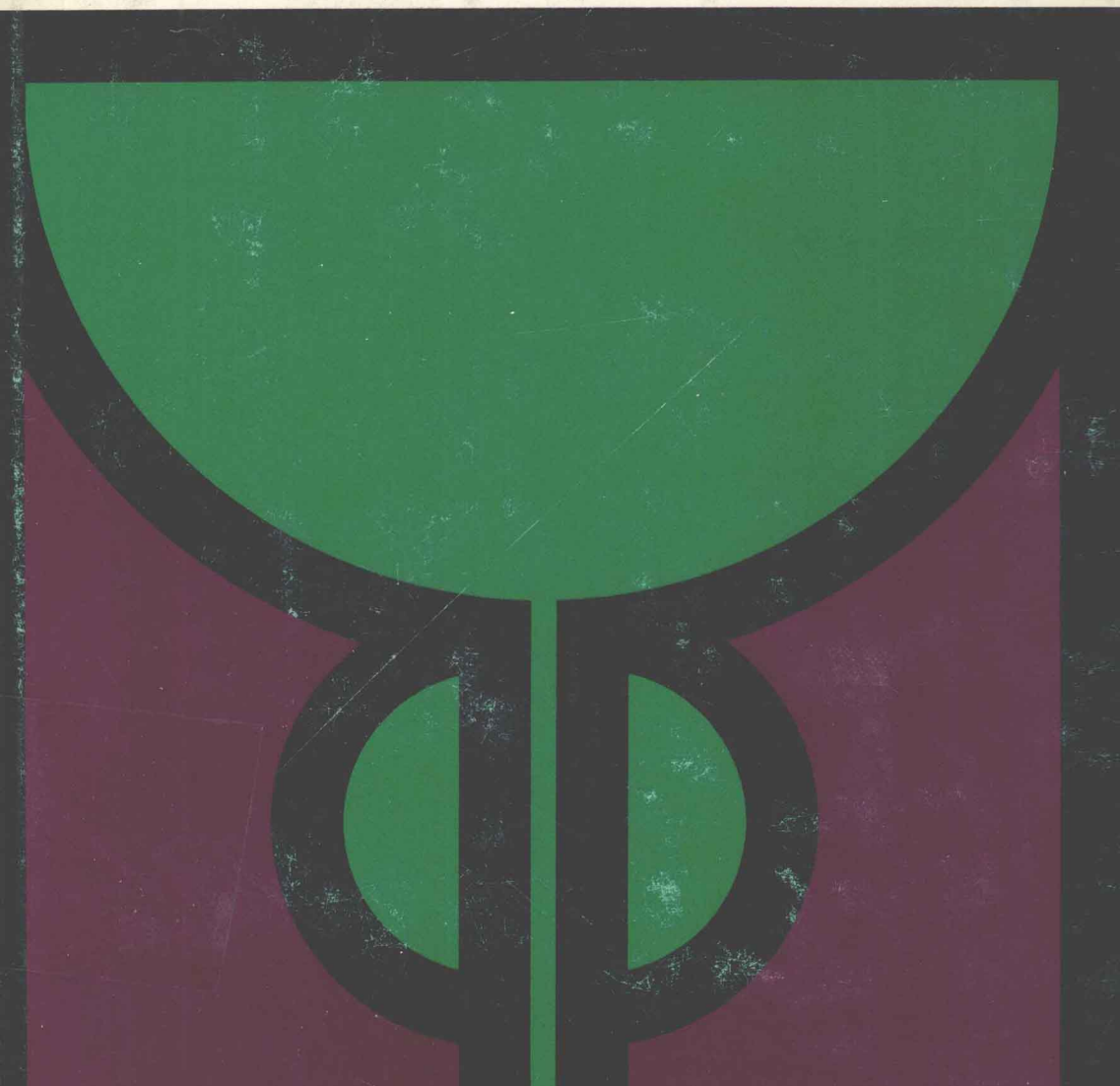


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Care of the Patient with Neurogenic Bladder



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LITTLE, BROWN AND COMPANY, BOSTON

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First Edition

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Library of Congress Catalog Card No. 77-72406

ISBN 0-316-10420-5

Printed in the United States of America

Care of the Patient with Neurogenic Bladder

TO MARJORY BAX, R.N.

