Ministry of Education and Science of Ukraine
Ministry of Health Care of Ukraine
Sumy State University

5534 Methodical instructions

for practical lessons
on the topic **"Emergency care and rules of care for patients with diseases of the urinary system"**
on the discipline **"Nursing care"**
(in accordance with the conditions of the Bologna process)
for students of specialty 222 *"Medicine"*
of full-time training

Sumy
Sumy State University
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Methodical instructions for practical lessons on the topic “Emergency care and rules of care for patients with diseases of the urinary system” on the discipline “Nursing care” / compilers: O. I. Smiyan, Y. A. Manko, O. G. Vasilyeva. – Sumy : Sumy State University, 2023. – 24 p.

Department of Pediatrics

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OBJECTIVE of this manual is to master the skills of collecting urine for different types of examination, to learn their diagnostic value, the rules for toileting the genitourinary system, the technique of bladder catheterization, urography, to be able to prepare the patient for the examination and provide first aid to children with acute diseases of the urinary tract.

SPECIFIC GOALS

The student should know:

- Rules for preparing a sick child for manipulations and research;
- Rules for the preparation of probes, catheters, end-pieces for manipulations.
- Principles of providing first aid for acute diseases of the urinary system
- The technique of carrying out the toilet of genitourinary organs;
- Bladder catheterization technique;
- Urography technique;
- Rules for taking urine for research according to the Zimnytsky method and its diagnostic value;
- Rules for the collection of urine by the Nechiporenko method and its diagnostic value;
- Rules for taking urine for research according to the Addis-Kakovsky method and its diagnostic value;
- Rules for taking urine for sugar and general analysis;
- Rules for preparing a sick child for manipulations and research.

The student should be able to

- Assist with vomiting;
- Assist with diarrhea;
- Assist with constipation;
- Wash the stomach;

- Give different types of enemas;
- Take wash water, faces for research;
- Prepare the probe, catheter for manipulation;
- Prepare a sick child for manipulations and research;
- Assist with acute urinary retention;
- Perform urination of genitourinary organs;
- Perform bladder catheterization;
- Prepare a child for manipulations and examinations;
- Collect urine for various types of research;
- Prepare a sick child for manipulations and examinations;
- Prepare a child for urography.

The initial level of knowledge and skills is checked by solving situational tasks on each topic, by answering tests and constructive questions.

A BRIEF SUMMARY OF THE MATERIAL

The Toilet of the Genitourinary Organs

Objective: to maintain the patient's personal hygiene.

Indications: severe or moderately severe condition of the child, bed rest of the patient's motor activity.

PREPARE:

1 Screen (if the patient is in a general ward);

2 Oiled cloth with a diaper or a moisture-resistant diaper;

3 Bedpan, preferably two (can be rubber, enamel, plastic, earthenware);

4 Container for water or aseptic solution;

5 Water or an aseptic solution, t° - +40 °C;

6. Apron;

7 Mask;

8 Gloves;

9 Container with sterile forceps (individual for each patient);
10 A sterile tray with a sterile napkin or a cotton-gauze.

SEQUENCE OF ACTIONS:

1 Change gloves after giving the bedpan to the patient, wash and dry hands and put on new sterile gloves. If this manipulation is carried out independently before another one, then fully prepare in advance, and put on gloves in the ward immediately before carrying out the toilet of the genitourinary organs.

DO NOT FORGET! POSITION OF THE PATIENT – "supine" with legs bent at the knees. Check with the patient whether it is comfortable for him/her to lie down.

2 In your LEFT hand, take a CONTAINER with water (t° - +40 °C) or an aseptic solution, and in your RIGHT hand - a pair of forceps with a medium or large cotton-gauze tampon.

3 Pour the water (solution) onto the napkin (tampon) to avoid splashing, keep the container quite low and irrigate ONLY IN ONE DIRECTION - TOP DOWN towards the anus and MUST then change the tampon (napkin) with a new one.

FIRST, wash the groin folds only IN ONE DIRECTION from top to bottom towards the anus, change the napkin (tampon), then wash the pubic area and labia majora ONLY FROM TOP TO DOWN towards the anus. CHANGE the tampon (napkin), then wash the folds between the labia majora and labia minora and the labia minora towards the anus. CHANGE the tampon (napkin). Finally, wash the crease between the clitoris and the vaginal opening.

REMEMBER!

