



Contents

<i>Contributors</i>	v
<i>Foreword</i> by Prof KV Krishna Das	vii
<i>Foreword</i> by Dr Thomas Mar Koorilos	ix
<i>Preface</i>	xi

Section 1: Kidneys and Common Kidney Diseases

1. Anatomy of Urinary Tract	3
Kidneys	4
Ureter	9
Urinary Bladder	9
Male Urethra	11
Female Urethra	12
2. Functions of the Kidneys and Mechanism of Urine Formation	13
Mechanism of Urine Formation	16
Glomerular Filtration	16
Sodium Reabsorption	18
Reabsorption of Nutrients, Water, and Ions	19
Tubular Secretion	21
3. Development and Development Anomalies of Urinary Tract	23
Migration of the Kidney	24
Congenital Anomalies of Kidneys and Ureters	24
Duplication of Urinary Tract	26
Cystic Diseases of the Kidneys	27
4. Kidney Diseases in Infants and Children	29
Nephrotic Syndrome (NS)	30
Acute Nephritis, Acute Glomerulonephritis (AGN)	32
Urinary Tract Infection (UTI) in Children	33
Nocturnal Enuresis (NE)	35
Renal Tubular Disorders in Children	36
High Blood Pressure—Hypertension (HTN) in Children	38
Kidney Failure in Children	39

Acute Kidney Injury (AKI) and Acute Renal Failure (ARF)	39
Chronic Kidney Disease (CKD) and Chronic Renal Failure (CRF)	41
Management of CKD in Children	42
5. Importance of Urine Examination	44
Macroscopic Examination of Urine	45
Chemical Examination of Urine	48
Bibliography	54
6. Blood Investigations in Kidney Disease	55
Basic Tests	55
Serum Calcium, Phosphorus and Alkaline Phosphatase	57
Serum Proteins	58
Lipid Profile	59
7. Importance of Imaging Urinary Tract	62
Plain X-rays Abdomen for Kidneys, Ureters and Bladder (X-ray KUB)	62
Intravenous Urogram (IVU)/CT Urogram (CTU)	63
Direct Pyelography	64
Micturating Cystourethrogram	65
Ultrasonography and Doppler Study	65
Renal Angiography	66
Computerized Axial Tomography (CAT) Scan	66
Magnetic Resonance Imaging (MRI)	67
PET Scan and Single-Photon Emission Computed Tomography (SPECT)	68
8. Importance of Radionuclide Studies	69
Renal Radiopharmaceuticals Used in Nephrology	70
Transplantation Renography	72
9. Importance of Kidney Biopsy	73
Prebiopsy Preparation	73
Setting up a Tray for Renal Biopsy	74
Processing and Despatch of Sample to the Laboratory	76
10. Signs and Symptoms of Renal Diseases	78
Presenting Symptoms of Renal Diseases	78
Abdominal Mass	82
Uremic Manifestations	83
Clinical Syndromes in Nephrology	84

11. Acute Nephritic Syndrome	85
Causes (Etiology) of Acute Nephritic Syndrome	85
Poststreptococcal Acute Glomerulonephritis	86
Differential Diagnosis	88
Management	90
12. Nephrotic Syndrome	93
Introduction	93
Common Causes	94
Clinical Features	96
Management	97
Complications	98
13. Acute Kidney Injury	100
Definition and Classification	100
Prerenal AKI	101
Diagnosis and Management	104
14. Chronic Kidney Disease	106
Etiology of CKD	106
Staging of Renal Failure	109
Estimation of GFR	110
Clinical Manifestations	110
Management	112
15. Stone Disease	116
Factors Inhibiting Stone Formation	117
Factors Favouring Stone Formation could be Metabolic to other Factors	117
Treatment	120
16. Asymptomatic Urinary Abnormalities (AUA)	123
Microscopic Hematuria	123
Proteinuria	123
17. Cysts in the Kidney	125
Classification of Renal Cysts	125
ADPKD	126
Acquired Cystic Disease	129
Autosomal Recessive Polycystic Kidney Disease (ARPKD)	129
Long-term Prognosis is Excellent	131
18. Hypertension and the Kidney	132
Classification of Hypertension	132
Regulation of Blood Pressure	132

Sympathetic Nervous System (SNS)	134
Primary or Essential Hypertension	135
Secondary Hypertension	135
Complications of Hypertension	139
Evaluation of a Hypertensive Patient	140
Steps in Treatment	141
19. Inherited Disorders of Renal Tubular Function	142
Inherited Renal Tubular Acidosis (RTA)	143
Vitamin D Dependant Rickets (VDDR)	144
Vitamin D Resistant Rickets (VDRR)	144
Bartter Syndrome	145
Gitelman's Syndrome	145
Pseudohypoaldosteronism	146
Liddle's Syndrome	146
Hereditary Nephrogenic Diabetes Insipidus	146
20. Diabetes Mellitus and Kidney	147
21. Systemic Lupus Erythematosus and Kidney	152
Etiology	152
Pathogenesis	153
Clinical Features	153
Diagnosis	154
Treatment	155
22. Pregnancy and the Kidney	156
Pre-eclampsia/Eclampsia	157
Chronic Hypertension	158
Superimposed Pre-eclampsia	158
Late Transient Hypertension	158
23. Drugs and Kidney	160
Vulnerability of Kidneys: Why the Kidneys are Affected by Drugs	160
Mechanism of Kidney Damage (Nephrotoxicity) due to Drugs	161
Aminoglycoside Group of Antibiotics	162
Nonsteroidal Anti-inflammatory Drugs (NSAIDs)	162
Radiocontrast Agents	163
24. Dialysis and Related Procedures	165
Peritoneal Dialysis	166
Continuous Ambulating Peritoneal Dialysis (CAPD)	167
Continuous (Nocturnal) Cycler (Assisted) Peritoneal Dialysis	167

Hemodialysis	168
Chronic Complications	176
25. Renal Transplantation	178
Donor	179
Recipient	180
Indications for Renal Transplantation	181
Transplantation Procedure in Living Donor Transplantation	182
Complications	184
26. Diet in Kidney Diseases	186
27. Psychiatric Aspects of Renal Diseases	189
28. Comprehensive Nursing in Nephrology	191
Nursing in Diagnostic Tests	191
Nursing Management in Common Renal Diseases	193
Nursing Management in Renal Replacement Therapies	197
Section 2: Fluid, Electrolyte and Acid–Base Balance	
29. Body Fluids and IV Fluids	203
Distribution of Water in the Body	203
Composition of Fluids in Various Body Compartments	204
Maintenance of Fluid Balance Chart	206
Precautions and Care of IV Lines	208
30. Normal and Abnormal and Electrolyte Homeostasis	220
Sodium and Water Homeostasis	221
Hypervolemia	223
Hyponatremia	224
Symptoms and Signs of Hyponatremia	225
Hypernatremia	226
Potassium Homeostasis	227
Calcium Homeostasis	231
Disorders of Phosphate Metabolism	233
Disorders of Magnesium Metabolism	234
31. Simplified Understanding of Acid–Base Balance	236
Common Acid–Base Disorders	239
Metabolic Acidosis	240
Metabolic Alkalosis	241
Respiratory Acidosis	241
Respiratory Alkalosis	242
Index	247