

MINISTRY OF HEALTH OF UKRAINE
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Departments of Pediatrics №2

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**METHODOLOGICAL RECOMMENDATIONS
ON PRACTICAL CLASSES FOR STUDENTS**

International Medical Faculty, course 6

Educational discipline "**PEDIATRICS**"

Approved

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1. Topic № 19

- 2.** Differential diagnosis of functional and organic diseases of the stomach in children. Leading clinical symptoms and syndromes in functional and organic diseases of the stomach in children (functional dyspepsia, gastroesophageal reflux disease, gastritis, peptic ulcer disease of the stomach and duodenum). Differential diagnosis of functional and organic diseases of the stomach in children. Clinical and instrumental examination and differential diagnosis of functional and organic diseases of the stomach in children. Clinical variants of the course of functional and organic diseases of the stomach. Differential diagnosis of functional and organic diseases of the stomach in children. Tactics of managing children with functional and organic diseases of the stomach. Emergency care for gastric bleeding. Prevention and dispensary monitoring of functional and organic diseases of the stomach in children.

3. Relevance of the topic.

The problem of diseases of the digestive system in children is one of the most pressing in pediatrics. The prevalence of gastrointestinal pathology in childhood is characterized by adverse trends, with functional disorders of the digestive system in the structure of diseases of the digestive system in children occupy a leading place.

Disorders of Gut-Brain Interaction (DGBI) are one of the most common problems in pediatric gastroenterology. According to various authors, DGBI occurs in 55-75% of children in the first months of life. As the child grows older, the frequency of functional disorders increases, their forms become more diverse. Many children with age have evolved symptoms of DGBI, such as belching in children under 1 year, cyclic vomiting in children 3-8 years and abdominal pain, dyspepsia in children older than 8 years.

Observations of practicing pediatricians and general practitioners have shown that functional disorders of the gastrointestinal tract (GIT) develop in every second child under the age of 2.5-3 years, that is, the first 1000 days of life, and represent a large group of conditions accompanied by belching, vomiting, diarrhea, colic, constipation. Irritable bowel syndrome (45%), functional abdominal pain (25-40%), functional dyspepsia (27%) and functional constipation (25%) prevail in the structure of functional disorders of the gastrointestinal tract in children and adolescents.

The urgency of the problem is due not only to the high prevalence, but also the social significance of DGBI. Beginning in childhood, DGBI can persist into adulthood, transforming into other types of functional disorders. Modern authors have shown that the quality of life of patients with DGBI can be significantly reduced. Thus, in the study Ranasinghe N. et al. Adolescents with DGBI associated with abdominal pain were found to have clear signs of psychological maladaptation and a number of negative personality traits, such as hostility and aggression, negative self-esteem, emotional intolerance, emotional instability, and a negative outlook. Another study found that the quality of life of children with DGBI and their families was significantly worse than that of children with organic diseases such as inflammatory bowel disease and gastroesophageal reflux disease. In addition, the DGBI has reduced the quality of schooling and there are problems in the mastering of the school curriculum by children. The lack of clear improvement of clinical symptoms during traditional therapy complicates the interaction in the doctor-patient-parent system. Anxiety disorders and depression are more often found in children with DGBI, which require a differentiated approach to therapy with the participation of a psychologist, psychotherapist. It should also be noted that such patients need an annual increase in the cost of examinations and medical care.

3. Objectives of the lesson

3.1. General goals

- To improve knowledge of anatomical and physiological features of the digestive system in children

- Improve understanding of etiopathogenetic mechanisms of development of functional gastrointestinal disorders
- Know the classification and clinical diagnostic criteria for the most common gastrointestinal disorders
- Know modern methods of diagnosing functional gastrointestinal disorders
- Be able to prescribe differentiated treatment depending on the type of functional disorders in children

3.2. Educational goals:

Get acquainted with modern recommendations, protocols for diagnosis and treatment of functional disorders of the gastrointestinal tract, get acquainted with the contribution of domestic scientists in studying the problem of functional gastrointestinal disorders in children (Shadrin OG, Kyiv; Nyankovsky SL, Nyankovskaya OS, Lviv; Mysnyk VP, Kyiv; Marushko Yu. V., Kyiv), be able to prove to parents the expediency of treatment and prevention measures for functional gastrointestinal disorders in children.

3.3. Specific goals:

- identify different clinical variants and complications of the most common functional gastrointestinal disorders in children
- to devise tactics for managing patients with the most common functional gastrointestinal disorders in children
- demonstrate the ability to keep medical records of sick children with pathology of the digestive system
- plan examination of a sick child and interpret the results of the most common functional gastrointestinal disorders
- make a differential diagnosis and make a preliminary clinical diagnosis of the most common functional gastrointestinal disorders

3.4. On the basis of theoretical knowledge on the topic:

Be able to:

- to conduct a quality history in the case of gastrointestinal diseases
- physical examination of the following interpretation of the data
- prescribe diagnostic procedures
- to make diagnoses according to modern classifications
- prescribe modern therapy and further prevention of gastrointestinal diseases

Master practical skills:

- diagnosis and management tactics for functional disorders of the gastrointestinal tract in children;
- to demonstrate mastery of moral and deontological principles of a medical specialist and the principles of professional subordination in pediatrics.

4. Materials for classroom independent training (interdisciplinary integration)

№ p / p	Disciplines	Know	To be able
1	Anatomy	Anatomical features of the gastrointestinal tract in children of different ages	Anatomical features of the gastrointestinal tract in children of different ages
2	Biochemistry	Investigation of acid- and secret-producing, enzyme-forming function of the stomach	To evaluate the results of fractional probing of the

			stomach, pH-metry, diagnosis of H. pylori infection
3	Physiology	Secretory function of the digestive organs, principles of regulation of food activity of the gastrointestinal tract, motor and protective functions of the gastrointestinal tract.	Evaluation of the results of motor and secretory function of the stomach
4	Pathophysiology	Pathogenesis of pathology of the gastrointestinal tract of inflammatory nature	Analyze the main links in the etiopathogenesis of the disease
5	Propaedeutics of internal diseases and propaedeutics of children's diseases	Typical complaints in the pathology of the gastrointestinal tract in children, the main clinical symptoms, methods of examination, differential diagnosis of diseases	Justify the diagnosis according to the classification
6	Pharmacology	Pharmacological action of necessary drugs	Prescribe appropriate treatment, taking into account the age dose
7	Organization of health care and social. hygiene	Principles and organization of dispensary observation in chronic diseases of the gastrointestinal tract	Make a plan for the rehabilitation of the dispensary patient.