IF the vaginal opening is gaping, tampon it before starting the irrigation or douching (the same applies during the "menstrual" period), then remove the tampon and irrigate the vagina and perineum up to the anus.

Drying is done in the same order, paying attention to the sacral region.

In boys, the sequence is only maintained when the penis is treated. It is NECESSARY to take it in the left hand and gently pull the prepuce, thereby freeing the glans of the penis, wet a napkin (tampon) in the solution and irrigate it, changing the napkins.

In young girls, during their "menstruation", the vagina does tampon before irrigating and an aseptic solution is used. At the end of irrigating, the tampon is removed and the vagina and perineum are irrigated, then the vagina is tamponed again.

First Aid for Acute Urinary Retention

Acute urinary retention is the impossibility of an independent act of urination when the bladder is full. Urinary retention should be distinguished from anuria, in which urination does not occur due to the absence of urine in the bladder. With urinary retention, the patient has strong urges to urinate, with anuria there are no urges.

First aid: Put a hot water bottle on the bladder area. You can also recommend a warm water bath to the patient. Urgent therapeutic measures for acute urinary retention consist in the urgent emptying of the bladder. The initial treatment measures for acute urinary retention are urgent emptying of the bladder. Urinary retention is unpleasant for patients not only because it causes pain, painful urges, and unpleasant sensations. But also because it can cause serious complications, such as inflammation of the bladder and kidneys, a sharp change in the state of the bladder wall, its thinning to the point of rupture.

Emptying the bladder is possible by three techniques: 1) bladder catheterization; 2) suprapubic bladder aspiration (capillary); 3) applying suprapubic cystostomy.

Bladder catheterization with soft rubber catheters is the most common and practically safe method. It should be remembered that in a significant number of cases of acute urinary retention, only bladder catheterization, leaving a fixed catheter in place for a short time (3-4 days) or by suprapubic aspiration of the bladder, is indicated. When about half a day has passed since the last urination, catheterization is

indicated. However, it may be necessary sooner. It may be necessary to repeat the catheterization if urination does not resume after some time (10-12 hours). Usually 3-4 catheterizations per day are sufficient..

Care of a Cystostomy

The manipulation is performed by a specially trained nurse.

PREPARE:

- Containers of disinfectant solutions (for soaking used material);
- Sterile gloves, trays, material;
- Aseptic solutions;
- If necessary, a new sterile catheter, as it is possible to block the catheter with urinary salts, deterioration of the rubber, etc.

REMEMBER!

A cystostomy can be permanent or temporary. In the first case, urine is passed through a Pezzer catheter. The doctor will change the catheter at least once a month. The patient's bladder is irrigated at least twice a week. Patients have difficulties at home. Therefore, they and their relatives should be taught the technique of urine collection.

Variant 1: The patient moves independently.

During the day, the outer end of the Pezzer catheter is lowered into a urine collection container (it can be made of rubber, polyethylene or nylon). It is a container with two holes; urine enters the container through the top hole and exits through the bottom hole. It is worn under the clothes on the abdomen or on the thigh. A valve regulates the flow of urine from the tank. At night, the outer end of the catheter is lowered into a container attached to the bed. Disposable urinals are currently used, which are disposed of after compulsory disinfection.

REMEMBER!

Genitourinary organs must be flushed! In case of skin irritation, it is necessary to treat it with a weak solution of potassium permanganate.

Variant 2: The patient does not move.

The outer end of the catheter is lowered into a container attached to the patient's bed.

Taking Material from the Urinary System

REMEMBER!

A healthy person's urine is sterile! Its contamination begins in the distal part of the urinary tract, where microorganisms enter from:

- Anus,
- Mucous membranes of the genitourinary organs.

It is necessary to collect 3-5 ml of the first morning urine in a sterile container, starting from midstream urine, for bacteriological examination. It is very important that the genitourinary organs are thoroughly emptied by following all the rules - only from top to bottom, replacing the napkin with a new one each time!

REMEMBER!

Urine in the morning usually remains in the bladder for several hours, which contributes to an increase in the number of microorganisms in it. Urine should not be stored for more than an hour before research. It is suitable for research within a day, no more when stored in the refrigerator. Because there is a process of continuous increase of microorganisms in it, which can completely distort the results of quantitative research.

URINE SAMPLING FOR CLINICAL ANALYSIS IN YOUNG CHILDREN

Equipment:

- Rubber gloves;
- A towel;
- A urinal;
- A rubber sheet;
- A dry clean container for urine with a label on it;
- A referral to the laboratory.

