

**MONITORING AND MEDICAL CARE  
OF PATIENTS WITH DISEASES OF THE  
GENITOURINARY SYSTEM**

Minsk BSMU 2022

МИНИСТЕРСТВО ЗДРАВООХРАНЕНИЯ РЕСПУБЛИКИ БЕЛАРУСЬ  
БЕЛОРУССКИЙ ГОСУДАРСТВЕННЫЙ МЕДИЦИНСКИЙ УНИВЕРСИТЕТ  
КАФЕДРА ПРОПЕДВТИКИ ВНУТРЕННИХ БОЛЕЗНЕЙ

**НАБЛЮДЕНИЕ И МЕДИЦИНСКИЙ УХОД  
ЗА ПАЦИЕНТАМИ С ЗАБОЛЕВАНИЯМИ  
МОЧЕПОЛОВОЙ СИСТЕМЫ**

**MONITORING AND MEDICAL CARE  
OF PATIENTS WITH DISEASES OF THE  
GENITOURINARY SYSTEM**

Учебно-методическое пособие



Минск БГМУ 2022

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Подробно изложены основные жалобы пациентов при заболеваниях почек и мочевыводящих путей. Освещены вопросы наблюдения за изменением диуреза и свойств мочи, а также медицинских уход за пациентами с острой задержкой мочи, недержанием мочи, почечной коликой, отеками. Описаны особенности медицинского ухода за пациентами с заболеваниями почек и мочевыводящих путей, лечебное питание, медицинский уход и наблюдение за пациентами пожилого и старческого возраста с заболеваниями почек и мочевыводящих путей.

Предназначено для студентов 1–2-го курсов медицинского факультета иностранных учащихся, обучающихся на английском языке.

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## MOTIVATIONAL CHARACTERISTICS OF THE TOPIC

Total class time: 3 hours.

Impaired kidney and urinary tract function can be observed in patients with various pathologies of internal organs.

Monitoring and care of patients with kidney and urinary tract diseases can be divided into General and special activities.

1. General activities — monitoring and care activities that patients with diseases of various organs and systems need: general health monitoring, thermometry, monitoring of pulse and blood pressure, filling in the temperature sheet, ensuring personal hygiene, feeding the vessel, etc.

2. Special events — monitoring and care activities aimed at helping patients with symptoms typical of kidney and urinary tract diseases — pain in the lumbar region, edema, urination disorders, etc.

A patient with kidney and urinary tract disease requires careful monitoring and careful care. If the patient develops (or increases) edema, urination disorders, changes in the color of urine, increased blood pressure, dyspeptic disorders, or deterioration of the general condition, the nurse should immediately inform the doctor about this. A nurse should master the skills to provide first aid for an attack of renal colic, acute urinary retention, know the techniques and know the technique of catheterization of the bladder with a soft catheter. The medical staff monitors changes in diuresis and urine properties, and prepares the patient for a urine test. as well as medical care for elderly and senile patients with kidney and urinary tract diseases.

The purpose of the lesson: to teach students the basic methods of observation and care of patients with impaired kidney and urinary tract function; the principles of first aid in emergency situations in patients with this pathology (acute urinary retention, attack of renal colic); teach proper preparation for additional laboratory and instrumental studies of the urinary system.

Lesson objectives:

1. Familiarize students with the main complaints of kidney and urinary tract diseases.

2. To acquaint students with the main directions of care for patients with impaired function of the genitourinary system.

3. Train students in hygiene measures for the care of patients with kidney and urinary tract diseases.

4. Train students in methods for monitoring daily diuresis.

5. Teach students to provide pre-medical care for acute urinary retention, attack of renal colic in patients with kidney and urinary tract diseases.

6. Teach students the rules for preparing patients for laboratory and instrumental methods of research of the kidneys and urinary tract.

Requirements for the initial level of knowledge.

To prepare for the lesson the student should revise the sections "ensuring infectious safety in health care institutions", "Sanitary treatment of the patient".

Test questions from related disciplines:

1. Anatomy of the kidneys and urinary tract.
2. Physiology and pathophysiology of the kidneys.
3. The role of kidneys in blood pressure regulation.

Test questions on the topic of the lesson:

1. The main complaints of patients with kidney and urinary tract diseases.
2. Definition of concepts: diuresis, day and night diuresis, diurnal diuresis, polyuria, oliguria, anuria, pollakiuria, stranguria.
3. Methods for determining water balance and hidden edema.
4. Technique of using a urogenital device.
5. Care of external genitals in men and women.
6. Technique of catheterization of the bladder with a soft catheter in men and women.
7. Preparing the patient for laboratory tests of urine.
8. Preparation of the patient for instrumental research methods (excretory urography. ultrasound examination of the kidneys).
9. Medical care for patients with acute urinary retention, urinary incontinence, renal colic, edema.
10. Therapeutic nutrition for diseases of the kidneys and urinary tract.
11. Medical care and supervision of elderly and senile patients with kidney and urinary tract diseases.
12. Features of medical care for patients with kidney and urinary tract diseases.

## **TRAINING MATERIAL**

### **THE MAIN COMPLAINTS OF PATIENTS WITH KIDNEY AND URINARY TRACT DISEASES**

1. Pain in the lumbar region.

Pain in glomerulonephritis is aching, there may be a feeling of heaviness on both sides in the lower back. In acute pyelonephritis, there is intense pain on the affected side. These pains occur as a result of inflammatory swelling of the kidney parenchyma and stretching of the renal capsule.

During an attack of urolithiasis, the patient has a sharp pain in the lower back with irradiation down the course of the ureter into the urethra, genitals. Pain occurs due to spastic contraction of the ureter, as well as urinary retention in the renal pelvis and its stretching. The pain has the character of colic (renal colic). Pain irradiation is caused by the fact that in the corresponding segments of the spi-

nal cord (DX-DHP, AI-ash) in the immediate vicinity pass nerve fibers that carry sensitive impulses from the kidneys, ureter, and genitals. In acute paranephritis (inflammation of the parotid fiber), the pain is intense on the side of the lesion.

Pain in the lower abdomen occurs with cystitis (inflammation of the bladder).

## 2. Violation of urination.

The next complaint that accompanies diseases of the urinary system is a violation of the formation and excretion of urine. The excretion of urine over a known period of time is called diuresis. Diuresis can be diurnal, nocturnal, diurnal, positive (if the patient releases more urine during the day than drinks fluids) and negative (if the ratio is reversed).

Positive diuresis is observed when edema converges, diuretics are taken, and in a number of other cases. Negative diuresis is observed when the body retains fluid (with edema) and when it is released excessively through the skin and lungs (in hot and dry climates).

