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DRAFT CLINICAL RECOMMENDATIONS FOR NEONATOLOGISTS AND PEDIATRICIANS ON THE MANAGEMENT OF NEWBORN CHILDREN SUFFERING FROM REGURGITATION / RUMINATION (FOR DISCUSSION BY SPECIALISTS)

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ABSTRACT. The practical recommendations are intended to optimize the tactics of managing newborns with regurgitation and are offered for use by neonatologists, pediatricians, gastroenterologists working in the outpatient healthcare of the Russian Federation, as well as all specialists who are interested in neonatology and clinical gastroenterology. These practical recommendations are offered for public discussion and are posted in full on the website of the Russian Society of Neonatologists: https://neonatology.pro.

KEYWORDS: *newborns, regurgitation, rumination, diagnostics, treatment, practical recommendations, clinical guidelines*

ПРОЕКТ КЛИНИЧЕСКИХ РЕКОМЕНДАЦИЙ ДЛЯ НЕОНАТОЛОГОВ И ПЕДИАТРОВ ПО ВЕДЕНИЮ НОВОРОЖДЕННЫХ ДЕТЕЙ, СТРАДАЮЩИХ СРЫГИВАНИЕМ / РУМИНАЦИЕЙ (ДЛЯ ОБСУЖДЕНИЯ СПЕЦИАЛИСТАМИ)

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РЕЗЮМЕ. Практические рекомендации предназначены для оптимизации тактики ведения новорожденных со срыгиванием и предлагаются к использованию врачам-неонатологам, педиатрам, гастроэнтерологам, работающим в амбулаторном звене здравоохранения Российской Федерации, а также всем специалистам, кто проявляет интерес к неонатологии и клинической гастроэнтерологии. Настоящие практические рекомендации предлагаются к обсуждению общественности и в полном виде опубликованы на сайте Российского общества неонатологов: https://neonatology.pro.

КЛЮЧЕВЫЕ СЛОВА: *новорожденные, срыгивание, руминация, диагностика, лечение, практические рекомендации, клинические рекомендации*

DEFINITIONS

Rumination syndrome is a functional gastrointestinal (GI) disorder characterized by repeated, effortless regurgitation. It occurs when recently swallowed food enters the mouth followed by a new episode of chewing and then swallowing or removal of a food clump, which is usually tasteless but may be sour or bitter because it occurs a few minutes after eating. Rumination syndrome (RS) is often misdiagnosed as gastroesophageal reflux disease (GERD) or vomiting, leading to unnecessary testing and treatment [1–5].

Regurgitation is a symptom characteristic only for newborns and children of the first year of life. In regurgitation, gastric contents are thrown passively without tension of the abdominal press and diaphragm. Unlike vomiting, regurgitation is not accompanied by autonomic reactions. In most cases, RS and regurgitation are uncomplicated self-limiting conditions that spontaneously resolve by the age of 12–15 months, but despite this, they can cause significant discomfort for parents due to increased parental stress and potential impact on quality of life [1, 3, 4, 6].

Features of the disease coding according to the International Statistical Classification of Diseases and Related Health Problems, 10th Revision

P92.1 Regurgitation and rumination of newborn.

EPIDEMIOLOGY

The true prevalence of regurgitation in infants of the newborn period is unknown. Using the Rome IV criteria, taking into account age, ethnicity, birth weight, gestational age, and age of weaning, daily regurgitation occurs in infants with an incidence ranging from 10.5 to 86.9% [7–11]. When the Rome IV criteria are not met, the incidence of regurgitation is reported in almost 100% of newborns [12].

According to the Diagnostic and Statistical Manual of Mental Disorders, 5th edition (DSM-5), the prevalence of RS, especially in newborns, is not studied because different diagnostic criteria are used for diagnosis depending on the clinical situation. According to some reports, it ranges from 0.8 to 10.6% in community samples [13–18].

