

Galvano-therapy- using hydrotherapy, principles, effects, indications and contraindications

Galvano-therapy using hydrotherapy can be done either by four-chamber galvanization, electrotherapy bath or ion bath of face.

Four-chamber galvanization is a special case of longitudinal galvanization, where input of galvanic current to the body is mediated by water.

Effect of the galvanic current, temperature of the water and hydrostatic forces and buoyancy.

The “electrode area” is area of submerged limbs, and there is no maximum current density.

Direction of current flow is from anode to cathode. Polarity of electrodes is chosen individually according to the desired effect.

Indications are neuralgia, neuritis and neuropathy, circulatory disorders, innervation disorders and acute posttraumatic states.

Application time is minimum 20 minutes, usually 30 minutes and with positive step with 5 minutes up to 45-60 minutes.

Frequency of procedures are 2 times daily in peracute posttraumatic states and once per week in chronic polyneuritides and circulatory disorders.

Intensity is threshold sensitive and max 40 mA in four chamber and 20 mA in two- and three-chamber.

Electrotherapy bath allows application of galvanic current to the whole body during general baths.

Galvanic current flow direction can be changed.

Intensity according to the patients feeling is 300 mA.

Water should be isothermic relative to body temperature, application time 30 minutes and frequency should be 2-3 times per week in total of 6-9 treatments.

Ion bath face is original equipment vs modified longitudinal galvanization.

One electrode (anode) at the bottom of insulated container, covered with security grid.

Second electrode on patients forearm.

Patient immerse whole face or affected half of the face.

Intensity is max 2 mA for 2-5 minutes, 5-7 times. Water should be isothermic.

Electro-diagnostics in general

Electrodiagnostics (ED) is used as assessment of optimal parameters for denervated muscles stimulation (electrostimulation).

We want to stimulate denervated muscle, but we dont know which intensity or length who are ideal.

By electrodiagnostic we can find these parameters and make stimulation effective!

Electrostimulation is stimulation of denervated muscles where we use oblique impulses due to neurological problems.

Electrogymnastic is stimulation of weakened muscles, when they are not denervated, so we use rectangular impulses.

Accommodation is adaptation of healthy efferent nervous fibres for stimulation of oblique impulses. If we want to induce muscle contraction in healthy muscles, we have to rise intensity many times more than intensity of rectangular impulses.

Denervated muscles are not under influence of efferent fibres and they have no adaptation. In these muscles we are able to provoke contraction with the same intensity for oblique or rectangular impulses.

Accommodation quotient (AQ) is something like a measure of accommodation. It is ratio of minimal intensity of muscle contractions by oblique impulse and by rectangular impulse, with length of impulse 1000 ms. We find the number by dividing response in oblique by rectangular impulse. The number should be between 1,6 to 6. Higher indicates dystonia and under indicates denervation.

Electro-diagnosis, electrostimulation of healthy and par-esthetic muscles (including I/T-curve)

From I/T-curve we are able to find optimal parameters (length and intensity) of oblique impulses, which can stimulate denervated muscles selectively, but with no contraction of healthy muscles, because healthy muscles have adaptation for these types of impulses.

There are two possibilities to create I/T-curves:

Classical curve with 44 measurements

Reduced curve with 6 measurements

We measure motoric threshold intensity (minimal intensity for motoric effect) in impulses with length 0,01-1000 ms.

-by oblique impulses in healthy muscle

-by rectangular impulses in healthy muscle

-by oblique impulses in denervated muscle

-by rectangular impulses in denervated muscles

Time of stimulation is very individual. We have to stop procedure in the moment when the quality of muscle contraction has changed. It is signal about energetic exhaustion of muscle.

It is better to stimulate only 1-3 min (5-15 contractions) in one motor point and then change to other one and continue all over again.

Frequency

Optimal every day.

Every 2-3 weeks make new control. When we are able to provoke the muscle by rectangular impulse with length 1-10 ms, we should change parameters and start with electrogymnastic.

Electrostimulation do not make regeneration faster!

We just keep muscle in condition and prevent again transformation to adipose tissue and atrophy.

Peripheral paresis:

Muscle is ok and nerve is impaired.

Central paresis:

Muscle is ok and nerve is ok. We stimulate nerve by short impulses.

Very often we stimulate the muscle by monopolar "ball" electrode (cathode) in motor point of the muscle.

MP are anatomically defined place usually at proximal part of muscle. In paretic muscle motoric point moves to the center of muscle belly. Place where nerve enters inside the muscle. There is the most number of neuromuscular junction. In motoric place the minimal intensity is necessary to provoke the contraction. Very often is identical with acupuncture point. One muscle can have more than one Mp.

Impulse therapy- basic characteristics, principles, using

Impulsotherapy utilizes the effects of electrical impulses with precise waveform.

Currents with vertical or steep start are leduce, faradic, neo-faradic and träbert current.

Impulse reaches the maximal intensity for stimulation within 10 ms.

Leduce got 1 ms impulse and 9 ms pause. Faradic got 2 ms impulse and 20 ms pause. Neo-faradic got 2 ms impulse and 20 ms pause. Träbert current got 2 ms impulse and 5 ms pause.

Currents with slow or gentle start have impulse which reaches the maximal intensity for stimulation in more than 10 ms.

We have to determine individual parameters by I/T-curve.

Application are by electrodiagnostic, electrostimulation and stimulation of smooth muscles.

Variants in physiotherapy are electrostimulation and electrogymnastic.

Variants outside of physiotherapy are electroconvulsive therapy/electroshock, pacemaker, deep brain stimulation and defibrillator.