3. Patients may complain of changes in the color of urine, the appearance of turbidity, blood impurities, and changes in its smell.

Red color of urine of various intensity as a sign of the presence of red blood cells in the urine (hematuria) is observed in kidney cancer, bladder, prostate, urolithiasis.

Urine the color of "meat slops" (dirty red) is a characteristic sign of acute glomerulonephritis, the color of beer is a sign of jaundice due to the presence of urobilin or bilirubin.

4. Edema — the most common complaint of patients, occurs with glomerulonephritis, amyloidosis of the kidneys, nephropathy of pregnant women. In kidney diseases, edema is varied in severity, localization and persistence. In glomerulonephritis, edema is localized on the face, eyelids due to loose fiber rich in capillaries, although there may be fluid accumulations in the cavities (hydrothorax, hydropericardium, ascites), General massive edema (anasarca). Kidney edema occurs in the morning after sleep, they are pale, warm and soft.

5. Headache, dizziness, convulsions, and vision loss are caused by symptomatic renal hypertension.

6. Additional complaints: loss of appetite, nausea, vomiting, diarrhea, itching of the skin, pain in the muscles, bones, joints, bleeding gums, nosebleeds, petechial rashes on the skin and mucous membranes. These complaints arise from the development of chronic kidney failure. With the increase in CRF, patients note General weakness and reduced ability to work.

## MONITORING OF CHANGES IN URINE DIURESIS AND PROPERTIES

Every 5–10 minutes, the entire body's blood mass passes through the kidneys — the kidneys "drive" up to 1000 liters of blood per day. Urine in the kidneys is formed continuously, gradually being released through the ureters into the bladder. In a broad sense, the term "diuresis" refers to the process of formation and excretion of urine, but it is most often used to characterize the amount of excreted urine (Greek. diureo-to excrete urine). Total amount of urine released by a person during the day, is called diurnal diuresis. The average diuresis for 1 min is called a minute diuresis (this value is used for calculating quantitative indicators of kidney function).

The daily amount of urine secreted by an adult normally ranges from 1000 to 2000 ml, making up an average of 50–80 % of the liquid taken inside. The remaining volume of fluid is released through the lungs (300–400 ml; with physical activity up to 500 ml/day) and the skin (300–400 ml/day); about 100 ml is excreted in the feces. Diuresis increases when taking a large amount of liquid and food that increases diuresis and, conversely, decreases during physical activity and in hot weather with profuse sweating, vomiting, diarrhea. Polyuria-increased diuresis of more than 2 liters of urine per day. It can be associated not only with kidney diseases, but also with certain features of nutrition, drinking habits, taking diuretics, etc.

Polyuria is observed in diabetes mellitus due to impaired reabsorption of fluid in the renal tubules due to high osmotic pressure of urine rich in glucose; in diabetes insipidus, it occurs due to insufficient intake of antidiuretic hormone in the blood of the posterior pituitary lobe.

Oliguria-a decrease in the amount of urine excreted to less than 500 ml per day. Physiological oliguria can be associated with insufficient hydration of the body and increased sweating. In some cases, oliguria is a consequence of kidney and urinary tract disease (renal oliguria).

Anuria-a decrease in the amount of urine to less than 50 ml per day until its complete absence.

Excretory anuria may occur if there is an obstruction in the urinary tract. This is possible when the ureter is blocked by a stone, inflammatory edema of the mucous membrane or the growth of a malignant tumor.

In contrast to acute urinary retention, in anuria, the bladder is empty, urine is not released by the kidneys or does not enter the bladder due to chronic kidney disease.

Depending on the cause, there are Arenal, prerenal, renal and subrenal anuria.

Arenal anuria is caused by the absence of kidneys, which occurs in the congenital absence of both kidneys or due to the erroneous removal of a single kidney.

Prerenal anuria occurs due to the cessation or insufficiency of blood flow to the kidney (with heart failure of II–III degree, when there are pronounced edema). Renal anuria is caused by kidney disease or injury with significant damage to the renal parenchyma. Subrenal anuria is a consequence of impaired outflow of urine during obturation or compression of the upper urinary tract.

Anuria is also divided into secretory, associated with glomerular filtration disorders (uremia) and excretory urinary retention (ischuria), associated with impaired urinary excretion through the urethra (when compression or damage to the spinal cord, in a coma).

In a healthy person, urination occurs 4–7 times during the day, at night the need to urinate appears no more than 1 time. The amount of urine released in this case varies on average 1000–2000 ml per day, but there may be wider fluctuations in the frequency of urination, depending on certain conditions: the use of excessively salty food, dry eating, excessive sweating, fever, etc.

Pollakiuria (frequent urination — a condition when the number of urinations reaches 10–15 in 1 hour) can be caused by various reflex effects on the musculature of the bladder from the kidneys and ureters in the presence of pathological processes in them (for example, with urolithiasis).

Frequent urge to urinate with the release of a small amount of urine each time is a sign of cystitis. In women, pollakiuria can be caused by various pathological conditions on the part of the genitals (pressure of the uterus on the bladder in an incorrect position, as well as during pregnancy).

Physiological pollakiuria is observed under stress and strong excitement. Sometimes pollakiuria is associated with taking medications (urotropin).

Pollakiuria also develops in all diseases accompanied by the release of a large amount of urine (polyuria), in particular nephrosclerosis, diabetes mellitus and non-sugar diabetes, when removing edema with diuretics.

Nycturia—the predominance of night diuresis over day diuresis (normally the ratio of day diuresis to night diuresis is 3:1 or 4:1).

In chronic kidney disease (CKD), there is a violation of the concentration of urine by the kidneys. Urine has a monotonous and low density (isostenuria and hypostenuria).

Stranguria (soreness and pain when urinating) — a sign of inflammatory changes in the urethra and bladder in cystitis, urethritis, pyelonephritis, urolithiasis.

The combination of stranguria and pollakiuria is called dysuria.



# FEATURES OF MEDICAL CARE FOR PATIENTS WITH KIDNEY AND URINARY TRACT DISEASES

## MEDICAL CARE FOR PATIENTS WITH ACUTE URINARY RETENTION

The main complaint with acute urinary retention is the lack of urination for 6–12 hours, despite frequent painful urges. Patients complain of severe pain in the area of the bladder, sometimes with radiation to the genitals.

Emergency care for urinary retention is to remove urine from the bladder as soon as possible.

1. Find out the time of the last urination, inform the doctor;
2. Calm the patient, reduce the emotional burden;
3. Screen off the patient;
4. Provide a warm dry vessel or urinator;
5. Help to take a more comfortable position (if there are no contraindications);
6. Open the water tap;
7. Place a hot water bottle on the lower abdomen (if there are no contraindications), irrigate the external genitals with warm water, as prescribed by a doctor – an enema with 100 ml of warm water;
8. Enter the medication prescribed by the doctor;
9. Carry out bladder catheterization.

