Prof. Rachel Musoke, MB.ChB (East Africa), M.Med (Makerere), FABM, Associate Professor and Consultant Paediatrician and Neonatologist, Department of Paediatrics and Child Health, University of Nairobi

Prof. Stephen W.O. Ogendo, MB.ChB (Nairobi), M.Med (Nairobi), FCS (ECSA), Associate Professor and Consultant Cardiothoracic Surgeon, Department of Surgery, University of Nairobi

REVIEWERS

Dr. Kirtida Acharya, Endocrinologist (Diabetes), MP Shah Hospital

Dr. John Aduda, Kenya Medical Supply Agency

Dr. Maureen Ambetsa, Med Sup, Nakuru

Dr. Dianne Amojong, Machakos Level 5

Dr. K. Chesang, WHO
Clinical Guidelines

Dr. Sarah Chuchu, Provincial Pharmacist – Nairobi Province
Dr. Samuel Gatere, MOMS – Mathari Hospital
Dr. Esther Getambo, Ministry of Medical Services (MOMS)
Dr. Michael Gichangi, MOMS
Dr. Evans Imbuki, New Nyanza Provincial General Hospital
Dr. Anne Indalo, University of Nairobi Pharmacy Department
Dr. Alice Inyangala, MOMS/Pharmacy
Prof. Francis D. Juma, UON-Faculty of Medicine
Mr. John Kabanya, Clinical Officer, Clinical Officers Council
Dr. Charles Kamotho, Thika District Hospital
Mrs. Lydia Karimuria, Ministry of Public Health and Sanitation (MOPHS), Division of Child and Adolescent Health
Mrs. Mercy Kasina, Ministry of Health, Department of Nursing
Dr. Harrison Kambati, Head Technical Planning, MOMS
Dr. Humphrey Karamagi, Technical Officer, Health System Development, WHO Kenya
Dr. David Kiima, Director of Mental Health, MOMS, Division of Mental Health
Mr. Titus M. Kilika, MOMS
Dr. Kilonzo, head of surgery, Machakos level 5 hospital
Dr. Sylvester J.N. Kimaiyo, Moi Teaching and Referral Hospital (MTRH)
Dr. Francis M. Kimani, Director of Medical Services, MOMS
Dr. Maureen Kamene Kimenye, Ministry of Health, NASCOP / PASCOs
Mr. Julius Kimitei
Mr. Michael Kisoo, Chief Clinical Officer, MOMS
Mr. Alex K. Kisyanga, Ministry of Medical Services
Dr. Ndinda Kusu, Clinical Pharmacist, Management Sciences for Health/ Strengthening Pharmaceutical Systems
Dr. William K. Maina, Ministry of Health, Division of Non Communicable Diseases (DNCD)
Dr. Beth Maina, Paediatrician, Embu Level 5
Dr. John Jao Majimbo, Clinical Pharmacist, KPA
Dr. Wekesa Masasabi, Head, MOMS, Dept. of Surgery
Dr. Johnson Masese, Clinical Pharmacist, Provincial General Hospital – Kakamega
Dr. Jane Masiga, Clinical Pharmacist, Medical Equipment & Drug Supplies
Dr. Chris Masila, Programme Pharmacist, MOPHS/Division of Leprosy, Tuberculosis and Lung Diseases (DLTLD)
Dr. Josephine Maundu, Clinical Pharmacist, Management Sciences for Health/ Strengthening Pharmaceutical Systems
Dr. Regina Mbindyo, National Professional Officer, Essential Drugs & Medicines, WHO
Bernard M. Mbogoh, Ministry of Health, Department of Environmental Health
Dr. Josphat N. Mbuva, Head, Essential Med Mgt, MOMS/Pharmacy
Dr. Tom Menge, Toxicologist, Kenyatta National Hospital
Dr. Njeri Mucheru, Head Policy Dev & Review, MOMS/Pharmacy
Dr. Simon W. Mueke, MOMS Division of Obstetric and Gynaecology, Dept of Medicine
Dr. Joseph Wahome Mukundi, Pharmacist, Meru District Hospital
Dr. Stephen Muleshe, MOMS Dept of Standards and Regulatory Services
Mr. Stephen M. Muneene, Ministry of Health, Curative & Rehabilitative Health Services
Dr. Assumpta Muriithi, National Professional Officer, Child and Adolescent Health
Prof. Rachel Musoke, University of Nairobi
Mr. James Botela Muthui, Ministry of Medical Services
Dr. Robert Mwangi, Clinical Pharmacist, Provincial General Hospital – Nyeri
Dr. Jonah Mwangi, Med Sup – Thika
Dr. Hilda Nderitu, Embu Level 5 - Clinical Pharmacist
Dr. Jacky Ndinda, Clinical Pharmacist, Rift Valley Provincial General Hospital
Mrs. Florence Ng’ang’a, Ministry of Health, Curative & Rehabilitative Health Services
Dr. George Ngatiri, Provincial Medical Officer, Central Province
Dr. Bibiana Njue, MOMS – Pharmacy and Poisons Board
Dr. Andrew J. Nyandigisi, Ministry of Public Health and Sanitation, Division of Malaria Control
Dr. Mary A. Ochola, Dentist, Chair, Medicines and Therapeutic Committee, Port Reitz District Hospital
Mr. Alfred J.B. Odhiambo, Chief Clinical Officer, Ministry of Health
Dr. Isaaq Odongo, Head, Internal Medicine, MOMS Department of Medicine
Dr. Margaret Oluka, Pharmacologist, UON-School of Pharmacy
Dr. Victor Ombeka, Ministry of Health, Division of Leprosy, Tuberculosis and Lung Diseases (DLTLD)
Dr. Elizabeth Ominde-Ogaja, Department of Pharmacy, Ministry of Medical Services
Dr. Enoch Omonde, Clinical Pharmacist, Kenya Medical Association
Dr. Joab Omondi Osumba, Machakos Level 5
Dr. Geoffrey Otumu, ENT Surgeon, Chair, Medicines and Therapeutic Committee, Kisii Level 5

Dr. Charles Ouma, Management Sciences for Health/Strengthening Pharmaceutical Systems

Dr. George Owiti, Chair, Medicines and Therapeutic Committee, Moi Teaching and Referral Hospital

Chris Rakuom, Chief Nursing Officer, MOMS

Dr. Nelly Rangara, Head Clinical Pharmacy Services, MOMS/Pharmacy

Dr. Gunturu Rivathi, Microbiologist, Aga Khan Hospital

Dr. Hardika Shah, Clinical Pharmacist, Pharmaceutical Society of Kenya

Dr. Ahmed Tawakal, Deputy Chief Pharmacist, Mater Hospital

Mary Wachira, Ministry of Health, Nutrition – NASCOP

Dr. Lois Wagana, Internal Medicine, Nyeri Level 5

Dr. Annah Wamae, Ministry of Health, Division of Child Health

Dr. Wandegu, Meru District Hospital

Mrs. Belina Wasike, Ministry of Health

Dr. Herman Weyenga, MOPHS, Division of Leprosy, Tuberculosis and Lung Diseases (DLTLD)

COORDINATORS

Persons responsible for coordinating the elaboration of the guidelines

Dr. Francis M. Kimani, Director of Medical Services

Dr. S. Sharif, Director of Public Health and Sanitation

Dr. Humphrey Karamagi, Technical Officer, Health Systems Development, WHO Kenya

Dr. Harrison M. Kiambati, Head, Sector Planning, Ministry of Medical Services

Dr. Elizabeth Ominde-Ogaja, Deputy Pharmacist, Head Appropriate Medicine Use Department of Pharmacy, Ministry of Medical Services
Following the articulation of the 1994 National Health Policy Framework, the Ministry of Health published the National Drug Policy, the Essential Drug List, and Clinical Guidelines and Referral Strategy. All these are important building blocks of the elaboration of the Kenya Essential Package for Health (KEPH) subsequently mooted in the second National Health Sector Strategic Plan (NHSSP II – 2005–2010). This volume is one of a three-volume set that comprises the latest edition of the Clinical Guidelines.

Intended as neither prescriptive nor restrictive, the guidelines are facilitative, enabling, and foundational. They provide a firm base for the attainment of equity and high standards in health care and the development of rational procurement and use of drugs by all prescribers, dispensers, hospital managers, and patients.

The guidelines are for the use of all clinicians and nurses who have the primary responsibility for diagnosis, management, and referral of outpatients and inpatients. They are also very useful to interns, medical students, clinical officers, pharmacists, and nurses in training – and generally to health professionals working in the clinical setting and especially those in rural health services where it might be the only reference book.

The revision has been widely consultative, incorporating recent advances in disease management and emerging medical challenges of the 21st century. Efforts have been made to include the most recent recommendations of the Ministry of Medical Services (MOMS) and the Ministry of Public Health and Sanitation (MOPHS) with inputs from specialized disease programmes, community health and the World Health Organization (WHO).

On behalf of the Ministry of Medical Services and the Ministry of Public health and Sanitation, many thanks are accorded to WHO, and to all contributors, reviewers, and the editors who have worked so hard to make the third edition of the guidelines a reality. We would like to acknowledge the technical guidance...
provided by WHO in compiling these revised clinical and management guidelines, and the financial support for the process from the EC/ACP/WHO partnership USAID-MSH/SPS (Management Sciences for Health/Strengthening Pharmaceutical Systems) on meeting the health targets of the Millennium Development Goals (MDGs).

The regular and consistent use of the guidelines by clinicians, nurses and other health professionals countrywide can be expected to improve health care in Kenya and encourage the rational use of available drugs and thus contribute albeit in a modest way towards the realization of Vision 2030 of “creating an enabling environment for the provision of sustainable quality health care that is cost effective and accessible to all Kenyans”.

Dr. Francis M. Kimani  
Director of Medical Services

Dr. S. K. Sharif, MBS, MBchB, M Med DLSHPM, MSc  
Director of Public Health and Sanitation
Preface

The clinical guidelines the sector has been utilizing were developed in 2002. Since then, the sector has put in place a strategy to respond to declining trends in health impact observed over the previous decade. This updated edition of the guidelines represents part of that strategy, in particular by taking cognisance of the changes introduced by the Kenya Essential Package for Health (KEPH), with its emphasis on distinct levels of care – including the community – to be provided to defined cohorts of the human life-cycle. The new edition thus addresses key shortcomings in the previous versions that limited the ability of clinicians to provide a comprehensive package of effective health care.

Specifically, the guidelines have been updated in relation to:
- Defining care protocols by level of service delivery, recognizing the fact that the skills and facilities for care differ at the different levels of health care.
- Making available a clear, separate volume for management of conditions at the community level, in recognition of the fact that good health is nurtured – or destroyed – primarily at individual and household levels, rather than at the health facilities.
- Providing greater elaboration of the identification and preparation for referral of clients in case the presenting condition or state doesn’t allow for management at the level where the client has presented.
- Updating management protocols to address current existing conditions and potential threats to the health of Kenyans.
- Including a process for monitoring and reviewing the guidelines.

