

Modern devices for magnetotherapy applied in treatment and diagnostics of different genesis CNS pathology. Analysis of medical application sphere, basic

AM	Quantity of MF	Frequency variable MF, initialization mode	Pulse waveform
----	----------------	--	----------------

technical characteristics.

Background and aims.

The efferent methods of treatment and diagnostics with using apparatus for magnetotherapy (AM) generating regulated magnetic field (MF) have become important component in intensive care (IC) of different genesis CNS damage and it's consequences. Here is discussed sphere of medical application of AM in treatment, IC and diagnostics of neurological and neurosurgical patients and basic technical characteristics of AM.

Methods. Review of clinical studies in CIS for the last 8 years, electronic oscillography and teslameteria of AM, analysis of pulses waveform in software AutoSignal v.1.7.

Results. AM «AUMAT», quantity of magnetic field (MF) on surface inductor no more than 40 mTl, frequency variable MF over the range 0,1–200 Hz. Sphere of medical application - craniocerebral trauma mean severity.

AM «NEURO-MS», control range: pulse amplitude of magnetic induction 0,3 - 2 Tl, pulse duration: 200 mcs, pulse repetition frequency at maximal magnetic induction - 5 Hz, assignment range: pulse repetition frequency 0,1 – 30 Hz, assigning range operation-time: in condition periodical stimulation 0,5 – 10 min. Sphere of medical application – epileptology research, combined therapy disseminated sclerosis.

AM «BEMER» has quantity of MF influencing on tissue to change within 2-150 mTl, current density in tissue come up to 10 mcA/sm³, electric field strength is about 1mB/sm. Magnetic intensity of last model (BEMER 3000) is within the framework of Earth magnetic flux density (about 50 mkTl), m.e. is comparable with natural MF. This series of sine wave signals of increasing frequency occurs within a trianle pulse form. Composite waveform verifiably achieved the most extensive physiological benefits. Sphere of medical application – restorative and rehabilitation periods of severe craniocerebral trauma.

AM «UNISPOK» with inductor «IAMI-7» is applicative for noninvasive multidirectional influence over large vessels projection. Quantity of MF on inductor surface - 60 mTl, carrier frequency 100 Hz, modulation frequency 10-20 Hz. Pulse waveform Fourier transformation closely corresponds to spectrum electrical activity of neural tissue. The inductor «IAMI-4» provides quantity of MF 140±10 mTl and is applied in new technique for invasive nonmedicamentous haemocorrection.

Sphere of medical application - severe craniocerebral trauma, researches in IC of cerebrovascular deasises and haemocorrection in neurooncology.

«AUMAT», inductor «IMTA - 5»	40 mTl	0,1 – 200 Hz	A – quad - B pulses
«NEURO-MS» «NEURO-MSD», completed inductors «IC-02-150», «IC- 02-100», «ID-02- 100» «IC-02-100»	Pulse amplitude of magnetic induction 0,3 - 2 Tl, pulse duration: 200 mcs, Up to 4 Tl	Pulse repetition frequency at maximal magnetic induction - 5 Hz, assignment range: pulse repetition frequency 0,1 – 30 Hz, assigning range operation-time: in condition periodical stimulation 0,5 – 10 min.	Quasi pulses
«BEMER 3000»	Influencing on tissue to change within 2 - 150 mTl, current density in tissue come up to 10 mcA/sm ³ , electric field strength is about 1mB/sm. Magnetic intensity is within the framework of Earth magnetic flux density (about 50 mktl), m.e. is comparable with natural MF.	30 Hz	This series of sine wave signals of increasing frequency occurs within a trianle pulse form. Composite waveform verifiably achieves the most extensive physiological benefits.
«UNISPOK»			
Inductor «IAMI-7» is applicative for noninvasive multidirectional influence over large vessels projection	On inductor surface - 60 mTl	Carrier frequency 100 Hz, modulation frequency 10 - 20 Hz	Pulse waveform Fourier transformation closely corresponds to spectrum electrical activity of neural tissue.
Inductor «IAMI -4» is applied in new technique for invasive nonmedicamentous haemocorrection	140 ± 30 mTl	Frequency variable 60 - 200 Hz	A – quad - B pulses, sine pulse and their combining

The examined basic technical characteristics of AM in tab.

Conclusion. Only AM «Bemer» and «UNISPOK» can generate composite signals of low frequency electromagnetic fields witch possess biotropic parameters, namely: intensity, gradient, vector, frequency, pulse waveform, exposition and localization. Because of these AM are widely used in neurotrumatology and neurology.