Excretion of urine by the catheter.

Bladder catheterization is a procedure of inserting a catheter into the bladder for therapeutic or diagnostic purposes.

A catheter device for emptying the cavity of the bladder.

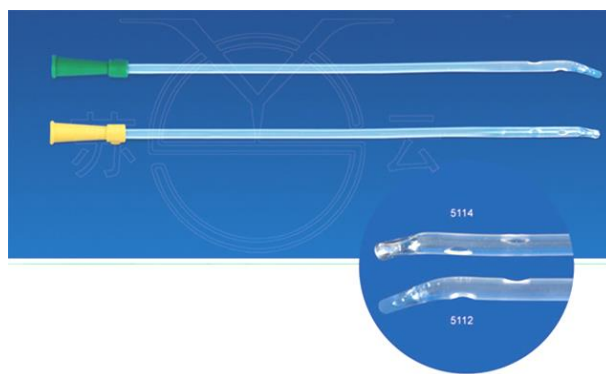
Types of urethral catheters:

As intended:

1. The Nelaton catheter is straight with a blind rounded end and an oval hole on the side (Fig. 1).
2. The Timan catheter is straight with a blind rounded end in the form of a curved beak and an oval hole on the side (Fig. 2).

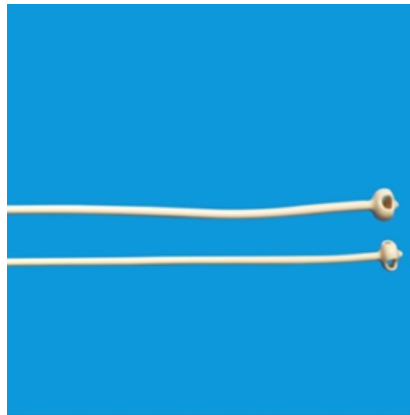


*Fig. 1. Nelaton Catheter*



*Fig. 2. Thymann's Catheter*

3. Pezzera or Maleco catheter (head) — with a large thickened head for retention in the bladder when removing urine through the suprapubic fistula (Fig. 3).



*Fig. 3.* The catheter Pezzera or Maleco

4. The Foley catheter — with an inflatable balloon to fill it with sterile liquid-is used for fixation in the bladder as a permanent catheter (Fig. 4).



*Fig. 4.* Foley catheter

Composition of the material:

- soft-rubber and polymer (disposable);
- semi-rigid-plastic;
- rigid-metal.

By diameter and length:

- female;
- male;
- child.

Indications for bladder catheterization:

- emptying the bladder in acute urinary retention;
- irrigation of the bladder;
- administration of medications;
- introduction of a contrast agent for cystography;
- taking urine for analysis.

Contraindications:

- injuries and inflammation of the urethra;
- presence of stones in the urethra.

Potential complication:

- infection of the urinary tract-pathogenic microflora can penetrate up the catheter (retrograde) — strict compliance with asepsis is required;
- trauma to the urethra is to carry out carefully, taking into account the feelings of the patient, the anatomical features (especially in men);
- urethral fever — the body's reaction to the procedure.

With a sharp overflow of the bladder, emptying it is performed gradually, 400–500 ml and then the catheter is squeezed for 2–3 minutes with rapid emptying of a sharply stretched bladder, bleeding from sharply expanded and sclerotically altered bladder veins may occur.

For long-term catheterization (up to 7 days) of the bladder and various medical manipulations (washing the bladder, instillation of medicines), a Foley catheter is used, at the initial end of which there is a balloon. After placing the catheter in the bladder cavity, air is injected into its outer opening using a syringe (with a capacity of 5–10 ml), which inflates the balloon, which ensures that the catheter is fixed in the bladder. When the catheter is removed, air is first removed from the balloon using a syringe, then the catheter is removed from the bladder.

#### **TECHNIQUE OF CATHETERIZATION OF THE BLADDER IN MEN WITH A SOFT CATHETER**

A nurse can only perform bladder catheterization with a soft catheter. Catheterization of the bladder using a semi-rigid or metal catheter is a medical manipulation.

Equipment for catheterization:

- 1) sterile catheter;
- 2) sterile gloves;
- 3) sterile wipes (medium — 4 PCs., small-2 PCs.);
- 4) sterile vaseline oil;
- 5) 2 sterile tweezers;
- 6) 2 sterile trays;
- 7) lining oilcloth and diaper;
- 8) antiseptic solution;
- 9) container for collecting urine;
- 10) 2 waste material trays;
- 11) equipment for washing;
- 12) personal protective equipment: apron, gloves, mask;
- 13) bag for used material.

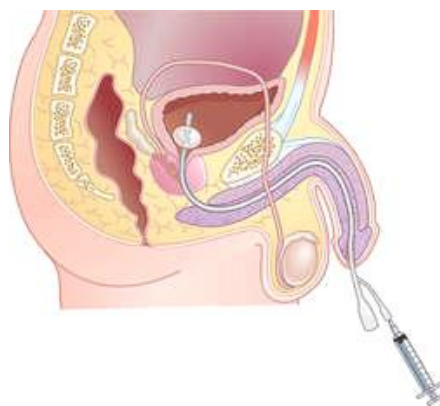
The procedure is performed subject to strict compliance with asepsis!

Preparing for the procedure. Catheterization of the bladder is performed after preliminary psychological preparation of the patient, explaining to him the need and methodology of the procedure. It is necessary to obtain the patient's informed consent to perform the manipulation. The nurse puts on a change of sanitary clothing, a waterproof apron, and prepares all the necessary equipment.

In order to create psychological comfort, the patient should be fenced off with a screen. Then the nurse performs hygienic hand antiseptics and puts on gloves. Under the patient's pelvis, an oilcloth and a diaper are laid. The patient is helped to take the necessary position for the procedure: on his back with his legs half-bent apart (the "frog" pose), then he is washed away. After treating the external genitals, the nurse removes the gloves and places them in a container with a disinfectant solution.

The next stage requires the use of only sterile equipment.

