

**MINISTRY OF HEALTH OF THE REPUBLIC OF BELARUS
EDUCATIONAL INSTITUTION
BELARUSIAN STATE MEDICAL UNIVERSITY**

Контрольный
экземпляр

APPROVED

by First Vice-Rector, Professor

S.V. Gubkin



Reg. # UD-609/1718 /edu.

UROLOGY

**Curriculum of higher educational institution
in the educational discipline for the specialty:**

1-79 01 01 «General Medicine»

Minsk BSMU 2017

Curriculum is based on the standard educational program “Urology”, approved 08.08.2017, registration №ТД-L.609/type.

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RECOMMENDED FOR APPROVAL:

by the Department of Urology of the Educational Institution “Belarusian State Medical University”

(protocol № 3 of 17. 10. 2017);

by the Methodological Commission of surgical specialties of the Educational Institution “Belarusian State Medical University”

(protocol № 3 of 15. 11. 2017)

EXPLANATORY NOTE

Urology is an educational discipline that contains systematized scientific knowledge and studying methodology of the urinary tract diseases in women, male genitourinary system, and develops treatment options and prevention strategies.

The curriculum of the discipline "**Urology**" reflects the latest scientific data in the anatomy and physiology of the human urinary system and male reproductive system as well as urinary dysfunction in women and genitourinary dysfunction in men; diagnosis and treatment. A distinctive feature of the new model curriculum is the formation of learning and teaching objectives aimed at developing students' academic, social, personal and professional competence.

The goal of teaching discipline "Urology" is the formation of students' knowledge in etiology, pathogenesis, treatment and prevention of female urinary system and male genitourinary system disorders and training future doctors to work independently with these patients.

The tasks are to develop the academic competence, based on the self-ability to search educational materials, acquiring knowledge and understanding:

- the basic concepts of etiology and pathogenesis, diagnosis and treatment of genitourinary diseases,
- the risk factors for the most common genitourinary diseases and their prevention,
- the causes of common complications,
- the most important signs and symptoms of common complications after urologic diseases and their treatment,
- the diagnosis and emergency urological care of children and adults.

The teaching objectives are to acquire social, personal and professional competence, knowledge and application of:

- theoretical knowledge, contributing to the formation of the clinical thinking in compliance with medical ethics and deontology,
- diagnosis and differential diagnosis of the acute conditions and diseases of the GU system,
- treatment of patients with genitourinary diseases,
- principles of follow-up of patients with urological diseases.

Teaching and successful studying of the discipline "Urology" are based on the students' acquired knowledge and skills in the following disciplines:

General Chemistry. Electrolyte composition of the blood, urine, blood buffer system. Acid-base status.

Latin language. Latin and Greek word-formation, elements, terminology.

Medical Biology and General Genetics. Biological basis of vital activity. Cellbiology. Reproduction. Parasitology (helminthes, protozoa). Medical genetic assesment and its role in diagnosis and treatment of urological diseases.

Human Anatomy. The structure of the human body, its constituent systems, organs, sex and aging characteristics of the body. Blood supply and innervation.

Normal Physiology. Basis Physiology of the human body.

Histology, Cytology, Embryology. Histological tissue structure. Blood and lymph. Epithelium. Connective tissue. Types of histological and cytological studies.

Pathology. Inflammation - concept and biological essence. Benign and malignant neoplasms.

Pathological Physiology. Pathogenesis. Environmental impact on human body.

Microbiology, Virology, Immunology. Bacteriological, virological and immunological studies. Microbiological principles of chemotherapy and antiseptics.

Pharmacology. The basic principles of drug action. Non-steroidal anti-inflammatory drugs. Antibacterial, antiparasitics, antifungal agents, diuretics.

Propaedeutic of diseases. Physical examination of the patient. Diagnosis and treatment of children, elderly, diabetic and immunocompromised patients. Diets. Follow up recommendations.

Topographic Anatomy and Operative Surgery. Anterior abdominal wall, peritoneum and retroperitoneum. Pelvis. Surgical instruments. Technique of the most common surgical procedures.

General Surgery. Physical examination of the patient with surgical pathology. Aseptic and antiseptic. Desmurgy. Diagnosis and treatment of bleeding. Blood transfusion, blood products, blood components. Indications, contraindications and complications of blood transfusion. Diagnosis of the most common surgical diseases.

Surgical diseases. Etiology and pathogenesis, signs and symptoms, diagnosis and treatment of surgical diseases.