ETIOLOGY AND PATHOGENESIS OF THE DISEASE

Regurgitation is physiological in nature and is related to the mechanism of sucking – it facilitates the expulsion of excess ingested air from the stomach. By the 6th month of life, the lower esophageal sphincter (LES) is complete, and symptoms of its dysfunction later in life may be considered as pathological.

Causes of regurgitation/ruminations in newborn infants [7, 19–28]:

1) high pressure in the abdominal cavity due to tight swaddling, constipation, increased gas formation, prolonged crying, violation of feeding technique (aerophagia), overfeeding;
2) syndrome of vegetovisceral disorders in cerebral ischemia (pylorospasm), GI dyskinesia, hereditary diseases associated with metabolic disorders;
3) low gestational age (<32 weeks);
4) low birth weight (<1.5 kg);
5) delivery by cesarean section;
6) early transfer to artificial feeding;
7) use of antibiotics in both mother and newborn;
8) inappropriate use of probiotics;
9) allergy (intolerance) to cow's milk;
10) duration of hospitalization of the newborn for more than 7 days;
11) harmful habits of the mother (including smoking history);
12) RS is characterized by emotional neglect (habitual style of interaction in the family, when parents do not notice and insufficiently respond to the emotions of children and their emotional needs) [29].

The high frequency of regurgitation in newborns and children of the first year of life is caused by the *peculiarities of the structure of the upper digestive tract* [7, 19]:

- the esophagus is wide, funnel-shaped, the expansion of the funnel is turned upwards;
- the muscular layer of the esophagus is poorly developed, anatomical constrictions are poorly expressed;

- the ligamentous apparatus is friable and delicate, the legs of the diaphragm loosely cover the esophagus;
- esophagus passes into the stomach at right angles;
- the stomach has a spherical shape;
- the pyloric section of the stomach is well developed, while the cardiac section is poorly expressed;
- there is practically no zone of increased pressure over the lower esophageal sphincter;
- there is immaturity of the nervous and humoral link of regulation of the sphincter apparatus and motility of the GI tract in the first years of life of the child.

The pathophysiology of rumination syndrome is not fully understood. The key mechanism may be an imperceptible postprandial contraction of the abdominal wall. Retrograde throwing of gastric contents into the oral cavity is realized due to the simultaneous combination of increased intra-abdominal pressure and negative intrathoracic pressure [15–18].

CLASSIFICATION

According to the Rome IV consensus, regurgitation/ruminations are classified as a "functional gastroduodenal disorder" [3]. According to the criteria adopted by the American Psychiatric Association in 2022 (DSM-5), regurgitation/ruminations are categorized under the term "feeding and eating disorder" [2].

CLINICAL PICTURE

The clinical picture of regurgitation/rumination is variable and nonspecific.

Characteristic symptoms of rumination disorder are regular regurgitation and repeated chewing of food. During regurgitation, children make peculiar movements: tense the muscles of the back and abdomen, arch their backs, throw their heads back and as if they were sucking or swallowing something. The most common parental complaint is frequent vomiting. The physical mechanism generating the regurgitation/ruminative phenomena depends on an involuntary process that changes the pressure in the abdomen and thorax accompanied by an esophageal-gastric junction [34].

The main clinical characteristics include [30]:

1) early postprandial regurgitation;
2) regurgitated material is effortlessly regurgitated similar to swallowed food;
3) regurgitated material is spit out or swallowed again.

Frequent regurgitation can lead to significant weight loss and dehydration. The severity of regurgitation syndrome, according to the recommendations of the ESPGHAN expert group, is assessed on a five-point scale (Table 1).