Essential condition: avoid prolonged storage of urine due to rapid lysis of its cellular elements and accumulation of bacteria in it.

Preparation for the procedure:

- Explain the mother (child) the aim and course of the procedure and receive a consent;
- Prepare the necessary equipment;
- Sign a referral to the clinical laboratory;
- Wash and dry your hands and put on gloves;
- Put a rubber sheet on the bed;
- Wash the child's genitals with flowing water in the anterior-posterior direction;
- Dry the child's genitals with a towel with soft blotting movements.

The procedure:

- Fix the urinal;
- Give the child some water to drink.
- Take the urinal after urination away;
- Dry the child's genitals with a towel or a napkin with soft blotting movements;

Completion of the procedure:

- Pour the collected urine into a dry clean container carefully;
- Remove the gloves;
- Wash and dry your hands;
- Arrange transportation of the received material to the laboratory within 1 hour after collection.

Urine Sampling for Bacteriological Investigation

Urine (5-10 ml) is collected from the midstream during voluntary urination into a sterile container immediately sealed with a sterile cap. The child's genitalia should be thoroughly washed and treated with furacillin (1:5000) solution prior to urine collection. In some cases, urine is obtained by catheterization of the urinary bladder.

Urine Collection for Glucose (Spot Urine)

The aim is diagnostic. *The doctor determines the indications. There are no contraindications.*

PATIENT PREPARATION:

1 Psychological;

2 Informing the patient about the research and the techniques of its implementation: it is collected in the morning or, if necessary, any portion of urine.

PREPARE:

- Diuresis;
- A funnel;
- A container for urine;
- Gloves;
- Glass rod;
- Laboratory referral.

SEQUENCE OF ACTIONS:

The patient collects only a midstream urine during diuresis, pours it into a container, the nurse writes out a referral and takes the container with the material to the laboratory.

Urine Sampling for Nechiporenko Test

Urine (10 ml) is collected from the midstream specimen during voluntary urination into a dry clean container. The child's genitals are washed right before sampling. The material is sent to the laboratory not later than 1 hour after collecting it.

The aim is diagnostic. It is the determination of the number of blood cells (leukocytes, erythrocytes and corpulscles) in 1 ml of urine.

The doctor determines indications.

Menstruation is a contraindication (if necessary, after a thorough toilet of the genitourinary organs, the vaginal opening is closed with a tampon and urine is taken with a catheter).

PREPARE:

- A clean dry container of at least 250 ml;

- Diuresis;
- A funnel;
- Laboratory referral;
- Disinfectant solutions.

PATIENT PREPARATION:

1 Psychological.

2 Inform on a thorough toilet of the genitourinary organs and collecting a midstream urine. Explain what “midstream urine” is.

SEQUENCE OF ACTIONS:

1 The day before, give the patient a clean, dry, lidded container, diuretic, and funnel.

2 Explain to the patient that in the morning he/she should collect a midstream urine in a container (the first and the last - in the toilet).

3 Explain that the container with urine must be placed in the sluice room no later than 7:30 in the morning.

4 Ensure proper laboratory referral and transfer of the urine no later than one hour after collection.

ADDITIONAL INFORMATION:

If necessary, urine is collected at any time of day. The patient must collect at least 10 ml of urine.

Usually 1 ml:

- Leukocytes – up to 4 × 103 (up to 2 in children);
- Erythrocytes – up to 1 × 103;
- Casts – up to 250 (hyaline).

Urine Collection and Examination According to Addis-Kakovskyi Count

The aim is to determine the blood cells (leukocytes, erythrocytes), protein, and casts in 1 ml of urine according to Addis-Kakovskyi count.

The doctor determines indications. There are no contraindications.

PREPARE:

- Clean dry container 0.5-1l;
- Gloves;
- A funnel;
- Preservative (formaldehyde).

PATIENT PREPARATION:

1 Inform the patient about the need to give urine specimen.

2 Report that you need to collect urine within 10 hours (from 10:00 p.m. to 8:00 a.m.).

3 If the patient cannot retain urine until 8 o'clock in the morning, he/she urinates into the container in portions. Preservative is added there (formaldehyde – 4–5 drops).

4 In the morning, the total volume of urine is mixed thoroughly, 200 ml is poured over the wall of the funnel (so that it does not foam) and taken to the laboratory.

