The Method of Proprioceptive-Deep Tendon Reflex (P-DTR)

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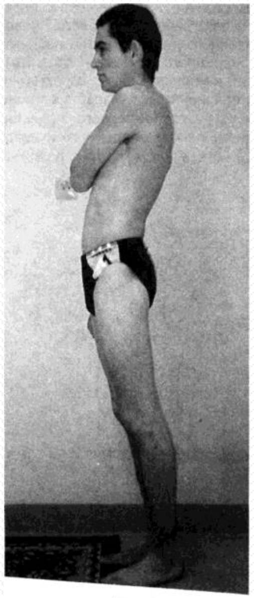
The method of Proprioceptive-Deep Tendon Reflex (P-DTR) was developed by Dr. José Palomar, and has been successfully used in clinical practice for a few years already. P-DTR is the first manual neurological method based on the principles of topical diagnosis in neurology, neurophysiology, and biomechanics, as well as the main cornerstones of applied kinesiology.

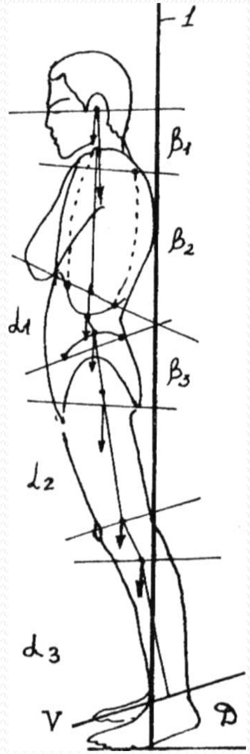
The Proprioceptive-Deep Tendon Reflex (P-DTR) method is a product of Dr. José Palomar Lever's original thinking and research. It represents a new course in the treatment of neurological and orthopaedic diseases.

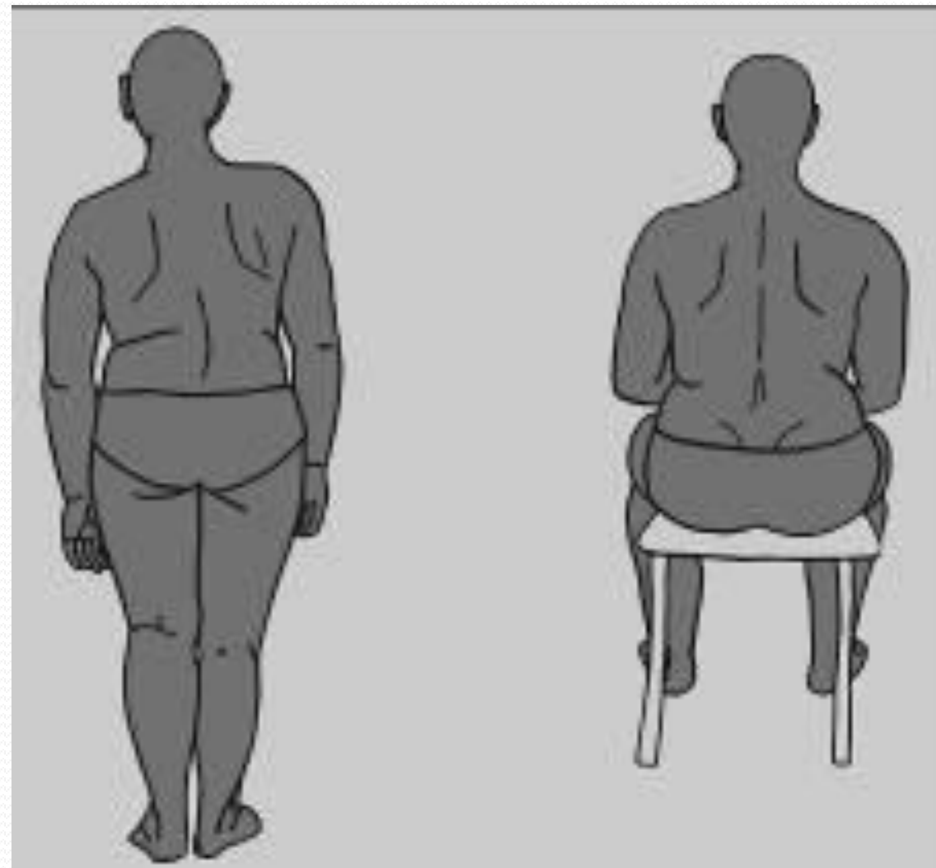
This method emerged from the basic knowledge of applied kinesiology (manual muscle testing) and Dr. Palomar's paired receptor theory.