Table 1. Scale for assessing the intensity of regurgitation

Таблица 1. Шкала оценки интенсивности срыгиваний [35]

Количество баллов / Number of points	**Характеристика / Characteristic**
0	Отсутствие срыгиваний / No regurgitation
1	Более 5 срыгиваний в сутки объемом не более 3 мл / More than 5 regurgitations per day with a volume of no more than 3 ml
2	Более 5 срыгиваний в сутки объемом более 3 мл / More than 5 regurgitations per day with a volume of more than 3 ml
3	Более 5 срыгиваний в сутки объемом до половины объема одного кормления, не чаще чем в половине кормлений / More than 5 regurgitations per day in a volume of up to half the volume of one feeding, no more often than in half of the feedings
4	Срыгивания небольшого объема в течение 30 минут и более после каждого кормления / Small amounts of regurgitation for 30 minutes or more after each feeding
5	Срыгивания более половины полного объема одного кормления, не менее чем в половине кормлений / Regurgitation of more than half of the total volume of one feeding, at least in half of the feedings

DIAGNOSTICS

Criteria for establishing the diagnosis/ condition

To establish a clinical diagnosis of regurgitation/ ruminating in the newborn requires [1–4, 7, 19, 21–23, 34]:

1) careful gathering of perinatal anamnesis;
2) physical examination with assessment of physical development and detection of anxiety symptoms indicating the presence of organic pathology.

Alarm symptoms ("red flags") [2–4, 6, 7, 19]:

- appearance of regurgitation in the 1st–2nd week of life;
- lethargy, fever;
- nausea with refusal to feed;
- fountain vomiting;
- impurity of blood or bile in the vomit masses;
- aspiration of gastric contents;
- prolonged coughing, wheezing;
- stunted physical development;
- difficulty feeding or swallowing food (dysphagia, odynophagia);
- incorrect body position, namely: dystonic position of the neck — Sandifer syndrome (a rare disorder characterized by episodes of paroxysmal torticollis, sometimes with spastic nodding movements of the head, occurring against the background of the course of GERD); this syndrome is a combination of GERD with spastic torticollis and dystonic body movements, in the presence of esophageal hernia or without it;
- excessive irritability/pain;
- bulging fontanelle;
- rapid rate of increase in head circumference;
- seizures;
- weight loss;
- dysuria;
- defecation disorders (diarrhea/constipation);
- disorders up to apnea and sudden death syndrome.

Comment. *When collecting anamnesis, much attention is paid to:*

1) *peculiarities of the course of pregnancy (toxicosis, gestosis, threat of termination, edema of pregnant women, anemia, preeclampsia, exacerbation of chronic pathology, etc.) and childbirth (rapid, weakness of labor, surgical delivery, etc.), which can cause fetal hypoxia and contribute to increased regurgitation in the infant;*
2) *careful collection of genealogical anamnesis, as many diseases are hereditary in nature (e.g., pylorostenosis in 15% of cases is a hereditary pathology); there is also a genetic predisposition to the occurrence of hernia of the esophageal opening of the diaphragm [36];*
3) *the time of the first regurgitation;*
4) *the regimen, method, duration and volume of each feeding; the type of formula used in artificial feeding, the nature of maternal nutrition;*
5) *the nature of regurgitation (e.g., nocturnal, immediately after eating, time after eating, composition of regurgitant masses: curdled or uncurdled);*
6) *family history, possible environmental triggers (including family psychosocial status and factors such as parental tobacco use);*
7) *the use of pharmacologic and dietary interventions in both the infant and the mother [4].*

Although regurgitation/ruminating in newborns is often benign, some infants who present with symptoms of anxiety need further evaluation.

A more difficult subgroup of patients are considered to be infants who are fussy, cry and wriggle, have persistent regurgitation, but otherwise feel well. In this subgroup of children, families often put intense pressure on the physician to initiate antireflux therapy or diagnostic testing because of the perceived severity of symptoms [4].

In the absence of warning signs, diagnostic tests and/or treatments, including acid suppression, are NOT required unless symptoms affect feeding, growth, or achievement of key developmental stages [4, 35].

The main symptom of RS is recurrent regurgitation of recently ingested food without effort. Apart from the main sign, there is no clear consensus among diagnostic guidelines on the signs of RS, mainly due to the lack of research to support diagnostic recommendations. Due to the lack of awareness of RS, this condition is often inaccurately diagnosed or missed [37–39].

