

**MINISTRY OF SCIENCE AND HIGHER EDUCATION  
RUSSIAN FEDERATION**

**FEDERAL STATE AUTONOMOUS EDUCATIONAL INSTITUTION OF  
HIGHER EDUCATION  
NORTH-CAUCASUS FEDERAL UNIVERSITY**

Methodological Guidelines  
for Students on arranging and performing independent work  
in the Discipline of "UROLOGY"  
for Students majoring (Specialty) in 31.05.01 General Medicine

## INTRODUCTION

The objective of this course is to equip learners with knowledge of the fundamental symptoms and syndromes of urological diseases, as well as the principles of a urologist's practice, communication skills with patients in accordance with professional ethics, and the ability to select optimal diagnostic methods and preventive strategies for the most common urological conditions.

The objectives of this discipline are:

- 1) to equip students with theoretical knowledge of the fundamental aspects of urology;
- 2) to teach students essential diagnostic methods for urological diseases—including laboratory, instrumental, radiological, and other techniques necessary for accurate diagnosis;
- 3) to train students in recognizing urological conditions during patient examinations.
- 4) Training students in providing care to urological patients during acute emergencies such as acute urinary retention, renal colic, and anuria;
- 5) Training students in selecting optimal conservative and surgical treatment approaches for the most common urological disorders.

### Methodological Recommendations for Studying Theoretical Material

When performing the independent study of theoretical material, the student must follow the rules as set below. The working curriculum of the respective academic discipline shall be recommended to be used as the basis for such activity. According to the schedule of classroom lessons and independent work, a different number of hours is to be allocated for studying individual topics. A significant portion of the student's independent work should be allocated to mastering the material on the covered topic, writing a summary (notes) on the specified theoretical blocks, and searching for additional literature based on the NCFU library and via the Internet system. The lecture material shall not cover all theoretical material; the greater part of it must be mastered through independent work. Given the above, working with the recommended literature is mandatory. Special attention must be paid to the content of the main provisions and conclusions, the explanation of phenomena and facts, and the understanding of the practical application of the theoretical issues under consideration. In the process of this work, the student should strive to understand and memorize the main provisions of the material being considered, the examples illustrating it, as well as to understand the illustrative material. Preparation should be completed by drawing up a plan (summary/notes) on the material (issue) being studied. This allows for the creation of a concentrated, concise representation of the issues being studied. First, studying the recommended literature is to be done. Special attention must be paid to the content of the main provisions and conclusions, the explanation of phenomena and facts, and the understanding of the practical application of the theoretical issues under consideration.

During this work, the student should strive to understand and memorize the main provisions of the material being considered, the examples illustrating it, as well as to understand the illustrative material. Preparation should be completed by drawing up a plan (summary/notes) on the material (issue) being studied. This allows for the creation of a concentrated, concise representation of the issues being studied. If necessary, one should seek (advice) consultation from the instructor. When going to a consultation, it is necessary to thoroughly think through the questions that require clarification. Keeping records contributes to turning reading into an active process, mobilizing motor memory along with visual memory. The following should be born in mind: a student who systematically keeps records creates their own individual stock of auxiliary materials for a quick review of what has been read and for the mobilization of accumulated knowledge. Records are especially important and useful when they reflect the thoughts that arose during independent work.

It is important to develop the students' capacity to compare sources and to think through the material being studied.

Improving note-taking skills among students is of great importance.

The instructor may recommend the following main forms of recording to students: a plan (simple and detailed), excerpts, and theses (abstracts).

The results of note-taking can be presented in various forms.

- A plan is an outline of the read material, a brief (or detailed) list of questions reflecting the structure and sequence of the material.
- A detailed plan fully replaces a summary.
- A summary (notes) is a systematized, logical presentation of the source material. Four types of summaries are distinguished:
  - Outline-summary (Plan-notes) – this is an expanded, detailed plan in which sufficiently detailed records are provided for those points of the plan that need explanation.
  - Textual summary – this is the reproduction of the most important provisions and facts of the source.
  - Free summary – these are clearly and briefly formulated (stated) main provisions resulting from a deep understanding of the material. It may contain excerpts, quotations, and theses; part of the material may be represented by a plan.
  - Theme-based summary – this is compiled on the basis of studying a number of sources and gives a more or less exhaustive answer according to a certain scheme (issue).

### **Methodological Guidelines for the Preparation for Practical Activities**

When preparing for practical activities, the recommendation implies studying the control questions for the given lesson and the theoretical material from one's own notes.

The main form of work during the lessons is an interview (discussion). Each student must be ready to speak on all issues raised in the plan and demonstrate maximum activity during their consideration.