5. The content of the topic

Definition. Roman Criterion IV defines DGBI as "disorders of the gut-brain axis". Thus, from the standpoint of modern medicine, the definition of DGBI will sound as follows: it is a stable complex of gastrointestinal symptoms that occur in connection with motility disorders, visceral hypersensitivity, changes in mucosal immunity and inflammatory response as a result of microbiota and changes in the regulation of the intestinal axis. -brain "in certain social and environmental conditions and / or in the presence of psychological characteristics, family predisposition.

According to experts, this definition is most consistent with the modern understanding of several pathophysiological processes that individually or together determine the characteristics of the symptoms that characterize the Roman classification of disorders. According to Drossman [2016], this definition is easy to understand and accept for physicians, scientists, regulators and the pharmaceutical industry, as well as patients.

Thus, the new classification system is an important component for the management of these disorders, but effective management requires a biopsychosocial approach that takes into account the variability and complexity of patients with such disorders.

Etiopathogenetic mechanisms of development of functional disorders of the digestive system in children. There is no doubt about the polyetiology of DGBI in children. The main in their pathogenesis are disorders of motor function and visceral sensitivity, but they are often accompanied by changes in secretory, absorption functions, microflora of the gastrointestinal tract and the inflammatory potential of the mucous membrane. At an early age, genetics, sociocultural and environmental factors can negatively affect psychosocial development in terms of personal qualities, propensity to life stress, psychological state, as well as knowledge and skills to overcome difficulties. These factors also affect susceptibility to intestinal dysfunction: abnormal motility or sensitivity, altered immune dysfunction of the mucosa or inflammation, microbial environment,

and exposure to food and nutrients. In addition, these changes in the connection between the brain and intestines interact with the expression of the CNS.

The term "mucosal homeostasis" means a structural and functional complex of the mucous membrane, including epitheliocytes, including secretory and immunocompetent cells, myocytes, blood and lymphatic vessels, nerve endings and plexuses of the enteric nervous system, mucus, parietal. Currently, the mucous membrane of the gastrointestinal tract is considered an immunocompetent organ involved in inflammatory and immune responses to the stimulating effects of exogenous (microorganisms, allergens, pollutants) and endogenous (cytokines, etc.) nature by stimulating the secretion of cytokines, eicosanoids, nitric oxide, endothelin, defensin, expression of cytokine receptors.

The intestinal-brain axis is a system of bilateral interaction between the intestine and the brain, which is based on neuroendocrine and immunological mechanisms, closely related to each other. This bidirectional axis includes the central nervous system (brain and spinal cord), the autonomic nervous system, the enteric nervous system, and the hypothalamic-pituitary-adrenal axis.

Thus, both neural and hormonal communication lines allow the brain to influence the activity of functional effector cells of the intestine. These same cells, on the other hand, are influenced by the intestinal microbiota, whose role in brain-intestinal interactions has only recently been assessed.

The biopsychosocial model based on the assumption of multifactoriality of DGBI genesis is considered as a basic concept of DGBI development.

In childhood, genetic, sociocultural and environmental factors can have a great influence on a person's psychosocial development, his personal qualities, susceptibility to stress and coping skills. These factors also largely determine the predisposition to the development of DGBI, including impaired motility and sensitivity, alteration of local immune properties of the mucous membrane and the composition of the microbiota.

Modern researchers have identified the negative effects of DGBI, which can be divided into short-term and long-term. The next ones include frequent repeated visits to a pediatrician and / or gastroenterologist; psychological problems and reduced quality of life of the family, frequent school absences, excessive use of analgesics, significant costs for examination and selection of therapy.

In recent years, in both domestic and foreign literature, there is growing evidence that the long course of DGBI can cause structural disorders in the gastrointestinal tract, as well as have a negative impact on future health in general, that is, to have long-term consequences.

Thus, in 28% of children who survived childhood intestinal colic in the first year of life, at the age of 13 there was DGBI. At the same time, among children who did not suffer from colic, DGBI in adolescence was observed in only 6% of cases. Thus, DGBI can affect a child's future health. In this regard, timely correction of these conditions seems important and relevant. To develop and implement effective programs for the prevention and correction of DGBI requires an understanding of the mechanisms underlying the violation of communication in the intestinal-brain axis.

Thus, the results of existing epidemiological studies suggest that DGBI is widespread among the pediatric population, with the most common intestinal colic and constipation in young children and functional dyspepsia, constipation and irritable bowel syndrome in older children, while such conditions, as rumination syndrome and aerophagia, are relatively rare, accounting for just over 3-5% of cases.

Features of the clinical course and criteria for the diagnosis of functional disorders of the digestive system in children

According to Minushkin ON (2015), the general signs of functional disorders of the digestive system include: the duration of the main symptoms is not less than 3 months. during the last six months, the absence of organic pathology and visible morphological substrate, multiple complaints from various organs, not only the digestive system, general satisfactory condition and

course of the disease without noticeable progression, but significant impairment of patient quality, frequent association of symptoms with exposure stressors and the presence of psycho-emotional disorders (feelings of anxiety, fear, depression) that require psychocorrection.

It should be noted that according to modern authors, one of the important features of the course of diseases of the digestive system in children, in particular functional disorders in modern conditions is the combined nature of the lesion, denoted by the term "syntropy", when there is diseases that have common etiological and pathogenetic mechanisms. Thus, according to Shadrin OG and Platonova OM (2013) the combination of gastroesophageal reflux disease and irritable bowel syndrome in school-age children is 33.7%.

Diagnosis of DGBI is based on criteria known as Roman. The latest version (Rome IV) was published in May 2016.

According to the Roman criteria for the diagnosis of IV review, there are two groups of DGBI in children - G and H. Group G - DGBI in newborns and young children; group H - DGBI in children and adolescents. Group G includes: G1 - regurgitation in infants, G2 - rumination syndrome in infants, G3 - cyclic vomiting syndrome, G4 - pediatric intestinal colic, G5 - functional diarrhea, G6 - infant dyschezia, G7 - functional constipation.