The main stage of manipulation. After putting on sterile gloves, the nurse stands to the right of the patient, takes a sterile napkin in her left hand and wraps it around the penis below the head. The penis is held between the 3rd and 4th fingers of the left hand, slightly squeezing the head, the 1st and 2nd fingers slightly push the foreskin. Using a sterile pair of tweezers and a sterile gauze cloth soaked in a solution of furacillin, treat the external opening of the urethra and the head of the penis clockwise. The used napkin is placed in the tray for the used material, and the tweezers are placed in the tray for the used instrumentaries. The second sterile tweezers take the catheter at a distance of 5–6 cm from the side opening, holding the outer end of the catheter with the 4th and 5th fingers of the same hand. Sterile vaseline oil is poured on the "beak" of the catheter. Enter the first 4–5 cm of the catheter into the urethra, then, intercepting the catheter another 3–5 cm from the head, slowly submerge it in the urethra until urine appears. Taking into account the physiological curves and narrowing of the urethra in men, when inserting a catheter, it is first necessary to deflect the penis to the abdomen, gradually moving the catheter, and then down. The outer end of the catheter is lowered into a container for collecting urine (Fig. 5).



*Fig. 5.* Scheme of catheterization of the bladder in men

If there is an obstacle in the progress of the catheter, you should ask the patient to relax, breathe in the stomach. This is usually enough to move the catheter into the bladder. Otherwise, the catheter should be stopped and a doctor should be called. In no case should you move the catheter by exerting force, as this may lead to a rupture of the urethra.

Completion of the manipulation. The tweezers are placed in the tray for the used tools. Continue to monitor the release of urine.

When the urine drops, press the left hand on the anterior abdominal wall above the pubis, while removing the catheter. Thanks to this method, the last stream of urine will wash the urethra after the catheter is removed. The used catheter is placed in a tray for used tools, a diaper and oilcloth — in a bag for used material. After removing the gloves, washing and drying the hands, the nurse helps the patient to take a comfortable position, covers it. You should make sure that the patient feels well after the manipulation. The screen is being removed. In conclusion, the used instruments are disinfected, followed by the disposal of disposable medical items. In the medical history, a record is made of the procedure and the patient's reaction to it.

If it is impossible to catheterize the bladder (damage to the urethra, compression of its adenoma or prostate tumor), resort to suprapubic puncture of the bladder or the imposition of an artificial opening (cystostomy) with the introduction of a cystostomy tube.

When a permanent catheter is inserted into the patient, a urine collection container is attached to it. Finding a permanent catheter in the patient requires special care.

Recommends:

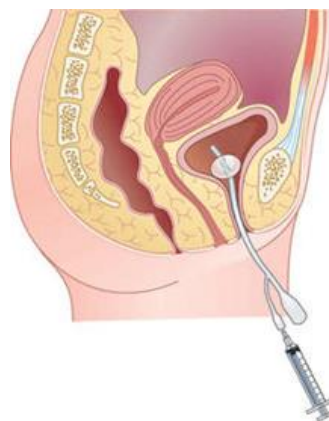
- follow the rules of asepsis: wash the catheter and bladder daily with antiseptic;
- fix the urinator on the patient's hip or to the patient's bed;
- monitor the outflow of urine through the drainage system.

### **TECHNIQUE OF CATHETERIZATION OF THE BLADDER IN WOMEN**

Catheterization is performed with a rubber catheter (Fig. 6).

Indications for bladder catheterization, contraindications, necessary equipment for men.

The first step is psychological preparation of the patient. A screen is put up. The nurse performs hygienic hand washing and puts on gloves. Under the patient's pelvis, an oilcloth and a diaper are laid, as well as a vessel. The patient is helped to take the necessary position for the procedure: on her back with her knees bent and her legs spread, washing is performed. After treating the external genitals, the nurse removes the gloves and places them in a container with a disinfectant solution.



*Fig. 6.* Scheme of catheterization of the bladder in women

After putting on sterile gloves, the nurse covers the entrance to the vagina with sterile napkins. With the help of two sterile wipes, he spreads the labia minora to the sides with his left hand to determine the location of the external opening of the urethra. With the help of sterile tweezers and a small sterile napkin dipped in an antiseptic solution, the entrance to the urethra is treated with movements from top to bottom. The napkin is placed in the tray for the used material, the tweezers-in the tray for the used tools. If necessary, repeat the processing. With the second sterile tweezers, the nurse takes a sterile catheter, pre-lubricated with sterile vaseline oil at a distance of 4–5 cm from the blind end. The distal end of the catheter is fixed between the IV and V fingers of the right hand. I and II fingers of the left hand spreads the labia majora and minora. After offering the patient to take a deep breath, the catheter is inserted carefully, without effort, into the urethra for 5–7 cm, the outer end of the catheter is lowered into the urinals. The appearance of urine indicates that the catheter is located in the bladder. After stopping the self-discharge of urine from the catheter, slightly press over the pubis, remove the remains of urine from the bladder and remove the catheter in order to wash the urethra with the remains of urine. The used catheter is placed in a tray for used tools, a diaper and oilcloth — in a bag for used material. Taking off her gloves, washing and drying her hands, the nurse helps the patient to take a comfortable position, covers her. You should make sure that the patient feels well after the manipulation. The screen is being removed. In conclusion, the used instruments are disinfected, followed by the disposal of disposable medical items. In the medical history, a record is made of the procedure and the patient's reaction to it.

After a long time finding the catheter, there is almost always an inflammation of the urethra (irritation of its rubber, plastic, micro-scratches on the mucosa). To prevent complications, before removing the catheter, a solution of furacilin is injected into the bladder and, without disconnecting the syringe, the catheter is removed.

After removing the catheter, it is also useful to make anti-inflammatory baths with a weak solution of potassium permanganate (permanganate) for several days: its crystals are diluted in boiled water in a Bank, pour warm boiled water into a basin, add a solution of potassium permanganate (make sure that the crystals do not fall!) to a light pink color and sit in the basin for a few minutes. You can also make similar baths with a decoction of chamomile, St. John's wort, sage (method of preparing solutions: 1 tbsp. 1. of grass for 1 glass of water, bring to a boil, but do not boil, let it infuse for 5 minutes). Baths are made several times a day, the more often, the better.

### **MEDICAL CARE FOR PATIENTS WITH URINARY INCONTINENCE**

Urinary incontinence is the involuntary release of small amounts of urine during physical exertion, coughing, and abdominal muscle tension. It occurs with inflammation of the bladder, at the first stage of prostate adenoma.

Urinary incontinence — involuntary discharge of urine without urge, inability to manage and control urination.

Causes: damage to the brain and spinal cord, unconsciousness, decreased tone of the sphincter of the bladder, omission of internal organs.

The purpose of medical care for urinary incontinence is to prevent skin complications and infection of the urinary tract, to ensure comfortable patient care.

1) Provide isolation of the patient (screen, separate room).

2) Provide a full-fledged diet with a restriction of liquid to 1 liter per day.