Who was a partner in translating the concept of this book into reality and without whose support and strength this project would not have been possible.

Preface

This book is a manual of holistic care of the disabled patient in terms of behavioral medicine and the biology of adaptation. The goal of holistic care is to restore homeostasis and to help the patient achieve functional adaptation through preventive, hygienic, rehabilitative, urologic, and other therapeutic measures. The text outlines the diagnosis and treatment of the neurogenic bladder and deals with syndromes, management, goals, and expectations related to this disorder.

Our specific purpose is to meet the growing need for explicit detail and sound direction in the care of patients with neurogenic bladder disease, including dissemination of the appropriate skills and knowledge among physicians, nurses, and all others in medical facilities for these patients. The approach is both theoretical and practical, involving principles as well as techniques.

We have long been interested and experienced in the various aspects of neurogenic bladder problems: chronic and acute, surgical and rehabilitative, inpatient and outpatient. As clinicians, investigators, and teachers, we are familiar with the problems of consumers and providers of medical care and can attempt to speak occasionally as ombudsmen.

Central to the concepts of care in this book is the team concept. The therapeutic team can best overcome the fragmentation of specialties and scientific methods and achieve the reunion of therapeutic modalities. The team, which includes all professionals who can make a positive contribution to the care of the patient, must be united by a strong, responsible, and perceptive professional who understands the skills and scientific experience of the team members as well as the needs and concerns of the patient. This team leader, who need not always be a physician, must function in a democratic, not dictatorial style. He or she coordinates, makes the decisions, and decides the priorities. At successive stages of the patient's recovery, different professionals might assume leadership responsibilities. The floating-leadership concept requires more than free communication among team members; it demands mutual education.

The text covers the necessary basic science and social science aspects of dealing with neurogenic bladder disease (which might define urologic rehabilitation). Topics to be discussed include the relevant principles of anatomy, physiology, neurophysiology, microbiology, pathology, urology, pharmacology, and rehabilitation. Diagnostic methods and urologic procedures, sexual counseling and guidance, drug therapy, surgical procedures, nursing care, laboratory tests, diagrams, and details of catheterization and other important procedures are also presented. As much as is known of certain neurophysiologic principles of spasticity is covered.

Care of the Patient with Neurologic Bladder is intended for all physicians, nurses, students, and residents involved with patients who have become so disabled by dysfunction in one system (the nervous system) that the other systems (especially the bladder) have progressively failed in their function. We hope to illustrate how the restoration to function of the disabled individual requires systems restoration and disease reversal on many fronts, not just in the original syndrome. This approach may have developed from a rehabilitationist need and a urologic seed, but it inte-

grates the principles of basic science into a philosophy of the biology of adaptation that considers each level of physiologic, psychological, and sociologic function of the individual in his environment.

The text may also serve as a manual for physicians, nurses, students, and residents who wish to deal intelligently with the troublesome, although ostensibly mundane, problems of catheters, drainages, urinary infections, and renal stones, but who are dissatisfied with the simplistic explanations and formulas that have proved to be so limited in value. Until disorders of the urinary tract are appreciated as threats to the homeostasis of the individual and until all functional needs are met by the rehabilitation team, neurogenic bladder disease will remain a frustration to the physician and a danger to the patient. Emphasis is placed on the principles, the reasons, and the biologic costs of various procedures by a rational rather than a doctrinaire approach. The choice of solutions to problems, of procedures, and even of catheters or drug therapy is amenable to scientific and biologic explanation. Necessary approaches to study and methods of treatment are discussed.

In a certain sense, this book developed from the dialogue which the urologist had with his colleagues on a team. We envision a process of give-and-take among team members that will add to their competence. This will stimulate an awareness of problems and a synthesis of methods and knowledge. The team will devise new techniques, reevaluate old ones, confront seemingly insoluble problems, and thereby fill in gaps in knowledge and add to the weapons against disease.