SEQUENCE OF ACTIONS:

1 The patient urinates into the container at 10 p.m., after thoroughly toiletting the genitals.

2 He/she saves urine from 10 p.m. to 8 a.m.

3 The patient urinates into the container at 8 a.m., after thoroughly toiletting the genitals.

4 Stir the urine thoroughly with a glass rod and pour 200 ml for examination.

5 Issue a referral to the laboratory and take the urine to the laboratory.

ADDITIONAL INFORMATION:

The container for urine should be clean, dry, preferably not used before.

A preservative is added so that erythrocytes and leukocytes are not destroyed, if the patient needs to urinate in a container during this time.

Normally in 1 ml:

- Leukocytes – up to 4 × 106 (in children up to 2);
- Erythrocytes – up to 1 × 106;
- Casts – up to 20,000 (hyaline).

Examination of Urinary Sediment According to Hamburger

The aim, according to Hamburger, is to determine the excretion of blood count (leukocytes, erythrocytes), protein, and casts in 1 minute.

The doctor determines the indications. There are no contraindications.

PATIENT PREPARATION:

1 Inform the patient about the need to give urine specimen.

2 Instruct the patient in the technique of giving urine.

3 Warn about the need for careful toileting of the genitourinary organs.

PREPARE:

- Sterile tray;
- Sterile glycerine;
- Sterile Falley catheter;
- Sterile test tube;
- Clamp stand;
- Gloves;
- Mask;
- Urine bag or bedpan;

- Container with disinfectant solution.

SEQUENCE OF ACTIONS:

1 Urine is collected within 3 hours (from 6 to 9 in the morning).

2 Put on gloves and a mask.

3 Thoroughly wash and dry the patient's genitourinary organs.

4 Prepare a sterile tube.

5 Ask the patient to pour the first urine (6-hour urine) into the toilet, and from the 9-hour urine take 2/3 of its volume from the midstream urine into a test tube.

6 Close the test tube with a sterile stopper.

7 Make a referral to the laboratory and take it to the bacteriology laboratory.

8 Disinfect gloves and bedpan (urine bag) with a solution for at least one hour after disinfection.

ADDITIONAL INFORMATION:

The test tube is taken in the bacteriological laboratory. If the patient cannot urinate, urine is taken with a catheter.

Normally in 1 minute:

- Leukocytes – up to 4 × 103 (in children up to 2);
- Erythrocytes – up to 1 × 103;
- Casts – up to 250 (hyaline).

Urine Sampling for Zimnitsky Test

Urine is collected every 3 hours during the day into separate clean and dry containers with stickers on them on which urination time is marked. The portion of urine collected at 6 a.m. on the day of investigation is not taken into account. Urine is collected every 3 hours until 6 a.m. the next day. There are 8 portions of urine. Four of them collected at 9.00, 12.00 a.m. and 3.00, 6.00 p.m. characterize day diuresis; the last portions received at 9.00, 12.00 p.m. and 3.00, 6.00 a.m. characterize night diuresis. The Zimnitsky test is used in young

children. Urine is collected in the free urine mode into containers marked according to the time of collection (6.00-9.00 a.m., 9.00 - 12.00 a.m., etc.). The test requires estimation of daily diuresis, daily urinary rhythm and urine density in each portion.

The aim is to determine the concentration and excretory function of the kidneys.

The doctor determines indications. There are no contraindications.

PATIENT PREPARATION:

1 Explain to the patient that drinking, eating and movement schedules should remain unchanged.

2 It is necessary to collect urine during the day for every 3 hours.

3 The doctor cancels uretics the day before the research.

SEQUENCE OF PATIENT ACTIONS:

(Or nurses if the patient is on bed rest)

1 Give the patient eight numbered containers with a time stamp and a 9th spare. The patient urinates in the toilet at 6 o'clock in the morning.

2 Then, every 3 hours, the patient urinates into the corresponding containers until 6 a.m. the next day. The morning urine is included in the research.

3 The received container must be tightly closed with bungs with sticky labels on which it is written:

– Patient's full name;

– Department number;

– Ward number;

– Time interval (6-9; 9-12; 12-15; 15-18; 18-21; 21-24; 24-3; 3-6).

4 Transport the urine to the laboratory.

5 Soak the used gloves, funnel, diuretic, bedpan (urine bag) in a disinfectant solution. Then disinfect them separately for at least 60 minutes.

