

**PREVENTION OF DEHYDRATION IN THE PHYSIOLOGICAL CONDITIONS IN NEONATES**

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**SUMMARY**

Current recommendations suggest that healthy exclusively breastfed infants do not require routine supplemental fluids. Supplementation of healthy full-term newborns can lead to less active sucking of the baby and decreased lactation. However, there are clinical situations where infants may require additional fluid. Supplementation of an infant may be indicated in case of a large loss of body weight (LBW), conditions and diseases with an increase in body temperature above 38,0°C, with dehydration, polycythemia, uric acid infarction, the use of radiant heat and phototherapy. Additional fluid administration to an infant may be advisable at elevated air temperatures and low humidity in the room. Compliance with the drinking regime is important in infants with intestinal infections, overweight and constipation. In each case, the issue is resolved individually, taking into account the child's weight, degree of maturity, correspondence between anthropometry and gestational age, the presence of exicosis and metabolic disorders. In all cases, the child is offered boiled water. If your baby drinks readily, it means he needs extra fluid. Additional drinking is carried out from a spoon or syringe. The recommended amount of drink per day corresponds to the volume of one feeding.

Water is the main component of the body of a child and an adult. In the body of a newborn, the amount of water is 75-80%, and in an adult – 55-65%. In the human body, the amount of fluid decreases with age [1,2]. In accordance with the recommendations of experts from the World Health Organization (WHO) and the United Nations Children's Fund (UN, UNICEF), supplementing with water for children who are exclusively breastfed (BF) should be excluded. If breastfeeding is organized effectively, a healthy child does not need additional fluid. Breast milk (HM) contains up to 85-90% water and fully satisfies the fluid needs of a healthy baby. A healthy child on free exclusively breastfeeding should not experience the need for additional fluid, even in a hot and dry climate. Supplementation of healthy full-term newborns can lead to less active sucking, decreased lactation and cessation of breastfeeding.

The practice of many domestic neonatologists and pediatricians shows that additional fluid may be required for a newborn and infant for medical reasons. In each case, the issue of introducing water is decided individually. The issue of supplementation is decided taking into account birth weight, degree of maturity, metabolic disorders [1,2,5-7], an increase in body temperature over 38,0°C, diarrhea and vomiting, the use of radiant heat and phototherapy, and polycythemia and dehydration, exicosis, signs of uric acid

renal infarction, as well as with a weight of more than 4000 g at birth [1]. In addition, the child may need additional fluid when introducing complementary foods, correcting excess body weight, and constipation. Supplementation is discussed with the particular diet of a nursing mother, high room temperature and low humidity [1,2,6,7]. In case of conditions and diseases of the infant, accompanied by an increase in body temperature above 38,0°C, there is an increase in imperceptible fluid losses. A rise in body temperature one degree above normal increases imperceptible fluid loss by 10%. Therefore, with the development of diseases accompanied by an increase in body temperature of more than 38.0°C, the child needs to be prescribed additional fluids [1,2,6,7].

A newborn may develop transient hyperthermia (TH), which occurs on the 3-5th day of a child's life and occurs with a frequency of 0,3-0,5%. In this case, the body temperature rises to 38,5-39,5 ° C or more, the child is restless, drinks greedily, dry mucous membranes and other signs of dehydration are noted. The most common point of view on the development of TH is dehydration of the newborn. In children with TH, a LBW of more than 10% is often recorded, and daily weight loss is more than 4%. Establishing adequate care, feeding and drinking regimen helps to relieve TH [1,6,7].

The severity of a child's condition during acute intestinal infections (AIE) is usually associated with the development of dehydration. When providing medical care to children with AIE, oral hydration is of great importance. Adequate oral hydration, carried out in compliance with the rules, is highly effective and has practically no complications. Correction of dehydration is impossible without the use of salt-free solutions, among which preference should be given to drinking water. The ratio of glucose-salt solutions and drinking water should be 1:1 for watery diarrhea, 2:1 for severe vomiting, 1:2 for invasive diarrhea [1,2,5-7].

To ensure thermal comfort in children, radiant heat sources are used, and to treat hyperbilirubinemia, phototherapy lamps are used, which help increase imperceptible fluid loss by 25-50%. When using radiant heat, they increase by 50% of the physiological requirement, reaching 50 ml/kg per day. During phototherapy with fluorescent lamps, the fluid requirement increases by 10-20 ml/kg/day compared to the physiological one. It should be remembered that the addition of water to the child's diet alone does not prevent the development of hyperbilirubinemia and does not reduce the level of total serum bilirubin. Infusion therapy for children is indicated only if additional hydration cannot be provided by supplementation [1,6,7].