3) Ensure the patient's personal hygiene (change of underwear and bed linen). Cover the mattress with oilcloth, put a sheet on it, an oilcloth and a diaper on top. Place the patient on a slightly inflated rubber vessel in a cover, and the patient is provided with an external urinator or use diapers, they are replaced after a maximum of 4 hours. They also use disposable diapers. If urinary incontinence occurs in patients who are on bed rest, the risk of developing bedsores increases. Prevention of bedsores is carried out in accordance with existing standards.

4) Ensure hygiene of the perineum: regular washing of the patient, lubrication of the perineum 3 times a day with vaseline oil.

5) Both women and men can be assigned a training program for the bladder, which provides for regular emptying of it every 2 hours.

6) Wet cleaning of wards with disinfecting solutions 2 times a day, use deodorizers. Ensure that the wards are regularly aired four times a day for 20 minutes.

7) Provide the patient with a urinal and, if necessary, strengthen the removable urinal on the patient's body (which does not interfere with movement), regularly disinfect it.

8) Provide psychological support for the patient (regular conversations, select popular literature, introduce the patient to a long-term user of the urinator). Provide support for relatives.

9) Train the patient and his relatives in the use of the urinator and its disinfection, the features of care.

### **MEDICAL CARE FOR PATIENTS WITH RENAL COLIC**

Renal colic is a painful attack that develops when there is a sudden obstacle to the outflow of urine from the kidney.

Symptoms:

- sudden onset of an attack;
- frequent urge to urinate;
- pain in the lower back, along the course of the ureters, towards the groin and genitals;
- nausea, vomiting;
- cutting pain in the urethra.

First aid measures:

- provide bed rest and rest;
- put a hot water bottle on the lower back or lie in a hot bath (if there are no contraindications) for 10–15 minutes;
- take an antispasmodic and/or analgesic medication.

### **MEDICAL CARE FOR PATIENTS WITH EDEMA**

Edema in the early stages of the disease may be hidden. Fluid retention in the body can be manifested by a fairly rapid increase in body weight and a decrease in diuresis.

Detection of hidden edema:

1. McClure-Aldrich test-blister test: after intradermal administration, a blister is formed in the area of the inner surface of the forearm 0.2 ml of saline solution, which resolves the faster the more pronounced the edematous readiness of the tissue. In a healthy person, the blister resolves within an hour.

2. Daily weighting of the patient. The state of the water balance can also be controlled by weighting: a rapid increase in body weight indicates fluid retention. It should be remembered that patients who are on bed rest and receiving diuretics should be provided with urinators, vessels.

3. Daily monitoring of the daily water balance is important — comparing the amount of liquid drunk and administered parenterally with the amount of urine released per day (daily diuresis). It takes into account the liquid contained in fruits, vegetables, etc., as well as parenterally administered solutions. Solid foods contain 60 to 80 % liquid.



Measurement of daily diuresis and determination of water balance should be carried out when monitoring and caring for a patient with kidney and urinary tract diseases to detect hidden edema, with increasing edema, to control the effect of diuretic drugs.

Necessary equipment: a graduated glass container for collecting urine; a water balance sheet.

The nurse should explain to the patient that to determine the daily diuresis, he needs to release urine into the toilet at 6.00. Then, after each urination, the patient collects urine in a graduated container, its volume in each portion is measured. The water balance sheet shows the time and amount of liquid released and injected into the body. Data is recorded until 6.00 the next day. The nurse evaluates the daily diuresis and water balance: the Daily diuresis should be 1.5–2 liters (70–80 % of the total volume of liquid consumed per day). If the urine is released less than 70–80 % of the total volume of liquid consumed per day, negative diuresis is detected (i. e. part of the liquid is retained in the body). If the amount of urine exceeds the amount of liquid consumed per day, diuresis is considered positive. Positive diuresis is noted during the convergence of edema, when taking diuretics.

Application of the vessel and the urinator.

For emptying the bladder, men use a urinal (Fig. 7, 8), it is more convenient for women to urinate in the vessel (Fig. 9).



*Fig. 7. The men's urinal polymer type «Duck»*

A urinal is an artificial reservoir for collecting urine for analysis or continuous intake in people who are not able to independently control the act of urination, or in bedridden patients.

Feed sack

Equipment: clean warm urinals (glass, plastic), oilcloth, gauze napkin, screen.

To empty the bladder, patients are given urinals. Urinals for men and women differ in the structure of the funnel. The male ureter has an upward-pointing tube, while the female has a funnel at the end of the tube with bent edges, located more horizontally. But women use the boat more often when urinating.

Before giving the patient a urinal, rinse it with warm water.

1. Put a screen by the bed.
2. Wash your hands, dry them with a towel, and apply antiseptic. Wear gloves and apron.
3. Pull back the blanket, ask the patient to bend their knees and spread their thighs. If he is not able to do this, help him.
4. In the left hand, take a gauze napkin, wrap it around the patient's penis, take the urinator in the right hand.
5. Insert the penis into the hole of the urinator, place it between the patient's legs, and remove the gauze cloth.
6. Cover the patient with a blanket and leave him along.
7. Remove the urinal, oilcloth, cover the patient, remove the screen.
8. Disinfect the urinal.
9. Remove the apron, it should be disinfected by wiping with a rag soaked in a solution of disinfectant.
10. Gloves are removed and immersed in a solution of disinfectant wash their hands.

To remove the sharp ammonia smell of urine, urinals are rinsed with a weak solution of hydrochloric acid or potassium permanganate.

In case of urinary incontinence, permanent rubber urinals are used, which are attached to the patient's body with ribbons.



*Fig. 8. Glass urinals (male and female)*



*Fig. 9. The ship polymer*

## Vessel feed

Necessary equipment: a vessel, oilcloth, diaper, screen, personal protective equipment, containers with a regulated disinfectant solution of the appropriate marking, a container for dirty Laundry.

1. Wash your hands, dry them with a towel, and apply antiseptic.
2. Wear gloves and apron.
3. Put the patient behind a screen.
4. Put an oilcloth and a diaper under the rump.
5. Rinse the vessel with warm water and leave some water in it.
6. The nurse is on the right. The left hand leads under the sacrum from the side, helping the patient to lift the pelvis. In this case, the patient's legs should be bent at the knees.
7. The right hand brings the vessel under the buttocks of the patient, so that the perineum is above the opening of the vessel.
8. We cover the patient with a blanket and leave him alone for a while.
9. At the end of defecation, we remove the vessel with the right hand, while helping the patient to lift the pelvis with the left hand.
10. After examining the contents of the vessel, pour it into the toilet, rinse the vessel with hot water. In the presence of pathological impurities (mucus, blood, and so on), we leave the contents of the vessel until the doctor examines it.
11. We wash the patient, having previously changed the gloves and substituted a clean vessel.
12. After performing the manipulation, we remove the vessel and the oilcloth. The used diaper must be put in a container for dirty Laundry, the oilcloth should be treated with a disinfectant.
13. The vessel is disinfected by immersing it in a container with a disinfectant solution marking for time (exposure) according to the instructions.
14. We cover the vessel with oilcloth and put it on a bench under the patient's bed or in a specially retractable device of a functional bed.
15. Remove the screen.
16. The apron should be disinfected by wiping with a rag soaked in a solution of disinfectant. Gloves are removed and immersed in a solution of disinfectant. Wash your hands.