When examining a patient, a neurologist focuses his /her attention on the patient's body symmetry, antalgic posture, and participation of the accessory muscles in the respiratory movements. However, it’s not only the posture and body symmetry that matter in applied kinesiology but also visual diagnostics of weak and hypertonic muscles; profound knowledge of the P-DTR method helps to achieve preliminary identification of the receptor dysfunction region by visual examination.



A





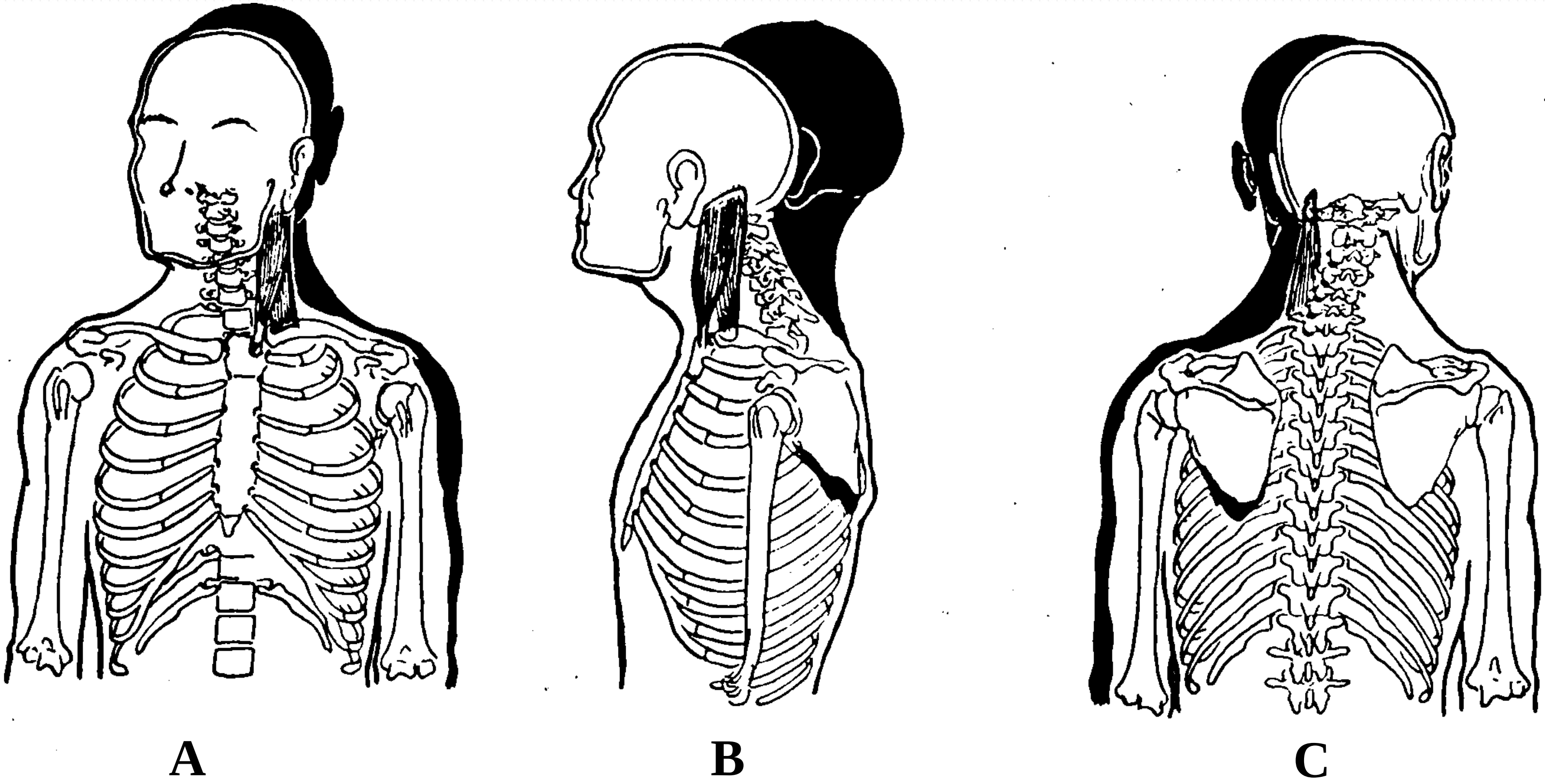
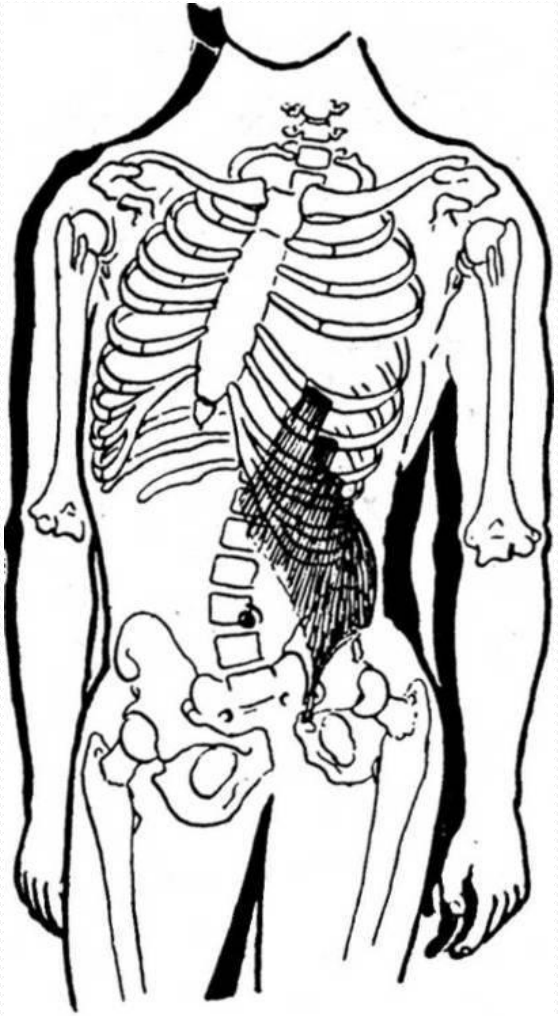
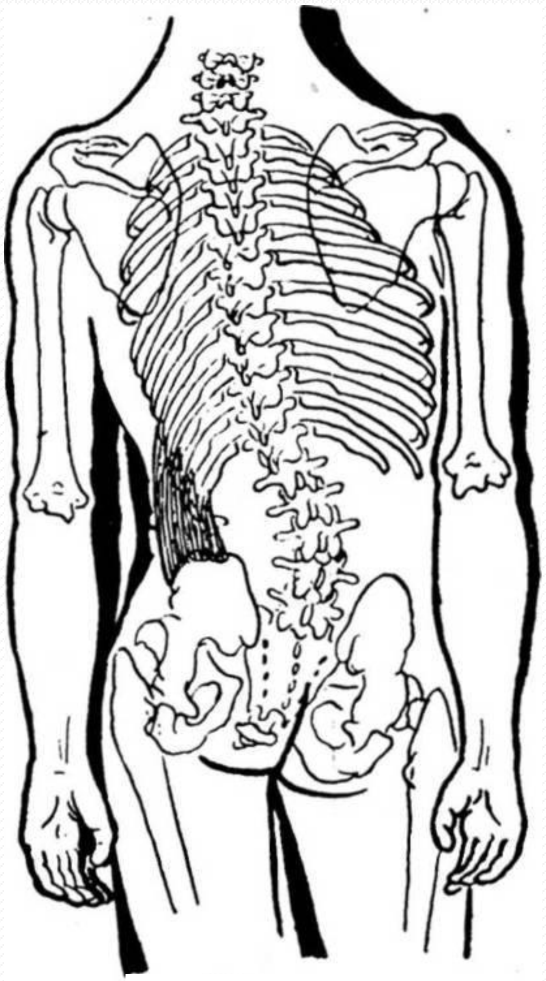