ADDITIONAL INFORMATION:

The nurse must remember to wake the patient every three hours during the night.

Urine is collected at 6 o'clock in the morning of the previous day; it is not examined because it is released at the expense of the previous day.

If the patient has polyuria and does not have enough volume of a container, the nurse gives him an additional container with the corresponding time period.

If the patient does not pass urine for a certain period of time, this container should remain empty.

EVALUATION OF RESEARCH RESULTS:

The nurse should know that daily portions are collected from 6:00 a.m. to 6:00 p.m.

Daily diuresis is 2/3-4/5 per day.

Urine specific gravity is normally 1010-1025. Daily diuresis is usually 1.5-2 L and depends on many factors.

In interpreting the results, ***the nurse must determine:***

- Daily diuresis;
- The total volume of all samples;
- The first 4 (day) and last 4 (night) volumes separately;
- The ratio of night diuresis to day diuresis;
- Urine specific gravity in each portion with a urometer.
- Pour urine from the container into the graduated cylinder and lower the urometer so that it reaches the bottom and then determine on which dividing line the urine level is on the lower meniscus.
- Record the result in the referral.

Normally, daytime urine has a lower specific gravity than night-time urine, but not less than 1010.

A decrease in the specific gravity of urine below 1010 indicates a decrease in the concentration function of the kidneys.

If it is not enough to determine the specific gravity of urine, then its specific gravity is determined as follows: the obtained sample

is diluted 2 times with water, measured with a urometer and multiply the obtained result by 2.

If the volume of urine is very small, you can dilute it 3 times or more, and multiply the result by this value.

The data obtained should be written on the form in the appropriate column.

The concentration capacity is considered to be maintained if the lowest specific gravity is not less than 1007; the highest specific gravity is not more than 1027. The difference between the maximum and minimum specific gravity values is not less than 7, or the specific gravity in one sample was not less than 1017. The amount of liquid released should be at least 70-80 % of the amount consumed.

Intravenous Urography

(X-ray examination of the kidneys, which requires careful preparation)

The doctor prescribes an individual training plan for each patient, but there are also general recommendations.

The nurse is obliged to:

- Warn the patient about the scheduled research at least two days in advance.
- Monitor how the patient follows the prescribed diet and from the second half of the day, before the research, limit fluid intake.
- The day before, perform a deep, to "clean" washing water, cleansing enema.
- In the morning, on the day of the research, 2 hours before it, perform a cleansing enema with six glasses of warm water and chamomile infusion.

The research is carried out strictly on an empty stomach, in the x-ray room; a contrast agent (verographin, urographin, etc.) is injected intravenously. The nurse must remember that contrast agents are injected into the patient's vein in a horizontal position at a rate of 0.3 ml/sec.

Retrograde Urography

(A research of the kidneys using contrast agents through the renal tracts)

Contrast is injected through the catheter, so no special patient preparation is required.

PREPARATION for the ultrasound investigation consists in releasing the intestinal tract from gases. This is achieved by following a special diet.

At present, enemas and Carbolene, Cerucal are practically not used.

EXAMPLES OF SITUATION TASKS

Task No. 1:

The standard data of leukocytes and erythrocytes in urine analysis according to Nechiporenko in children are:

A) < 4 000 and < 1 000
B) 4 000 and 1 000
C) < 2 000 and < 1 000
D) < 4 000 and < 500
E) < 2 000 and < 100

Task No. 2:

The standard data of leukocytes and erythrocytes in urine analysis according to Amburzhe in children are:

A) < 4 000 and < 1 000
B) 4 000 and 1 000
C) < 2 000 and < 1 000
D) < 4 000 and < 500
E) < 2 000 and < 100

EXAMPLES OF TEST CONTROL

1 About growth of renal insufficiency testifies:
A) Asymmetry of stomach
B) Out pouching at the level of kidney projection
C) Appearance of urea smell from mouth
D) Pouching above the pubic bone

2 The forms of severe renal insufficiency include, except for

A) Postrenal
B) Prerenal
C) Renal
D) Monorenal
E) Arenal

3 The stages of development of acute renal failure are, except for

A) Recovery
B) Initial (shock)
C) Oligoanuric
D) Restoration of diuresis
E) Prodromal

4 The clinical signs of chronic renal failure are, except for

A) All indicated is wrong
B) Disruption of water-electrolyte balance
C) Disruptio of acid-base balance
D) Hemostasis disorders
E) Immune changes

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