As the result of studying the discipline “Urology” the student should know:

- basic concepts of diagnosis, treatment, prevention and rehabilitation, clinical protocols for the examination and treatment of patients (children and adults) with urological diseases;
- causes and mechanisms of the formation of complications, as well as methods for their treatment, prevention in patients with urological diseases;
- criteria for the cure of patients with urological diseases;
- principles of clinical examination of patients with urological diseases;

should be able to:

- carry out an objective assesment of the organs of the urinary system in men and women and sex in men;
- carry out an objective assesment of the organs of the urinary system in childhood;
- make a diagnosis and provide emergency medical care, determine the tactics of providing medical care for the most frequent urological diseases;
- perform catheterization of the bladder with an elastic catheter for acute urinary

retention, suprapubic urinary bladder puncture with acute urinary retention, to perform inability to catheterize with an elastic (metal) catheter;

- organize care for patients with total incontinence, constant cystostomy, nephrostomy, uretherokutaneostomy, urinary retention syndrome requiring systematic catheterization of the bladder;
- assess the state of the prostate gland in digital rectal examination;

should master:

- the technique of catheterization of the urinary bladder with an elastic catheter for acute urinary retention; technique of suprapubic urinary bladder puncture with acute urinary retention and should master impossibility of catheterization with an elastic (metal) catheter;
- technique of palpation of the patient's kidneys in a lying, standing position;
- technique of palpation and percussion of the bladder;
- technique of examination of the scrotum organs;
- technique of digital rectal examination;
- algorithm of examination of patients with renal colic, acute retention of urine, macrohematuria, acute renal failure, anuria, injuries of urogenital organs, acute obstructive pyelonephritis, "acute scrotum" syndrome;
- methods of taking care of patients with total incontinence, constant cystostomy, nephrostomy, uretherokutaneostomy, urinary retention syndrome requiring systematic catheterization of the bladder;
- skills of registration of the medical documentation on patients with urological diseases.

Total amount of hours for the study of the discipline is 90 academic hours. Classroom hours according to the types of studies: lectures - 8 hours, practical classes - 45 hours, student's independent work (self-studies) - 37 hours.

Current assessment is carried out according to the syllabus of the specialty in the form of a credit (10 semester).

Form of higher education – full-time.

THEMATIC PLAN

Section	In-class hours	
	Lectures	Practical classes
1. Introduction to the discipline "Urology". Signs and symptoms of genitourinary diseases. Physical examination	2	5
2. Non-specific inflammatory diseases of the genitourinary system. Urgent conditions in urology.	1	6
3. Urolithiasis	1	6
4. Genitourinary tract anomalies. Nephroptosis. Penile and urethra anomalies. Anomalies and diseases of the scrotum organs		6
5. Injuries of the urogenital system	2	6
6. Genitourinary neoplasms	1	6
7. Benign prostatic hyperplasia (BPH)		5
8. Prostate cancer (PCa)	1	5
Total hours	8	45

EDUCATIONAL MATERIAL CONTENT

1. Introduction to the discipline "Urology". Signs and symptoms of genitourinary diseases. Physical examination.

History of Urology. A brief historical review of "Urology" development in the Republic of Belarus. Milestones of World urological science. Role of Belarusian medicine and physicians in development of Urology. Current structure and organization of GU care in the Republic of Belarus.

Topographic Anatomy and Clinical Physiology of the kidney and urinary tract. Skeletopy and Syntopy of the kidneys, ureters, urinary bladder. Renal anatomy and anatomy of male genitourinary organs. Topographic anatomy of the retroperitoneum. Pelvic anatomy. Hilartopography. Testicular capsule.

Kidney as a homeostasis organ. Glomerular and tubular function. Urine formation (filtration, reabsorption, secretion). Upper urinary tract, bladder, urethral physiology.

Signs and symptoms of genitourinary diseases. Pain. Pathogenesis. The location and pain qualities associated with the kidney diseases and diseases of the bladder, prostate, urethra and scrotum. Causes, irradiation and specific pains associated with renal colic. Bladder pain pathogenesis. The role of the Lieto triangle in the pathogenesis of the pain, painful urination. Pain in the sacral area. Painless GU diseases.

Micturition disorders. Types: frequent urination (frequency), painful (dysuria), night urination (nocturia). Acute and chronic urinary retention, urgency. Urinary incontinence, bed-wetting (nocturnal enuresis).

Quantitative changes of urine Polyuria, opsuria, oliguria, anuria (prerenal, renal, postrenal). Differential diagnosis.