For ease of reference and use, the guidelines are presented in 3 volumes:
- Volume 1: Management Guidelines for Level 1 (Community)
- Volume 2: Management Guidelines for Levels 2 and 3 (Primary Care)
- Volume 3: Management Guidelines for Levels 4–6 (Hospitals)

It is the hope of the sector that these guidelines will serve the users well as a
guide for the appropriate care expected to be delivered at each respective level in the health system, thus facilitating the realization of the Kenya Essential Package for Health at all levels. Any information that could be of use in improving the management protocols is welcome, and can be provided directly to the Office of the Director of Medical Services in the Ministry of Medical Services.
Introduction

Kenya’s health sector aims to prevent ill health, and where this cannot be done, to address the medical and social implications of the resulting ill health. Clinical management relates to this by ensuring efficient and effective management of the implications of ill health. It complements the public health services by ensuring that a specified quality of essential medical care is made available as needed, when needed, and in appropriate amounts.

Rationale for Revision of Clinical Guidelines

The sector last issued revised clinical guidelines in 2002. The guidelines defined management approaches for the key conditions that were expected to be afflicting the Kenyan population at that time. The guidelines had a number of weaknesses, however, including the following:

- The health sector lacked a clear, comprehensive, evidence-based approach to service delivery. Such an approach is important as it provides the overall guidance for the services the sector intends to provide, plus the process for delivering the services.
- The mechanism for monitoring and updating the clinical guidelines was not clear. As a result, the new management protocols that have come up since the guidelines were developed have not been incorporated, such as for avian influenza, management of multi-drug resistant tuberculosis (MDR/XDR TB), use of artemisinin combination treatment (ACT) for management of malaria, use of anti-retroviral drugs (ARVs) in HIV management, non-communicable diseases, and injuries/violence management, among others.
- Guidelines for preparation and management of clients for physical referral were not included.

Besides these more or less innate shortcomings, the clinical guidelines predated the approach to service delivery grounded in the framework of 6 life-cycle cohorts and 6 levels of care, as set out in the second National Health Sector
Strategic Plan (NHSSP II – 2005–2010). Thus they did not take into consideration the new approach that calls for different capacities and different functions at the different service levels in the country. Significantly, there was no guidance on management of services at the community level, and the lack of a referral framework is a drawback that has become more apparent as the care level approach has become institutionalized. These updated guidelines attempt to address these shortcomings. In addition, they are aligned to the comprehensive multilevel service delivery approach defined by the Essential Package for Health (KEPH).

Comprehensive Service Delivery Approach

The review of the 1st National Health Sector Strategic Plan (NHSSP I) in 2004 highlighted, amongst other issues, evidence of stagnating or downward trends in health indicators, especially in the key areas of maternal, newborn, and child health. To respond to this worrying trend, the health sector in Kenya initiated an accelerated reform process to halt, and then reverse, this trend.

The reform process is enshrined in NHSSP II, which states the midterm goal of the health sector as “To reduce health inequalities and reverse the downward trends in health-related outcome and impact indicators”. The plan’s defined strategic objectives are to:

- Increase equitable access to health services;
- Improve the quality and the responsiveness of services in the sector;
- Improve the efficiency and effectiveness of service delivery;
- Foster partnerships in improving health and delivering services; and
- Improve financing of the health sector.

As part of the reform process, the sector elaborated clear operational approaches to enable it to achieve its strategic objectives, as well as health service norms and standards. Investment plans now guide multi-year investment priorities for different key areas of the sector. The comprehensive service delivery approach is one of these operational approaches (refer to Figure A).

A comprehensive service delivery approach is based on provision of guidance – at community, dispensary/health centre, and hospital levels of care – on services to be provided, service standards to be attained, service inputs (human resource, infrastructure, equipment, etc.), and mechanisms for monitoring, evaluation, and supervision.

---

The services to be provided for each level of care are defined in the Kenya KEPH). A particular focus of the package is the community level. The service linkages are defined in the Sector’s Referral Strategy. These documents together describe the overall strategic approach for the sector, and are further elaborated.

The Kenya Essential Package for Health

KEPH is a life-cohort based approach to the delivery of health care services. Its main focus is to define the priority services that will ensure a healthy population at 6 distinct levels of the health system – from the community level up to tertiary care.
The diagram in Figure B illustrates the 6 life-cycle cohorts defined by KEPH: pregnancy and the newborn (up to 2 weeks); early childhood (to 5 years); late childhood (6–12 years); adolescence and youth (13–24 years); adulthood (25–59 years); and the elderly (60+ years). The diagram also illustrates the linkages of the 6 levels of care that KEPH defines:

- Level 1: Community: Village/households/families/individuals
- Level 2: Dispensaries/clinics
- Level 3: Health centres, maternities, nursing homes
- Level 4: Primary hospitals – District and subdistrict hospitals
- Level 5: Secondary hospitals – Provincial hospitals
- Level 6: Tertiary hospitals – National hospitals

The expected services to be provided are described in Table A. The KEPH has the following key characteristics:

- The package puts emphasis on health (rather than disease), on rights (rather than needs), and on community empowerment to exercise their rights.
- It identifies and redefines 6 distinct functional levels of care. The community level is recognized as the first level of care where major decisions are made and interventions are done that have an immediate impact. The focus at the community level is on the promotion of family practices that preserve and promote health.
<table>
<thead>
<tr>
<th>Cohort 1:</th>
<th>Pregnancy, delivery and newborn (to 2 weeks)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment targeted communities with current knowledge and facilitate appropriate practices and attitudes leading to safe pregnancy and delivery of a healthy newborn</td>
<td>Ensure that health facilities are equipped to provide very basic ANC and refer all deliveries (regardless of risk analysis)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cohort 2:</th>
<th>Early childhood (0–5 years)</th>
</tr>
</thead>
</table>
| Equip the community and health care providers with knowledge about the prevention of common childhood diseases and disabilities; and facilitate appropriate practices and attitudes leading to healthy child growth and development | a) Develop an outreach programme to serve “hard-to-reach” populations  
b) Strengthen the promotion and prevention of common childhood illnesses, impairments, and disabilities  
c) Strengthen case management and surveillance of common childhood illnesses  
d) Establish a functional supportive supervision system to ensure quality assurance | a) Strengthen the prevention of common childhood illnesses, impairments, and disabilities  
b) Strengthen case management & surveillance of common childhood illnesses  
c) Enhance the health systems support for delivery of quality child health services  
d) Establish a functional supportive supervision system to ensure quality assurance  
e) Develop outreach programmes to serve the “hard-to-reach” populations | Ensure availability of facilities to diagnose and appropriately manage sick children | Recognize and appropriately manage a sick child | Ensure provision of facilities to adequately manage children referred from lower levels |

---

Table A: KEPH strategic Interventions, by level and life-cycle cohort

<table>
<thead>
<tr>
<th>Level 1 (Community)</th>
<th>Level 2 (Dispensary/ clinic)</th>
<th>Level 3 (Health centre)</th>
<th>Level 4 (Primary/ district/subdistrict hospital)</th>
<th>Level 5 (Secondary/ provincial hospital)</th>
<th>Level 6 (Tertiary/ national hospital)</th>
</tr>
</thead>
</table>
| Equip targeted communities with current knowledge and facilitate appropriate practices and attitudes leading to safe pregnancy and delivery of a healthy newborn | Ensure that health facilities are equipped to provide very basic ANC and refer all deliveries (regardless of risk analysis) | a) Ensure that health centres are equipped to provide basic essential obstetric care  
b) Enhance health systems support for delivery of quality obstetric and newborn care  
c) Establish a functional supportive supervision system to ensure quality assurance  
d) Develop outreach programmes to serve “hard-to-reach” populations | Ensure that facilities are equipped to provide essential comprehensive obstetric care | Ensure that facilities are equipped to provide essential obstetric care | Ensure provision of facilities to adequately manage mothers and newborn referred from lower levels |
### Cohort 3: Late childhood 6–12 years

Equip the child with relevant knowledge and skills that promote healthy lifestyle, including psycho-social development

a) Develop an outreach programme to serve hard-to-reach populations
b) Strengthen the promotion and prevention of common illnesses, impairments, and disabilities in late childhood
c) Strengthen the case management and surveillance of common late childhood illnesses
d) Establish a functional supportive supervision system to ensure quality assurance

Facilitate and support caregivers and community in the provision of a safe environment for child survival, growth, and development

a) Ensure that the health team is able to recognize and appropriately manage a sick child and where necessary refer
b) Facilitate rehabilitative care for disabilities, and integration of children with disabilities (CWDs)

Strengthen provincial hospitals to diagnose and manage complicated childhood medical and surgical conditions

Ensure provision of facilities to adequately manage children referred from lower levels

### Cohort 4: Adolescence and youth (13–24 years)

Equip the youth with knowledge and life skills, and facilitate creation of a supportive environment to enhance adoption of healthy lifestyles for themselves and the community

Create an enabling environment for young people that discourages harmful practices, encourages psycho-social development, and prevents disease and injuries

Create an enabling environment for young people that discourages harmful practices and prevents disease and injuries

a) Ensure availability and access to quality youth-friendly services to encourage appropriate care seeking amongst the youth
b) Ensure provision of rehabilitative services for substance abusers

a) Ensure provision of comprehensive rehabilitative services for youth drug abusers
b) Ensure access to quality youth-friendly referral services for management of complicated medical and surgical conditions

Ensure provision of facilities to adequately manage youth referred from lower levels
<table>
<thead>
<tr>
<th>Cohort 5: Adulthood (25–59 years)</th>
<th>Level 1 (Community)</th>
<th>Level 2 (Dispensary/clinic)</th>
<th>Level 3 (Health centre)</th>
<th>Level 4 (Primary/district/subdistrict hospital)</th>
<th>Level 5 (Secondary/provincial hospital)</th>
<th>Level 6 (Tertiary/national hospital)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equip adults with knowledge and skills to facilitate creation of a supportive environment to enhance adoption of healthy lifestyles for themselves and the village</td>
<td>Provide information on and encourage utilization of recommended services for disease/injury prevention and facilitate creation of supportive environment to enhance adoption of healthy lifestyle.</td>
<td>Equip health facilities with staff who are able to conduct general medical and reproductive care assessment, disease/injury prevention and refer complicated cases to the district hospital</td>
<td>Ensure accessibility to quality curative services for adults with acute and chronic conditions</td>
<td>Ensure access to quality services for the diagnosis and management of complicated medical and surgical conditions</td>
<td>Ensure provision of facilities to adequately manage seriously ill adults referred from lower levels</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cohort 6: Elderly (60+ years)</th>
<th>Level 1 (Community)</th>
<th>Level 2 (Dispensary/clinic)</th>
<th>Level 3 (Health centre)</th>
<th>Level 4 (Primary/district/subdistrict hospital)</th>
<th>Level 5 (Secondary/provincial hospital)</th>
<th>Level 6 (Tertiary/national hospital)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equip the elderly persons, the community and health care providers with relevant knowledge on common old age diseases, impairments and disabilities in old age; and how to improve quality of life and enhance longevity</td>
<td>a) Provide information on and encourage utilization of recommended services for disease/injury prevention b) Refer cases to district hospital</td>
<td>a) Provide information on and encourage utilization of recommended services for disease/injury prevention b) Refer difficult cases to the health centre</td>
<td>a) Ensure early recognition and appropriate management of acute and chronic illnesses/injury as per recommended guidelines b) Provide appropriate comprehensive and special rehabilitation to older persons with chronic illnesses and disabilities at all levels</td>
<td>Ensure provision of facilities for the diagnosis and management of severe illnesses in old age</td>
<td>Ensure provision of facilities to adequately manage seriously ill older persons referred from lower levels</td>
<td></td>
</tr>
</tbody>
</table>
Its overall thrust is on revitalizing health promotion and preventive care at the first 3 KEPH levels. It defines health needs at each level of human development – from birth to old age – and identifies comprehensive and cost-effective interventions required at each stage of the human life cycle. It recognizes the packages of health care services per level of care to be rendered by both public and private health service providers.