Contents

Preface vii

1. NORMAL GENITOURINARY ANATOMY	1
<i>Anatomy and Physiology of the Urinary Tract</i> 1	
THE KIDNEY 1	
<i>Renal Anatomy</i> 1	
<i>Renal Physiology</i> 1	
<i>Renal Pelvis, Calices, and Ureters</i> 4	
THE URETER 5	
THE BLADDER 6	
<i>The Bladder Neck</i> 9	
THE URETHRA 11	
<i>Urethral Physiology</i> 12	
<i>Genital Anatomy and Physiology of the Male</i> 12	
THE PROSTATE GLAND 14	
THE EPIDIDYMIS 14	
THE TESTICLE 15	
THE SCROTUM 15	
THE INTERNAL SPHINCTER AS A GENITAL STRUCTURE 15	
2. NEUROGENIC BLADDER: DEFINITION AND PATHOPHYSIOLOGY	17
<i>Pathophysiology of the Neurogenic Bladder</i> 17	
THE NORMAL BLADDER 17	
THE ABNORMAL BLADDER 18	
<i>Spinal Shock</i> 24	
<i>Problems of Classification</i> 27	
<i>Autonomic Hyperreflexia</i> 29	
3. HOLISTIC AND TEAM APPROACH TO PATIENT MANAGEMENT	33
<i>Philosophy of the Team Approach</i> 33	
<i>Neurogenic Bladder as a Disease and a Disability</i> 35	
<i>Principles of Patient Management</i> 36	
<i>General Considerations</i> 38	
<i>Principles of Adaptation</i> 39	
PSYCHOLOGY OF ADAPTATION 39	
BEHAVIORAL MEDICINE: BIOLOGY OF ADAPTATION 40	
<i>The Concept of the Therapeutic Team</i> 42	
ROLE OF THE NURSE 43	
<i>Psychosocial Principles in Holistic Care</i> 44	
<i>Attitudes of the Hospital Staff</i> 46	
<i>A Comparison of Conventional Medical Care with Holistic Rehabilitative Care</i> 46	

The Health Facility 47

A SPINAL UNIT OR SPINAL CORD INJURY CENTER 47

Selected Readings 48**4. EVALUATION OF THE PATIENT FOR REHABILITATION 51***Principles of Rehabilitation* 51

INTEGRATION AND FEEDBACK IN LIVING SYSTEMS 51

FORMULATING THE REHABILITATION PROGRAM 51

Rehabilitation Meeting 51 *Approaches to the Patient* 52*Rehabilitation Formulation* 52*Concerns and Fears of the Patient* 52*Obtaining the Patient's History* 54*Present Illness* 55*Specific Urologic Symptoms* 55

PAIN 55

HEMATURIA 56

PYURIA 57

URINARY FREQUENCY 57

URINARY STREAM 58

INCONTINENCE 58

Genital Symptoms Related to Intercourse 59

URETERAL COLIC 60

NEUROUROLOGIC ANALYSIS 60

GENERAL REMARKS ON HISTORY TAKING 60

Order of Urologic Examination 61*Laboratory Procedures* 61

ROUTINE STUDIES 61

NORMAL VALUES 65

URINALYSIS 65

COLLECTION OF URINE SPECIMENS 66

Urinalysis Procedure 70

URINE CULTURES AND SENSITIVITY TESTING 70

Urine Cultures 70 *Sensitivity Tests* 71 *Bacteriology of**Urinary Tract Infections* 71 *Bacterial Spectrum* 71 *Blood**Chemistries* 72*Radiologic Procedures* 72

CARE OF THE PATIENT 72

PLAIN FILM (SCOUT FILM) OR KIDNEY, URETER, AND
BLADDER (KUB) FILM 73

PYELOGRAPHY AND UROGRAPHY 73

CYSTOGRAPHY AND CYSTOURETHROGRAPHY 76

NEPHROTOMOGRAPHY 76

CINERADIOGRAPHY 77

RENAL STUDIES 77

Renal Arteriography 77 *Renograms and Renal Scans* 77*Renal Sonograms* 77*Diagnostic Aspects of Urologic Instrumentation* 77