Qualitative changes in urinary. Urine characteristics: color, clarity, smell, pH, etc. Pyuria, hematuria and their types. Bacteriuria. Hemoglobinuria, myoglobinuria, chyluria, gidatiduriya, pneumaturia. Specific gravity and urine osmolarity. Hyperstenuria, hypostenuria, isostenuria. Proteinuria and its types.

Physical examination. Complains. General examination. Palpation. Percussion. Auscultation. Examination during urination. Digital rectal examination.

Laboratory methods. Common blood count and basic metabolic profile. Urinalysis. Urinemicroscopy. Types of urine specimen. Urine collection in women and children.

Quantitative urine assessment for presence of blood cells: Nechiporenko, Addis-Kakovskomu, Ambyurzhe. Assessment of pyuria and/or hematuria origin (3-glass and 4-glass tests).

Urine culture and sensitivity to antimicrobial drugs.

Biochemical urine assessment. Immunochemical studies of urine proteins.

Urine cytology and its importance in the diagnosis of GU neoplasms.

Evaluation of renal function. 24 hour urine volume. Methods of calculations.

Affecting factors. The dynamic specific gravity: Zimnitskiy's test. Dilution and concentration tests. The concept of "middle molecule". BUN and creatinine. Rehberg-Tareev's test. Provoking tests.

Ultrasonic evaluation (US). GU sonogram. Transrectal US. Stress tests, Doppler use with GU ultrasound. Ultrasound for GU procedures (FNA and core biopsy, cysts and hematoma drainage, US-guided drainage placement).

Radiographic Methods: *KUB (kidney-ureter-bladder X-ray)*. Overview, Indications. Preparation of the patient. Technique. Urogram review: musculoskeletal structures, skeletopy, pathological shadows.

Excretory urography. Indications. Preparation of the patient. Techniques. Infusionurography. The value of upright and supine position. Interpretation. Contraindications. Contrast agents used in urology, classification, doses and routes of administration. Complications and side-effects. First aid in case of complications.

Antegrade ureteropyelography. Percutaneous pyelography or by using a previously inserted nephrostoma. Indications, contraindications, complications. Interpretation. Possible complications and their prevention.

Retrograde ureteropyelography. Indications, contraindications. Technique. Interpretation. Possible complications and their prevention.

Angiography in urology. The basics of the technique. The value of renal angiography as a morphological evaluation of the kidneys. Indications and contraindications for renal arterio - and venography. Possible complications and their prevention. Angiographic signs of tumors, cysts, and other space-occupying lesions. Signs for renal artery stenosis, nephrosclerosis, hydronephrosis.

The principles of endovascular interventions in urology: renal artery and internal iliac artery embolization. Balloon angioplasty. Embolization of testicular, ovarian and adrenal veins.

Cystography. Overview, indications and contraindications. Techniques. Descending, sedimentary, voiding, pneumocystogram. Cystogram in the diagnosis of benign prostatic hyperplasia, tumors, diverticula, bladder stones, bladder tuberculosis. The role of cystogram in neurogenic bladder patients. Aseptics and antiseptics during cystography.

Urethrography. Overview. Classification. Indications, contraindications. Techniques. The role of urethrography in patients with stones, foreign bodies, tumors and lesions of the urethra. Interpretation. Possible complications and their prevention.

Radionuclear diagnostics. *Scintigraphy.* Overview. Types. Isotopes. The role of the kidney scan in the evaluation of renal function. Indications for the dynamic kidney scan (DNSG). Indications for the static kidney scan (SNSG). Contraindications. Pharmacological stress tests. Interpretation.

Renal scan (isotope). Overview. Indications and contraindications for renography. Pharmacological stress testing. Interpretation.

Computed tomography (CT), magnetic resonance imaging (MRI) Overview. Spiral computed tomography. Indications and contraindications. Diagnostic value.

Instrumental and endoscopic evaluation. Instrumental and endoscopic

methods, its possible therapeutic benefits. Catheters, dilators, urostomas: purpose and application technique.

Ureteroscopy. Tools and equipment, implementation. Indications and contraindications for ureteroscopy.

Cystoscopy. Tools and equipment, implementation. Indications and contraindications for cystoscopy. Normal and abnormal cystoscopic findings. Chromocystoscopy. Ureteral catheterization: diagnostic and therapeutic value. Indications and contraindications. Risks and complications of ureteral catheterization.