The speech must be constructed freely, convincingly, and with arguments. The instructor ensures that the speech is not reduced to a reproductive level (simple reproduction of the text); simple reading of the summary is also not allowed.

It is necessary for the speaker to show their own attitude towards what they are talking about, express their personal opinion and understanding, substantiate it, and be able to draw the correct conclusions from what has been said. In doing so, the student may refer to the entries in the summary, directly to the primary sources, use knowledge of previously studied disciplines, etc. In addition, to obtain a grade at an advanced level, students solve situational tasks based on the results of the mastered topics.

During the execution of practical works, a defense of practical skills is provided, the full list of which is specified in the fund of assessment tools.

### **Methodological Recommendations for the Preparation of Presentations and Reports**

The report must contain elements of novelty; along with the fundamental aspect, an analysis of the current state of the problem under study must be carried out, as well as inclusion in regional issues. The report must include an introduction, a theoretical part, a conclusion, a list of literature, and a presentation that reveals the essence of the topic in graphs, pictures, diagrams, and formulas.

The report is recommended to be submitted on 1 printed sheet. The text of the work must be printed with 1.5 line spacing on one side of a standard sheet (A4) of white paper.

The text and other printed elements of the work must be black, and the contours of letters and signs must be clear, without halos and shading. The font must be Times New Roman, size 14. The titles of chapters and paragraphs are highlighted in bold. The sheet with text must have margins: left – 30 mm, right – 10 mm, top – 20 mm, bottom – 20 mm.

Page numbering of the text is done in the lower right corner of the sheet. It is necessary to number pages starting from the page where the Introduction is printed, on which the number 3 is placed. After that, all pages, including appendices, are numbered.

A space equal to two intervals is placed between the title of the chapter and the title of the paragraph of this chapter, and the title of the paragraph must not be separated from the text of this paragraph by a space. The titles of paragraphs shall be separated from the text of the previous paragraph by a space equal to two intervals. Each chapter, as well as the introduction, conclusions, appendices, and the list of used literature, begin on a new page. The word Chapter is not to be written. Chapters have ordinal numbers within the entire work, designated by Arabic numerals (for example: 1, 2, 3), followed by a period.

The word **PARAGRAPH** or the paragraph symbol (§) is not placed in the title. Paragraphs have ordinal numbers within the chapters, designated by Arabic numerals (for example: 1.1. and 1.2.).

Headings of chapters and paragraphs in the text must be centered; a period shall not be placed at the end of the title of the chapter and paragraph. It is not allowed to hyphenate (transfer) a part of a word in a heading. 4.5. The numbering of tables and figures can be running (continuous) or relate to the number of the chapter and paragraph. For example, if a table or a figure is included in the text of the first paragraph of the second chapter, the numbering is as follows: Table 2.1.1., Fig. 2.1.1.

The last digit means the ordinal number of the table (or figure) in this paragraph.

The table is to be placed as the next page after the first mention of it in the text.

#### **Recommended Literature. Main References:**

1. Osipova, O. V. Urology: Textbook / O. V. Osipova. – 2nd ed. – Saratov: Nauchnaya kniga, 2019. – 159 pp. – ISBN 978-5-9758-1796-9. – Text: electronic version // Digital Educational Resource IPR SMART: [website]. URL: <https://www.iprbookshop.ru/81085.html> ;
2. Complete Handbook for Urologists / O. V. Ananyeva, V. N. Shilov, A. V. Kudryavtseva [et al.]. – Saratov: Nauchnaya kniga, 2019. – 732 pp. – ISBN 978-5-9758-1837-9. – Text: electronic format // Digital educational resource IPR SMART: [website]. URL: <https://www.iprbookshop.ru/80179.html> .

#### **Additional literature:**

1. Alekseev, B. Ya. Clinical Oncourology: Monograph / B. Ya. Alekseev, M. I. Volkova, N. V. Vorobyev. – Moscow: ABV-Press, 2011. – 934 pp. – ISBN 978-5-903018-23-9. – Text: electronic format // Digital educational resource IPR SMART: [website]. – URL: <https://www.iprbookshop.ru/9906.html>
2. Nechiporenko, N. A. Acute Urological Conditions: A Textbook. Minsk: Higher School Press, 2012. – 400 pp. – ISBN 978-985-06-2093-4. – Text: electronic format // Digital educational resource IPR SMART: [website]. – URL: <https://www.iprbookshop.ru/20232.html>
3. Organization of a series of practical courses in urology and their content covering both general and specific areas of the specialty for fourth-and fifth-year medical students. Part 1: Teaching and Methodological Manual / Authors: D. V. Svirenko et al., edited by V. S. Tarasenko. – Orenburg: Orenburg State Medical Academy, 2011. – 107 pp. – Text: electronic // Digital Educational Resource IPR SMART: [website]. URL: <https://www.iprbookshop.ru/31829.html>