KEPH is expected to improve the quality of services at levels 1–4 so that clients have confidence in these levels of care, thus resulting in increased client utilization of the lower level health facilities. KEPH is also expected to improve the networking of providers and facilities at the different levels of the health system thereby ensuring continuity of care for those who need the services provided at the higher levels of the system.

**Sector Norms and Standards**

Norms and standards defined to guide the provision of KEPH services are a statement of the human resource, infrastructure, equipment, and financing inputs necessary to ensure efficient and effective delivery of health care services to the population in Kenya. Service delivery standards relate to the expectations of each level of care with regard to service delivery and the types of human resources needed to provide these expectations. Service delivery norms define the quantities of these resource inputs needed to efficiently, effectively, and sustainably offer the service delivery package. These norms and standards are defined on the basis of the following principles:

- **Units of service delivery:** The focus is on the function, as opposed to the physical level, as the function may also be provided by a higher level facility.

- **Equity in access and utilization:** All inhabitants of the country and its respective districts have equal right not only to access health services, but also to use them equally for equal need.

- **Relevance and acceptability:** Health care needs to be rooted in the cultural and social reality of the communities and to include user satisfaction in the health care delivery equation.

- **Continuity of care:** Care should be viewed in a continuum, from the start of the illness or the risk episode until its resolution irrespective of the level at which care is sought. This means that a functional referral and counter-referral system should exist to make sure that services are availed.

- **Integration of care:** Every contact is used to ensure that a comprehensive set of defined services is made available.

- **A comprehensive/holistic approach:** Health services need to consider all the dimensions of the persons and their environment, and maintain a permanent interaction and dialogue with clients.
Levels 2–3 – Primary Care

- **The involvement of individuals, households, and communities:**
  Involvement is expressed in people taking up responsibility for their own health; it provides them with a sense of ownership of all they undertake relating to their health.

**Referral Strategy**

The categorization of KEPH into the 6 levels of care is primarily meant to rationalize the delivery of health services within the health system, for efficiency in the use of existing resources. The implication of this, however, is that the health service delivery unit a client may have direct access to may not be able to adequately manage their health care needs. The referral system is intended to address this shortcoming. A referral system is defined as a mechanism to enable clients’ health needs be comprehensively managed using resources beyond those available where they access care. It is based on the premise that while capacity for health service delivery has to be rationalized around different levels of care, the services received by clients should not be determined only by the services available where they access care, but rather by the full scope of care the health system is able to provide in the country.

An effective referral chain, therefore, provides the linkages needed across the different levels of the health system – from level 1 (community) to level 6 (national hospitals). These linkages ensure that a given health care need of a client can be addressed irrespective of the level of the health system at which the client first physically accesses care. The referral system can thus be likened to an “elevator/lift” in a multistory building: facilitating forwards and backwards management of clients across different floors (levels of care).

The referral strategy thus guides the sector on building an effective referral system that responds to the needs of rural and poor populations, thereby contributing to the realization of Vision 2030, and the Millennium Development Goals (MDGs).

**Process of Elaborating the Clinical Management Guidelines**

This revision of the clinical management guidelines has been carried out in an extensive 3-year consultative process over 2006–2008. The process has been coordinated by the Government’s top management in the Ministries in Health, through the offices of the technical directors – Director of Medical Services and Director of Public Health and Sanitation.

Technical coordination of the revisions was structured around the key disciplines of Medicine, Surgery, Obstetrics/Gynaecology, and Paediatrics. A lead technical
specialist from each of these areas was in charge of coordinating the internal consultation process in each of these areas. In addition, pharmacy specialists were involved to review and guide the definition of the medicines and medical products included in the management protocols, ensuring that the management protocols are harmonized with the Essential Medicines List.

Four stakeholder consultations were held over the 3 years, to ensure that the management protocols being defined were in line with the overall policy direction from the programme and Ministry levels, and that their implementation is feasible. These involved management and technical specialists in each of the respective areas, from the public and non public sectors.

**Description of the Revised Clinical Management Guidelines**

In line with the process described above, this new addition of the clinical management guidelines is based on the latest orientation for each condition expected to afflict the population in Kenya. These are both for conditions in existence, plus conditions that are recognized as threats to the population.

Management descriptions are comprehensive, based on the expected capacity at each level of care. Descriptions of each condition are set out in terms of how it presents, physical and laboratory investigations for diagnosis, and the appropriate management, including when referral is to be made.

The referral management includes:
- Identifying signs during client management that indicate referral should be considered.
- Preparing the client for referral.
- Arranging the required logistics for referral at the referring and receiving facility, plus during transport.
- Ensuring the receipt and emergency management of the client who has been referred.
- Managing the referred client by the referring facility when they return.

For relevance, alignment with the service delivery approach, and ease of use, the guidelines are presented in 3 volumes representing the major levels of care:
- Volume I: Clinical Management and Referral Guidelines for Community Care – Corresponding to level 1 of the health care system
- Volume II: Clinical Management and Referral Guidelines for Primary Care – Corresponding to levels 2 and 3 of the health care system
- Volume II: Clinical Management and Referral Guidelines for Hospital Care – Corresponding to levels 4–6 of the health care system
The Process of Physical Referral

Critical Inputs to Have at the Facility to Expedite Referral

<table>
<thead>
<tr>
<th>Input category</th>
<th>Type of input</th>
<th>Description of needs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment</td>
<td>Emergency tray</td>
<td>Description</td>
</tr>
<tr>
<td></td>
<td>Emergency room</td>
<td>Number</td>
</tr>
<tr>
<td></td>
<td>4x4 ambulance</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Motorized bicycle</td>
<td></td>
</tr>
<tr>
<td>Staff</td>
<td></td>
<td>Referral forms</td>
</tr>
<tr>
<td>Supplies</td>
<td></td>
<td>3-month supply</td>
</tr>
</tbody>
</table>

Referral Instruments

1. Preparation of a client for referral
   1.1 Referral for a pregnant mother
   1.2 Referral of a child with a medical problem
   1.3 Referral for a child with a surgical problem
   1.4 Referral for an adolescent, adult, or elderly patient for a medical problem
   1.5 Referral for an adolescent, adult, or elderly patient for a surgical problem

2. Handling of a client during referral
   2.1 Referral for a pregnant mother
   2.2 Referral of a child with a medical problem
   2.3 Referral for a child with a surgical problem
   2.4 Referral for an adolescent, adult, or elderly patient for a medical problem
   2.5 Referral for an adolescent, adult, or elderly patient for a surgical problem

3. Receipt and emergency management of a client who has been referred
   3.1 Referral for a pregnant mother
   3.2 Referral of a child with a medical problem
   3.3 Referral for a child with a surgical problem
   3.4 Referral for an adolescent, adult or elderly patient for a medical problem
   3.5 Referral for an adolescent, adult or elderly patient for a surgical problem

4. Follow up of a client who has been referred back
   4.1 Referral for a pregnant mother
   4.2 Referral of a child with a medical problem
   4.3 Referral for a child with a surgical problem
   4.4 Referral for an adolescent, adult, or elderly patient for a medical problem
   4.5 Referral for an adolescent, adult, or elderly patient for a surgical problem
PART I
Internal Medicine and Related Disciplines

IN THIS SECTION:
1. Acute Injuries, Trauma, and Selected Emergencies 3
2. AIDS and Sexually Transmitted Infections 11
3. Cardiovascular Diseases 25
4. Central Nervous System 31
5. Endocrine System 35
6. Gastrointestinal Conditions 40
7. Infections (Selected) and Related Conditions 48
8. Musculoskeletal Conditions 61
9. Neoplasms 63
10. Haematologic Conditions 63
11. Conditions in Pregnancy 65
12. Lower Respiratory Tract Conditions 68
13. Other Common Conditions 71
14. Skin Diseases 74
15. Genito-Urinary Diseases: Urinary Tract and Renal Conditions 81
16. Mental Disorders 87
1. Acute Injuries, Trauma, and Selected Emergencies

1.1 Anaphylaxis

Occurs as allergic reaction to allergens facilitated by mediators in a sensitized individual. Allergens may be drugs, food, sera, stings, and intravascular contrast media.

Clinical Features
Include pruritus, urticaria, respiratory distress (due to laryngeal oedema, bronchospasm), and hypotension.

Management
- Avoid offending agents.
- Address airway, blood pressure and cardiac status.
- Administer adrenaline 0.2–0.5mg IM repeated every 10–15 minutes for 3 doses.
- Administer aminophylline 6mg/kg IV over 20 minutes if there is wheezing
- Administer antihistamine:
  - Chlorpheniramine 10mg IV slowly. IM/SC then continued 10mg 8 hourly for 24–48 hours (children 0.1mg/kg)
  - 100mg IV is of secondary value but useful to prevent delayed recurrences
- Observe patients with mild to moderate reaction, e.g., urticaria or mild bronchospasm, for at least 6 hours because attacks may recur after full recovery.
- Give nebulized oxygen OR bronchodilators, e.g., salbutamol.

Referral/Admission
Level 2 refer, level 3 admit where possible, in the case of:
- Severe reactions, e.g., hypotension, severe bronchospasm (especially with orally ingested antigens). Severe reactions require intravenous fluid replacement with normal saline and close monitoring, especially BP and urinary output.

1.2 Cardiac Arrest

This is due to asystole, ventricular fibrillation, and cardiovascular collapse in extreme arterial hypotension. There is absence of heart sounds and of carotid and femoral pulses. There may be associated apnoea and cyanosis.

Cessation of circulation requires immediate treatment.

Optimal chances of survival are achieved when cardiopulmonary resuscitation begins within 4 minutes of the arrest, and when advanced cardiac life support
including intubation, intravenous medications, and defibrillation is started within 8
minutes.

1.2.1 MANAGEMENT

Airway
Clear airway immediately. Vomitus and secretions should be aspirated or
removed with fingers or handkerchief.

Ventilation
Inflate lungs with air or oxygen by:
• mouth-to-mouth OR
• mouth-to-nose insufflation OR
• bag and mask devices (ensure thoraco-abdominal motion).

Circulation
Cardiac Massage
Carry out external cardiac massage (compressions) by applying appropriate
pressure over the sternum. One breath should be interposed between every 4 to
5 cardiac compressions.

Defibrillation
Use standard defibrillators delivering 200–360 J and biphasic defibrillators
delivering 150–200 J.

Drugs
Administer intravenous adrenaline 1mg bolus, repeated every 3 to 5 minutes, OR
vassopressin 40 IU by intravenous push, OR amiodarone 300mg in 20–30ml
normal saline.

