NEVRALON (solution for injections)
(thiamine hydrochloride, pyridoxine hydrochloride, cyanocobalam)

COMPOSITION
1 ampule of the solution contains
thiamine hydrochloride (vitamin B₁) 100 mg,
pyridoxine hydrochloride (vitamin B₆) 100 mg,
cyanocobalamin (vitamin B₁₂) 1 mg.

PHARMACOLOGICAL PROPERTIES

Neuralon is a vitamin B complex.

Neurotropic group B vitamins have positive effect in inflammatory and degenerative diseases of nerves and musculoskeletal system. In high doses they have analgesic properties; they enhance blood circulation and normalize the function of nervous system and hematopoiesis.

Thiamine hydrochloride (vitamin B₁) is an important active element. In human organism, as a result of phosphorylation, it transforms into cocarboxylase, which is a coenzyme of many fermentative reactions. It plays important role in carbohydrate, protein and lipid metabolism, and also in transmission of nerve impulses in synapses. It protects cell membranes against toxic effect of peroxidation products.

Pyridoxine hydrochloride (vitamin B₆) in phosphorylated form is a component of enzymes, which take part in decarboxylation and transamination of amino acids, as well as lipid metabolism. It is essential for normal function of peripheral and central nervous system (CNS).

Physiological function of both vitamins appears to be potentiation of one another’s function, which may be observed in their positive effect on neuromuscular and cardiovascular systems. Widely spread conditions associated with vitamin B₆ deficiency, are quickly contained when the vitamin is absorbed.

Cyanocobalamin (vitamin B₁₂) is essential for cellular metabolism. It affects hematopoiesis (external antianemic factor); takes part in the formation of choline, methionine, creatinine and nucleic acids; it has analgesic properties.

PHARMACOKINETICS

After parenteral administration thiamine hydrochloride is quickly absorbed from the injection site and is distributed in the entire organism. The blood concentration is comparatively low; consequently, mainly free thiamine circulates in plasma, and in erythrocytes and leukocytes – its phosphate esters. Phosphorylation is conducted in liver. Thiamine diphosphate is the most active phosphate ester and it has coenzyme activity. Approximately 1 mg of vitamin B₁ is metabolized daily. Metabolites are excreted with urine. Biological half-life is 0.35 h. Thiamine hydrochloride is not
concentrated in organism because it is not fat-soluble. It penetrates blood-brain barrier (BBB) and placental barrier, and can be traced in breast milk.

Vitamin B₆ phosphorylates and oxidizes to pyridoxal-5-phosphate. In blood plasma pyridoxal-5-phosphate and pyridoxal bind with albumin. In order to penetrate cell membrane pyridoxal-5-phosphate, bound with albumin, hydrolyzes into pyridoxal by means of alkaline phosphatase. Approximately 80% of the vitamin binds with blood plasma proteins. Pyridoxine hydrochloride is distributed in the entire organism, it penetrates placenta and can be traced in breast milk. There is 40 – 150 mg of vitamin B₆ in organism; its daily excretion rate is approximately 1.7 – 3.6 mg with replenishment rate of 2.2 – 2.4%. It is deposited in liver and oxidized to 4-pyridoxic acid, which is excreted with urine in no more than 2 – 5 h after absorption.

After parenteral administration vitamin B₁₂ forms transport protein complexes, which are quickly absorbed in liver, bone marrow and other organs. Vitamin B₁₂ enters bile and enterohepatic circulation; it also penetrates placenta barrier.

THERAPEUTIC INDICATIONS
- as a pathogenic and symptomatic medication in complex therapy of nervous central system disorders and syndromes of various origin;
- polyneuropathy (including diabetic, alcoholic, and other);
- neuritis and polynerveitis, including optic neuritis;
- peripheral paresis, including facial nerve paresis;
- neuralgia, including trigeminal nerve and intercostal nerves neuralgia;
- pain syndrome (radicular, myalgia, herpes zoster);
- systemic neurological disorders associated with manifested vitamin B₁, B₆ and B₁₂ deficiency.

CONTRAINDICATIONS
- hypersensitivity to any components of the medication;
- decompensated heart failure.

SIDE EFFECTS
In isolated cases – sweating, acne, skin reactions (urticaria). Seldom – hypersensitivity (skin rash, respiratory disorders, anaphylactic shock, angioedema).
**DOSAGE AND ADMINISTRATION**

Medication is intended for deep intramuscular injection. In severe cases and for acute pain the dose is 2 ml once daily; after relief and in mild cases – 2 ml 2 – 3 times a week.

The duration of treatment depends on the severity of the condition.

**PACKAGING**

Solution for injections.

5 dark glass ampoules, each containing 2 ml of the solution, are in a blister.

1 blister together with a leaflet is in a carton box.