Considering the Rome Criteria, a diagnosis of RS requires the presence of symptoms **for at least two months**. These symptoms include [3, 21]:

- repetitive contractions of the abdominal muscles, diaphragm and tongue;
- mild regurgitation of gastric contents, which are either ejected from the mouth or repeatedly chewed and swallowed again;
- age of manifestation between the 3rd and 8th month;
- infants do not respond to treatment for GERD and regurgitation;
- rumination does not occur during sleep or when the infant interacts with people in the environment [40].

Complaints and anamnesis

In the presence of regurgitation/rumination in the newborn, it is **recommended** to:

- review the mother's history to identify risk factors;
- review the birth history and early neonatal period of the newborn;
- note the time of onset and progression of clinical symptoms [1–4, 7, 19–24, 34].

The level of convincingness of the recommendations is C (level of evidence — 4).

Comments. *See "Etiology and pathogenesis of the disease".*

When studying the history of a newborn with regurgitation/ruminations, it should be remembered that the main risk factors are premature birth, severe asphyxia, stressful situation in the family, dysbiosis, iatrogenic interventions leading to disruption of microbiocenosis [7, 19–24].

Physical examination

- A newborn infant with regurgitation/ruminations is **recommended** to undergo visual therapeutic examination to identify symptoms of anxiety, anthropometry with assessment of mass-height parameters [1-4, 7, 19-23, 34].

The level of convincingness of the recommendations is C (level of evidence — 5).

Comments. *Due to the absence of pathognomonic symptoms, first of all, it is necessary to pay attention to the presence of symptoms of anxiety, in the detection of which it is necessary to exclude organic pathology (infections, congenital malformations, metabolic disorders, GERD, etc.) [2–4, 7, 19, 21, 34, 36].*

Laboratory diagnostic tests

- It is **recommended** that newborn infants with regurgitation/ruminations in the presence of anxiety symptoms should undergo a general blood test in order to exclude/confirm infectious-toxic inflammatory process and disorders in the hemostasis system of both prenatal and postnatal genesis [41, 42].

The level of convincingness of the recommendations is C (level of evidence — 5).

Comments. *In case of changes in blood parameters, in-depth examination is recommended in accordance with the main causes of the development of the above-mentioned conditions (diseases).*

- It is **recommended** for newborns with regurgitation/rumination in the presence of anxiety symptoms, with poor weight gain/loss in order to identify metabolic changes arising against the background of metabolic disorders in hereditary metabolic diseases (HMDs) and severe infectious process to conduct a study of acid-base status (ABS) and blood gas composition, determination of lactic acid and ammonia levels in the blood for further diagnostic search [41, 42].

The level of convincingness of the recommendations is C (level of evidence — 5).

Comments. *In case of changes in the above parameters, in-depth examination is recommended.*

Instrumental diagnostic

- **Recommended** for newborns with regurgitation/rumination in the presence of heavy, persistent belches to diagnose conditions such as pyloric stenosis, hydronephrosis, ureteral obstruction, gallstones, and ovarian torsion, sliding hernia of the esophageal aperture of the diaphragm, as well as determining the length and position of the lower esophageal sphincter relative to the diaphragm, the value of the gastroesophageal angle of Gis, ultrasound examination of the abdominal cavity

(complex examination), kidneys and adrenal glands [4].

The level of convincingness of the recommendations is C (level of evidence — 5).

- It is **recommended** for newborns with regurgitation/rumination in the presence of persistent, profuse regurgitation, debuting in the first week of life, unresponsive to conventional therapies to exclude malformations (sliding hernia of the esophageal aperture of the diaphragm, malrotation, pyloric stenosis, duodenal stenosis, antral membrane, esophageal narrowing, Shatsky's rings, achalasia, esophageal strictures, and external esophageal lesions) to perform esophageal fluoroscopy with contrast [4, 34].