Admit/Refer
• Undertake thorough investigation and treatment of the underlying cause.
• For level 2, observe closely and refer immediately.
• For level 3, admit for observation then refer to a higher level immediately.

1.3 Shock

This is circulatory insufficiency and becomes irreversible if not promptly
corrected. Shock may be either hypovolaemic shock or septic shock.

1.3.1 HYPOVOLAEMIC SHOCK

This condition is caused by the loss of intravascular fluid volume. Decreased
blood and/or fluid leads to decreased diastolic filling pressure and volumes.

Causes
• Haemorrhage
• Severe burns: Rapid plasma loss from damaged tissues when over 25% of
the body surface area (BSA) is involved
• Endotoxaemia makes matters worse
• Dehydration
• Vomiting and diarrhoea (cholera and enterocolitis)
• Septicaemia
• Intestinal obstruction (mechanical or paralytic ileus)

Clinical Features
The patient becomes cold, clammy, drowsy, and tachypnoeic. There is cold
sweat and restlessness. Blood pressure may become unrecordable. The skin is
pale and cold with collapsed peripheral veins, with a tachycardia. The urinary
output is an indicator of renal blood flow, and will fall significantly. Temperature is
subnormal (less than 35°C).

Investigations
• Hb and PCV
• Urea and electrolytes
• Blood sugar
• Group and cross-match blood
• Blood gas analysis if possible
• Blood cultures

Management
Once shock is suspected, the medical staff taking care of the patient should
initiate appropriate and coordinated emergency management.
• Treat the primary problem, e.g., control haemorrhage, endotoxaemia, etc.
• Secure a large intravenous line; do a cut-down if there is no accessible
  peripheral line.
• Use a central venous pressure line if available.
• Start infusion of isotonic saline (normal saline), or run 2 litres fast in an adult.
• Group and cross-match blood before you give plasma expanders (dextran 70,
  etc.).
• Transfuse in cases of blood loss, or shock due to burns.
• If shock is due to vomiting or diarrhoea, replace continuing fluid loss.
  • Adults: 1 litre 6 hourly Hartmann’s solution or even normal saline.
  • Continue with IV fluids till shock reversed and cause treated.
• Closely monitor vital signs.
• Monitor urinary output.
• Administer broad spectrum bactericidal antibiotics if septic shock is
  suspected.
• Continue maintenance until shock is reversed and the cause is reversed. If
  condition does not improve refer to higher levels.

1.3.2 SEPTIC SHOCK
This condition is due to systemic sepsis and may result in hypotension or
multiple organ failure.
Clinical Features
Initially "warm shock": increased heart rate, diaphoresis, warm skin. Later "cold shock": decreased cardiac output; cool vasoconstricted skin.

Complications
- Pulmonary oedema
- Renal failure
- Disseminated intravascular coagulopathy (DIC)

Investigations and Diagnosis at Level 3
- Hb, WBC, platelets, urea and electrolytes, creatinine
- Blood sugar culture and sensitivity (blood and body fluids)

Management – General
- Resuscitate with normal saline or dextran 70. Large volumes may be required but watch for heart failure.
- Monitor pulse and BP hourly.
- Catheterize and monitor urine output hourly. If less than 20ml/hr after adequate fluid replacement, give frusemide 80mg IV STAT.
- Administer oxygen via face mask
- Determine and treat the cause.

Management – Pharmacological
- Commence resuscitation measures immediately the patient is seen.
- Start empirically on:
  - Benzyl penicillin 4 mega units IV every 6 hours
  - + gentamicin 80mg IV 8 hourly
  - + metronidazole 500mg IV 8 hourly OR 1g suppositories rectally 8 hourly.
  - Start oral metronidazole 400mg 8 hourly as soon as patient is able to swallow.

Use of other antibiotics will depend on source of infection and culture and sensitivity results.

Refer
Make the decision to refer if the case is complicated, especially if urinary output starts falling; serum urea, creatinine, and potassium begin to rise; or there is evidence of any other organ failure despite attention to adequate hydration with brisk electrolyte balancing, and antimicrobial administration. The onset of disseminated intravascular coagulopathy should always be anticipated.

1.4 Stings and Bites

Insect and animal bites can cause serious reactions, even death, and need to be treated with care.

1.4.1 BEE STING
Bee sting causes sharp pain followed by intense itching. Signs subside within a few hours. In hypersensitive individuals, anaphylaxis may occur (see Section 1.1,
anaphylaxis). Other patients may experience delayed reactions usually after 0–14 days. In case of severe reaction to a sting,
• Ensure the stinger is removed; scrape out, do not pull with tweezers as this can release more poison.
• Administer antihistimine if patient is allergic.
• Relieve pain with aspirin or paracetamol, and relieve itching with an appropriate lotion or a paste of bicarbonate of soda and water.

1.4.2 BITE BY A SUSPECTED RABID ANIMAL (RABIES)
Any mammalian animal may carry rabies. Saliva from a rabid animal contains large numbers of the rabies virus, which is inoculated through a bite, any laceration, or a break in the skin. Rabies is almost universally fatal once clinical features appear. It is therefore important to prevent the onset of symptoms. The incubation period is 10 days to 1 year with an average of 1–2 months. This period is adequate to allow immunization.

Management

Immediate Local Care
• Thorough irrigation with copious amounts of saline solution
• Cleansing with a soap solution debridement
• Administration of antibiotic
• Administration of tetanus toxoid
• Infiltrate the wound with rabies immunoglobulin

- Suturing and skin grafting of bite wounds MUST be delayed, and be done at a higher level.

Indication for Anti-Rabies Vaccine
• Bites from wild animals
• Bites from UNPROVOKED domestic animal
• Bites from a sick looking domestic animal, whether immunized or not
• Severe injury (multiple or deep puncture wounds), or any bites on the head, face, neck, hands or fingers
• Laboratory findings of Negri bodies in the brain of the involved animal
• Persons at high risk of exposure.

Immunization
Pre-exposure prophylaxis should be provided to persons at high risk of exposure such as laboratory staff working with rabies virus, animal handlers, and wildlife officers:
• Three full intramuscular doses of 1ml on days 0, 7 and 28 in the deltoid area.

Post exposure prophylaxis of previously vaccinated persons:
• Local treatment should always be given. Post exposure prophylaxis should consist of 2 booster doses either intradermally or intramuscularly on days 0 and 3 if they have received vaccination within the last 3 years. Otherwise, a full course of rabies vaccine.
Post Exposure Prophylaxis

- Passive immunization: Give human rabies immunoglobulin as a dose of 20 IU/kg of body weight infiltrated around the wound and 20 IU/kg given IM in gluteal region. This is followed by a course of rabies vaccine.
- Intradermal schedule: Give 1 dose (0.1ml) at each of 2 sites, either the forearm or the upper arm, on days 0, 3, and 7 and 1 dose at 1 site on days 30 and 90.
- Intramuscular schedule: Administer 1 dose (1ml) on days 0, 3, 7, 14, and 28. All IM injections should be made in the deltoid region or in small children in the anterolateral area of the thigh muscle.

1.5 Poisoning

Can be acute or chronic. Acute poisoning is often life threatening and should always be treated as an emergency even if the immediate threat to life does not appear real. Table 1.1 summarizes the clinical features and treatment of a number of common acute poisonings.

Clinical Monitoring

- Blood pressure measurement
- Urine output (1–2ml/kg/hr); catheterize
- Nasogastric suction in abdominal conditions
- Blood glucose levels
- Hb or PCV daily and correct appropriately

Treat renal complications appropriately. More importantly, treat the cause of the hypovolaemia to pre-empt these complications. Remember to consult in this very dire emergency.

Prevention

- Public education about farm or household chemicals known to cause accidental, para-suicidal, or suicidal poisoning.
- Parent education about NOT storing such substances in soft drink or juice bottles, and keeping them out of reach and sight of children.

<table>
<thead>
<tr>
<th>Substance</th>
<th>Clinical features</th>
<th>Recommended action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kerosene</td>
<td>Nausea, vomiting, cough, pulmonary irritation, difficulty in breathing; headaches, loss of consciousness</td>
<td>Remove contaminated clothing; wash exposed skin with water and soap. Activated charcoal. Maintain airways and respiratory support. DO NOT INDUCE VOMITING or perform gastric lavage.</td>
</tr>
<tr>
<td>Carbon monoxide, e.g., car exhaust, charcoal jiko</td>
<td>Headache, dizziness, confusion, slurred speech, convulsions, coma; symptoms vary with percentage of carboxyhaemoglobin</td>
<td>100% oxygen. Hyperbaric oxygen.</td>
</tr>
</tbody>
</table>

Table 1.1: Clinical features and treatment of common acute poisonings

Continued
### Table 1.1, continued

<table>
<thead>
<tr>
<th>Substance</th>
<th>Clinical features</th>
<th>Recommended action</th>
</tr>
</thead>
</table>
| Corrosives, e.g., acids, alkalis, hydrogen peroxide | Excruciating pain in the mouth, pharynx, epigastric area; dysphagia, vomiting and haematemesis; later develops laryngeal oedema and obstruction, oesophageal perforation; long-term: Stenosis of oesophagus | • Liberal water or milk orally  
• Analgesic injection to relieve pain  
• DO NOT INDUCE VOMITING  
• DO NOT PERFORM LAVAGE |
| Methanol                         | Intoxication, drowsiness, muscle weakness, blurred vision, photophobia, papilloedema blindness, coma, cerebral oedema, cardiorespiratory depression, seizures, DEATH | • IV sodium bicarbonate  
• 10% Ethanol in 5–10% dextrose as oral or IV infusion  
• Loading dose 0.7g/kg over 1 hour  
Maintain at 0.1–0.2g/kg/hour up to ethanol level of 100mg/dl |

### 2. Pharmaceuticals

<table>
<thead>
<tr>
<th>Substance</th>
<th>Clinical features</th>
<th>Recommended action</th>
</tr>
</thead>
</table>
| Paracetamol                      | Nausea, vomiting, altered mental status, abdominal pain, evidence of liver failure (elevated transaminases) | • Gastric lavage within 1 hour  
• Activated charcoal  
• Antidotal therapy with N-acetylcysteine for up to 72 hours |
| Chloroquin                       | Convulsions, cardiac arrhythmia, cardiac arrest | • Gastric lavage  
• IV diazepam for convulsions  
• Refer if in coma |
| Digoxin                          | Arrhythmias, ventricular fibrillation, anorexia, nausea, vomiting, confusion, amblyopia | • Discontinue drug, administer potassium  
• Treat arrhythmias with lidocaine OR phenytoin  
• Antidigoxin FAB fragments |
| Iron tablets, e.g., FeSO₄, vitamins with iron | Vomiting, abdominal pain, palor, cyanosis, diarrhoea, shock | • Emesis  
• Gastric lavage  
• Desferrioxamine 1g IV 15/kg/hour max 80mg in 24 hours |
| Opiates, narcotics (drugs of abuse) | Drowsiness, pinpoint pupils, shallow respiration, spasticity, respiratory failure | • Do not give emetics  
• Gastric lavage  
• Activated charcoal  
• Naloxone 5µg/kg IV to awaken and improve respiration  
• IV fluids to support circulation |
| Isoniazid                        | CNS stimulation, seizures, coma | • Emesis, gastric lavage  
• Diazepam  
• Pyridoxine (1mg for 1mg ingested up to 200mg) |
| Warfarin                         | Generalized bleeding, with intracranial haemorrhage being most serious | • Vitamin K 10mg IV STAT + OD for 5 days  
• Transfuse fresh blood |