URODYNAMICS PROCEDURES 78

CYSTOMETROGRAMS AND BLADDER PRESSURE STUDIES	78
URINE FLOW RATE	80
VOIDING AUDIOGRAPH	80
OTHER URODYNAMIC PROCEDURES	81
<i>Cystoscopy</i>	81
<i>Neurologic Diagnosis</i>	83
SPECIFIC NEUROLOGIC TESTS	83
<i>Observation and Patient Data Systems</i>	84
OBSERVATIONS BY THE NURSE	84
<i>Catheter Drainage and Residual Urine</i>	84
<i>Volume and Character of Urine</i>	84
INTAKE AND OUTPUT	85
<i>Patient Complaints and Symptoms</i>	85
<i>Incontinence</i>	85
<i>The Weed System</i>	85
<i>Selected Readings</i>	86
 5. THERAPEUTIC MANAGEMENT OF NEUROGENIC BLADDER	 87
<i>Goals of Management</i>	87
<i>Approaches to Management</i>	87
PREVENTIVE MEASURES IN THERAPY	88
<i>Bladder Training</i>	88
INITIATION OF BLADDER TRAINING	89
MANEUVERS IN BLADDER TRAINING	90
TRIGGER MECHANISMS FOR BLADDER EMPTYING	92
<i>Catheterization</i>	92
PRINCIPLES AND TECHNIQUES OF CATHETERIZATION	94
INTERMITTENT CATHETERIZATION	97
THE INDWELLING CATHETER	98
<i>Permanent Indwelling Catheter Drainage</i>	98
<i>Complications of the Indwelling Catheter</i>	98
COMPLICATIONS OF CATHETERIZATION	99
<i>Prevention of Complications</i>	99
<i>The Balloon Catheter</i>	100
<i>Catheterization in Place of Urinary Diversion for Meningomyelocele</i>	100
SELF-CATHERIZATION	101
<i>Urologic Surgery</i>	101
TYPES OF UROLOGIC PROCEDURES	102
PREOPERATIVE CARE	102
POSTOPERATIVE CARE	103
<i>Maintaining Balance in Body Fluids</i>	104
<i>Pain</i>	104
REHABILITATIVE PROGRAMS	104
<i>Bladder Training as Nursing Care</i>	104
<i>Physical and Occupational Therapy</i>	105
<i>Psychological and Family Counseling</i>	105
PLANNING FOR DISCHARGE	105

Management of Urinary Incontinence 105

Selected Readings 107

6. MEDICAL AND SURGICAL INTERVENTION 109

Therapeutic Principles of Urologic Surgery 109

COMPLICATIONS THAT REQUIRE SURGERY 109

INDICATIONS FOR SURGERY 110

ROLES AND PURPOSES OF SURGERY 111

Surgery for Drainage 111 *Curative Surgery* 111 *Reconstructive Surgery* 111 *Adjunctive Surgery* 111

PLANNING FOR SURGERY 112

Types of Surgical Procedures 113

TRANSURETHRAL SURGICAL PROCEDURES 113

Transurethral Resection 113 *Transurethral Incision of the External Sphincter* 114 *Bladder Neck Y-V Plasty* 115