Sometimes the above method of feeding the vessel is not possible, because some seriously ill patients can not lift themselves. In this situation, you can do the following. The algorithm is the same but the patient is turned slightly to one side, while the patient's legs are bent at the knees, and the vessel is brought under the patient's buttocks. We turn the patient on his back so that his perineum is above the opening of the vessel.

## CARE OF EXTERNAL SEXUAL ORGANS

Care for the external genitals (washing patients) is used to ensure that patients maintain personal hygiene when there is a lack of self-care, for the prevention of ascending urinary tract infection. Wash away patients who are in a serious condition, patients with incontinence of urine and feces; after each act of defecation and urination.

The procedure is performed using Retrofitting:

- manipulation table;
- a jug with a solution of furacillin 1 : 5000 or a weak solution of potassium permanganate;
- preheated to 37 °C;
- sterile tray with cotton swabs (at least 5 pcs.);
- disinfected tweezers or Korsang;
- vessel;
- oilcloth and diaper;
- screen;
- a set of changing clothes (robe, cap, mask);
- apron, gloves;
- tray for waste material;
- tank with disinfectant solution;
- bag for dirty Laundry.

## CARE OF EXTERNAL GENITALS IN WOMEN

Before manipulation, the patient must be psychologically prepared. The nurse explains the purpose and method of performing the procedure. The nurse changes into a change of sanitary clothing, performs hygienic hand antiseptics, puts on an apron and gloves. In the ward, the patient should be fenced off with a screen. The patient is placed on her back with her legs bent at the knees and spread at the hips, and an oilcloth with a diaper is placed under the buttocks. Bring a clean vessel under the buttocks, rinsing it with warm water, so that the perineum is above the opening of the vessel. Kortsang with a gauze napkin is taken in the right hand, the jug — in the left hand. Pouring from a jug on the external genitals, make movements of the cortsang with a gauze napkin in the following sequence: first wash the inguinal folds and labia majora (1st napkin), then-the labia minora, the urethra area and the anal opening (2nd napkin). Movements should be directed from the perineum to the anus. In conclusion, a dry cloth drains the small, large labia, inguinal folds and anal opening. Used napkins are placed in the waste material tray, kortsang — in the de-solution. Remove the ship and oilcloth. Lay the patient, covering with a blanket. The vessel is taken to the

toilet room, the contents are emptied into the toilet bowl, thoroughly rinsed and submerged in de-solution. Remove a change of sanitary clothing. Hands should be washed and dried. The screen is being removed.

### **CARE OF EXTERNAL GENITALS IN MEN**

Before manipulation, the patient is psychologically prepared. A screen is placed near the bed. The nurse explains the purpose and method of performing the upcoming procedure. The patient is placed on his back, helping him to slightly bend his legs at the knees and spread them. Next to the patient, an oilcloth is spread out, the left hand is brought under the sacrum, they help him lift the pelvis and push the oilcloth on the sheet, then the vessel is placed under the buttocks. Take the forceps in your right hand, and clamped them with a napkin. The nurse is to the right of the patient, holding the pitcher in his left hand and the forceps with the napkin on the right, an antiseptic solution from a pitcher pours on the sexual organs, but cloth produces a careful top-down from the genitals to the anus. You should carefully remove the foreskin from the head of the penis and thoroughly wash it using cotton swabs, then dry it with a soft cloth, blotting it, but in no case wiping it. The used tampon is thrown into the vessel, clamped on the korntsang a clean tampon and, gently blotting, drains the skin of the perineum in the same direction. Conducts an examination of the inguinal folds, to prevent diaper rash, the folds are smeared with vaseline oil using a tampon clamped in the kortsang. The vessel is removed and the oilcloth is removed. The vessel is emptied of its contents and placed in a disinfectant solution.

## **INSTRUMENTAL METHODS OF RESEARCH OF KIDNEYS AND URINARY TRACT**

### **RADIOLOGICAL EXAMINATION**

1. Overview radiography of the kidneys and urinary tract makes it possible to assess the shape and position of the kidneys and ureters, in some cases to detect the presence of stones (concretions).

2. Urography (contrast radiography) is a research method based on the introduction of a radiopaque substance parenterally (urographin, verografin). Urography allows you to assess the size and shape of the kidneys, their location, functional ability (by accumulation and speed of contrast material release), the presence of concretions, and the patency of the ureters. Depending on the method of administration of radiopaque substance there are two types of urography.

a. Retrograde urography is a method of investigation when a radiopaque substance is injected through a urinary catheter under the control of a cystoscope into the desired ureter. Special patient training is not required.

b. Excretory urography-contrast agent is administered intravenously.

The nurse prepares the patient for the study, informs and trains the patient, and receives his informed consent.

Contraindications to excretory urography:

- increased sensitivity to iodine preparations;
- acute liver diseases;
- hemorrhagic diatheses;
- chronic kidney disease stage 3–5;
- thyrotoxicosis;
- chronic heart failure.

Equipment: radiopaque iodine-containing substance (urographin, verografin), disposable syringes with a capacity of 20 ml, a 30 % solution of sodium thiosulfate, a set for emergency care. Action sequence:

1. Explain to the patient the purpose and progress of the upcoming study, the specifics of preparation (if necessary, give written instructions):

a) the patient should be excluded from the diet for 3 days before research food rich in plant fiber and other substances that contribute to excessive gas formation (fresh vegetables and fruits, potatoes, legumes, fresh milk, fresh rye bread, fruit juices);

b) for flatulence (excessive gas formation), the patient is prescribed espumizan for three days before the study, 2 tablets 4 times a day;

c) the study is conducted strictly on an empty stomach (the last meal 18–20 hours before the study);

d) the night before and 2–3 hours before the study, it is necessary to perform a cleansing enema to the effect of "clean" water;

e) the patient should release the bladder (urinate) immediately before the examination;

f) find out the allergological history, conduct a test for sensitivity to the contrast agent 1–2 hours before the study-enter intravenously 1 ml of contrast heated to 38 °C.