#### **Internet resources:**

1. <http://rudocor.net> / – Medical portal;
2. <http://www.e-reading.club> / – Large online library;
3. <https://dic.academic.ru> / – Dictionaries and encyclopedias;
4. <https://roszdravnadzor.gov.ru> / – Federal Service for Healthcare Supervision;
5. <https://www.rmj.ru> / Russian Medical Journal

**MINISTRY OF SCIENCE AND HIGHER EDUCATION  
RUSSIAN FEDERATION**

**FEDERAL STATE AUTONOMOUS EDUCATIONAL INSTITUTION OF  
HIGHER EDUCATION  
NORTH-CAUCASUS FEDERAL UNIVERSITY**

Methodological Guidelines  
for Students on arranging and performing independent work  
in the Discipline of "UROLOGY"  
for Students majoring (Specialty) in 31.05.01 General Medicine

## INTRODUCTION

The objective of this course is to equip learners with knowledge of the fundamental symptoms and syndromes of urological diseases, as well as the principles of a urologist's practice, communication skills with patients in accordance with professional ethics, and the ability to select optimal diagnostic methods and preventive strategies for the most common urological conditions.

The objectives of this discipline are:

- 6) to equip students with theoretical knowledge of the fundamental aspects of urology;
- 7) to teach students essential diagnostic methods for urological diseases—including laboratory, instrumental, radiological, and other techniques necessary for accurate diagnosis;
- 8) to train students in recognizing urological conditions during patient examinations.
- 9) Training students in providing care to urological patients during acute emergencies such as acute urinary retention, renal colic, and anuria;
- 10) Training students in selecting optimal conservative and surgical treatment approaches for the most common urological disorders.

### Topic 1. Methods of investigating urological patients.

1. Pain in urology: definition; types classified by location, radiation pattern, and intensity; causes of pain; renal colic: etiology, pathogenesis, and progression; pain associated with genitourinary disorders.
2. Urinary dysfunction (dysuria): polyuria, stranguria, nocturia, etc.; types of urinary retention: acute, chronic, paradoxical; types of urinary incontinence: stress-induced, urge-type, mixed, paradoxical. Enuresis.
3. Changes in urine: qualitative and quantitative alterations.
4. Pathological discharge from the urinary tract: pus, blood, semen, prostatic fluid, etc.
5. Diagnosis of urological diseases: General clinical and laboratory examination methods; radiological techniques—including contrast urography, excretory urography, retrograde ureteropyelography, anterograde pyelography, ascending and descending cystography; voiding cystography; ascending and descending ureterography; arteriography; computed tomography (CT); multi-slice computed tomography; radioisotope imaging; and ultrasonography.
6. Magnetic resonance imaging (MRT).
7. Instrumental diagnostic methods in urology: urethral and vesicoureteral catheterization, urethral stimulation, cystoscopy, chromocystoscopy, urethroscopy, pyeloureteroscopy, nephroscopy (intraoperative).
8. Anomalies of the upper and lower urinary tracts and genital organs: kidneys, ureters, bladder, urethra. Statistics, clinical manifestations, diagnosis and differential diagnosis, diagnostic and tactical errors, correction of abnormalities of the scrotal organs. Anorchism, monorchism, polyorchism. Testicular Hypoplasia: Clinical Presentation, Diagnosis, Treatment; Cryptorchidism: Types and Forms, Causes of This Abnormality, Clinical Management, Diagnosis, Treatment; Testicular Ectopia: Clinical Presentation, Diagnosis, Treatment; Genital Organ Abnormalities: Congenital Phimosis, Clinical Management, Paraphimosis, Complications, Treatment; Shortening of the Penile Cord: Clinical Presentation, Treatment.

### Topic 2. Inflammatory Diseases of the Urinary Tract

1. Pyelonephritis – acute and chronic forms; classification, etiology, pathogenesis, clinical manifestations, diagnosis, and treatment.
2. Paraneuritis – classification, clinical features, diagnosis, and treatment.
3. Cystitis – etiology, pathogenesis, classification, symptoms, course, diagnosis, treatment, and prevention.