Uretero-, pyelo-, nephroscopy. Tools and equipment, implementation. Indications and contraindications.

Urodynamics: uroflowmetry, cystomanometry, electromyography studies of pelvic floor muscles. Urethral profilometry. The concept of biofeedback.

Endoscopic urology: Laparoscopy, endoscopy, transurethral resection, endolithotripsy.

Extracorporeal shock wave lithotripsy.

2. Non-specific inflammatory diseases of the genitourinary system. Urgent conditions in urology.

Pyelonephritis. Definition. Classification. Etiology and pathogenesis. Pathways of infection to the kidney. Urine reflux, their types. The role of urine reflux, venous stasis, the immunological status of the body in developing pyelonephritis. Primary and secondary pyelonephritis. Acute and chronic pyelonephritis. Forms of acute pyelonephritis (serous, purulent, necrotizing papillitis).

Clinical aspects and diagnosis of acute pyelonephritis. Signs and symptoms of acute pyelonephritis. Clinical course of the disease with underlying urinary tract obstruction. Diagnosis of acute pyelonephritis. Physical examination. Assessment of fever dynamics, blood and urine lab results. Imaging: ultrasound, renal scan, KUB and excretory urogram, CT, MRI. Endoscopy. Importance of timely diagnosis of acute purulent forms of pyelonephritis.

Treatment of acute pyelonephritis. Principles of treatment of primary and secondary acute pyelonephritis. Treatment of obstructive pyelonephritis. Treatment of acute pyelonephritis in pregnant women. Indications for surgical treatment. Urinary obstruction management: ureteral catheter/stent placement, nephrostomy. Treatment for acute pyelonephritis in patients after surgery. Septic shock. Etiology, pathogenesis, management.

Chronic pyelonephritis. Paraneuritis. Classification of chronic pyelonephritis. Signs and symptoms. Diagnosis. Treatment: the importance of restoring passage of urine, antibacterial therapy. Outcomes of chronic pyelonephritis (secondary nephrosclerosis, pyonephrosis). Etiology and pathogenesis of paraneuritis. Pathology. Signs and symptoms, Diagnosis. Treatment. Prevention.

Cystitis. Classification. Acute and chronic cystitis. Etiology and pathogenesis of cystitis. Pathways of infection into the bladder. Microbial pathogenesis of inflammation in the bladder. Infection types. Risk factors (local and general). Signs and symptoms of cystitis. Diagnosis of acute and chronic cystitis. Features of

symptomatology and diagnosis of cystitis in newborns, school-age children and adolescents. Treatment. Prevention.

Epididymitis. Orchitis. Etiology and pathogenesis. Infection pathways, types. Conservative treatment: anti-bacterial, anti-inflammatory, physical therapy. Surgical treatment. "Acute scrotum": differential diagnosis, treatment strategy.

Urethritis. Etiology and pathogenesis of urethritis. Classification. Types of pathogens: protozoa, bacteria, fungi, chlamydia, mycoplasma, ureoplasma and viruses. Non-infectious urethritis (due to allergens, thermal, chemical, physical injuries, etc.). Specific and non-specific urethritis. Pathology. Signs and symptoms, clinical course. Lab studies. Ureteroscopy. Complications. Treatment of urethritis and complications.

Prostatitis. Classification. Acute and chronic prostatitis. Etiology and pathogenesis. The role of infectious agents in the etiology of the disease. Signs and symptoms. Diagnosis. Prostate biopsy. Treatment. Indications and contraindications to prostate massage. Prognosis of acute and chronic prostatitis. Prostatic abscess. Surgical treatment and drainage of the abscess.

Vesiculitis. Etiology and pathogenesis. Classification. Clinical signs, diagnosis and treatment.

Balanitis. Balanoposthitis. Etiology and pathogenesis. Causes of chronic infection. Diagnosis. Treatment. Phimosis as a cause of balanoposthitis. Hygiene in newborns, children and adolescents, adult men.

Rare nonspecific inflammatory diseases. Paracystitis. Ormond's disease. Cavernitis. Fournier's disease. Etiology and pathogenesis. Signs and symptoms. Diagnosis. Treatment.

Principles of medical treatment diseases of the genitourinary system. Complications of antibiotic therapy in urological patients. *Curation of patients with inflammatory diseases of the genitourinary system:* collection of complaints and history of the disease, physical examination, drawing up a survey plan, interpretation of laboratory and instrumental survey results, diagnosis, substantiation of indications for surgical intervention. Writing a medical history.