The level of convincingness of the recommendations is C (level of evidence — 5).

Comments. *Barium examination of the esophagus and stomach is performed in the straight and lateral projections and in Trendelenburg position with slight compression of the abdominal cavity. The study evaluates the permeability of the suspension, esophageal diameter, contours, wall elasticity, pathologic constrictions, ampullary dilatations, peristalsis, relief of the mucosa. To the disadvantages of the method should be attributed the fact that radiography does not always allow you to fix hernias of small size, and also gives a high radiation load.*

- It is **recommended** that newborn infants with regurgitation/rumination in the presence of anxiety symptoms should undergo videofluoroscopic swallowing studies (VFSS) in order to detect oropharyngeal dysphagia followed by aspiration, the symptoms imitating GERD [43–46].

The level of convincingness of the recommendations is C (level of evidence — 4).

Comments. *Videofluorogaphy depends on the technical capabilities of the medical organization.*

- If congenital anomalies of GI development or GI diseases of inflammatory genesis are suspected, it is **recommended** to perform esophagogastroduodenoscopy (EGDS) in newborn infants with regurgitation/rumination in order to determine the degree of mucosal lesions (ML) of the esophagus, stomach, to identify complications and to perform differential diagnosis [4].

The level of convincingness of the recommendations is C (level of evidence — 5).

Comments. *The study evaluates the condition of the esophageal mucosa, which is especially important in the presence of alarming symptoms (hematomesis, dysphagia, delayed weight gain). The study allows you to diagnose a number of congenital anomalies of esophageal development, acquired diseases of inflammatory and non-inflammatory nature. EGDS under general anesthesia can be considered as a safe procedure in pediatric patients [4].*

- It is **recommended** to perform a manometric study — high-resolution manometry (HRM) with or without impedance — to assess the activity of intraluminal pressure in infants with regurgitation/rumination, if there is no effect on the current therapy in case of suspected congenital neuromuscular diseases or esophageal malformations [4, 30, 34, 47–51].

The level of convincingness of the recommendations is C (level of evidence — 5).

Comments. *High-resolution manometry is now being performed to assess esophageal motility, providing a more detailed view of intraluminal pressure activity than conventional manometry. Based on pediatric studies, HRM may be of value for evaluating "R teeth" and retrograde bolus flow to diagnose rumination that mimics intractable reflux symptoms [30, 34, 47–51]. Manometric study depends on the technical capabilities of the medical organization.*

Other diagnostic tests

Diagnosis of diseases associated with regurgitation, vomiting is performed on indication [52].

TREATMENT

Therapeutic measures in the presence of regurgitation in newborns include a complex of non-medicamentous effects, mainly normalization of lifestyle, daily regimen, nutrition and conservative therapy. The choice of treatment method or their combination is made depending on the cause, severity and possible complications [4, 52].

Conservative treatment

Postural therapy

- It is **recommended** that newborns with regurgitation use postural therapy, i.e. treatment by changing the position of the body: when feeding, hold the baby at an angle of 45–60°, which prevents regurgitation and aerophagia. At night, it is advisable to raise the head end of the crib by 10–15 cm [4, 6, 7, 19].

The level of convincingness of the recommendations is C (level of evidence — 5).

Comments. *Keep the baby in an upright position after feeding should be kept for at least 20–30 minutes (with the head elevated). Giving the newborn a forced position during sleep (raised head end of the bed, especially horizontal position on the stomach) is not recommended due to the high risk of sudden infant death syndrome.*

Diet therapy

- In newborn infants with regurgitation, dietary adjustments are **recommended** [4, 6, 7, 19, 52].

The level of convincingness of the recommendations is C (level of evidence — 5).

Comments. *In natural feeding, it is recommended to create a calm environment for the nursing mother aimed at preserving lactation, normalize the child's feeding regimen, avoiding overfeeding and controlling correct breastfeeding to prevent aerophagia.*

- It is **recommended** to increase the frequency of feedings with a decrease in the single volume of formula [6, 7, 19].