*Continued*
### Table 1.1, continued

<table>
<thead>
<tr>
<th>Substance</th>
<th>Clinical features</th>
<th>Recommended action</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3. Pesticides</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Organo-phosphates, e.g.,      | Headaches, weakness, vomiting, cold sweating, hypersalivation, muscular twitching,| • Decontaminate (see above).  
                                | diazinon, dimethoate                                                             | muscular twitching, fasciculations, diarrhoea, tenesmus, convulsions, dyspnoea    |
                                |                                                                                   | with bronchoconstriction, meiosis, bilateral crepitations                         |
                                |                                                                                   | **Rodenticides, e.g., zinc phosphide**                                                |
                                | Severe abdominal pain, nausea, vomiting and diarrhoea; strong garlic smell; severe| Supportive:  
                                |                                                                                   | respiratory distress; myocardial injury                                           |
                                |                                                                                   | • Maintain airways                                                               |
                                |                                                                                   | • Assist ventilation                                                             |
                                |                                                                                   | • Observe for pulmonary oedema                                                     |
                                |                                                                                   | **Rodenticide (anticoagulant based)**                                               |
                                | Generalized bleeding, with intracranial haemorrhage being most serious             | • Vit. K 10mg IV STAT                                                             |
                                |                                                                                   | • Transfuse fresh blood                                                           |
                                |                                                                                   | **Acaricides, e.g., Amitraz**                                                      |
                                | Weakness, difficulty breathing, convulsions, coma                                  | • Remove contaminated clothing; wash exposed skin with water and soap. DO NOT     |
                                |                                                                                   | INDUCE VOMITING.                                                               |
                                |                                                                                   | • IV sodium bicarbonate                                                           |
                                |                                                                                   | **Herbicides, e.g., Paraquat**                                                    |
                                | Oral/pharyngeal inflammation, later multi-organ failure within hours or days       | • Lethal dose as low as 10ml                                                       |
                                | depending on dose. Later interstitial pulmonary oedema and fibrosis. Multi-organ   | • Gastric lavage with 50–100g activated charcoal 4 hourly until patient improves  |
                                | failure or pulmonary oedema invariably leads to death!                            |                                                                                   |
                                |                                                                                   | **Organochlorines, e.g., DDT, aldrin, dieldrin**                                   |
                                | Excitement, tremors, convulsions with respiratory failure due to convulsions      | • IV diazepam for convulsions                                                   |
                                |                                                                                   | • Gastric lavage if within 1 hour                                                |
                                |                                                                                   | • Survivors beyond 48 hours almost invariably recover                            |
                                |                                                                                   | **4. Others**                                                                      |
                                | Thirst, abdominal pain, vomiting, diarrhoea, encephalopathy following ingestion of | • Eliminate source of poisoning                                                  |
                                | suspicious substance                                                             | Chelation with Dimercaprol (BAL) Inj 4mg/kg and combined with calcium sodium      |
                                |                                                                                   | motility                                                                          |
                                |                                                                                   | (oral succimer) Treatment over long periods (months to years)                     |
                                |                                                                                   | **Mercury**                                                                       |
                                | Acute: gastroenteritis, vomiting, nephritis, anuria, delayed GI motility           | • Gastric lavage                                                                  |
                                |                                                                                   | • Activated charcoal                                                              |
                                |                                                                                   | • Penicillamine                                                                   |
                                |                                                                                   | • Haemodialysis for renal failure                                                 |
                                |                                                                                   | • Look out for GIT perforation                                                    |
                                |                                                                                   | • Lungs: supportive care                                                           |
                                |                                                                                   | **Others**                                                                       |
                                |                                                                                   |                                                                                   |
                                |                                                                                   |                                                                                   |
2. AIDS and Sexually Transmitted Infections

2.1 HIV/AIDS

HIV infection is caused by one of two related retroviruses, HIV-1 and HIV-2, resulting in a wide range of clinical manifestations. Transmission requires contact with body fluids containing infected cells or plasma. HIV is present in blood, semen, vaginal secretions, breast milk, saliva, CSF, and wound exudates (see Table 2.1). The virus progressively destroys the body's immune functions, leading to opportunistic infections and tumours. It is these opportunistic infections and tumours that give the manifestations of this disease.

<table>
<thead>
<tr>
<th>Mode of transmission</th>
<th>Preventive measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sexual intercourse: vaginal intercourse (majority of cases), anal or oral sex</td>
<td>Practice abstinence Avoid risky sex practices like casual and multiple partners Use condoms Treat STIs promptly and effectively (STIs increase risk of HIV transmission)</td>
</tr>
<tr>
<td>Mother to baby: In utero, during childbirth, breastfeeding (30–40% transmission rate)</td>
<td>Advise counselling and testing Give ARV (nevirapine) to both mother and infant</td>
</tr>
<tr>
<td>Blood transfusion</td>
<td>Ensure that all blood is screened before transfusion Arrange autologous transfusions where possible</td>
</tr>
<tr>
<td>Contaminated instruments: Needles, skin piercing instruments</td>
<td>Ensure that sterile needles are used at all times Ensure that instruments for ear piercing, circumcision, tattooing, etc., are sterile. For needle drug addicts, do not share needles</td>
</tr>
</tbody>
</table>

2.1.1 CLINICAL MANIFESTATIONS

These vary from asymptomatic carrier states to severe debilitating and fatal disorders related to defective cell-mediated immunity. AIDS (acquired immune deficiency syndrome) is the end stage of the spectrum of disease and is characterized by life threatening opportunistic infections and neoplasms.

The manifestations of HIV infection are many and present in all disciplines of medicine. Some of these are skin, respiratory system, GIT, and nervous system.

SKIN

Dermatological manifestations are probably the commonest. The diseases may be infective (bacterial, fungal, viral), reactive (eczema, hypersensitivities), or neoplastic. The most common ones are:
Clinical Guidelines

- Herpes zoster (shingles)
- Seborrhoeic dermatitis
- Molluscum contagiosum
- HIV-associated pruritis
- Chronic Herpes simplex or HSV ulcers
- Psoriasis
- Kaposi’s sarcoma

Management
- For treatment of dermatological conditions, refer to specific areas in these guidelines.
- For Kaposi’s sarcoma, refer to treatment guidelines in level 4 and above.
- For chronic Herpes simplex or HSV ulcers, use/advise antiseptic soaps or saline baths and topical acyclovir cream or systemic acyclovir tabs, 800mg PO 5 hourly for 10 days. Administer antibiotics for secondary bacterial infections.

GASTROINTESTINAL TRACT

Candidiasis
Caused by yeast or fungus, Candida albicans is the commonest agent. It is usually a normal inhabitant of mucosal surfaces but overgrows with increasing immune deficiency.

Presentation
Appears as white, milk-like, removable plaques on the oral mucosa – oral thrush – white coating on hard or soft palate and tongue; causes dysphagia if oesophagus involved; occurs in late disease.

Management
- Nystatin 100,000 units 4 times daily after food for 7 days
- Ketoconazole 200mg or 400mg OD for 7 days.
- Diarrhoea of more than 1 month’s duration is often caused by shigella, salmonella, or amoeba; can also be caused by the HIV itself (slim or wasting disease).

RESPIRATORY SYSTEM
Pulmonary tuberculosis (PTB) cases have increased since the advent of the HIV/AIDS epidemic. The risk of reactions to anti-TB therapy is higher in HIV positive patients, thus thiacetazone (in thiazina) is to be avoided (see Section 7.3.3, TB). Pneumocystis carinii pneumonia is less frequent than in the western world.

Neurological Features
- Headaches (progressively worsening)
- Mental deterioration., seizures
- Meningitis including cryptococcal meningitis
- CMV encephalitis
- Sensory disturbances
General Features
- Fever, constant or recurrent
- Unexplained weight loss of >10% of body weight
- Chronic malaise or fatigue
- Enlarged lymph nodes at 2 or more extra-inguinal sites for more than 3 months

Investigations
- Rapid tests: 2 parallel tests with 2 different kits. A third kit can be used as tie breaker. Alternatively, use a double ELISA.
- Routine screening for HIV: People should be encouraged through VCTs and DCT/ PITC to learn their serostatus – and what to do once they know.

2.1.2 HIV TESTING AND PATIENT EDUCATION
- Pre-test and post-test counselling: HIV test should not be done without first counselling the patient, unless under emergency situations.
- Everyone should know:
  - How HIV is transmitted
  - How one can avoid getting infected
  - That HIV CANNOT be transmitted by shaking hands or touching people with AIDS; sneezing or coughing; eating food, drinking water or sharing utensils; from infected insect bites; from using contaminated toilets or latrines.

HIV-negative patients/clients need to know:
- That one can be in the window period (i.e., time between infection with HIV and development of detectable antibodies).
- That a negative result today does not mean that a person cannot acquire HIV if exposed.

HIV-positive patients need to know the following:
- They can transmit the infection to their sexual partner(s), and to their unborn baby in utero (if the patient is pregnant).
- Their health can deteriorate faster if they acquire other infections, including STIs.
- Their health can deteriorate faster if they take alcohol excessively, smoke, have poor nutrition, and have multiple sexual partners.
- Condoms, as generally used, are roughly 70–80% effective in preventing acquisition and transmission of HIV and other STIs. Proper education on condom use can increase the effectiveness of the condom to 90%.
- Pregnancy hastens the progression of disease and up to 40% of babies born to HIV infected mothers will acquire the infection. Contraceptive advice should be given. Intrauterine contraceptive devices (IUCD – the Coil) are known to predispose to pelvic inflammatory disease (PID) and hence are discouraged.
2.1.3 STAGING OF HIV/AIDS
The World Health Organization (WHO) defines 4 stages or phases in the progression of HIV and AIDS, as shown in Table 2.2.

2.1.4 MANAGEMENT OF HIV/AIDS

General Management
- Eat a well-balanced diet, get good rest, and take regular exercise.
- Minimize alcohol consumption and smoking.
- Pay prompt attention to any health problem.
- Seek social support through counselling, support groups of other HIV patients/clients.

Pharmacological Management of HIV/AIDS
The main aim of anti-retroviral drug treatment (ARV/ART) is to suppress the viral load, achieve reconstruction of the immune system, and hence improve quality of life. Combination therapy using anti-retroviral drugs started from levels 3 and above, can be continued at lower levels, but in consultations with higher levels. Refer to Table 2.3 for standardized ARV regimes for adults and adolescents.

Principles of Treatment
- Ensure patient compliance through counselling and follow up.
- Use combination therapy of 3–4 drugs.
- Advise on nutritional support as an important component of management.
- Advise on ART – so far no drug or herb has been shown to eliminate the virus from the body. Some drugs have been shown to slow the multiplication of the virus and thus improve quality of life and delay the progression of the disease.
- Refer for anti-retroviral treatment to higher levels.

Treatment in Tuberculosis Patients
- Avoid ARVs in intensive phase: D4T + 3TC and EFV (800mg per day)
- NB: Protease inhibitors are contraindicated when rifampicin is used.