3. Urolithiasis

Etiology. Pathogenesis. History. Incidence. Prevalence in different geographic areas in the World and the Republic of Belarus. Age-specific and location-specific incidence in men and women.

Etiology and pathogenesis. Theories of stone formation. The role of lymphatic drainage, infection, obstruction, pH, pyelonephritis, necrotizing papillitis, metabolic disorders, hyperparathyroiditis, prolonged immobilization, liver and GI dysfunction, geographic eating habits, water intake habits.

Pathology (changes in the kidney due to obstruction). Stone chemical composition. Classification. Pathological anatomy. Changes in kidneys and urinary tract due to obstruction (total or partial) with underlying hydronephrosis, pyelonephritis or chronic renal failure.

Morphology and chemical composition of the stones (urates, phosphates, carbonates, oxalates, cystine, cholesterol and protein stones).

Kidney and ureter stones. Signs and symptoms. Changes in the kidneys and urinary tract. Diagnosis.

Renal colic. Differential diagnosis. Etiology and pathogenesis of renal colic. The role of upper urinary tract obstruction in pathogenesis of renal colic. Signs and symptoms. Diagnosis. Differential diagnosis with acute abdominal diseases, neurological diseases, cardiovascular diseases. Diagnostic value of urinalysis, CBC, renal US, KUB, isotope renography. Complications (acute pyelonephritis or exacerbation of chronic pyelonephritis, hydronephrosis, etc.). Medical treatment: thermal procedures, use of drugs, novocaine blockade, stenting (external and internal), nephrostomy.

Diagnosis and treatment. Prevention of stone formation. Ultrasound, X-rays, CT, MRI, DNSG, isotope renography (RWG). Indications and contraindications for conservative treatment. Principles of facilitating stone passage and stone dissolving therapy. Surgical treatment. Extracorporeal and contact lithotripsy, stone extraction, and open surgery. Indications and contraindications. Surgical treatment for staghorn calculi, bilateral nephrolithiasis, single kidney stones. Repeated surgical procedures. Rehabilitation. Prevention of new stone formation.

Bladder and urethral stones. Primary and secondary. Role of urinary obstruction and infection. Signs and symptoms. Diagnosis (ultrasound, endoscopy and X-Ray). Treatment. Surgical treatment. Indications and contraindications. Prevention of new stone formation.

Curation of patients with urolithiasis: collection of complaints and anamnesis of the disease, physical examination, drawing up of a survey plan, interpretation of laboratory and instrumental survey results, diagnosis, substantiation of indications for operative intervention, drawing up an operative intervention plan. Postoperative management of the patient. Writing a medical history.

4. Genitourinary tract anomalies. Nephroptosis. Penile and urethra anomalies. Anomalies and diseases of the scrotum organs.

Incidence. Embryology. Clinical significance of renal anomalies – changes in urodynamic and hemodynamics. Diagnostic and management errors.

Types of renal anomalies. Quantitative anomalies (agenesis, aplasia, extra kidney), abnormal size - hypoplasia (single and double), abnormal location - dystopia (thoracic, lumbar, hip, pelvic, cross), relationship anomalies (horseshoe, fused kidney, L-shaped, S-shaped kidney), structural anomalies - polycystic, solitary cyst, multicystic kidney, sponge kidney, renal dysplasia, polimegakalikosis. Diagnosis: physical examination, ultrasound, NSG, RWG, functional tests, X-ray, renal angiography, CT, MRI. Treatment.

Hydronephrosis. Etiology and pathogenesis. Pathological anatomy. Classification. Signs and symptoms. Diagnosis (ultrasound, DNSG, CT, MRI, X-ray). Pharmacodynamic tests. Surgical treatment. Nephrectomy. Indications. Follow ups.

Vesicoureteral reflux. Etiology and pathogenesis. Pathological anatomy. Classification. Signs and symptoms. Diagnosis (voiding cystogram, ultrasound, SNSG, CT, MRI). Surgical treatment: endoscopic, laparoscopic and open approach.

Principles of surgical treatment. Indications. Follow ups.

Megaureter (neuromuscular ureteral dysplasia). Definition. Classification. Signs and symptoms. Diagnosis. Indications for medical and surgical treatment.

Other ureteral anomalies: double ureter (complete or incomplete), ectopic ureter, ureterocele, retrocaval ureter.

Bladder anomalies. Agenesis, extrophy, bladder diverticula, double bladder. Patents urachus. Diagnosis: physical exam, ultrasound, x-ray, cystoscopy.