2. Warn the patient about the consequences of violating the rules of preparation, get consent to conduct the study.

3. Take the patient to the x-ray room with a medical history by the appointed time.

4. After performing the survey image, enter intravenously slowly (for 2–6 minutes) x-ray contrast agent at the rate of 0.5–1 ml/kg, heated to body temperature.

5. After performing a series of images, take the patient to the ward.

## **ULTRASOUND EXAMINATION OF THE KIDNEYS**

The nurse must prepare the patient for the examination:

1. Explain to the patient the purpose and progress of the upcoming study and get their consent.
2. Explain to the patient the specifics of preparation for the procedure:
  - a) 3 days before the examination, it is necessary to exclude gas-forming products (bread, milk, vegetables, potatoes);
  - b) for flatulence, take activated charcoal (4 tablets 3 times a day (for two days));
  - c) on the evening before the study, a cleansing enema is placed;
  - d) for 18–20 hours before the study, stop eating, medication, liquid;
  - e) patients with liver, gall bladder, and pancreas damage are recommended to take enzyme preparations on the eve of the study;
  - f) do not smoke before the study;
  - g) if necessary, the patient should have a towel with them.

## **LABORATORY TESTS OF URINE**

### **COLLECTION OF URINE FOR GENERAL CLINICAL ANALYSIS**

Proper preparation for the collection of urine for General clinical analysis is important to ensure a reliable result of the study.

Necessary equipment: referral for research, clean dry container with a volume of 200–240 ml.

Execution sequence. On the eve of the study, the patient receives a disposable container for collecting urine.

A day before the upcoming study, the patient is recommended to refrain from consuming large amounts of carrots and beets, taking diuretics and sulfonamides, and not change the drinking regime.

A nurse fills out a research referral containing the patient's passport data. You should explain to the patient the purpose and upcoming procedures and training (if required to give a written statement); to teach the patient the technique of cleaning: in the morning the day before the study, to treat external genitals with warm water and soap in the direction from the urethra to the perineum with subsequent drying cloth in the same direction.

During menstruation, a urine test is not collected as planned. In emergency cases, as prescribed by a doctor, urine can be collected using a catheter or after inserting a cotton-gauze swab into the vagina.

The patient is trained in the technique of collecting urine for research: in the morning, after a hygienic procedure, the patient collects urine in a disposable

container. The patient is told where to leave the container with urine and who to report it to.

In the morning on the day of collecting urine for research, the patient's actions should be monitored and the collected urine sent to the clinical laboratory.

## **COLLECTION OF URINE FOR NECHIPORENKO TEST**

Urinalysis by Nechiporenko is used for differential diagnosis between pyelonephritis and glomerulonephritis, the number of cells of the urinary sediment (white blood cells, red blood cells) and cylinders (protein-containing casts of the renal tubules) per unit volume of urine (recalculated by 1 liter of volume) is estimated.

Necessary equipment: disposable container, referral for test. Execution sequence. The stages of preparation for collecting urine for research on Nechiporenko do not differ from the preparation for collecting urine for General clinical analysis. The difference is that for the study, you need to collect an average amount in a jar a portion of urine, the patient first urinates in the toilet, then in a container and completes urination in the toilet.

## **THE URINE COLLECTION FOR THE STUDY IN GENERAL**

The study is designed to assess the concentration function of the kidneys by determining the relative density of urine, as well as the volume of diuresis.

Required equipment: 8 clean dry containers with labels indicating the sample name, first name and patronymic of the patient, compartment, portion number, time, and 2–3 additional clean dry containers.

Execution sequence. You should prepare containers beforehand, issue labels for each bottle: "Zymnitski urine analysis; portion # 1; 9.00; I. I. Rakov; 30 years; Nephrology; PAL. No. 3; 30.03.2020; signature of the nurse".

The patient is explained the purpose, the course of the upcoming procedure and the specifics of preparation (if necessary, you must give written instructions):

- urine collection will take place during the day;
- water-food regime normal;
- a day before the upcoming collection of urine, diuretics are canceled;
- on the day the study starts at 6.00 am the patient must urinate in the toilet;
- then all the urine is collected in separate containers every 3 hours:
  - a) portion # 1 — from 6.00 to 9.00;
  - b) portion # 2 — from 9.00 to 12.00;
  - c) portion # 3 — from 12.00 to 15.00;
  - d) portion # 4 — from 15.00 to 18.00;
  - e) a portion of No. 5 — from 18.00 to 21.00;



- f) a portion of No. 6 from 21.00 to 24.00;
- g) a portion of No. 7 from 24.00 to 3.00;
- h) serving number 8 — from 3.00 to 6.00.

Additional cans are used if the capacity of the main jar is not sufficient for a specific portion. If there was no urine during the specified period of time, the corresponding container is delivered to the laboratory empty. You should warn the patient that the containers are stored in the toilet (sanitary room); specify the place and time where to bring the containers with urine. On the day of collecting urine for research, the nurse should monitor the patient's actions, and at night, at the proper time for collecting urine, Wake the patient. In the morning, the collected urine is sent to the clinical laboratory no later than 8.00.

## **COLLECTION OF URINE FOR BACTERIOLOGICAL TEST**

Necessary equipment: sterile tube with a stopper, direction.

The nurse should teach the patient the technique of collecting urine for test: in the morning, after a hygienic procedure, you should start urinating in the toilet at the expense of "1, 2", then delay urination, open the tube and collect the urine, filling the tube with 1/2 or 3/5, close the stopper. The procedure should be carried out clearly and quickly, so that the bottle remains open for a minimum time and its edges do not come into contact with non-sterile surfaces Medical care and supervision of elderly and senile patients with kidney and urinary tract diseases.

One of the problems of caring for elderly and senile patients is the presence of frequent urination at night (not only due to the pathology of the urinary system, but also due to age-related changes in the kidneys, sleep disorders), which leads to the need to frequently get out of bed at night. Therefore, the nurse should explain to the patient that he should not drink liquid later than 6–7 pm, so as not to experience frequent urge to urinate at night, and at night leave a vessel by the bed. Patients may have urinary incontinence-enuresis (for kidney diseases, cystitis, prostate adenoma, violation of cerebral circulation, General exhaustion of the patient, senile dementia, etc.). A special form of enuresis is the so-called stress urinary incontinence, which occurs in women when coughing, sneezing or laughing, and in the elderly and senile age due to insufficiency of the sphincter of the bladder. Complete urinary incontinence develops with complete loss of sphincter function, when the innervation of the bladder is disrupted due to the sprouting of the sacral nerve plexus by the tumor or direct sprouting of the tumor into the neck of the bladder. In this case, the patient has a constant leakage of urine. In case of urinary incontinence, the nurse should wash the patient and change his underwear after each urination. You should advise relatives to buy special diapers for adults. In case of urinary incontinence, it is recommended to limit fluid

intake after 3 hours of the day. Food should be easily digestible, the patient should take food frequently during the day, in small portions. It should be remembered that you need to regularly disinfect the vessel (urinal) and disinfect the patient's secretions before draining them into the sewer.