Group H included: H1 - functional nausea and vomiting disorders (H1a - cyclic vomiting syndrome, H1b - functional nausea, functional vomiting, H1c - rumination syndrome, H1d - aerophagia); H2 - functional abdominal pain disorders (H2a - functional dyspepsia (H2a1 - postprandial distress syndrome H2a2 - epigastric pain syndrome), H2b - irritable bowel syndrome, H2c - abdominal migraine, H2d - functional disorders without additional abdominal; defecation (H3a - functional constipation, H3b - incontinence).

Classification of functional gastrointestinal disorders (Roman criteria 4)

G . Pediatric gastrointestinal disorders: newborns / infants	
G 1 Regurgitation in infants G 2 Rumination syndrome G 3 Cyclic vomiting syndrome (SCS) G 4 Pediatric colic	G 5 Functional diarrhea G 6 Pediatric dyschezia G 7 Functional constipation
H . Pediatric gastrointestinal disorders: child / adolescent	
H 1 Functional disorder of nausea and vomiting • H 1 a Cyclic vomiting syndrome (SCS) • H 1 b Functional nausea and functional vomiting • H1b1 Functional nausea • H1b2 Functional vomiting • H1c Rumination syndrome • H1d Aerophagia	✓•H2a1 Postprandial distress syndrome ✓•H 2 a 2 Epigastric pain syndrome • H 2 b Irritable bowel syndrome (IBS) • H2c Abdominal migraine • H 2 d Functional abdominal pain - organ-specific
H 2 Functional disorders of abdominal pain • H2a Functional dyspepsia	H3 Functional disorders of defecation • H3a Functional constipation • H 3 b Fecal incontinence without fixation

As already mentioned, the most common DGBI in young children is infantile colic, vomiting and functional constipation, and in older children - functional dyspepsia, irritable bowel syndrome.

Infant colic is an episode of irritability, anxiety, or inconsolable crying that occurs and ends for no apparent reason. The duration of colic is more than 3 hours a day, at least 3 days in one week.

The diagnosis is established in the presence of all the following symptoms in a child under 5 months of age:

1. Recurrent paroxysms of irritability, restlessness or screaming that begin and end for no apparent reason;

2. At least three hours a day for three or more days a week;

3. No signs of progression, the child is gaining weight, no fever or other illness.

No special instrumental and laboratory research methods are required to diagnose "baby colic".

The basic principles of treatment of colic in children include:

- Conducting a conversation with parents, explaining to them the causes of colic, the peculiarities of their course;

- Elimination of psychological tension in the family (especially in the mother), normalization of family lifestyle;

- Creating an aura of confidence in the mother, which will help to properly perform all the doctor's appointments;

- Mothers of babies who are on breastfeeding should **normalize ration** their **food**. In particular, it is necessary to exclude from the diet foods that can cause flatulence (extractives and fatty foods), and sometimes limit the consumption of cow's milk;

- In mixed and artificial feeding, infants are recommended treatment mixtures with partially hydrolyzed protein and low lactose content;

- Reduce the intervals between feedings, reduce the amount of single feeding (especially during artificial feeding);

- Postural therapy: after feeding it is necessary to hold the child in an inclined position (at an angle of 45 ° tummy down) for 10-15 minutes, to drain the air swallowed during feeding;

- Between feedings and during an attack, the baby's colic is spread on the abdomen.

Regurgitation in infants (vomiting) is a passive discharge of stomach contents (swallowed food) into the mouth and out, the most common DGBI in children of the first year of life is due to immaturity of the motility of the upper gastrointestinal tract.

Diagnostic criteria include the presence of all the following symptoms in a healthy child 3 weeks - 12 months:

1. vomiting (passive leakage of food from the mouth or nose) **2 or more times a day** for **3 weeks** or more;

2. absence of vomiting, blood impurities in the vomit, aspiration, apnea, general disorders, difficulty in feeding and swallowing or incorrect position during or after feeding.

Vomiting intensity rating scale

Bali	Characteristic
0	No regurgitation
1	Less than 5 regurgitation with a small volume (not more than 3 ml)
2	More than 5 regurgitation with a day with a volume of more than 3 ml
3	More than 5 regurgitation per day with a volume of up to ½ the amount of mixture administered in one feeding, not more often than half of the feedings
4	Regurgitation a small volume for 30 minutes or more after each feeding
5	Regurgitation from 1/2 to the full volume of the mixture that the child ate less than half of the feedings

Tactics in regurgitation consists of the following stages:

- Exclude gastroesophageal reflux disease, pylorospasm, pylorostenosis, organic pathology of the CNS, abnormalities in the development of the oropharynx, etc.;

- Reassure parents (psychological support);

- Breastfeeding at an angle of 45-60 degrees, which prevents regurgitation and aerophagia;
- At night it is advisable to raise the main end of the bed by 10-15 cm;
- Feed the baby more often, in smaller portions;
- Correction of the mother's diet (during breastfeeding) - the diet excludes foods that can cause gas and flatulence in the baby, if necessary, a hypoallergenic diet;
- In the absence of effect - use thickeners, which are given to the child at the beginning of feeding in small quantities (rice-free milk porridge or rice broth of industrial production);
- In the diet of children in the first months of life who are on artificial feeding, it is recommended to use adapted milk formulas, casein is preferred. In the absence of positive dynamics, **special antireflux mixtures** are prescribed, the peculiarity of which is a change in the ratio of casein and whey proteins to **casein**, as well as the inclusion of thickeners (most often, **gum (locust bean gluten)**, starch (amylopectin), etc.);

The use of drug therapy (prokinetics, H2-histamine receptor blockers, proton pump inhibitors) - in infants and young children is significantly limited, due to contraindications for the use of these drugs at an early age and a high risk of complications. Sufficient attention should also be paid to measures and prescriptions of drugs to reduce flatulence, aerophagia, intestinal colic, correction of intestinal dysbiosis. If necessary, conduct therapy aimed at rehabilitation of perinatal CNS lesions, according to the recommendations of a neurologist.

Functional constipation (FC) is characterized as a condition that is manifested by a change in bowel movements up to 2 times a week or less and the discharge of solid fecal masses, accompanied by difficulty in the act of defecation, as well as a feeling of incomplete defecation.