Infravesical obstruction. Bladder neck contracture (Marion's disease). Congenital urethral valves (classification). Signs and symptoms. Diagnosis. Treatment.

Nephroptosis. Signs and symptoms (pain, hematuria, hypertension, asthenoneurotic syndrome). Diagnosis (Signs and symptoms, ultrasound, X-ray, CT). Treatment. Surgical treatment. Indications.

Anomalies of the urethra and penis. Hypospadias. Definition. Etiology and pathogenesis. Classification. Signs and symptoms. Diagnosis. Treatment. Surgical correction. Hypospadias and hermaphrodite in newborns. Emergency sex determination. Genetic analysis. Epispadias. Definition. Etiology and pathogenesis. Classification. Signs and symptoms. Diagnosis. Treatment. Surgical correction. Penile anomalies: phimosis, short frenulum, double penis, micropenis, curvature of the penis, hidden penis.

Scrotal anomalies. Cryptorchidism. Definition. Etiology and pathogenesis. Classification. Signs and symptoms. Diagnosis. Hormonal profile. Treatment (medical and surgical). Indications for surgical treatment. Future fertility. Complications of cryptorchidism. Monorchism, Anorchia. Diagnosis. Hormone therapy.

Other diseases of the scrotum. Varicocele: definition, etiology and pathogenesis, classification, diagnosis (physical and instrumental examination, hormonal profile research), treatment (conservative and operative), indications for surgical treatment. Hydrocele: definition, etiology and pathogenesis, classification, diagnosis (physical and instrumental examination), treatment.

Curation of patients with diseases of the scrotum: collection of complaints and history of the disease, physical examination, drawing up a survey plan, interpreting the results of laboratory and instrumental methods of examination, diagnosing, substantiation of indications for surgical intervention, drawing up an operative intervention plan, assisting in operations on the scrotum, postoperative management the patient. Writing a medical history.

5. Injuries of the urogenital system

Kidney injury. Closed and open renal damage, pathogenesis, classification, diagnosis. The value of determining the functional state of the contralateral kidney. Treatment for the kidney trauma: conservative and operative. Possible late complications of the kidney injuries.

Injuries of the bladder. Closed and open bladder damage, classification. Pathogenesis of extraperitoneal and intraperitoneal ruptures of the bladder. Combined trauma, classification of the bladder injuries, diagnostic significance of ultrasound,

cystography and excretory urography. Symptoms, diagnosis, treatment of the bladder trauma. Damage of the bladder during labor, gynecological operations, instrumental research. Diagnosis, treatment for bladder injuries.

Damage of the ureters: etiology and pathogenesis, classification, methods of early diagnosis, treatment, dispensary observation.

Injuries of the urethra and penis: pathogenesis, injury mechanism, simple and combined injuries, classification, clinical symptomatology, diagnosis. The significance of ascending urethrography. Consequences of urethral trauma: early and late complications. Structures of the urethra, their diagnosis and treatment. Injuries of the penis. The most frequent mechanisms of penile trauma. Bruise, bite, "fracture", infringement of the penis. Clinical picture, treatment of injuries of the penis.

Curation of patients with traumas of the genitourinary system: collection of complaints and history of the disease, physical examination, drawing up a survey plan, interpretation of the results of laboratory and instrumental examination methods, diagnosis, substantiation of indications for operative intervention, postoperative management of the patient. Writing a medical history.

6. Genitourinary neoplasms

Renal and ureter neoplasms. Incidence. Etiology and pathogenesis. Classification: neoplasm of the renal parenchyma, renal pelvis and ureter. Benign neoplasms of the kidney and ureter: adenoma, fibroma, lipoma, angioliipoma, hemangioma, myxoma, dermoid cyst. Malignant neoplasm: adenocarcinoma, sarcoma, Wilms tumor. TNM classification. Metastatic spread.

Renal signs and symptoms (hematuria, pain, palpable mass, varicocele) and extrarenal symptoms (cachexia, polycythemia, anemia, hypo- and dysproteinemia). Neoplastic syndrome. Features of papillary cancer of renal pelvis and ureter. Hematuria in renal and ureter neoplasms.

Significance of renal ultrasound in the diagnosis. X-ray. Diagnostic value of CT, MRI, renal angiography in detecting renal cancer and its metastases.