4. Urethritis – etiology and pathogenesis; classification; clinical course and symptomatology; diagnostic methods (clinical and bacteriological). Treatment of urethritis and its complications.
5. Prostatitis, epididymitis, orhoepididymitis: Etiology and pathogenesis; Classification; Symptoms and diagnosis; Treatment options: conservative and surgical approaches; Indications for surgery.

### **Topic 3. Urolithiasis.**

1. Urolithiasis (UL). Prevalence in children, etiology and pathogenesis of UL; significance of exogenous and endogenous factors in its etiology; modern theories of stone formation mechanisms: 1) hyper saturation leading to crystallization; 2) matrix theory; 3) absence of crystallization inhibitors (protective colloids, pyrophosphates); radiological characteristics of urinary calculi. Clinical manifestations. Pathogenesis of renal colic and its clinical presentation; differential diagnosis from surgical disorders. Diagnosis and treatment of renal colic. Conservative management of renal colic. Surgical treatment in children: types of procedures, indications, and contraindications. Lithotripsy: types, indications, and contraindications for its use.
2. Hydronephrosis and ureteral hydronephrosis: Definition and pathogenic mechanisms of hydronephrosis and ureteral hydronephrosis; primary and secondary hydronephrosis. Causes of hydronephrotic transformation and ureterohydronephrosis; their clinical manifestations. Diagnostic methods and differential diagnosis. Indications for surgical treatment of hydronephrosis. Principles and types of plastic surgeries for hydronephrosis. Surgical correction of ureterohydronephrosis.

### **Topic 4. Tumors of the urogenital system.**

1. Prostatic adenoma: Etiology and pathogenesis; Pathogenesis and disease progression stages of prostatic adenoma; Clinical manifestations at various stages; Complications of prostate adenoma; Diagnosis: digital rectal examination, radiographic methods, ultrasound; Measurement of prostate-specific antigen; Differential diagnosis; Conservative treatment. Surgical treatment: single-stage and two-stage adenomectomy; indications and contraindications. Transurethral electroresection of the prostate adenoma. Complications and their prevention.
2. Prostate cancer: Etiology; Stages according to the TNM classification; Routes of metastasis for prostate tumors; Clinical manifestations of prostate cancer; Diagnosis; Data obtained from medical history and digital rectal examination; Prostate biopsy. The role of prostate-specific antigen (PSA) and transrectal ultrasound in the diagnosis and dynamic monitoring of prostate cancer progression, as well as in evaluating treatment efficacy. Differential diagnosis of prostate cancer. Treatment options include prostatectomy, radiotherapy, transurethral electroresection, brachytherapy, and estrogen therapy.
3. Testicular tumors: Pathoanatomical characteristics of benign and malignant testicular tumors; classification according to the TNM system. Etiology of the disease; Metastasis; Clinical manifestations; Diagnosis: radiographic examination, ultrasound, CT scan; Differential diagnosis of space-occupying lesions in the scrotum; Treatment: surgical intervention, radiation therapy, and chemotherapy.
4. Bladder tumors: Etiology and pathogenesis; Pathological anatomy; Benign and malignant bladder tumors; Classification of bladder cancer by stages adopted by the International Union Against Cancer; Metastasis. Symptoms and clinical course; Diagnosis; The role of cystoscopy in diagnosing bladder cancer; Cytological examination of urine sediment; Biopsy of bladder tumors; Excretory urography, descending cystography, ascending cystography, sedimentary cystography; combination of cystography with pericistography and tomography; polycystography; Diagnostic capabilities of ultrasound scanning and computed tomography in bladder cancer diagnosis. Emergency treatment and types of surgeries; radiation therapy,

chemotherapy, and laser therapy; the role of endoscopic surgery in the treatment of bladder cancer and its indications;

5. Kidney tumors: benign and malignant kidney tumors; tumors of the renal parenchyma and renal pelvis; the modern international classification of kidney tumors (TNM); metastasis of kidney tumors. Diagnosis: Ultrasonography; radiological diagnostics including excretory urography, retrograde pyelography, and computed tomography (CT). Diagnostic capabilities of renal angiography. Radioisotope methods for diagnosing kidney tumors and their metastases. Treatment: Radiation therapy, hormone therapy, chemotherapy, and immunotherapy. Surgical approaches for hypernephroid renal cell carcinoma and papillary renal cell carcinoma. Prognosis of treated patients. Embolization therapy for renal cancer.

6. Genital tract cancer: Etiology. The role of phimosis and balanopostitis in the development of penile cancer: Clinical manifestations, diagnosis, metastasis, and treatment principles.

