

# Acalculiya and dyscalculiya: symptoms, mechanisms, classifications

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# Acalculiya

**Acalculia**—dysfunction of the account and recognition of numbers, arising from the defeat of the cortical part of the brain.

- In adults and children, due to injuries, hemorrhages, brain tumors.
- It can also develop in children amid general mental retardation.



# Discalculiya

Dyscalculia – underdevelopment of abilities computational operations, pathological difficulty in performing computational operations.

- The frequency of occurrence in the school population is about 5%.
- Dyscalculia occurs equally often among both sexes.




# Neuropsychological Aspects of acalculia

The psychiatrist F. Henschen mentioned the disease for the first time in 1919. Thanks to his research on the violation of the analysis and synthesis of computational operations, the scientist identified two main types of acalculia:

- a) primary;
- b) secondary.

The primary form of the syndrome is observed in the defeat of the parietal and temporal areas of the cortex. Most significant violations in the primary form of the syndrome are observed in children. The formation of brain regions responsible for the concept of space may not occur by the time a child enters school. In such cases, in the first year of study, difficulties may arise in understanding numbers and arithmetic operations.



# The main symptoms of primary forms of acalculia

1. Lack of understanding of the difference between numbers, for example, seem to the patient the same numbers are 245 and 254;
2. The inability to distinguish bit the structure of numbers;
3. Violation of the concept of spatial coordinates;
4. Difficulties with arithmetic operations;
5. The absence of the concept of numbers; violation of the concept of "more" – "Less."



# Symptoms of dyscalculia

- Lack of mastery of mathematical vocabulary;
- Wrong naming of numbers;
- Inaccurate representation of the graphic structure of numbers;
- Mechanical reproduction of the order of numbers;
- Difficulties in determining the place of a number in the series of natural numbers;
- Lack of knowledge of the composition of the number;
- The difficulty of learning the rules of education number;
- The difficulty of establishing the relationship of a number to its neighbors;
- Unformed quantitative relations of numbers;
- The elementary way of performing arithmetic actions (children do not rely on rules, but on external actions, use the “manual” method of performance);
- Mental operations are predominantly



# Mechanism of dyscalculia

The question of the mechanisms of dyscalculia in children is a complex of poorly understood problem. There are several concepts: The authors of the first concept (N.Granjon–Galifret, A..Benton, L.Kosc) distinguish gnostic–praxical disorders as mechanisms of dyscalculia. At the same time, dyscalculia is associated with impaired digital gnosis and praxis, combined with a lack of body pattern, constructive apraxia.





# Classifications of dyscalculia

- congenital and acquired (S. S. Mnukhin);
- primary and secondary (N. Grunion-Halifat (N. Granjon-Galifret), J. Ajuriaguerra (Ajuriaguerra J.), L. S. Tsvetkova)

The most generalized and practice-oriented classification is L. Kosch (L. Kosč).

1. Verbal dyscalculia.
2. Precognitions dyscalculia.
3. Lexical dyscalculia.
4. Graphic dyscalculia.
5. Operational dyscalculia.