The level of convincingness of the recommendations is C (level of evidence — 5).

- In the absence of evidence of intolerance to cow's milk proteins, it is **recommended** to transfer the child to one of the specialized foods — antireflux (AR) milk formula, the viscosity of which is increased by introducing one of the thickeners into its composition [4, 6, 7, 19].

The level of convincingness of the recommendations is C (level of evidence — 5).

Comments. *Two types of polysaccharides are used as thickeners — non-digestible (carob bean gluten — gum) and digestible (modified starches). The gum or starch (rice, corn or potato) in AR formulas binds liquid and swells when it enters the baby's stomach, making the mixture thicker and preventing backflow into the esophagus and mouth. AR products are introduced into the child's diet gradually, at each feeding. The volume of the therapeutic formula is selected individually until regurgitation stops. The effect from the use of AR-formula enriched with starch comes in a more distant period compared to AR-formula containing gum. AR products are recommended for children with both normal stools and a tendency to unstable stools [53, 54]. Starch-containing formulas are recommended to be prescribed in full daily volume. Despite the high clinical efficacy of AR products, they should not be used uncontrolled as an alternative to conventional standard milk formula (SMF). AR-formulas are used at a certain stage of regurgitation syndrome treatment, as indicated. The duration of their use is individualized, sometimes it is quite long (up to 2–3 months), and only after achieving a persistent therapeutic effect the child is transferred to SMF [3, 6, 7, 19, 53, 54].*

- The use of deep protein hydrolysis (DPH) or amino acid-based formulas, which can reduce regurgitation episodes in children with cows milk protein intolerance, has been **recommended** if dietary correction with AP formulas is ineffective for 2–4 weeks [6, 7, 19].

The level of convincingness of the recommendations is B (level of evidence — 2).

Comments. *Formulas based on DPH are indicated when the child has other symptoms indicative of atopic (allergic) diseases [4, 6, 7, 19]. Lack of improvement of the clinical picture within 2–4 weeks indicates the ineffectiveness of the chosen tactics of diet therapy. In case of a positive effect, it is recommended to continue taking the formula for up to 12 months, but not less than 6 months [43, 55].*

Drug therapy

- The use of drugs such as proton pump inhibitors (PPI) (ATX code A02BC)(#esomeprazole**) is **not recommended** in infants with regurgitation/rumination due to lack of scientific evidence and potential risk of adverse events [4, 55–61].

The level of convincingness of the recommendations is B (level of evidence – 2).

Comment. *PPI (ATX code A02BC) in children at different doses may have little or no symptomatic or endoscopic effect. There is no statistical superiority of one PPI (ATX code A02BC) over another [59].*

- Acid-suppressive therapy with PPI antagonists (ATX A02BC code) (#esomeprazole**) has been **recommended** for infants whose condition has not improved with strict adherence to postural and nutritional therapy and/or with moderate to severe esophagitis [55, 61–64].

The level of convincingness of the recommendations is C (level of evidence – 3).

Comments. *#Ezomeprazole** (ATX code A02BC05) is administered in a daily dose of 0.5 mg/kg for 1–2 doses. The average duration of therapy is 4–6 weeks. Contraindications: individual intolerance to the drug [4]. Reduction of treatment duration is not recommended [59].*

- Administration of stimulants of GI motility (ATX code A03FA) and antacids in combination with other drugs (ATX code A02AX) is **not recommended** for infants with regurgitation/rumination [4, 59, 65].

The level of convincingness of the recommendations is C (level of evidence – 5).

Comments. *Evidence from RCS is insufficient to assess the efficacy of gastrointestinal motility stimulants (prokinetics) (ATX code A03FA) and antacids in combination with other drugs (ATX code A02AX) [4, 59, 65].*

- The routine use of antidiarrheal drugs of biological origin that regulate the balance of intestinal microflora (probiotics) (ATX code A07FA) in neonates with regurgitation/rumination is **not recommended**.