The disease is poly etiological with a hereditary predisposition. The most common cause of FC is functional disorders of motor-evacuation function of the colon and rectum. Posthypoxic CNS damage is of great importance in the formation of FC in young children. Also important is the morphofunctional immaturity, which causes a late start of the functioning of intestinal enzymes and the imperfection of the receptor apparatus. A significant role in the development of FC is played by violation of the act of defecation due to the lack of timely development of the appropriate reflex.

The pathogenesis of constipation in children includes the following factors:

- Delay in the promotion of fecal masses in the intestine;
- Weakness of intra-abdominal pressure;
- Violation of the act of defecation (dysfunction of the rectum and / or anal sphincter, pelvic floor muscles) - anorectal dysfunction.

Diagnostic criteria for functional constipation should include 2 or more of the following signs recorded at least once a week for at least 1 month with insufficient criteria for diagnosing IBS: at least 2 or fewer bowel movements per week in a 4-year-old child; at least 1 attack of incontinence per week; in the history of the disease there is recurrent rigidity or excessive volitional defecation; in the history of the disease there are painful or rigid bowel movements; the presence of a large fecal mass in the rectum, in the history of the disease - data on cases of difficult defecation with fecal masses; after appropriate examination, the symptoms cannot be fully explained by another medical condition.

Ancillary studies to rule out organic pathology include:

- rectal (finger) examination;
- laboratory tests should include a series of coprograms, analysis of feces for worm eggs and Giardia cysts, microbiological studies (analysis of feces for dysbiosis);
- endoscopic examination (rectoromanoscopy, sigmoidoscopy), which allow to assess the condition of the mucous membrane of the distal parts and to exclude developmental abnormalities and inflammatory diseases;
- consultation with a neurologist;
- radiological, ultrasound, colonodynamic, tonometric, biopsy of the submucosal layer.

Therapeutic tactics

Therapeutic tactics

Diet therapy must meet the following requirements:

- Ensuring the physiological needs of the child in nutrients and energy,
- Elimination of excessive consumption of proteins and fats (which can inhibit motility),
- Enrichment of the diet with dietary fiber.
- Normalization of intestinal microflora (due to pre- and probiotics);
- For breastfed babies - it is necessary to adjust the diet and fluid intake for the mother, as well as to monitor the regularity of her bowel movements.
- Products with a high content of animal fats are excluded as much as possible, products that promote gas formation are limited (cabbage, onions, tomatoes, grapes, legumes, etc.);
- It is recommended to include in the diet of the nursing mother products that stimulate intestinal motility (fermented milk products with a high content of dietary fiber: vegetables, fruits, dried fruits, cereals, wholemeal bread, etc.), adhere to the optimal drinking regime. It is sometimes suggested to exclude products with a high allergic potential, and especially cow's milk, fish, nuts.
- For formula-fed babies - it is effective to use specialized mixtures that contain dietary fiber: mixtures with oligosaccharides (galacto- and fructooligosaccharides): Nutrilon, Nutrilon comfort, Humana, Nestozhen. Mixtures with lactulose (in the absence of colic): Detolact-1 plus, Detolact-bifidus, Lausanne bifidus, Semper bifidus. Mixtures that include locust bean gum: Nutrilon AR, Human AR, Detolact AR, etc.; sour milk mixes (Nan sour milk, Nutrilon sour milk, etc.).

Drug therapy

- Drugs that increase the volume of fecal masses and facilitate defecation (lactulose - Dufalak, Normaze, Lactuvit)
- Pre- and probiotics (BioGaia, Bifiform Baby, Hilak, etc.).
- Drugs that normalize intestinal motility - prokinetics (in infants are practically not used)
- Enzyme preparations that contain bile and hemicellulose (hofitol).
- Psychotherapeutic drugs.

Cyclic vomiting syndrome includes the following symptoms:

1. Two or more relapses of intense, persistent nausea and paroxysmal vomiting lasting from several hours to several days for 6 months;
2. Characteristic stereotyping of episodes;
3. Between episodes there are periods lasting from weeks to months, during which there is a return to baseline health;
4. After an appropriate medical evaluation, the symptoms cannot be attributed to another medical condition.

It is believed that CVS - a polyetiological disease, which is based on violations:

- •hypothalamic-pituitary-adrenal system (increased secretion of corticotropin-releasing factor) and
- •autonomic regulation (hyperactivation of the sympathetic division and low tone of the parasympathetic division).

CVS begins mainly at the age of three. The frequency of CVS attacks is usually from 4 to 70 per year (average 12). Seizures are stereotyped for a particular patient, occur at the same time, often at night and in the morning, at regular intervals or sporadically. Each episode of the attack is similar in onset, intensity, duration, associated signs and symptoms.

In the clinical picture of the cyclic vomiting syndrome there are **four periods**: symptom-free, prodrome, vomiting, and recovery.

- Symptom-free: children feel well, often do not even want to talk and even think about the suffering they endured while they were sick.
- Prodromal period (aura phase): the patient begins to feel the approach of an episode of cyclic vomiting, but can still prevent it by taking medication orally, can last from several minutes to several hours and even several days (however, this period is often absent).
- Period of attack: uncontrolled nausea and vomiting (up to 6 times per hour), signs of autonomic disorders, lethargy; dehydration, headache, photophobia, phonophobia and dizziness, gastrointestinal symptoms, average duration 24–48 hours. (min. 2 hours), seizures are observed every 2-4 weeks, episodes occur at night or in the morning.
- Recovery period: increased activity of the child, restoration of appetite, normalization of skin color, positive emotions return, water-salt balance is gradually restored.

Diagnosis of CVS is based solely on **clinical criteria**, there are no tests and laboratory signs to detect CVS.

The diagnosis of CVS is a diagnosis of exclusion and can be established by excluding other pathology accompanied by vomiting (organic CNS pathology, metabolic and endocrine disorders, abdominal migraine, chronic kidney disease, gastrointestinal abnormalities, partial intestinal obstruction, recurrent pancreatitis, etc.).

Therapeutic tactics for cyclic vomiting syndrome

Period	I	II	III	IV
Symptoms	Missing	Prodroma	Attack	Recovery
The purpose of therapy	Attack prevention	Seizure abortion	Seizure termination and (if unsuccessful) sedation until the end of the attack	Restoration of food without recurrence
Therapy	Elimination of triggers, adherence to the daily routine, exclusion of traumatic factors. Diet. Prevention (cyproheptadine <5, amitriptyline > 5, propranolol)	Ondasetron and / or Lorazepam (per os or sublingually). Sleep. Analgesia (for abdominal pain). Triptan (for headache).	Intravenous fluid replenishment in combination with H ₂ -blockers. For termination of an attack intravenously lorazepam or ondansetron. Repeat every 3-4 hours. with nausea in the waking state.	After buying vomit -sweet tea, glucose solution and honey, juices. Restoration of nutrition, diet expansion.