In uric acid infarction (UAI), uric acid crystals are deposited in the lumen of the collecting ducts of the kidneys. This is a transient condition during the newborn period. The reason for the increased secretion of uric acid is the catabolic orientation of metabolism. The condition develops in the first week of life in 25-30% of full-term and 10-15% of premature babies. With UAI, the urine becomes brick yellow and cloudy. The sediment may contain hyaline and granular cylinders, leukocytes, and epithelium. All changes disappear by the end of the first week of life. Detection of changes from the

middle of the second week of life is pathological. Many domestic experts allow the possibility of administering additional fluid during UAI in a newborn. There is an opinion that the development of UAI is facilitated by a large LBW after birth and blood thickening because of limited diuresis. Unfortunately, in modern publications there is no consensus on the issue of prescribing additional fluid to a child with UAI. It is very important to promptly diagnose other, more serious kidney diseases masked by transient UAI [1,6,7,8]

Polycythemia is understood as a clinical and hematological symptom complex characterized by an increase in blood viscosity. There is an increase in venous blood hematocrit to 0,65 or more, hemoglobin to 220 g/l or more. Polycythemia vera is recorded with fetofetal and placental transfusion, intrauterine growth retardation, diabetic fetopathy, thyrotoxicosis, and congenital adrenal hyperplasia. In newborns older than 24-48 hours of life, a differential diagnosis should be made with hypovolemic, or false, polycythemia, which occurs secondary, is associated with dehydration and is characterized by an increase in hematocrit level because of hemoconcentration. Dehydration is indicated by a LBW of more than 8-10%, dry mucous membranes, decreased turgor and diuresis. A child with hypovolemic polycythemia should undergo measures aimed at rehydration. After 6 hours of adequate rehydration, the hematocrit level usually decreases. Thus, with peripheral blood hematocrit values of more than 65% after two days of life, in combination with signs of exicosis, the child may require additional fluid administration [1,6,7,8].

The frequency of births of children weighing more than 4000 g in the population is 4-6%. Newborns with macrosomia often have adaptation disorders in the early and late neonatal periods. Due to increased fluid loss from the body surface, such children may require supplemental water [1,2,5-7]. Programs for optimizing feeding of children in the first year of life indicate that a child may need additional fluid intake when the room temperature rises above 26,0°C. According to the current sanitary rules, in postpartum wards with a joint stay of mother and child, boxes for premature babies and wards for infants, the permissible air temperature is 23,0-27,0°C (estimated temperature – 24,0°C). Low indoor humidity also contributes to an increase in imperceptible fluid losses. A comfortable humidity level is 40-60%. Domestic pediatricians recommend offering a full-term baby additional fluid in the amount of 5-6 ml/kg/day for every degree increase in air temperature above 25,0°C [1, 2,5-7].

For the first 4 hours of oral rehydration (for mild dehydration)

Babies under 6 months of age	30 to 90 mL (1 to 3 oz.) every hour
Children 6 months to 2 years of age	90 to 125 mL (3 to 4 oz.) every hour
Over 2 years of age	At least 125 to 250 mL (4 to 8 oz.) every hour

Complementary feeding products, in contrast to breast milk and adapted mixtures, contain less water (on average only 30%). Therefore, children receiving complementary

feeding should be offered water in small portions between feedings in a volume of 150-200 ml per day [1,2,5]. One of the reasons for excess weight is considered to be a large number of feedings during prolonged wakefulness and restlessness of the child, especially at night. Feeding a child should not be used as the only means of calming him down. This leads to increased food consumption and increases the risk of obesity, especially among children older than the second or third month of life. In this regard, when waking up at night, an overweight child should not be fed immediately. It is necessary to take a certain pause, you can offer him water [1,2,5].

Regardless of the nature of feeding, children with constipation should be offered water during the day in the amount of one feeding. For constipation, you can use mineral water at the rate of 3-5 ml per 1 kg of body weight per day [1,2,5].

Measure the amount of liquid your child needs based on their weight. If your child can not sip from a cup, try using a teaspoon or a syringe.

Child's weight minimum	Goal to Give Every Hour*
7-10 lbs.	At least 2 ounces (4 tablespoons or ¼ cup)
11-15 lbs.	At least 2½ ounces (5 tablespoons)
16-20 lbs.	At least 3½ ounces (½ cup)
21-40 lbs.	At least 6½ ounces (¾ cup)
41-60 lbs.	At least 10 ounces of liquid every hour (1¼ cups per hour)

\* Minimum fluid goals per hour may increase if vomiting, diarrhea or fever are present.

In all clinical situations, the issue of administering additional fluid is decided individually. In most cases, boiled water is used to feed the child. It is acceptable to use sterile water, sterile isotonic sodium chloride solution. The recommended dose of drinking per day corresponds to the volume of one feeding, regardless of the nature of feeding. Additional drinking is carried out from a spoon or syringe. If a child needs water, he will drink it; if not, he will refuse water. Water and drinking solutions must be individually packaged. For drinking, preparing formulas and complementary foods, you can use special bottled water for baby food. This water is microbiologically safe, does not contain harmful impurities, has good organoleptic properties, and has low mineralization. Boiling water for at least one minute allows you to destroy possible pathogens in it. Microwave ovens should never be used to heat water, as uneven heating may cause burns to an infant's mouth. Instead of drinking water, glucose solutions, sweet liquids, juices and compotes, herbal decoctions and milk should not be used [1,2,5-7].

Conclusion. According to current recommendations, healthy exclusively breastfed infants do not require routine supplemental fluid administration. In certain clinical situations, infants may require additional fluids regardless of feeding pattern. A child may

need to be supplemented with water in case of high LBW, in diseases or conditions accompanied by body temperature above 38,0°C, dehydration (exicosis) and diarrhea, the use of radiant heat and phototherapy.

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