Neurologic and Neurosurgical Procedures 115

BLADDER MUCOSAL BLOCK 115

PUDENDAL NERVE BLOCK 116

SACRAL NERVE ANESTHESIA 116

Urinary Diversion 118

SUPRAPUBIC CYSTOSTOMY 119

TUBELESS CYSTOSTOMY 120

SUPRAVESICAL DIVERSION 121

CUTANEOUS URETEROSTOMY 124

Nephrostomy and Pyelostomy 124

Phimosis and Paraphimosis 124

Vasectomy 126

Selected Readings 127

7. SEXUAL PROBLEMS IN REHABILITATION 129

Sexual Dysfunction in Males 129

EFFECTS OF SPINAL CORD INJURY 129

EFFECTS OF DIABETES 130

EFFECTS OF MULTIPLE SCLEROSIS 133

Sexual Dysfunction in Females 133

EFFECTS OF SPINAL CORD INJURY 133

EFFECTS OF DIABETES 134

Coping with Marriage 134

Sexual Counseling 135

SOME GENERAL PRINCIPLES 136

PHYSIOLOGIC COUNSELING 136

COUNSELING ON RELATIONSHIPS 137

COUNSELING ON PARENTHOOD 138

PRACTICAL COUNSELING	138
<i>Coital Positioning</i>	138
<i>Alternative Stimulation</i>	139
<i>Penile Prosthesis</i>	139
<i>Spasticity</i>	139
<i>Contractures</i>	139
<i>Bladder Care</i>	140
<i>Hygiene</i>	140
<i>Autonomic Hyperreflexia</i>	140
<i>Selected Readings</i>	141
8. ASSOCIATED UROLOGIC DISORDERS AND THEIR TREATMENT	143
<i>Pathophysiology of Genitourinary Diseases</i>	143
GENERAL PRINCIPLES OF DISEASE	143
PATHOPHYSIOLOGY OF SPECIFIC DISEASES	143
<i>Urologic Pain</i>	144
<i>The Role of Altered Hydrodynamics in the Genesis of Infection</i>	145
<i>Iatrogenic and Nosocomial Factors in Urinary Infection</i>	146
<i>Pathophysiology of Urinary Tract Infections</i>	147
ROUTES OF ENTRY	147
<i>Ascending Infections</i>	147
<i>Hematogenous Infection</i>	147
<i>Lymphatic Route</i>	147
<i>Direct Extension</i>	150
BLADDER DEFENSE MECHANISMS	150
FACTORS CONTRIBUTING TO INFECTION	150
INVADING ORGANISMS	151
IDENTIFYING THE SITE OF URINARY TRACT INFECTION	151
BACTERIOLOGIC STUDY OF THE URINARY TRACT	153
<i>Prognosis of Urinary Tract Infection</i>	153
SEPTICEMIA	154
RESIDUAL URINE	154
<i>Antibiotic Therapy</i>	155
LOCAL PATTERNS OF DRUG RESISTANCE	156
POINTERS IN ANTIBACTERIAL THERAPY	156
USE OF ANTIBACTERIALS IN HEPATIC OR RENAL DISEASE	156
CHOICE OF ANTIBACTERIAL AGENT	156
<i>Pathophysiology of Pyelonephritis</i>	158
PATHOGENESIS OF ACUTE PYELONEPHRITIS	158
SYMPTOMS AND DIAGNOSIS	158
CHRONIC PYELONEPHRITIS	159
CONDITIONS ASSOCIATED WITH PYELONEPHRITIS	159
COMPLICATIONS OF PYELONEPHRITIS	159
<i>Necrotizing Papillitis or Papillary Necrosis</i>	159
<i>Renal Carbuncle and Perinephric Abscess</i>	159
<i>The Pathophysiology of Obstructive Uropathy</i>	161
EFFECTS OF OBSTRUCTIVE UROPATHY	161
SPECIFIC MORPHOLOGIC ALTERATIONS IN EACH ORGAN	161
ETIOLOGY OF OBSTRUCTIVE UROPATHY	161
EFFECTS OF OBSTRUCTIVE UROPATHY ON URINE COMPOSITION	161