The term "**functional dyspepsia**" refers to the presence of one or more of the following symptoms: pain, burning in the epigastrium, a feeling of fullness in the epigastrium, early saturation - in the absence of data on organic (secondary) pathology that can explain these symptoms.

For functional dyspepsia, diagnostic signs should include one or more severe symptoms that occur at least 2 months before diagnosis and at least 4 days per month, namely: a feeling of fullness in the abdomen in the epigastric region after eating; early saturation; epigastric pain or burning not associated with defecation; after appropriate examination, the symptoms cannot be fully explained by another medical condition. Today, two subtypes of functional dyspepsia are accepted: postprandial distress syndrome, which includes a severe feeling of fullness in the abdomen, epigastric region, after a meal, or early satiety, which prevents the completion of a normal meal. Concomitant symptoms include bloating in the upper abdomen, postprandial nausea, belching or excessive belching. The second subtype, epigastric pain, includes all of the following: persistent pain (severe enough to disrupt normal functioning) or burning localized in the epigastrium. The pain is not common or localized in other abdominal or thoracic areas and is not relieved by defecation or flatulence. Concomitant criteria: 1) quality of burning / pain, but without retrosternal component; 2) the pain is usually activated or soothed by eating, but may also occur during fasting.

Treatment of functional dyspepsia consists of the following measures:

- refusal to take *nonsteroidal anti-inflammatory drugs*
- diet with exclusion / restriction of *provocative products* (such as caffeine, spices, fatty foods)
- antisecretory drugs (proton pump inhibitors for older children, adolescents) are taken for predominantly pain syndrome
- with discomfort in the upper abdomen - prokinetics
- with confirmation of *H. pylori-etiology of functional disorders* shown *eradication therapy*

Irritable bowel syndrome (IBS) can be defined as a functional bowel disorder in which abdominal pain is associated with impaired defecation or intestinal transit. Diagnostic criteria for IBS should include all of the following at least 2 months before diagnosis: abdominal pain at least 4 days per month associated with one or more of the following factors: association with defecation; change in the frequency of bowel movements; change in the shape (appearance) of feces; in children with constipation, the pain does not disappear with the treatment of constipation (children whose pain subsides are diagnosed with functional constipation, not IBS); after appropriate examination, the symptoms cannot be fully explained by another medical condition. Irritable bowel syndrome in children can be divided into subtypes similar to adults, reflecting the predominant nature of bowel movements (IBS with constipation, IBS with diarrhea, IBS with constipation and diarrhea and IBS without classification).

The Bristol stool form scale

Type 1		Separate hard lumps, like nuts (hard to pass)
Type 2		Sausage-shaped but lumpy
Type 3		Like a sausage but with cracks on its surface
Type 4		Like a sausage or snake, smooth and soft
Type 5		Soft blobs with clear-cut edges (passed easily)
Type 6		Fluffy pieces with ragged edges, a mushy stool
Type 7		Watery, no solid pieces ENTIRELY LIQUID

Therapeutic tactics for IBS include the following:

- Correction of the daily routine;
- Special diet, recommended dietary correction depending on the leading clinical manifestation;
- Psychocorrection;
- Drug therapy depending on the course (the presence of a leading clinical manifestation);
- In the presence of dysbiosis, dysbiotic changes need to be corrected

The Rome Criteria for the Fourth Revision clarified the difference between functional constipation and constipation. Immediately, 75% of children who reported constipation pain, as well as studies, showed that patients with IBS were often diagnosed with functional constipation. The Committee recommends that patients with constipation and abdominal pain be treated only for constipation. If abdominal pain disappears in the treatment of constipation, the patient has functional constipation. If the pain does not go away with proper treatment for constipation alone, the patient is more likely to have constipation.

During the diagnosis of DGBI, special attention should be paid to the identification of the so-called symptoms of anxiety ("red flags" in the foreign literature), which may indicate the presence of organic pathology and require in-depth examination of the patient.

Red flag symptoms in infants and young children	Red flag symptoms in older children and adolescents
Unexplained fever Unmotivated weight loss Refusal to eat Dysphagia Vomiting with blood impurities The presence of blood in the stool Sandifer syndrome	Unexplained fever Dysphagia Gastrointestinal bleeding Weight loss Lag in physical development Delayed sexual development Abdominal pain that wakes up during sleep

Anemia Leukocytosis Increased ESR Progressive deterioration of the child's condition Burdened family history of allergic diseases	Arthritis Perianal inflammation Diarrhea during sleep A burdensome history of inflammatory bowel disease, celiac disease, gastric ulcer and / or duodenal ulcer
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Features of complaints in functional and organic pathology of the gastrointestinal tract

Signs	Organic pathology of the gastrointestinal tract	DGBI
Prescription of symptoms	Small	Significantly
The severity of complaints	Constant	Variable
Localization of pain	Limited	Diffuse, variable
Weight loss	++	(+)
Relationship of complaints with stress	(+)	+++
Complaints disrupt night sleep	++	(+)
Complaints from other gastrointestinal tract	+	+++
Pain symptoms of another localization	(+)	+++

6. Material and methodological support of the lesson

6.1. Tests

- Saliva secretion increases significantly in children aged:
 - the period of the newborn
 - after a year
 - from 3-5 years
 - after 5 years
 - 2-3 months *
- The physical methods of examination of the digestive tract include:
 - examination of the abdomen, palpation of the gallbladder, fractional examination of gastric contents
 - pH-metry, medical history, digital rectal examination
 - palpation of the abdomen, advanced coprologic examination, ultrasound
 - examination of the abdomen, palpation of the liver, endoscopic examination
 - examination of the mucous membranes of the mouth, examination of the abdomen, percussion of the stomach, auscultation of the intestine *
- In the normal intestinal microbiocenosis of children in the first half of the year are dominant:
 - lactobacilli and bifidobacteria *
 - Escherichia coli and bacteroids
 - enterococci and Escherichia coli
 - staphylococci

