

## Modern Solutions to Prevent the Origin and Development of Pneumonia in Young Children

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**Abstract:** Pneumonia is an acute respiratory disease that affects lung tissue, mainly its alveolar apparatus. Under physiological conditions, the lungs are involved in maintaining normal body temperature, removing toxins, purifying the blood, producing proteins and fats, and regulating fluid levels in the body. When organs and tissues become infected, extensive injuries or burns occur, the lungs cannot fully perform their functions. They accumulate bacterial and viral toxins, which penetrate the lung tissue and increase the risk of developing complications such as pneumonia.

**Key points:** Causes of pneumonia in children, Weakening of general and local immunity; Premature birth, low birth weight.

Pneumonia is an infection transmitted through air droplets (coughing, sneezing), household contact and transplacental mechanisms. Entering the upper (nasal cavity, oropharynx, nasopharynx) and lower respiratory tract, viruses and bacteria suppress the functional activity of the lungs and the protective function of the epithelium, reduce general and local immunity.

As a result, microorganisms enter the alveolar apparatus of the lungs, the bronchioles, more easily and faster. Actively multiplying in the epithelium, pathogens stimulate an inflammatory reaction. If the disease is not detected in time, the infected mucus penetrates to other parts of the lungs, where bacteria intensively penetrate the tissues and cause new foci of inflammation.

The age of the child and the conditions of development of the disease play an important role in determining the cause of pneumonia. Thus, congenital pneumonia develops as a result of infection of the fetus with herpes virus type 1, chlamydia, staphylococci and streptococci, Escherichia coli and mycoplasma. Infection occurs through the placenta, by contact or from mother to child. Factors that provoke this form of pneumonia: infectious diseases of the mother's genitourinary system, immaturity of the bronchopulmonary apparatus, intrauterine hypoxia, the child's respiratory distress syndrome. Premature birth significantly increases the risk of viral pneumonia in children.

In the hospital, pneumonia appears against the background of existing diseases and is caused by bacteria resistant to the antibiotics used (Escherichia coli, streptococci and staphylococci).

Most often, pneumonia in a 2-year-old child can be caused by long periods of bed rest and intestinal infections caused by congestion in the lungs. In some cases, inflammation is provoked by frequent regurgitation of the child, in which particles of vomit enter the lungs when breathing.

Factors that cause the development of pneumonia:

weakening of general and local immunity;

premature birth, low birth weight;

long-term untreated or chronic diseases of the respiratory system (tracheitis, bronchitis);

presence of congenital malformation of the bronchopulmonary system;

hypothermia of the body;  
viral diseases (influenza, parainfluenza, adenovirus infection);  
HIV infection;  
frequent psycho-emotional stress;  
hypo- and avitaminosis, lack of mineral components;  
poor nutrition of children, low weight gain;  
passive smoking, unsatisfactory living conditions;  
long bed rest.

#### Classification

Depending on the type of pathogen, there are 6 forms of pneumonia in children:

Bacterial (staphylococci, streptococci and pneumococci, Escherichia coli, Pseudomonas aeruginosa).

Viral (adenoviruses, influenza viruses, parainfluenza).

Chlamydia (pulmonary chlamydia).

Protozoa (pneumocystis).

Fungus (mycoplasma).

A mix.

Pneumonia in newborns and preschool children is often caused by pneumococci, in small schoolchildren - mycoplasma, in teenagers - pulmonary chlamydia.

Depending on the mechanism of development and environmental conditions, pneumonia is divided into the following types:

Congenital - the end of life due to infection in the last weeks or days of the prenatal period (from the mother through the placenta) or directly during birth (when the contents of the birth canal enter the lungs) is determined in the first three days. .

Hospital (sick leave) - develops 72 hours after hospitalization or three days after the child is discharged.

Community-acquired - often manifests as complications of ARVI and develops at home.

Acute (up to 6 weeks) and prolonged (more than 6 weeks) forms are distinguished according to the duration of the disease. In the acute form, with timely treatment, recovery occurs in 10-12 days.

Based on the manifestation of clinical symptoms and the reaction of the body during pneumonia, 3 degrees of severity are determined:

Mild - symptoms of general intoxication of the body are mild (body temperature reaches 38 ° C), heart rate and blood pressure are normal. X-ray examination reveals a local, unexpressed inflammation in the lung tissue.

Medium - body temperature rises to 39 ° C, heart rate rises to 100 beats / min, sweating increases. An X-ray shows infiltration of lung tissue.

Severe - clear intoxication of the body (body temperature rises to 40 ° C, strong shivering, nausea, vomiting, confusion). Heart rate exceeds 100 beats per minute. At rest, the child suffers from shortness of breath. Radiologically, diffuse focal lesions of lung tissue are detected. The risk of complications increases.

Depending on the location and size of the affected tissues, the following forms are distinguished:

segmental (local damage to the lobar segment);  
lobar (damage to the lobe / lobes of the lung, including the interstitial pleura);  
hilar (tissue damage at the root of the lung, at the junction with the bronchi);  
interstitial (inflammation of alveoli and parenchymal connective tissue);  
focal (damage to several segments within the lobe / lobes of the lung);  
unilateral;  
bilateral.

If the inflammatory process affects the walls of the bronchioles of one or more lobes, then the child is diagnosed with bronchopneumonia.

Pneumonia is also divided into complicated and uncomplicated. In the first case, in addition to lung tissue, organs of the digestive tract, cardiovascular system and central nervous system are affected.

#### Symptoms

From the moment of infection, symptoms of pneumonia manifest themselves within 5-7 days. Among the specific symptoms of the disease:

dry or wet cough with sputum production;  
high temperature (38-40 ° C);  
cough "with wheezing" (wheezing is usually heard in the morning and evening, during deep inspiration);  
difficulty breathing, mixed shortness of breath;  
moderate cyanosis of the oral mucosa and nasolabial triangle;  
pain in the chest or hypochondria when coughing and taking a deep breath.

In the early stages of the disease, sputum has a slimy nature. With the development of the pathological process, the sputum becomes purulent. During lobar pneumonia, the secretion has a characteristic color. Due to severe coughing and general tension, the small blood vessels passing through the respiratory tract burst and red blood cells are released into the mucus.

Against the background of classic manifestations of pneumonia, the child may have the following.

decrease in blood pressure;  
stomach ache;  
small pain and tingling in the heart area;  
headache, dizziness;  
loss of appetite, flatulence;  
refusal of the breast (in newborns);  
vomiting, frequent belching (in newborns);  
weakness, slow reaction to stimuli;  
insomnia.

In the focal or focal-confluent form, when the infectious-inflammatory process affects all tissues of the lungs, the clinic is characterized by bleeding from the nose and lungs, symptoms of respiratory failure, and inflammation of the pleura.

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