The level of convincingness of the recommendations is B (level of evidence – 3).

Comments. *The evidence from RCS is not strong enough to actively recommend antidiarrheal drugs of biological origin that regulate the balance of intestinal microflora (probiotics) (ATX code A07FA) in neonates with regurgitation.*

Surgical treatment is not applicable.

Other treatment is not applicable.

Medical rehabilitation and sanatorium-resort treatment, medical indications and contraindications to the use of medical rehabilitation methods, including those based on the use of natural therapeutic factors are not applicable.

PREVENTION AND MEDICAL FOLLOW UP, MEDICAL INDICATIONS AND CONTRAINDICATIONS TO THE USE OF PREVENTION METHODS

- It is **recommended** to prevent regurgitation/rumination in newborns by taking measures aimed at preventing etiologic factors: perinatal hypoxia, asphyxia; fighting for natural childbirth, breastfeeding; creating a favorable environment in the family, as well as friendly, attentive attitude to the newborn [7, 19, 21-25].

The level of convincingness of the recommendations is C (level of evidence – 5).

- Follow up of infants with regurgitation/rumination by a pediatrician is recomended. Pediatrician monitor physical development indicators, hold explanatory talks with parents about their child's health status and feeding rules, and give **recommendations** regarding the diet of the lactating mother [7, 12, 19].

The level of convincingness of the recommendations is C (level of evidence – 4).

ORGANIZATION OF MEDICAL CARE

For prevention, timely diagnosis and choice of further management tactics for newborns with rumination/regurgitation, medical care is provided in medical institutions of the *first* (medical institutions providing primary medical and sanitary assistance to the population with basic and specialized profiles), *second* (medical institutions providing medical assistance in certain profiles) and *third* levels, with specialized and high-tech medical care, consultations with specialists (neonatologist, neurologist, gastroenterologist, allergist-immunologist, pediatric surgeon), examination and therapy.

Indications for hospitalization in a medical organization for newborns with rumination/regurgitation [1, 7]:

- persistent regurgitation that cannot be corrected;
- presence of persistent, pronounced symptoms of anxiety (regurgitation alternating with vomiting; blood and/or bile in the refluxate), leading to significant weight loss, symptoms of dehydration, electrolyte

and metabolic disorders, as well as respiratory symptoms associated with regurgitation (laryngospasm, bronchospasm, aphonia, cough).

Indications for discharge from a medical organization of ruminating/regurgitating newborns:

- management of anxiety symptoms;
- stabilization of the condition;
- exclusion of organic nature (surgical, infectious, endocrine, metabolic, allergic, neurological, etc.).

After discharge from the hospital, children are subject to outpatient observation by a pediatrician and other specialists depending on the identified etiology (neurologist, gastroenterologist, endocrinologist, surgeon, geneticist, etc.).

The decision on the need for re-hospitalization is made by the pediatrician or specialist on a case-by-case basis.

Issues related to the rehabilitation of infants with regurgitation/rumination are decided by a pediatrician on an individual basis.

ADDITIONAL INFORMATION (INCLUDING FACTORS AFFECTING THE OUTCOME OF THE DISEASE OR CONDITION)

The prognosis for regurgitation/ruminations is predominantly favorable. However, frequent regurgitation in infancy may have long-term health consequences, increasing the risk of heartburn, vomiting and acid belching [66].

ADDITIONAL INFORMATION

Author contribution. Thereby, all authors made a substantial contribution to the conception of the study, acquisition, analysis, interpretation of data for the work, drafting and revising the article, final approval of the version to be published and agree to be accountable for all aspects of the study.

Competing interests. The authors declare that they have no competing interests.

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Вклад авторов. Все авторы внесли существенный вклад в разработку концепции, проведение исследования и подготовку статьи, прочли и одобрили финальную версию перед публикацией.

Конфликт интересов. Авторы декларируют отсутствие явных и потенциальных конфликтов интересов, связанных с публикацией настоящей статьи.

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