### **Topic 5. Primary Insufficiency**

1. Renal Insufficiency (RI): Etiology, pathogenesis, clinical manifestations and diagnosis, classification; principles of conservative treatment; hemodialysis using an artificial kidney device – indications and working principle; application of peritoneal, gastric, and intestinal dialysis; hemofiltration; hemodiafiltration; separate ultrafiltration; hemosorption; plasma exchange; plasma sorption.

2. Chronic Renal Insufficiency (CRI): Etiology and pathogenesis; stages and clinical manifestations; clinical features; diagnosis. Emergency treatment for patients in the terminal stage of chronic renal failure; Indications for hemodialysis and peritoneal dialysis; Complications; Kidney transplantation; Indications and contraindications for kidney transplantation; Donor selection and recipient preparation; Postoperative management and the use of modern immunosuppressive agents; Complications and their management.

### **Topic 6. Trauma of the Urinary Tract Organs**

1. Kidney injuries: Classification, symptoms, diagnosis, and diagnostic methods (radiographic techniques: excretory urography, retrograde pyelography, arteriography; radiotracer and ultrasonic imaging). Treatment: Conservative and surgical approaches based on indications; iatrogenic kidney injuries.

2. Bladder trauma: Classification; mechanisms of bladder injury; clinical manifestations of bladder injuries and potential complications. Diagnosis: examination, palpation, percussion, instrumental diagnostic methods, radiography, ultrasonography. Procedures performed. Treatment. Characteristics of surgical interventions for intraperitoneal and extraperitoneal bladder ruptures. Methods of drainage of the bladder and paravesical tissue.

3. Injuries to the male urinary tract. Classification. Mechanisms of injury in various segments of the urethra following trauma. Symptoms. Complications. Diagnosis. Ascending urethrography: its advantages and diagnostic value. Surgical treatment: episciotomy, drainage of hemorrhages, primary urethral suture. Post-traumatic urethral strictures. Clinical presentation; Diagnosis; Treatment. Plastic surgeries for urethral strictures: Holtsv's method and Solovov's method; buccal plastic surgery; forced urethral tunneling; internal optical urethrotomy – their characteristics and long-term outcomes.

4. Injuries to the scrotal organs (closed and open types); treatment includes conservative and surgical approaches (orchidectomy, testicular removal). Testicular torsion: etiology, symptoms, diagnosis, treatment

### **Recommended Literature. Main References:**

3. Osipova, O. V. Urology: Textbook / O. V. Osipova. – 2nd ed. – Saratov: Nauchnaya kniga, 2019. – 159 pp. – ISBN 978-5-9758-1796-9. – Text: electronic version // Digital Educational Resource IPR SMART: [website]. URL: <https://www.iprbookshop.ru/81085.html> ;
4. Complete Handbook for Urologists / O. V. Ananyeva, V. N. Shilov, A. V. Kudryavtseva [et al.]. – Saratov: Nauchnaya kniga, 2019. – 732 pp. – ISBN 978-5-9758-1837-9. – Text: electronic format // Digital educational resource IPR SMART: [website]. URL: <https://www.iprbookshop.ru/80179.html> .

### **Additional literature:**

4. Alekseev, B. Ya. Clinical Oncourology: Monograph / B. Ya. Alekseev, M. I. Volkova, N. V. Vorobyev. – Moscow: ABV-Press, 2011. – 934 pp. – ISBN 978-5-903018-23-9. – Text: electronic format // Digital educational resource IPR SMART: [website]. – URL: <https://www.iprbookshop.ru/9906.html>
5. Nechiporenko, N. A. Acute Urological Conditions: A Textbook. Minsk: Higher School Press, 2012. – 400 pp. – ISBN 978-985-06-2093-4. – Text: electronic format // Digital educational resource IPR SMART: [website]. – URL: <https://www.iprbookshop.ru/20232.html>
6. Organization of a series of practical courses in urology and their content covering both general and specific areas of the specialty for fourth-and fifth-year medical students. Part 1: Teaching and Methodological Manual / Authors: D. V. Svirenko et al., edited by V. S. Tarasenko. – Orenburg: Orenburg State Medical Academy, 2011. – 107 pp. – Text: electronic // Digital Educational Resource IPR SMART: [website]. URL: <https://www.iprbookshop.ru/31829.html>

### **Internet resources:**

6. <http://rudocor.net> / – Medical portal;
7. <http://www.e-reading.club> / – Large online library;
8. <https://dic.academic.ru> / – Dictionaries and encyclopedias;
9. <https://roszdravnadzor.gov.ru> / – Federal Service for Healthcare Supervision;
10. <https://www.rmj.ru> / Russian Medical Journal