Treatment for renal cell carcinoma, Wilms' tumor, papillary carcinoma of the renal pelvis. Surgical treatment. Radiation therapy and chemotherapy. Prognosis. Clinical follow-up of patients with malignant neoplasms of the kidneys, ureters.

Bladder neoplasms. Incidence. Etiology and pathogenesis. TNM classification. Precancer. Occupational risk factors in etiopathogenesis. Metastatic spread.

Signs and symptoms and clinical course. Diagnosis of the bladder neoplasms: ultrasound, cystoscopy, photodynamic diagnostic, biopsy, IVP, cystogram, sediment samples, pericystogram, venogram, lymphogram, angiogram, CT, MRI.

Treatment of bladder neoplasms (surgical, radiation, chemotherapy, combined, use of vaccines). Surgical treatment: endoscopic, open surgery. Indications. Short and long-term results. Follow ups.

Neoplasms of urethra in men and women. Classification. Signs and symptoms. Diagnosis. Treatment.

Penile neoplasms. Incidence. Classification. The role of phimosis and recurrent balanitis in etiopathogenesis of penile cancer. Signs and symptoms. Diagnosis. Treatment. Prevention.

Testicular tumors. Role of testicular injury and testicular ectopia in ethiopathogenesis. Timely surgical treatment for cryptorchidism as a prevention for testicular cancer. Incidence. Classification. Metastatic spread. Diagnosis. Differential diagnosis with space-occupying scrotal lesions (epidimitis, hydrocele, hematoma). Combined treatment: surgical, radiation therapy, and chemotherapy.

Curation of patients with neoplasms of genitourinary organs: collection of complaints and anamnesis of the disease, physical examination, drawing up a survey plan, interpretation of laboratory and instrumental survey results, diagnosis, substantiation of indications for surgical intervention, planning operative intervention, postoperative management of the patient. Writing a medical history.

7. Benign prostatic hyperplasia (BPH)

Age-specific incidence. Etiology and pathogenesis. Pathology of BPH. Clinical course. Urinary retention (ischuria). Ischuria types. First aid in acute urinary retention. Signs and symptoms (irritative, obstructive). Diagnosis. Grading scales IPSS and QOL. Differential diagnosis of BPH with chronic prostatitis, prostate cancer, urethral strictures, bladder neoplasms, bladder neck sclerosis. Phasic flow BPH. Signs and symptoms in different stages.

Conservative treatment of BPH. Types of surgical treatment of BPH. Indications and contraindications for various types of conservative treatment of BPH. Indications and contraindications for surgical treatment of BPH. Complications of BPH, prevention of complications. Follow ups of patients with BPH.

Curation of patients with BPH: collection of complaints and the history of the disease, the physical examination, the preparation of a survey plan, the interpretation of the results of laboratory and instrumental methods of examination, diagnosis, substantiation of indications for surgical intervention, drawing up an operative intervention plan, assisting in the implementation of adenomectomy, postoperative management of the patient. Writing a medical history.

8. Prostate cancer (PCa)

Incidence. Etiology and pathogenesis. Pathological anatomy. Prostatic intraepithelial neoplasia (PIN). Classification. Clinical course. Metastatic spread and types of metastasis. Diagnosis. Multifocal prostate biopsy. Differential diagnosis (BPH, chronic prostatitis, prostatic abscess, prostate and bladder stones, prostate tuberculosis, bladder neoplasms). Medical treatment. General principles and complications of hormone therapy. Primary and secondary hormone resistance. Indications for surgical treatment. Short and long-term results. PCa screening.

Curation of patients with PCa: collection of complaints and the history of the disease, physical examination, drawing up a survey plan, interpretation of the results of laboratory and instrumental examination methods, diagnosis, substantiation of indications for surgical intervention, planning operative intervention, postoperative management of the patient. Writing a medical history.