5. Citrobacter and Clostridia
- 4 . In young children, normally the liver comes out from under the edge of the costal arch along the right mid-clavicular line:
 1. at 0.5-1 cm
 2. at 2-3 cm *
 - 3 to 4 to 5 cm
 4. at 6- 7 cm
 5. does not speak
- 5 . Vomiting in a newborn baby usually indicates:
 1. congenital pylorostenosis *
 2. peptic ulcer disease
 3. chronic gastroduodenitis
 4. cystic fibrosis
 5. celiac disease
- 6 . The upper limit of the esophagus in newborns is located at the level of:
 1. 1-2 thoracic vertebrae
 2. 3-4 cervical vertebrae *
 3. 5-6 cervical vertebrae
 4. 7 cervical vertebrae
 5. 1-2 cervical vertebrae
- 7 . At microscopic research of feces define:
 1. starch, color, fat
 2. fiber, fat, color, consistency
 3. pus, blood, fecal stones, color, mucus
 4. foreign bodies, parasitic elements, mucus
 5. muscle fibers, fats, fiber, mucus, erythrocytes *
- 8 . A child 3, 5 years old was admitted to the hospital with complaints of constipation, abdominal pain, poor appetite. At inspection the functional constipation is diagnosed. What drug should be prescribed to such a patient?
 - A. Famotidine
 - B. Trimebutine *
 - S. Domperidone
 - D. Tserukal
 - E. Omeprazole
- 9 . A 4.5-year-old child is in the gastroenterology department with a diagnosis of functional constipation. What physiotherapy procedures should be prescribed to such a patient?
 - A. Electrosleep
 - B. UV radiation throat
 - C. Laser therapy on the epigastric region
 - D. Diadynamic on the abdomen *
 - E. Electrophoresis with bromine on the cell area
- 10 . A 1-month-old child was diagnosed with functional intestinal colic. What are the causes of intestinal colic in children?
 - A. Morphofunctional immaturity of peripheral innervation of the intestine
 - B. Dysfunction of central regulation
 - C. Late start of the enzymatic system
 - D. Violation of the formation of intestinal microbiota
 - E. All of the above *
- 11 . The mother of a 2-year-old child complained to the district pediatrician about the detention stools in a child who appeared about a year ago. As a result of the survey diagnosed with "Functional constipation". What are the most common reasons

lead to the development of this condition ?:

- A. Violation of the regime and nature of nutrition
- B. Early transition of the child to artificial feeding
- C. Eating lots of sweets
- D. The presence of constipation in the mother
- E. All of the above *

12. The mother of a 1.5-month-old child turned to a pediatrician with complaints that during or shortly after feeding, the baby begins to "suddenly" press his legs to his stomach, to show anxiety. Then he blushes sharply and starts screaming. The general condition of the child is not disturbed and in the period between attacks he is calm, normally adds weight, has a good appetite. Your previous diagnosis?

- A. Functional disorders of the biliary tract
- B. Pediatric colic *
- C. Chronic colitis
- D. Acute intestinal infection
- E. Acute appendicitis

6.2. *The information necessary for the formation of knowledge and skills can be found in literary sources.*

Basic:

1. Pediatrics: A textbook for students of higher med. educational institutions of III-IV levels of accreditation. - 4th ed. / V.G. Maidannik. - Kharkov: Folio, 2009. -- S. 108-153.
2. Aryaev ML Pediatrics: a textbook in 2 volumes / ML Аряев, Н.В. Kotova, N.Yu. Gornostaeva [etc.] // Odessa: Phoenix, 2014. - 659 p.
3. Order of the Ministry of Health of Ukraine dated January 29, 2013 № 59 "Unified clinical protocols of medical care for children with diseases of the digestive system"
4. D 362 State form of medicines. Issue ten. Kyiv, 2018 https://moz.gov.ua/uploads/1/5052-dn_20180510_868_dod_2.pdf
5. Differential diagnosis of the most common diseases of childhood. Textbook / ed. V.M. Dudnyk, 1st edition. Vinnytsia: Nilan Ltd., 2017. 560 p.
6. Karen J. Markdante, Robert M. Kligman. Fundamentals of Pediatrics according to Nelson: translation of the 8th English. edition: in 2 volumes. Volume 1. Kyiv: VSV "Medicine", 2019. XIV, 378 p.
7. Karen J. Markdante, Robert M. Kligman. Fundamentals of Pediatrics according to Nelson: translation of the 8th English. edition: in 2 volumes. Volume 2. Kyiv: VSV "Medicine", 2019. XIV, 426 p.
8. Emergencies in pediatric practice: Textbook. way. for students. honey. ZVO, interns. - 2nd type. Recommended by the Ministry of Education and Science, Recommended by the Academic Council of NMU. O.O. Bogomolets / Marushko YV, Chef GG etc. Kyiv: VSV "Medicine", 2020. 440 p.
9. Pediatrics National tutorial, in 2 vols. / Ed. prof. Berezhnoy V. Kyiv, 2013. Vol.1. Kyiv, 2013. 1040 p.
10. Pediatrics: a national textbook: in 2 volumes / Ed. prof. Berezhnogo VV Kyiv, 2013. Vol.2. Kyiv, 2013. 1024 p.

Additional:

1. Bovbel IE Modern ideas about the intestinal microbiota and the possibility of effective use of probiotics in the practice of a pediatrician. *Medical news*. 2017. № 2. S. 37–43.
2. Zagorsky SE Functional gastrointestinal disorders: children older than 4 years and adolescents - what has changed with the adoption of the Roman criteria IV. *Pediatrics. East Europe*. T. 2017. 5, № 1. S. 94-110.
3. Maidannyk VG Roman Criteria IV (2016): what's new? *International Journal of Pediatrics, Obstetrics and Gynecology*. 2016. № 10 (1). Pp . 10–18.