With strict bed rest, a serious condition of the patient, the nurse should pay special attention to the condition of the patient's skin, especially if he has edema, and carry out the prevention of bedsores.

### **THERAPEUTIC NUTRITION FOR KIDNEY DISEASES**

DIET with HIGH PROTEIN CONTENT-diet M (high PROTEIN) is a Close analog of diet 5, 7, 7a, b, 10.

General characteristics, cooking.

A diet with a high protein content, a normal amount of fat, complex carbohydrates, and a restriction of easily digestible carbohydrates. Limited table salt (6–8 g / day), chemical and mechanical irritants of the stomach, bile ducts. Dishes are cooked in boiled, stewed, baked, mashed and UN-mashed form, steamed. Food temperature — from 15 to 60–65 °C. Free liquid — 1.5–2 l. the Rhythm of nutrition is fractional, 4–6 times a day.

Indications for use.

Diseases and conditions that require the introduction of an increased amount of protein (disorders of absorption, kidney disease with nephrotic syndrome without violation of nitrogen-releasing function, type 1 diabetes, sepsis and other severe bacterial diseases, severe anemia).

Proteins — 110–120 grams (including the animals — 45–60 g). Vitamin C — 70 mg.

Fat — 80–90 g (including vegetable — 30 g).

Carbohydrates — 250–350 g, including mono- and disaccharides (30–40 g); refined carbohydrates are excluded for patients with diabetes.

Energy value — 2080–2650 kcal.

According to the indications of the attending doctor special pharmacological composites and mixtures are prescribed.

A diet with a LOW PROTEIN CONTENT-diet H (low-PROTEIN) is a Close analog of the diet 5, 7G.

General characteristics, cooking.

A diet with a restriction of protein to 0.8, or 0.6, or 0.3 g / kg of ideal body weight (up to 60, 40 or 20 g / day), with a sharp restriction of table salt (2–3 g/day) and liquid (0.8–1 l/day). Nitrogenous extractives, cocoa, chocolate, coffee, and salty snacks are excluded. The diet includes protein-free white bread, mashed potatoes, and mousses made of swollen starch. Dishes are prepared without salt, in boiled form, not rubbed. The diet is enriched with vitamins and minerals. The food rhythm is fractional, 4–6 times a day.

Indications for use.

Chronic glomerulonephritis with severe and moderate impairment of nitrogen-releasing kidney function and severe and moderate azotemia. Cirrhosis of the liver with hepatic encephalopathy.

Proteins — 20–60 g (including animals — 15–30 g). Vitamin C — 70 mg.

Fat — 80–90 g (including vegetable — 20–30 g).

Carbohydrates — 350–400 g, including mono- and disaccharides (50–100 g).

Energy value — 2120–2650 kcal.

According to the indications of the attending doctor special pharmacological composites and mixtures are prescribed.

#7 Diet H, M acute nephritis during recovery (from the 3rd–4th week of treatment), chronic nephritis without exacerbation and kidney failure.

No. 7 a Diet N, M acute nephritis in severe form after fasting days and moderate severity from the first days of the disease, chronic nephritis with severe renal failure.

#7 b Diet N, M acute nephritis after diet # 7a or immediately with mild form, chronic nephritis with moderate kidney failure.

## SELF-CONTROL OF TOPIC ACQUISITION

### **1. An early manifestation of developing hidden edema is:**

- a) Hydrothorax;
- b) hydroperiod;
- c) abdominal enlargement;
- d) increase in body weight and decrease in daily diuresis.

### **2. Urine analysis using the Nechiporenko method is performed to determine the unit volume:**

- a) protein, glucose;
- b) salts, bilirubin;
- c) acetone, glucose;
- d) white blood cells, red blood cells.

### **3. When conducting a urine analysis using the Zimnitsky method is determined:**

- a) acetone, sugar;
- b) bilirubin, protein;
- c) white blood cells, red blood cells;
- d) quantity, relative density of urine.

### **4. X-ray contrast examination of the kidneys and urinary tract:**

- a) barium enema;
- b) tomography;
- c) chromatotherapy;
- d) excretory urography.

**5. Daily diuresis in a patient with acute glomerulonephritis was 400 ml — this is:**

- a) anuria;
- b) oliguria;
- c) polyuria;
- d) proteinuria.

**6. Position of the patient during renal colic:**

- a) with a raised head end;
- b) rushes, all the time changing position;
- c) on the side, with the legs brought to the stomach;
- d) with a forward tilt and emphasis on the hands.

**7. To collect urine for General analysis, the nurse must provide the patient with:**

- a) dry can;
- b) dry the test tube;
- c) a sterile jar;
- d) a sterile test tube.

**8. Excess of night diuresis over day diuresis:**

- a) anuria;
- b) nycturia;
- c) oliguria;
- d) polyuria.

**9. Edema of renal origin appears:**

- a) on your feet in the morning;
- b) in the morning on the face;
- c) on your feet in the evening;
- d) in the evening on the face.

**10. The primary prevention of acute glomerulonephritis includes everything except:**

- a) tempering;
- b) prevention of hypothermia;
- c) medical nutrition, employment with suitable working conditions;
- d) physical education.

**11. To conduct a urine test using the Nechiporenko method, the nurse sends to the laboratory:**

- a) 50 ml of freshly extracted warm urine;
- b) 100–200 ml of the daily amount;
- c) 10-hour portion;
- d) at least 10 ml of the average serving.

**12. To assess the functional state of the kidneys, the nurse prepares the patient for a urine test:**

- a) General;

- b) according to the Zimnitsky method;
- c) according to the method of Nechiporenko;
- d) bacteriological.

**13. Water balance is:**

- a) daily amount of urine;
- b) the ratio of day and night diuresis;
- c) daily diuresis for 3 days;
- d) the ratio of the liquid consumed and excreted.

**Answers:** 1 — g; 2 — g; 3 — g; 4 — g; 5 — b; 6 — b; 7 — a; 8 — b; 9 — b; 10 — a; 11 — g; 12 — a; 13 — g.

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ПАЦИЕНТАМИ С ЗАБОЛЕВАНИЯМИ  
МОЧЕПОЛОВОЙ СИСТЕМЫ**

**MONITORING AND MEDICAL CARE OF PATIENTS  
WITH DISEASES OF THE GENITOURINARY  
SYSTEM**

Учебно-методическое пособие

На английском языке

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