<table>
<thead>
<tr>
<th>Table 2.2: WHO classification of HIV and AIDS clinical stages (adults and adolescents)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Clinical stage I – Asymptomatic</strong></td>
</tr>
<tr>
<td>o Persistent generalized lymphadenopathy</td>
</tr>
<tr>
<td><strong>Clinical stage II – Early (mild disease)</strong></td>
</tr>
<tr>
<td>o Weight loss &lt;10% body weight</td>
</tr>
<tr>
<td>o Minor skin infections</td>
</tr>
<tr>
<td>o Herpes zoster</td>
</tr>
<tr>
<td>o Recurrent upper respiratory infections</td>
</tr>
<tr>
<td><strong>Clinical stage III – Intermediate (moderate)</strong></td>
</tr>
<tr>
<td>o Weight loss &gt;10% body weight, chronic diarrhoea, fever, oral candida, TB, severe bacterial infections</td>
</tr>
<tr>
<td><strong>Clinical stage IV – Late (severe disease)</strong></td>
</tr>
<tr>
<td>o HIV wasting syndrome, CMV, Pneumocystis carinii pneumonia, toxoplasmosis</td>
</tr>
<tr>
<td>o Kaposi’s sarcoma, HIV encephalopathy</td>
</tr>
</tbody>
</table>
2.1.5 PREVENTION OF MOTHER TO CHILD TRANSMISSION
Refer to Part IV, Obstetrics and Gynaecology, which deals with prevention of mother to child transmission of HIV/AIDS.

2.1.6 POST-EXPOSURE PROPHYLAXIS
- Low risk: AZT/3TC within 72 hours for 28 days.
- High risk: AZT/3TC/indinavir within 72 hours for 28 days.

Refer to higher level for appropriate post-exposure prophylaxis.

2.1.7 OPPORTUNISTIC INFECTIONS AND OTHER MANIFESTATIONS
Appropriate management of the specific infection is covered in the relevant chapter and should be looked up.

Most opportunistic infections in HIV/AIDS are treatable. Patients respond well and are able to resume work.

2.2 Sexually Transmitted Infections (STIs)
These are communicable diseases and usually transmitted through sexual contact. Other forms of transmission of these diseases include vertical transmission from mother to child in utero, during birth or soon after birth and blood transfusion, or via contaminated needles, syringes, specula, gloves, and skin piercing and cutting instruments. Clinical manifestations of these conditions depend on the offending organism and are numerous.

Accurate diagnosis and effective treatment of STI are essential and cost-effective HIV/AIDS prevention strategies.

Management
- Give full course of appropriate drug therapy – see Table 2.4 and Figure 2.1 on urethritis.
- Follow up the patient.
- Provide health education and counselling.
- Manage the sexual contacts, including contact tracing, diagnosis, treatment, health education and counselling.
- Refer to higher level for complications.

Table 2.3: ARV standardized regimes in Kenya (adults and adolescents)

<table>
<thead>
<tr>
<th>1st line:</th>
<th>D4T or AZT + 3TC + NVP or EFV</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>For pregnant women and those likely to get pregnant give D4T + 3TC + NVP</td>
</tr>
<tr>
<td>2nd line:</td>
<td>ddi + ABC + lopinavir with ritonavir (kaletra) (needs refrigeration), alternatively – nelfinavir OR TDF + ABC + Lopinavir/ritonavir (kaletra)</td>
</tr>
</tbody>
</table>
Each and every treatment of STI must include the 4 C's.

**Patient Education**
- Avoid multiple or anonymous partners, prostitutes or any other person with multiple sex partners.
- Use condoms correctly, e.g., avoid oil-based lubricants.
- Avoid alcohol or drug abuse, as these may lead to irresponsible sexual behaviour.

**Clinical Features and Treatment Summary**
For more detailed descriptions see clinical features of specific conditions below.

### 2.2.1 GONORRHOEA AND URETHRAL DISCHARGE

**Clinical Features**
Discharge in anterior urethra with dysuria or urethra discomfort. Caused by gonococcal infection in 90% of cases. The other 10% are non-gonococcal infections (NGIs) mainly due to Chlamydia trachomatis and to less a extent trichomonas or Herpes simplex. In 5–10%, there is a mixture of gonorrhoea and NGIs. In addition, infection of the glans (balanitis) or prepuce (posthitis) by Candida albicans can lead to discharge. Otherwise:
- Gonorrhoea: Abundant pus-like discharge, incubation period 3–10 days.
- NGI: Mucoid or serous discharge, scanty, usually seen in morning, incubation 10–14 days.

**Investigations**
- Diagnosis in male is usually clinical, but if confirmation is required a urethral smear is done.
- Gram stain showing pus cells and intracellular Gram-negative diplococci is 95% accurate.

**Management**
Refer to Table 2.4 and Figure 2.1.

---

**Table 2.4: Management – Gonorrhoea and other urethritis (levels 2–4)**

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>First line treatment</th>
<th>Second line treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gonorrhoea – Adults</td>
<td>Amoxicillin 3g orally + probenecid 1g orally OR</td>
<td>Kanamycin 2g IM STAT OR</td>
</tr>
<tr>
<td></td>
<td>Amoxicillin-clavulanate 625mg orally + probenecid 1g orally OR</td>
<td>Cefuroxime 1g orally OR</td>
</tr>
<tr>
<td></td>
<td>Ciprofloxacin 500mg orally OR</td>
<td>Azithromycin 2g orally</td>
</tr>
<tr>
<td></td>
<td>Ofloxacin 400mg orally OR</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ceftriaxone 250mg IM STAT</td>
<td></td>
</tr>
<tr>
<td>Pregnancy</td>
<td>As above</td>
<td>As above</td>
</tr>
<tr>
<td>Non-gonococcal &amp; chlamydia urethritis – Adults</td>
<td>Doxycycline 200mg STAT followed by 100mg daily x 7 days</td>
<td>Erythromycin 500mg orally QDS x 7 days</td>
</tr>
<tr>
<td>Pregnancy</td>
<td>Erythromycin 500mg orally QDS x 7 days</td>
<td></td>
</tr>
</tbody>
</table>
Urethritis, usually caused by gonorrhoea and chlamydia

**Figure 2.1: Decision flow chart for urethral discharge**

- **EXAMINE FOR DISCHARGE**
  - **DISCHARGE PRESENT**
    - **URETHRITIS Rx & 4C’s**
      - IF DISCHARGE PERSISTS AFTER 7 DAYS
        - Alternative URETHRITIS Rx & 4C’s
          - IF DISCHARGE PERSISTS AFTER 7 DAYS
            - REFER FOR INVESTIGATIONS
  - **DISCHARGE ABSENT**
    - SYMPTOMATIC Rx

**URETHRITIS Rx**
- Norfloxacin 800mg STAT
- Doxycycline 100mg BD x 7 days

**Alternative Rx**
- IM Spectinomycin 2g STAT
- Doxycycline 100mg BD x 7 days

---

**2.2.2 GENITAL DISCHARGE IN THE FEMALE**

Causes of vaginal discharge include Candida vulvovaginitis (monilia or thrush), trichomonas vaginitis, and bacterial vaginosis. Endocervical discharge can be caused by gonorrhoea, Chlamydia trachomatis, and Mycoplasma hominis.

**CANDIDA VULVOVAGINITIS (MONILIA OR THRUSH)**

Common infection of the vulva and vagina caused by the fungus Candida albicans. It is not always transmitted by sexual intercourse. Predisposing factors are diabetes mellitus, systemic antibiotics, pregnancy, hormonal oral or injectable contraceptives, and decreased host immunity.
Clinical Guidelines

Clinical Features
Vaginal discharge is creamy and thick (curd like), associated with itching, burning, and soreness during micturition and sexual intercourse. There is erythema, excoriation, and fissures. Diagnosis is mainly clinical.

Investigations
Wet mount is prepared by putting a drop of the discharge onto a glass slide and adding a drop of saline or 10% potassium hydroxide (KOH) and covering with a cover slip. Examine under low-power microscope. Candida albicans is identified by pseudohyphae and spores.

Management
- Apply gentian violet 1%, once daily for 3 days (use cotton wool balls or speculum).
  OR
- Insert Nystatin pessaries high in the vagina 1 BD for 7 days.
- Apply Nystatin cream to vulva BD for 14 days.
  OR
- Insert Clotrimazole pessaries 1 OD for 6 days.
- Also treat partner with application of cream.

Prevention
People who get recurrent infection should be given concurrent prophylactic treatment whenever broad-spectrum antibiotics are prescribed.

TRICHOMONAS VAGINITIS
“Trich” is a common cause of vaginal discharge. Caused by Trichomonas vaginalis, a flagellated protozoan, it is mainly sexually transmitted.

Clinical Features
Symptoms depend on the severity of the infection and include a frothy, greenish-yellow, foul-smelling discharge. Other features are vaginal soreness, dyspareunia, and post-coital spotting. Infection usually involves the vulva, vagina, and cervix, which may appear reddish and swollen. Diagnosis is mainly clinical.

Investigations
- Wet mount preparation demonstrates flagellated protozoa.
- Trichomonas may also be noted on urine microscopy or pap smear.

Management
- Metronidazole 200mg–400mg TDS for 7 days. The same dose for the male partner. Alcohol consumption to be avoided during treatment with metronidazole. Drug to be avoided during first trimester of pregnancy. In pregnancy use tinidazole pessaries.
- Tinidazole 2g STAT. The same dose for the male partner.
**BACTERIAL VAGINOSIS**
This is usually associated with Gardnerella vaginalis.

**Clinical Features**
Vaginal discharge greyish-white in nature with a characteristic fishy odour that increases in intensity after sexual intercourse. Not usually associated with soreness, irritation, pruritus, burning sensation, or dyspareunia. Diagnosis is usually clinical.

**Investigations**
- Wet mount preparation, which will show vaginal epithelial cells with adherent clusters of Gram-negative bacilli or coccobacilli (CLUE CELLS).
- Whiff-test in which a drop of discharge is mixed with a drop of KOH, which gives a characteristic fishy odour.

**Management**
- Treat both patient and male partner.
- Metronidazole 400mg TDS for 7 days (avoid alcohol).

**CERVICITIS**
About one-third of all women presenting with vaginal discharge have cervicitis. The commonest causes of endocervicitis are gonorrhoea, chlamydia, trichomonas, and Herpes simplex virus.

**Clinical Features**
Cloudy-yellow vaginal discharge that is non-irritating, non-odorous, and mucoid. There may also be inter-menstrual or post-coital spotting or both. There may also be dyspareunia or pelvic discomfort or both. Cervical mucosa appears inflamed with focal haemorrhages. Cervix is friable and bleeds easily on touch. Vesicular herpetic lesions will be found on vulva, vagina, and cervix. Abdominal and bimanual pelvic examination should be done to rule out pelvic inflammatory disease.

**Investigations**
- Wet mount preparation: Look for pus cells, trichomonas and yeasts.
- Gram-stain of the discharge of endocervical swab (Neisseria gonorrhoea shows Gram-negative intracellular diplococci).
- Culture for gonorrhoea or chlamydia if available.
- Pap smear after treatment.