EFFECTS OF OBSTRUCTION ON RENAL HEMODYNAMICS	162
THE URETER IN OBSTRUCTION	162
BACKFLOW, EXTRAVASATION, AND REABSORPTION	162
<i>Problems of Calcium Metabolism</i>	162
OSTEOPOROSIS	162
HYPERCALCIURIA	165
SPASTICITY	167
TREATMENT	167
<i>Calculi</i>	169
RENAL CALCULI	169
URETERAL CALCULI	171
BLADDER STONES	171
PROSTATIC CALCULI	173
COMBINED UROPATHY	173
TREATMENT OF CALCULI	173
<i>Prevention of Stone Recurrence</i>	173
<i>Renal Failure</i>	174
<i>Other Inflammations of the Urinary Tract</i>	175
URETERITIS	175
CYSTITIS	175
<i>Acute Cystitis</i>	175
<i>Chronic Cystitis</i>	176
<i>Prostatitis</i>	176
ACUTE PROSTATITIS	176
CHRONIC PROSTATITIS	176
<i>Acute Urethritis</i>	176
<i>Acute and Chronic Epididymitis</i>	176
<i>Hematuria</i>	177
<i>Contractures, Strictures, and Fistulas</i>	177
CONTRACTURE OF THE BLADDER NECK	177
PARAPHIMOSIS	177
PENOSCROTAL OR OTHER FISTULAS	177
URETHAL STRICTURE	178
<i>Vesicoureteral Reflux</i>	178
<i>Urinary Frequency</i>	181
<i>Urinary Retention—Acute and Chronic</i>	181
<i>Incontinence</i>	181
<i>Neoplasms</i>	182
<i>Trauma</i>	182
<i>Selected Readings</i>	183

9. THE ROLE OF DRUGS IN MANAGEMENT

185

<i>General Principles of Drug Therapy</i>	185
<i>Neurohumoral Autonomic Transmission and Neurohumoral Drugs</i>	187
PRINCIPLES OF THERAPY WITH NEUROHUMORAL DRUGS	187
NEUROHUMORAL TRANSMISSION	188

TYPES OF NEUROHUMORAL DRUGS 188

Parasympathomimetic Drugs 188 The Atropine, Belladonna, Scopolamine Series 188 Imipramine 189 Ephedrine 189 The Adrenergic Blockers 189

Drugs Used for the Treatment of Skeletal Muscle 189

DIAZEPAM (VALIUM) 190

DANTROLINE (DANTRIUM) 190

BACLOFEN (LIORESAL) 191

FLAVOXATE 191

Antibiotic and Antibacterial Drugs 191

PROPERTIES OF AN IDEAL ANTIBIOTIC 192

SPECIFIC ANTIBIOTIC AGENTS 192

Sulfonamides 192 Methenamine Mandelate 194 Nalidixic Acid 194 Trimethoprim 194 Colistin 194 Nitrofurantoin 194 The Penicillin Group 195 Cephalosporins 196 Tetracyclines 196 Erythromycin 197 Chloramphenicol 197 Kanamycin 197 Gentamicin 198 Phenazopyridine Hydrochloride (Pyridium) 199

Selected Readings 199

APPENDIXES

201

A. Samples of Cystometric Tracings 201

B. Physical Examination of the Genitourinary Tract 213

C. Urinalysis 219

D. Sample Procedures for Clean-Catch Urine Collection for Urinalysis, Culture, and Sensitivity Test 223

Index 239

1. Normal Genitourinary Anatomy

Rational therapy for the neurogenic bladder patient demands that both patient and professional understand the working mechanism of the bladder. Most people can grasp the essential anatomy and physiology after a proper explanation. It is in the best interest of everyone that the entire staff as well as the disabled individual have this basic information. In this way the neurogenic bladder patient can be treated and appropriately rehabilitated by the professional team.

ANATOMY AND PHYSIOLOGY OF THE URINARY TRACT

The urinary tract functions as a whole to serve the organism. Urinary infections tend sooner or later to involve the entire length of the urinary tract. Figure 1-1 illustrates the basic structures that compose the urinary tract. Implicit in this illustration are the homeostatic function of the renal parenchyma, the transport function of the ureters, the receptacle and expulsion functions of the bladder, and the transport function of the urethra.

Figure 1-1 is intended to summarize a concept and habit of thinking common to urologists: One must ascertain rather than assume that the renal mass is anatomically and functionally symmetrical. It should not be taken for granted that the opposite kidney is present until intravenous urograms or other appropriate studies demonstrate its presence.

