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**Multi-stimulant for critical patients**  
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Created in our institute a combined device allows to accelerate the regenerative-repair processes in critically ill patients by the simultaneous and combined effects of several factors on the physical part of the body of the patient.

**Key Words:** Critical patients.bone marrow,progenitor precursor cells, “Georgia-1,2,3,4”

**Introduction:**An important part of rehabilitation measures for critical patients is to accelerate the regenerative-repair processes, which reduces the time of stay of patients in hospitals. In this regard, accelerated differentiation of stem cells plays an important role. In our clinic, a complex of instruments "Georgia-1" and "Georgia-2" based on electrical stimulation, accelerating the differentiation of stem cells.

No less important role in the rehabilitation of patients plays a critical impact and other physical factors. The aim is to develop a multi-function device to accelerate the rehabilitation of critically ill patients.

**Materials and Methods:**Among the factors that positively influence the healing process can be called the stimulation of electric shock, mechanical massage the patient's body, the effects of magnetic field, exposure light (particularly infrared), ultrasound irradiation, and others.

Individually, all of these factors are well understood and proven their positive effect. There is a desire to create a device for the simultaneous exposure to the desired area of the body, as many of these factors. Exposure time, i.e. session procedures for all of these factors practically the same.

As a support structure, we used a manual mechanical signature massage "Body Sculptor". Working body consists of eight plastic beads, performs rotational movement in a horizontal plane. Rotational speed of the working part is regulated within broad limits.

On Massagers out of the rotation of the working head diametrically opposite were reinforced two strong flat magnet. These magnets create a constant magnetic field.

At the same magnets falling electrical stimulation pulses. We applied pacemaker "Georgia-1" developed in our institute. The apparatus may generate a square wave with variable frequency and variable power supply.

In the corners of the flat magnets placed infrared LED-s. The length of the radiation around 740 nanometers. Powered by the electrical stimulator "Georgia-1."

Figures showing the structure of the device.

**Results and Discussion:**Testing devices are in healthy people (volunteers) and critically ill patients.

The frequency of rotation of the body of the mechanical tumbler set at averages.

The frequency of stimulation pulses was varied depending on the condition of the patient. The strength of the current through the electrodes are also set individually. Most patients are unconscious, so there was no verbal contact. To determine the current, we used the ability of muscles to contract under the influence of low-frequency electrical pulses, called tetanus. The current value is determined by increasing from a minimum to a value at which begins tetanus. Tetanus can be visually noted when the motor is turned off tumbler. The current limit is restricted.

To reduce the transition resistance area of the body smeared with a conductive paste.

Treatment time varied from 20 to 30 minutes.

Thus, the selected portion of the patient's body at the same time exposed to mechanical massage, electrical pulses, magnetic field, and light irradiation in the infrared (warming).

Each of these factors alone had a positive effect. In the case of joint and simultaneous action resulting therapeutic effect is greater than the sum of effects of individual factors.

The important role played also gain time to carry out the procedure. Since we are working simultaneously by four factors, this time is reduced fourfold.



Fig.1



Fig.2

The device is absolutely harmless and effective. It can be used in critical medical clinics and outpatient basis. It can be used in the interest of space medicine.

**Conclusion:** Created in our institute a combined device allows to accelerate the regenerative-repair processes in critically ill patients by the simultaneous and combined effects of several factors on the physical part of the body of the patient.

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