**Management**
See Figure 2.2, Vaginal discharge flow chart.
Give norfloxacin 800mg STAT then 400mg BD for 7 days.
- Doxycycline 100mg BD
- Metronidazole 2g STAT
**DYSURIA IN THE FEMALE**
Can result from urinary tract infection, vaginitis, or cervicitis. See relevant sections of manual for clinical features, investigations and management. Gonorrhoea should be considered for patients at high risk for STIs.

**LOWER ABDOMINAL PAIN IN THE FEMALE**

**Clinical Features**
Lower abdominal pain is often due to pelvic inflammatory disease (PID – see...

---

**Figure 2.2: Flow chart for vaginal discharge**

| Vaginitis, usually caused by candida and trichomonous | Cervicitis usually caused by gonorrhea and chlamydia |

ENQUIRE ABOUT LOWER ABDOMINAL PAIN
EXAMINE FOR LOWER ABDOMINAL TENDERNESS

NO LOWER ABDOMINAL PAIN OR TENDERNESS

VAGINITIS Rx & 4C’s

IF NO IMPROVEMENT AFTER 7 DAYS

CERVICITIS Rx & 4C’s

IF DISCHARGE PERSISTS AFTER 7 DAYS

REFER FOR INVESTIGATIONS

<table>
<thead>
<tr>
<th>VAGINITIS Rx</th>
<th>CERVICITIS Rx</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clotrimazole 1 pessary intra-vaginally daily for 6 days and Metronidazole 2g STAT</td>
<td>Norfloxacin 800mg STAT and Doxycycline 100mg BD for 7 days</td>
</tr>
</tbody>
</table>

If Pregnant

Clotrimazole 1 pessary intra-vaginally daily for 6 days

If Pregnant

IM spectinomycin 2g STAT and Erythromycin 500mg QID for 7 days
Chapter 54). It must be differentiated from urinary tract infection, ectopic pregnancy, threatened abortion, appendicitis, and other causes of acute abdomen.

- Abdominal and pelvic examinations must be done on all cases of lower abdominal pain in women.

Management
- See Figure 2.3 and relevant sections of manual.

---

**Figure 2.3: Decision chart for lower abdominal pain in women**

<table>
<thead>
<tr>
<th>PID, caused by gonorrhoea, chlamydia and mixed anaerobes Surgical and obstetrical conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>DO ABDOMINAL AND BIMANUAL EXAMINATIONS</td>
</tr>
<tr>
<td>ABDOMINAL TENDERNESS DUE TO SURGICAL OR GYNAECOLOGICAL CAUSES</td>
</tr>
<tr>
<td>REFER FOR SURGICAL OR GYNAECOLOGICAL ASSESSMENT</td>
</tr>
<tr>
<td>ABDOMINAL TENDERNESS OR TENDERNESS ON MOVING THE CERVIX</td>
</tr>
<tr>
<td>PID Rx and 4C’s</td>
</tr>
<tr>
<td>NO TENDERNESS ABDOMINAL EXAMINATION</td>
</tr>
<tr>
<td>SYMPTOMATIC Rx OR VAGINITIS Rx IF THERE IS VAGINAL DISCHARGE</td>
</tr>
<tr>
<td>IF NO IMPROVEMENT AFTER 7 DAYS</td>
</tr>
<tr>
<td>REFER FOR INVESTIGATIONS</td>
</tr>
<tr>
<td>START FLOWCHART AGAIN AFTER REPEATING ABDOMINAL EXAMINATION</td>
</tr>
</tbody>
</table>

*Surgical or gynaecological causes are determined by rebound tenderness and/or guarding; last menstrual period overdue; recent abortion or delivery; menorrhagia or metrorrhagia*

**PELVIC INFLAMMATORY DISEASE (PID) Rx**

- Norfloxacin 800mg STAT
- Doxycycline 100mg BD for 7 days
- Metronidazole 400mg BD for 10 days

*If Pregnant*

Refer for obstetric evaluation if PID is suspected.
GENITAL ULCER DISEASE

Clinical Features
These are summarized in Table 2.5 for the more common ulcers.

Management
See flow chart in Figure 2.4 and management summary in Table 2.6.

BUBOES OR SWOLLEN INGUINAL GLANDS
Buboes are enlarged lymph nodes in the groin. They may be associated with an ulcer in the genital area or on the lower limbs. Refer to genital ulcer disease.

Clinical Features
• Lymphogranuloma venerium: Several nodes matted together on one or both sides, usually without suppuration.
• Chancroid tender fluctuant bubo that suppurates, leaving an undermined inguinal ulcer should be aspirated before suppuration.

Investigations
Serology for syphilis should always be performed.

GENITAL WARTS

Clinical Features
• Condyloma acuminatum (Human papilloma virus): Cauliflower-like warts. May be single or multiple on the vulva, vagina, perineal area, penis, urethra, and sub-prepucial. Vaginal discharge, pain, bleeding on coitus or touch may occur.

<table>
<thead>
<tr>
<th>Clinical features</th>
<th>Probable diagnosis &amp; cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single, painless, relatively clean ulcers without pus Incubation period up to 3 weeks Painless lymphadenopathy</td>
<td>Primary syphilis chancre T. pallidum</td>
</tr>
<tr>
<td>Multiple, soft, deep, tender ulcers with profuse pus Incubation period 1 week Very painful lymphadenopathy, which can be fluctuant Disfiguration of the genitalia Secondary infection</td>
<td>Chancroid H. ducreyi</td>
</tr>
<tr>
<td>Multiple shallow and tender ulcers May start as vesicles grouped together. Itchy Incubation period 1 week Tender lymphadenopathy, may be recurrent, rarely suppurative</td>
<td>Herpes genitalis H. simplex</td>
</tr>
<tr>
<td>Single, small and transient ulcers Incubation period 1–2 weeks Lymphadenopathy; several glands may be matted together Fistula and stricture formation</td>
<td>Lymphogranuloma venerium (LGV) C. trachomatis</td>
</tr>
<tr>
<td>Large, beefy ulcers Variable incubation period None or rarely lymphadenopathy</td>
<td>Granuloma inguinale Calymmatobacterium granulomatis (Donovan bacilli)</td>
</tr>
</tbody>
</table>
Figure 2.4: Flow chart for genital ulcer disease (GUD)

GUD, usually caused by chancroid, syphilis and Herpes genitalis

EXAMINE FOR ULCER

MULTIPLE VESICLES GROUPED TOGETHER WITH A HISTORY OF RECURRENTE (HERPES GENITALIS) → GUD Rx AND 4C's

SYMPTOMATIC Rx & 4C's → IF DISCHARGE PERSISTS AFTER 7 DAYS → FOLLOW OTHER GUD COLUMN

OTHER GUD

GUD Rx AND 4C's → IF DISCHARGE PERSISTS AFTER 7 DAYS → ALTERNATE GUD Rx AND 4C's

FOLLOW OTHER GUD COLUMN

GUD heals slowly; improvement is defined as a sign of healing and reduction of pain. People with HIV infections will be slower in responding to GUD treatment.

GENITAL ULCEAR DISEASE (GUD) Rx

Erythromycin 500mg TID for 7 days and Benzathine penicillin 24 MU IM STAT If penicillin allergy, use erythromycin 500mg QID for 14 days

Alternate Rx

Ceftriaxone 250mg IM
• Molluscum contagiosum (Pox group virus): Umbilicated multiple papules with whitish, cheesy material expressed when squeezed. Secondary infection and spread to other sites may occur.

• Secondary syphilis should be ruled out when evaluating genital venereal warts

Management
• Carefully apply podophyllin 25% in tincture of benzoin to each wart, protecting the normal surrounding skin with petroleum jelly.
• Wash off the podophyllin thoroughly 1–4 hours later. Repeat 1–2 times weekly.
• If there is no regression after 4 applications, refer to higher level.

<table>
<thead>
<tr>
<th>Table 2.6: Treatment of selected STIs, including GUD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnosis</td>
</tr>
<tr>
<td>----------</td>
</tr>
<tr>
<td>Chancroid Adults</td>
</tr>
<tr>
<td>Pregnancy/allergy</td>
</tr>
<tr>
<td>Early syphilis</td>
</tr>
<tr>
<td>Late syphilis (more than 1 year)</td>
</tr>
<tr>
<td>In pregnancy</td>
</tr>
<tr>
<td>Congenital syphilis</td>
</tr>
<tr>
<td>Herpes genitalis</td>
</tr>
<tr>
<td>Lymphogranuloma venereum</td>
</tr>
<tr>
<td>Granuloma inguinale</td>
</tr>
</tbody>
</table>
3. Cardiovascular Diseases

3.1 Introduction

These are the diseases and disorders of the heart and blood vessels. They include rheumatic heart disease, coronary heart diseases, hypertension, and deep venous thrombosis (DVT), among others.

Heart failure occurs when the heart is unable to supply sufficient output for the metabolic needs of the tissues, in face of adequate venous return. Common causes of heart failure are hypertension, valvular heart disease, ischaemic heart disease, anaemia, and pulmonary thromboembolism.

Clinical Features
Tachycardia, gallop rhythm, raised JVP, dependent oedema, tender hepatomegaly, orthopnoea, fatigue, exercise intolerance, and basal crepitations.

Common precipitating factors of heart failure in cardiac patients must be considered in treatment of acutely ill patients: poor compliance with drug therapy; increased metabolic demands, e.g., pregnancy, anaemia; progression of underlying disease, e.g., recurrent myocardial infarction, uncontrolled hypertension; cardiac arrhythmias; pulmonary embolism; infective endocarditis; infection, e.g., pneumonia.

Investigations
Refer for investigations.

Management – General
- Restrict physical activities.
- Order bed rest in cardiac position.
- Administer oxygen by mask for cyanosed patients.
- Restrict salt intake, control fluid intake, and measure urine output.
- Measurement weight daily.
- Refer to higher level.

3.2 Acute Myocardial Infarction (AMI)

AMI is caused by the complete or partial occlusion of a coronary artery and requires prompt hospitalization and extensive care management.

Clinical Features
Chest pain: Severe, retrosternal/epigastric crushing or burning or discomfort. Discomfort radiates to neck and down the inner part of the left arm lasting at least 20 minutes to 7 hours. Occurs at rest and is associated with pallor, sweating, arrhythmias, pulmonary oedema, and hypotension. May also occur with physical activity.
Clinical Guidelines

Management
- Support and maintain vital functions.
- Carry out cardio-pulmonary resuscitation (CPR).
- Administer 100% oxygen.
- Refer immediately to higher level.

3.3 Acute Rheumatic Fever

This is an acute, systemic connective tissue disease related to an immune reaction to untreated group A beta haemolytic streptococcus infection of the upper respiratory tract. The initial attack of acute rheumatic fever occurs in most cases in children aged 3–15 years. The major complication of this disease is the cardiac involvement, which can eventually lead to severe heart valve damage. This is the commonest cause of heart disease in Kenyan children.

Clinical Features
- Major criteria: Migrating polyarthritis, carditis (signs of cardiac failure, persistent tachycardia, pericardial rub, or heart murmurs), Sydenham’s chorea, erythema marginatum, and subcutaneous nodules.
- Minor criteria: Past history of rheumatic fever, raised ESR, fever, arthralgia.
- Diagnosis: 2 major and 1 minor or 1 major and 2 minor manifestations.