**EDUCATIONAL DISCIPLINE CURRICULAR CHART "UROLOGY"
FOR SPECIALTIES 1-79 01 01 "GENERAL MEDICINE"**

Section, chapter, topic	Section (topic) name	Number of class-hours		Self-studies	Form of control
		lectures	Practical		
1	INTRODUCTION TO THE DISCIPLINE "UROLOGY". SIGNS AND SYMPTOMS OF GENITOURINARY DISEASES. PHYSICAL EXAMINATION	2	5	3	Interviewing; tests; a follow-up survey; reports on classroom practical exercises with their oral defence; electronic tests.
2.	NON-SPECIFIC INFLAMMATORY DISEASES OF THE GENITOURINARY SYSTEM. URGENT CONDITIONS IN UROLOGY.	1	6	4	Interviewing; tests; a follow-up survey; test; abstracts; reports on classroom practical exercises with their oral defence; reports on home practical exercises with their oral defence; electronic tests.
3.	UROLITHIASIS	1	6	4	Interviewing; tests; a follow-up survey; test; abstracts; reports on classroom practical exercises with their oral defence; reports on home practical exercises with their oral defence; electronic tests.
4.	ANOMALIES OF THE KIDNEYS AND URINARY TRACT. NEPHROPTOSIS. PENILE AND URETHRA ANOMALIES. ANOMALIES AND DISEASES OF THE SCROTUM ORGANS		6	10	Interviewing; tests; a follow-up survey; test; abstracts; reports on classroom practical exercises with their oral defence; reports on home practical exercises with their oral defence; electronic tests.
5.	INJURIES OF THE UROGENITAL SYSTEM	2	6	4	Interviewing; tests; a follow-up survey; test; abstracts; reports on classroom practical exercises with their oral defence; reports on home practical exercises with their oral defence; electronic tests.
6.	GENITOURINARY NEOPLASMS	1	6	4	Interviewing; tests; a follow-up survey; test; abstracts; reports on home practical exercises with their oral protection;

Section, chapter, topic	Section (topic) name	Number of class-hours		Self-studies	Form of control
		lectures	Practical		
7.	BENIGN PROSTATIC HYPERPLASIA	1	5	4	electronic tests. Interviewing; tests; a follow-up survey; test; abstracts; reports on classroom practical exercises with their oral defence; reports on home practical exercises with their oral defence; electronic tests.
8.	PROSTATE CANCER		5	4	Interviewing; tests; reports on home practical exercises with their oral defence; electronic test; final test; credit.

Information and methodological List

LITERATURE

Summary:

1. Urology: a textbook for students of institutions of higher education in the specialties "General Medicine", "Pediatrics" / [A.V.Strotsky and others]; Ed. A.V.Strotsky. - Minsk: New knowledge, 2016. - 223 p.

Additional

2. Lopatkin, N.A. Urology: textbook / N.A. Lopatkin [and others]. Moscow: Medicine, 2014. 496 p.

3. Pugachev, A.G. Children's urology: a guide for doctors / A.G.Pugachev. Moscow: Georat-Media, 2009. 822 p.

4. Urology / under. Ed. Yu.G.Alyaeva. M.: Medical News Agency, 2005. 640 pp.

5. Campbell-Walsh Urology. – 10th ed. / editor-in-chief, Alan J. Wein; editors, Louis R. Kavoussi, [et al.], 1600 John F. Kennedy Blvd. Ste 1800 Philadelphia, PA 19103-2899, 2012. - 3831 p.

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LIST OF AVAILABLE DIAGNOSTIC METHODS

The following forms are used to diagnose competencies:

1. Oral form:

- interview.

2. Written form:

- tests;
- control polls;
- test papers;
- abstracts.

3. Oral and written form:

- oral reports on classroom practical exercises with their oral defence;
- oral reports on home practical exercises with their oral defence;
- final test;
- credit.

4. Technical form:

- electronic tests.

LIST OF PRACTICAL SKILLS

- Catheterization of the bladder with an elastic catheter for acute urinary retention;
- Suprapubic urinary bladder puncture with acute urinary retention and impossibility of catheterization with an elastic (metal) catheter;
- Palpation of the patient's kidneys in a prone position;
- Palpation and percussion of the bladder;
- Palpation of the scrotum;
- Digital rectal examination of the prostate;
- Examination of patients with renal colic, acute urinary retention, macrohematuria, acute renal failure, anuria, injuries of urogenital organs, acute obstructive pyelonephritis, "acute scrotum" syndrome;
- Care for patients with total incontinence, constant cystostomy, nephrostomy, uretherokutaneostomy, urinary retention syndrome requiring systematic catheterization of the bladder;
- Registration of medical documentation for patients with urological diseases

LIST OF ACCESSORY STUDY MATERIALS

1. Tables, posters and slides, methods of diagnostics (X-ray, CT, MRI etc.).
2. Surgical sets
3. Nephrostomy and cystostomy sets. Catheters, dilators, stents.
4. Diagnostic and operative cystoscopes.
5. DVD, video with various urologic procedures and surgeries. Topic presentations.
6. Patient's chats
7. Computer tests.

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Curriculum content, design and accompanying documents comply with established requirements.

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