4. Makarova EG, Ukraintsev SE Functional disorders of the digestive system in children: long-term consequences and modern possibilities of prevention and correction. *Pediatric pharmacology*. 2017. № 14 (5). Pp. 392–399. doi: 10. 15690 / pf. v14i5. 1788
5. Nyankovska OS Modern views on functional constipation in infants. *Child health*. 2018. T. 13, № 1. S. 83–86.
6. Nyankovska OS Modern views on functional colic in infants. *Child health*. 2017. T. 12, № 2. S. 284–287.
7. Pediatrics: textbook: in 2 volumes / ML Aryaev, P 24 NV Kotova, N. Yu. Gornostaeva; edited by ML Aryaeva, NV Kotova.- Odessa: ONMedU, 2014.- Vol. 2: Diseases of young children. Pulmonology. Allergology. Cardiology. Gastroenterology. Nephrology. HIV infection. Primary health care. 312 s. (Series "Medical Student Library").
8. Notification on promulgation of the draft order of the Ministry of Health of Ukraine "On approval and implementation of medical and technological documents for standardization of medical care for colic in infants" [Electronic resource]. Access mode: <http://www.moz.gov.ua/>. 2016

6.3. Approximate map for independent work with literature

№ p / p	Main tasks	Instructions	Answers
1	2	3	4
1.	Get acquainted with the literature and objectives of the lesson	To define the regurgitation syndrome, functional constipation, infant colic, cyclic vomiting syndrome, functional dyspepsia, irritable bowel syndrome	To formulate the concept of multifactorial disease and its functional nature
2.	Epidemiology	List the risk factors for the development of these diseases. Know their prevalence among children.	Remember what factors are those that predispose, cause and contribute to the development of these diseases
3.	Etiology	Know that many factors matter	The basis for the development of DGBI is the peculiarities of the morphofunctional mechanisms of the child and the motility of the gastrointestinal tract
4.	Pathogenesis	Know modern ideas about the pathogenesis	The basis of pathogenesis are specific and nonspecific mechanisms
5.	Classification	Know the classification	Be able to make a diagnosis
6.	Clinic	Describe the clinical picture of the most common DGBI in children	Common symptoms are pain, dyspepsia, vomiting and stool disorders
7.	Diagnosis	To know on the basis of what these diseases are diagnosed in children	Be able to evaluate the results of laboratory and instrumental research methods
8.	Differential diagnostics	List diseases with eastern clinical and laboratory manifestations	Pay attention to the complexity of the diagnosis of organic diseases of the baby's digestive system

7. Materials for self-control over the quality of training.

A. Questions for self-control.

1. Define the most common DGBI in young children: vomiting syndrome, colic, functional constipation and cyclic vomiting syndrome.
2. Define the most common DGBI in older children: functional dyspepsia, irritable bowel syndrome.
3. Prevalence in the pediatric population, risk factors for disease.
4. Modern classification of DGBI in children.
5. Clinical picture of these diseases.
6. Diagnostic criteria for the most common DGBI in young and older children.

B. Tests for self-control:

- 1 . A child of 5 years admitted to the hospital complaining of loss of appetite, bloating or stomach, seething and abdominal pain, delayed stool for 3-4 days. On examination, pale skin, coated tongue, belly swollen, painful on palpation along the intestine. Defecation was not 3 days. Assign inspection plan:
 - A. General blood test
 - B. scatological survey
 - C. Ultrasound of the abdominal cavity
 - D. Rectoromanoscopy
 - E. All of the above *
- 2 . A 3-year-old child was diagnosed with functional constipation during the examination. What table should be assigned to such a patient?
 - A. Table №5
 - B. Table №2
 - S. Table № 15
 - D. Table № 3 *
 - E. Table №4
- 3 . A 5-year-old child is hospitalized with a diagnosis of functional constipation. What drugs are undesirable to use in such a patient as a result of the identified side effects?
 - A. Dietary fiber
 - B. Lactulose preparations
 - S. drugs senna *
 - D. Prokinetics
 - E. Mineral oils
- 4 . Child 2 years is at the dispensary in a district pediatrician with a diagnosis of functional constipation. What are the trigger factors of this disease?
 - A. Psycho-emotional state
 - B. Neurological factors
 - C. Residual effects of perinatal hypoxia
 - D. Unsatisfactory social adaptation
 - E. All of the above *
- 5 . A 3-week-old child was diagnosed with functional intestinal colic. What is the most common cause of pain in this condition?
 - A. Increased gas filling of the intestine during the reception and digestion of food
 - B. Violation of the intestinal microbiota
 - C. Irrational feeding
 - D. Disorders of the central nervous system
 - E. All of the above *
- 6 . A 4-year-old child was discharged from the hospital with a diagnosis of functional constipation. What recommendations should parents receive for a child from a family doctor?

- A. Eat enough vegetables and fruits
- B. Drink up to 1 liter of fluid per day
- C. Eat dark breads
- D. Conduct daily abdominal massage
- E. All of the above *

7 . A 3-year-old child was admitted to the hospital with complaints of decreased appetite, bloating, grunting and abdominal pain, delayed defecation for up to 3-4 days. On examination, the skin is pale, the tongue is covered, the abdomen is swollen, painful on palpation along the bowel. There were no bowel movements for 4 days. Make a preliminary diagnosis:

- A. Peptic ulcer disease
- B. Functional disorders of the biliary tract
- C. Chronic hepatitis
- D. Functional constipation *
- E. Acute intestinal infection

8 . The child was diagnosed with functional intestinal colic at 1.5 months. What drug should be prescribed to such a child?

- A. Penicillin
- B. Plantex *
- S. Alohol
- D. Omeprazole
- E. De-nol

9 . The 3-month-old child was admitted to the hospital with a diagnosis of vomiting syndrome, is on artificial feeding. What mixtures should be recommended to parents for breastfeeding?

- A. NAS
- W. Hipp
- S. Nutrilon
- D. Antireflux mixture *
- E. Detolact

10 . 5 years old boy entered the gastroenterological ward complaining of dull, aching abdominal pain, emotional lability. The survey put the diagnosis of functional dyspepsia. What options are functional dyspepsia according to modern classification:

- + A. Epigastric pain syndrome, postprandial distress syndrome.
- B. Gastritoid, nonspecific variants.
- C. Ulcerative, dyskinetic variants
- D. Inorganic variant

11. A 10-year-old patient was discharged from the gastroenterology department with a diagnosis of functional dyspepsia, epigastric pain syndrome. Which of the factors is not etiological for the occurrence of this pathology:

- + A. Acid-peptic factor
- B. Nervous and emotional overstrain
- C. Changes dynamic stereotype
- D. Helicobacter pylori infection

12. A 14-year-old child complains of abdominal pain that occurs on an empty stomach, is accompanied by belching air or food eaten, decreases after eating. These complaints bother the patient for about a year. Emotionally labile Abdomen is painful on palpation in the stomach. At carrying out fibrogastroscopy any changes of a mucous membrane of a stomach and a duodenum are not revealed. In favor of which pathology are these signs:

- A. Chronic gastritis
- + B. Functional dyspepsia

- C. Gastric ulcer
- D. Chronic duodenitis

13. A 12-year-old boy was admitted to the hospital with complaints of abdominal pain, aching nature, intensified after eating, heaviness and discomfort in the abdomen, headaches, fatigue. These complaints bother the patient for about 9 months. As a result of inspection the diagnosis was made: functional dyspepsia. Which variant of functional dyspepsia is characterized by the described clinical picture:

- A. epigastric pain syndrome
- + B. postprandial distress syndrome
- C. Nonspecific option
- D. Organic version

14. An 11-year-old girl was admitted to the hospital with complaints of recurrent epigastric pain, often on an empty stomach, fatigue, and a tendency to constipation. From the anamnesis it is known that these complaints bother the child for about a year. As a result of the examination, a diagnosis of functional dyspepsia was made. Indicate which study allows the doctor to differentiate functional dyspepsia from peptic ulcer disease:

- A. Radiological
- + B. EFGDS
- C. Intragastric pH meter
- D. Duodenal sounding

15. A 13-year-old patient for 1.5 years complains of aching abdominal pain that worsens after eating, a feeling of heaviness and discomfort in the abdomen, headaches, fatigue. Which study is the most informative for the diagnosis of functional dyspepsia:

- + A. EFGDS
- B. Histological
- C. Radiological
- D. pH meter

16. A 5-year-old child was admitted to the hospital with complaints of repeated vomiting during the day, weakness, drowsiness, intermittent abdominal pain. Preliminary diagnosis of cyclic vomiting syndrome. What is the average duration of an attack of vomiting in such patients?

- A. 2-4 years
- B. 24-48 hours
- Pp. 12-14 hours
- + D. 18-20 hours

17. A child of 8 years complains of abdominal pain, without visible connection with food, defecation or other physiological functions of the body. This condition worries the patient for about 8 months. Examination of any organic pathology of the digestive organs was not detected. What diagnosis can you think of?

- A. Peptic ulcer disease
- B. Chronic gastroduodenitis
- + C. Functional dyspepsia
- D. Chronic enteritis

18. What is the cause of the development of functional diseases of the gastrointestinal tract in children.

- A. Acute infection
- B. The presence of a chronic infection

- C. + Violation of CNS regulation
- D. Endocrine disorders

19 . In the family history of the parents of a child with cyclic vomiting syndrome?

- A. chronic gastritis
- B. pancreatitis
- C. gout
- D. + migraine

20 . Which drug is a prokinetic:

- A. + cerucal
- B. but-spa
- C. smectite
- D. famotidine

B. Tasks for self-control:

1. A 3.5-year-old child was admitted to the hospital with complaints of constipation, abdominal pain, poor appetite. These complaints bother the child for about a year. Examination in the hospital did not reveal any organic pathology of the gastrointestinal tract.

Question:

1. Make a clinical diagnosis
2. What is the etiology of this disease?
3. Principles of diet therapy
4. Principles of treatment
5. Scheme of dispensary observation

Answers:

1. Functional constipation
2. Violation of the mechanisms of regulation of motor activity of the gastrointestinal tract
3. Table №3
4. Adherence to active motor regime, exercise therapy, massage, physiotherapeutic methods of exposure, enkephalins, prokinetics, laxatives.
5. For 3 years, examinations 2 times a year, anti-relapse and spa treatment.

2. The mother of a 3-week-old child complained to a pediatrician that after feeding the baby screams loudly and shrilly, there may be redness of the face or pallor of the nasolabial triangle. The abdomen is bloated and tense, the legs are pulled up to the abdomen, the feet can often be cold to the touch, the handles are pressed to the torso. Noticeable relief occurs immediately after defecation.

Question:

1. Make a diagnosis
2. What are the reasons for the development of this pathology
3. What are the causes of pain
4. Principles of treatment
5. Principles of dispensary observation

Answers:

1. Baby colic
2. Morphofunctional immaturity of peripheral innervation of the intestine; dysfunction of central regulation; late start of the enzymatic system; violation of the formation of the intestinal microbiocenosis
3. Abdominal syndrome during colic is associated with increased gas supply to the intestines during the intake or digestion of food.

4. Heat, change of position, as well as mechanical means - a gas tube or enema. For prophylactic purposes it is recommended to use drugs of simethicone and mild antispasmodic effect on the basis of plant raw materials.
5. Up to a year, drugs simethicone and mild antispasmodic effect based on plant materials.

8. Materials for classroom independent training.

- 8.1. The list of educational practical tasks that must be performed during practical classes.
 1. Collect anamnesis, select data that indicate the disease.
 2. Identify the most informative signs of the disease during the objective and laboratory-instrumental examination of the patient.
 3. To establish the clinical diagnosis according to the modern classification.

9. Instructional materials for mastering professional skills and abilities.

9.1. Methods of work performance, stages of performance

1. To evaluate the received data of the anamnesis of life and illness, to allocate risk factors
2. Conduct a clinical examination of the patient.
3. Make a plan for additional examination.
4. Evaluate the results of laboratory and instrumental examination.
5. To formulate the clinical diagnosis according to the classification.
6. Prescribe treatment that is adequate for the specific situation

10. Materials for self-control of mastering knowledge, skills, abilities

Situational tasks:

The child is 3 months old, born to a woman with a burdensome obstetric and gynecological history. The pregnancy was threatened with termination, in connection with which she received hormone therapy until the 36th week of pregnancy. Childbirth with stimulation of labor, a long waterless period. The child is breastfeeding, gains weight satisfactorily. Sleep, appetite are normal. The chair from birth is irregular, in a day, more often after stimulation (exhaust tube), is formed.

1. What state can you think of?
2. Make a survey plan.
3. Prescribe treatment.

Task № 2

The child is 2.5 months old, born prematurely at 37 weeks. Is on breastfeeding, weight and growth allowances are satisfactory. Appetite is normal. There is anxiety during feeding, vomiting after feeding in a volume of 2-3 ml of curdled milk. Stool up to 8-10 times a day, with greens and mucus, undigested, foamy, "loud".

1. What state can you think about?
2. Make a survey plan.
3. Prescribe treatment.