The Kidney

RENAL ANATOMY

Normal kidneys are paired, retroperitoneal structures lying below the diaphragm and obliquely along the borders of the psoas muscles. During embryologic development, the liver displaces the right kidney slightly so that it is lower than the left in most but not all patients. An adult kidney is normally about 12 cm long and weighs 150 gm.

The intrinsic renal capsule is tough and fibrous, but the perirenal Gerota's capsule consists of loose fat and allows a normal mobility of one vertebral level with changing position and respiratory influences. The tough, fibrous capsule exerts tamponade function during contusion and hemorrhage and, to a lesser extent, serves partially to confine infection and tumor.

Elaborately detailed discussions and drawings of the anatomy of the kidney are available in many other books and need not be repeated here.

RENAL PHYSIOLOGY

The kidneys contribute to homeostasis, or regulation of the internal chemical composition of the body, by excretion of the body's excess water, nitrogenous products, and other substances; regulation of the acid-base balance, the volume, and the electrolyte concentration of the body fluids; regulation of blood pressure and blood volume; and certain endocrine functions. Reductions in renal blood flow or arterial pressure may cause a release of the enzyme renin, which reacts with a circulating substrate of

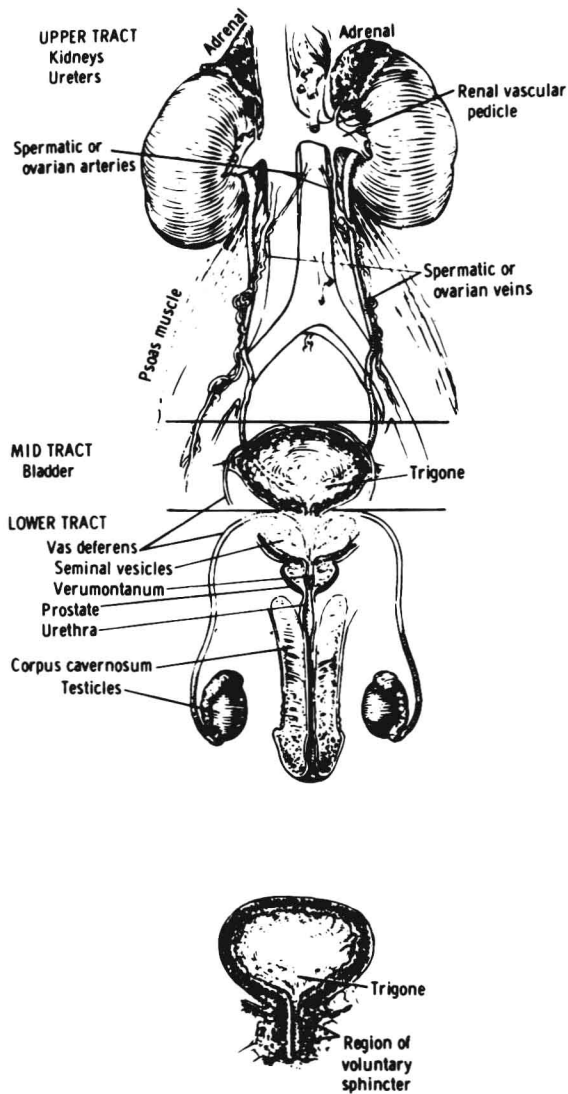


Figure 1-1. Anatomy of the urinary tract in health and disease. Lower insert shows the female mid and lower urinary tracts. (From D. Smith, *General Urology*. Los Altos, Calif.: Lange, 1975.)

hepatic origin to produce angiotensin, a powerful vasopressor substance. There is a renal effect on the production of aldosterone by the adrenal-renal interplay with erythropoietin which promotes red blood cell formation, and the kidneys are also involved with the posterior pituitary function.