Investigations
- Refer to higher level for further investigation.

Management
- Refer to higher level for management.

Prevention
- Early treatment of streptococcal sore throat with Benzathine penicillin 1.2 mega units STAT dose OR phenoxyethylpenicillin 125–250mg TDS for 10 days.

Prophylaxis
- Previous acute rheumatic fever without carditis: Give benzathine penicillin 1.2 mega units monthly for 5 years or up to the age of 18 years whichever is longer OR erythromycin 125–250mg BD for 5 years for those sensitive to penicillin.
- Previous acute rheumatic fever with carditis: Benzathine penicillin 1.2 mega units OR erythromycin 125–250mg BD for those sensitive to penicillin for life.
- Patient education: Emphasize need for follow up for prophylaxis.

3.4 Rheumatic Valvular Heart Disease

This is a complication of rheumatic fever. The main site of pathology is on the valves. There may be mitral stenosis, mixed mitral valve disease (both stenosis and incompetence), mitral incompetence, and/or aortic stenosis and
incompetence. Dyspnoea, palpitations, or heart murmurs may occur depending on the valvular lesion. Patients may be asymptomatic and may be discovered to have the lesion during routine examination or during periods of increased demand such as pregnancy or anaemia. Patients may present also with congestive cardiac failure.

Investigations
Refer to higher level.

Management
Refer.

Prophylaxis
- **Rheumatic fever**: All patients with a history of rheumatic fever should be given prophylaxis for recurrences, for life, with: Benzathine penicillin 1.2 mega units IM monthly **OR** amoxicillin 125–250mg PO BD **OR** erythromycin 125–250mg PO BD.

- **Infective endocarditis prophylaxis**: In addition to rheumatic fever prophylaxis the following are required:
  - Dental procedures: Amoxicillin 3.0g PO 2 hours before procedure and 1.5g PO 6 hours after the initial dose.
  - If penicillin allergy: Erythromycin 1g PO 2 hrs before procedure then half the dose 6 hours after the initial dose.
  - Lower gastrointestinal and genitourinary procedures: Amoxicillin 2g IM 30 minutes before procedure and 6 hrs after the initial dose + gentamicin 1.5mg/kg IM 30 minutes before procedure and 8 hrs after the initial dose.

Patient Education
- Emphasize need for follow up.
- Advise female patients on contraception.

Complications
- Congestive cardiac failure
- Pulmonary oedema
- Bacterial endocarditis

### 3.5 Hypertension

Hypertension is diagnosed when blood pressure (BP) reading is greater than 140/90mmHg on 3 separate readings.

Clinical Features
Majority of patients are asymptomatic. Occasionally patients may present with early morning occipital headaches, dizziness or complication of hypertension, e.g., renal failure, stroke, and heart failure. Majority of patients have essential hypertension. Table 3.1 summarizes the degrees of hypertension.
Table 3.1: Classification of hypertension

<table>
<thead>
<tr>
<th>Systolic (mmHg)</th>
<th>Diastolic (mmHg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optimal</td>
<td>&lt;120</td>
</tr>
<tr>
<td>Normal</td>
<td>&lt;130</td>
</tr>
<tr>
<td>High-normal</td>
<td>130–139</td>
</tr>
<tr>
<td>Stage 1 hypertension (mild)</td>
<td>140–159</td>
</tr>
<tr>
<td>Stage 2 hypertension (moderate)</td>
<td>160–179</td>
</tr>
<tr>
<td>Stage 3 hypertension (severe)</td>
<td>≥ 180</td>
</tr>
</tbody>
</table>

Note: Hypertension classification is based on the average of > 2 readings taken at each of two or more visits after initial screenings.

Investigations
Refer to higher level.

Management – General
Aim to reduce diastolic BP to 90mmHg; individualize treatment depending on age. Not all patients with hypertension need drug treatment. Non-pharmacological management includes:
- Weight reduction in obese patients
- Low salt diet
- Advising patients to give up smoking
- Regular dynamic exercises
- Low fat diet

Management – Pharmacological

Summary of plan for care in hypertension:
The choice of combination is no longer important. Presently, one combines multiple drugs from different classes starting at very low doses and where indicated, considering lipid lowering treatment in combination with antihypertensives to achieve a blood pressure of below 140/90mmHg. Refer to Table 3.2 for choices and dosages of drugs.

Table 3.2: Drug regimens for hypertension

<table>
<thead>
<tr>
<th>Drugs</th>
<th>Daily dosages</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Diuretics</strong></td>
<td></td>
</tr>
<tr>
<td>Thiiazide diuretics</td>
<td></td>
</tr>
<tr>
<td>– Hydrochlorothiazide (HCTZ)</td>
<td>6.25–25mg</td>
</tr>
<tr>
<td>– Chlorthalidone</td>
<td>6.25–25mg</td>
</tr>
<tr>
<td>Idapamide</td>
<td>1.25–5mg</td>
</tr>
<tr>
<td>Metalazone</td>
<td>2.5–5mg</td>
</tr>
<tr>
<td><strong>Loop diuretics</strong></td>
<td></td>
</tr>
<tr>
<td>Frusemide</td>
<td>20–160mg</td>
</tr>
<tr>
<td>Bumetamide</td>
<td>0.5–2mg</td>
</tr>
<tr>
<td>Ethacrynic acid</td>
<td>25–100mg</td>
</tr>
<tr>
<td>Torsemide</td>
<td>2.5–20mg</td>
</tr>
</tbody>
</table>

Continued
Table 3.2, continued

<table>
<thead>
<tr>
<th>Drugs</th>
<th>Daily dosages</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Potassium sparing diuretic</strong></td>
<td></td>
</tr>
<tr>
<td>Amiloride</td>
<td>5–20mg</td>
</tr>
<tr>
<td>Triamterene</td>
<td>25–100</td>
</tr>
<tr>
<td>Spironolactone</td>
<td>125–200mg</td>
</tr>
<tr>
<td><strong>β-blockers</strong></td>
<td></td>
</tr>
<tr>
<td>Acebutolol</td>
<td>200–800mg</td>
</tr>
<tr>
<td>Atenolol</td>
<td>25–100mg</td>
</tr>
<tr>
<td>Metoprolol</td>
<td>50–200mg</td>
</tr>
<tr>
<td>Nadolol</td>
<td>20–320mg</td>
</tr>
<tr>
<td>Pindolol</td>
<td>10–60mg</td>
</tr>
<tr>
<td>Propranolol</td>
<td>40–160mg</td>
</tr>
<tr>
<td>Timolol</td>
<td>20–60mg</td>
</tr>
<tr>
<td><strong>β/α-blockers</strong></td>
<td></td>
</tr>
<tr>
<td>Labetolol</td>
<td>200–1200mg</td>
</tr>
<tr>
<td>Carvedilol</td>
<td>6.25–50mg</td>
</tr>
<tr>
<td><strong>Calcium channel blockers</strong></td>
<td></td>
</tr>
<tr>
<td>Amlodipine</td>
<td>2.5–10mg</td>
</tr>
<tr>
<td>Nifedipine XL</td>
<td>30–120mg</td>
</tr>
<tr>
<td>Felodipine</td>
<td>2.5–20mg</td>
</tr>
<tr>
<td>Nicardipine SR</td>
<td>30–120mg</td>
</tr>
<tr>
<td>Diltiazem CD</td>
<td>120–540mg</td>
</tr>
<tr>
<td>Verapamil HS</td>
<td>120–480mg</td>
</tr>
<tr>
<td><strong>ACEIs</strong></td>
<td></td>
</tr>
<tr>
<td>Captopril</td>
<td>25–150mg</td>
</tr>
<tr>
<td>Enalapril</td>
<td>2.5–40mg</td>
</tr>
<tr>
<td>Lisinopril</td>
<td>10–80mg</td>
</tr>
<tr>
<td>Ramipril</td>
<td>2.5–20mg</td>
</tr>
<tr>
<td><strong>Angiotensin receptor blockers</strong></td>
<td></td>
</tr>
<tr>
<td>Candesartan</td>
<td>8–32mg</td>
</tr>
<tr>
<td>Losartan</td>
<td>25–100mg</td>
</tr>
<tr>
<td>Valsartan</td>
<td>80–320mg</td>
</tr>
<tr>
<td><strong>α-blockers</strong></td>
<td></td>
</tr>
<tr>
<td>Prazosin</td>
<td>1–40mg (2–3 divided doses)</td>
</tr>
<tr>
<td>Phenoxybenzamine</td>
<td>20–120mg (2 doses)</td>
</tr>
<tr>
<td><strong>Sympatholytic agents</strong></td>
<td></td>
</tr>
<tr>
<td>Clonidine</td>
<td>0.2–1.2mg</td>
</tr>
<tr>
<td>Methylldopa</td>
<td>250–1000mg</td>
</tr>
<tr>
<td>Reserpine</td>
<td>0.05–0.25mg</td>
</tr>
<tr>
<td>Direct vasodilators</td>
<td></td>
</tr>
<tr>
<td>Hydralazine</td>
<td>25–200mg</td>
</tr>
<tr>
<td>Minoxidil</td>
<td>2.5–100mg</td>
</tr>
</tbody>
</table>

### 3.6 Hypertensive Crisis

Sudden or sustained diastolic BP of more than 120mmHg with papilloedema, progressive decrease in renal function, and evidence of neurological dysfunction. **Aim of treatment is to achieve diastolic BP of 100–110mmHg. BP should be**
controlled within 1 hour in order to prevent permanent damage. However, rapid decrease of BP should be avoided to reduce risk of cerebral hypoperfusion.

**Management**
Refer to higher level.

**Patient Education**
Untreated hypertension has a high mortality rate due to: renal failure, stroke, coronary artery disease, and heart failure.

### 3.7 Pulmonary Oedema

*This is an acute medical emergency* caused by an increase in pulmonary capillary venous pressure leading to fluid in the alveoli, usually due to acute left ventricular failure.

**Clinical Features**
Breathlessness, sweating, cyanosis, frothy blood tinged sputum, respiratory distress, rhonchi, and crepitations.

**Investigations**
Refer to higher level.

**Management – Pharmacological**

*This must be immediate:*  
- Prop up patient in bed.  
- Administer 100% oxygen 3.5–5/L/min.  
- Give IV frusemide 40mg initial, repeat with higher dose every 20–30 minutes to 200mg maximum total dose (see Section 38.2 for paediatric doses)  
- If not already on digoxin, digitalize except if due to myocardial infarction (see Section 3.2).  
- Give IV aminophylline 250–500mg slowly.  
- Refer to higher level.

### 3.8 Deep Vein Thrombosis

Commonest site for DVT is the calf of the lower limbs followed by the pelvis.  
(See also Section 53.3.7, on DVT in pregnancy.)

**Clinical Features**
Pain usually of sudden onset; warmth on palpation, local swelling, tenderness. An extremity diameter of 2cm or greater than the opposite limb from some fixed point is abnormal. In DVT related to pregnancy and its complications as risk factors, the left lower limb is involved in over 80% of the cases. Diagnosis is mainly clinical.

**Investigations**
Refer.