The nephron (Fig. 1-2) is the functioning unit of the kidney. The nephron contains a glomerulus (where plasma is filtered) and tubules (where filtrate is reabsorbed, concentrated, or receives additional components). The glomerulus is a capillary network projecting into the lumen of the

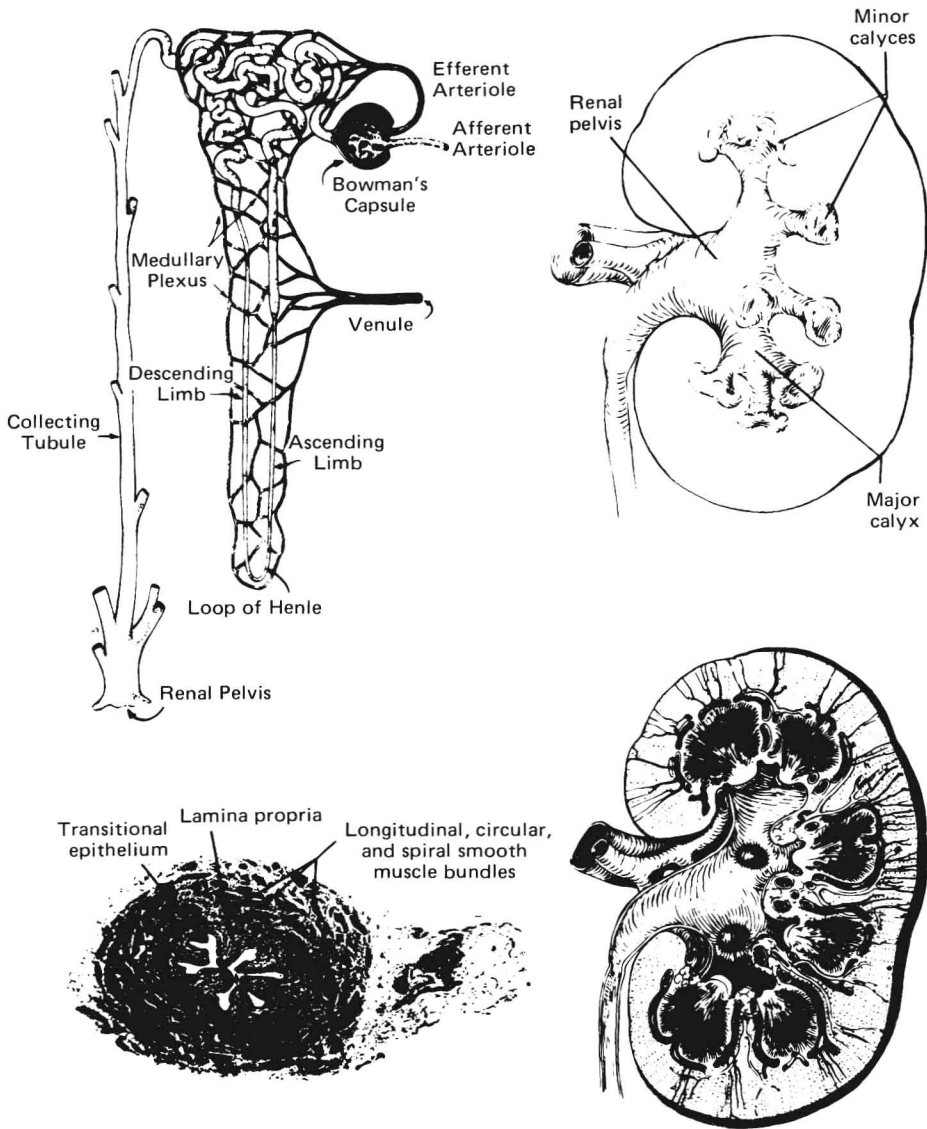


Figure 1-2. Nephron. Anatomy of the kidney and nephron with ureteral histology. (From D. Smith, *General Urology*. Los Altos, Calif.: Lange, 1975.)

tubule so that filtration can proceed under the pressure head of the renal arterial blood entering the afferent arteriole. Filtration takes place across the capillary membrane; the filtrate contains water and solutes but no protein molecules or cells. The filtered blood leaves the glomerulus through the efferent arteriole to enter the second capillary network, the peritubular capillaries surrounding the tubule, before it enters the regular venous system.