Figure 59. Deformed body contours in a patient with a shortened sternocleidomastoid muscle
A - front view B – side view C – back view



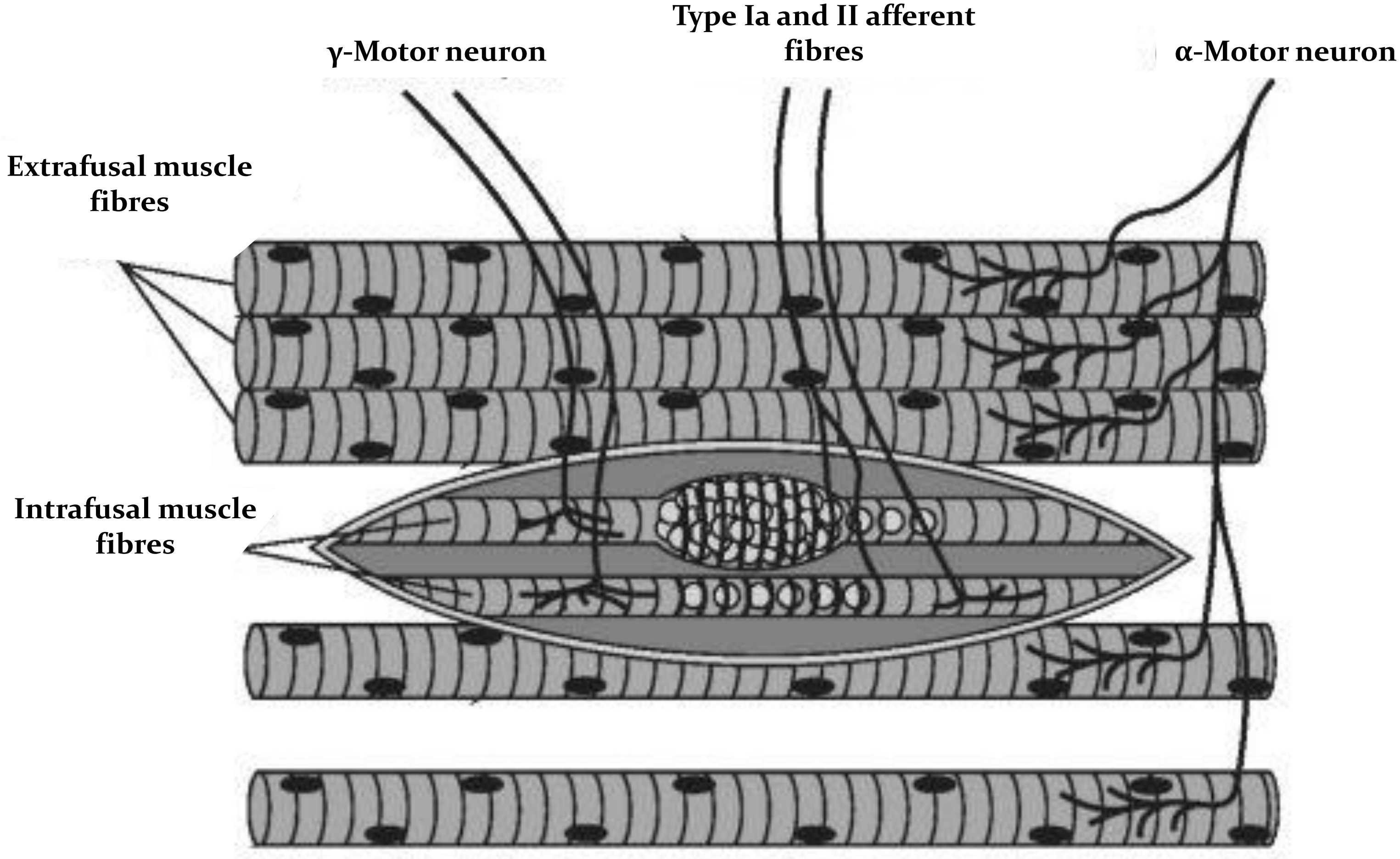
A

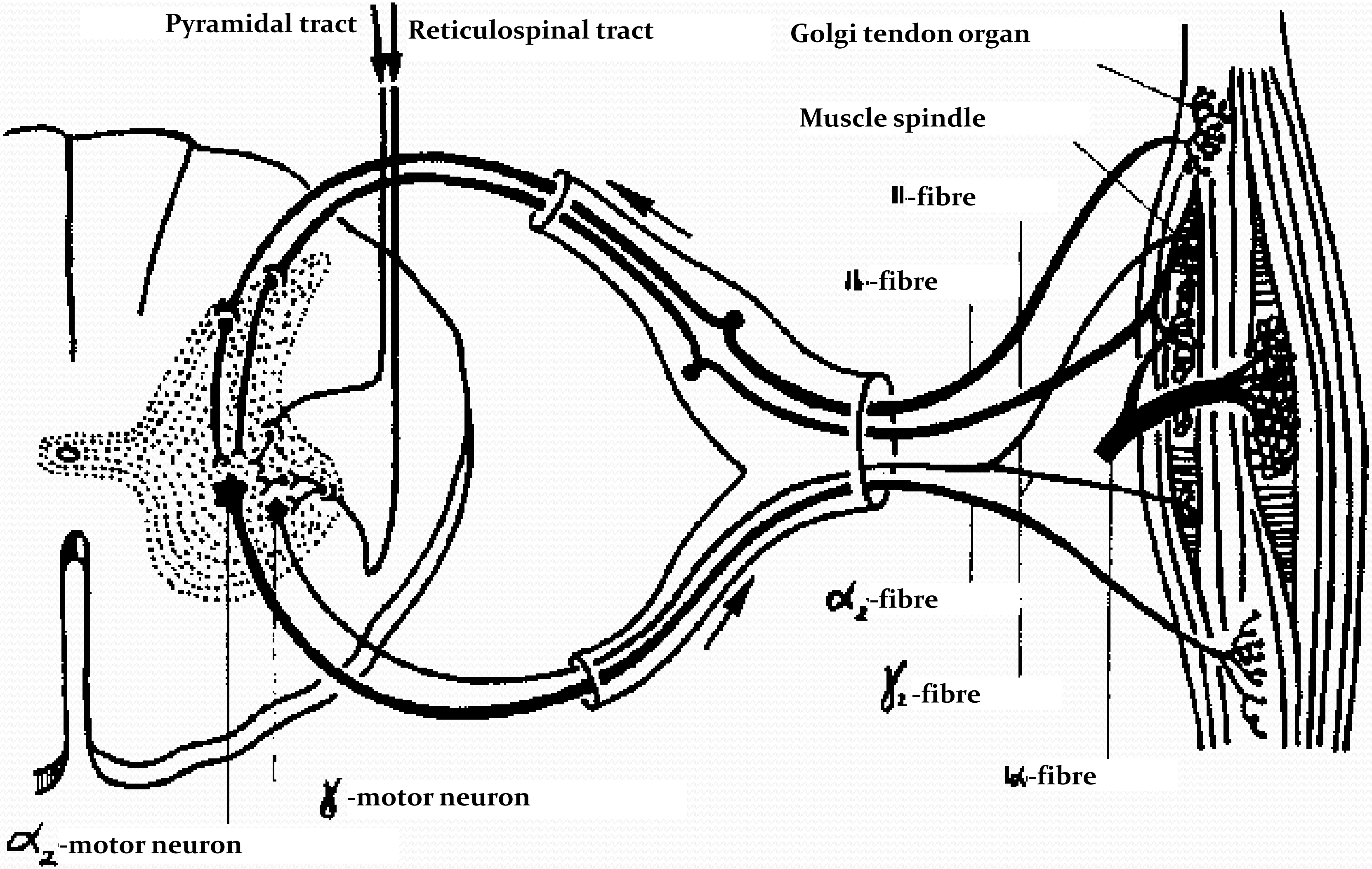


C

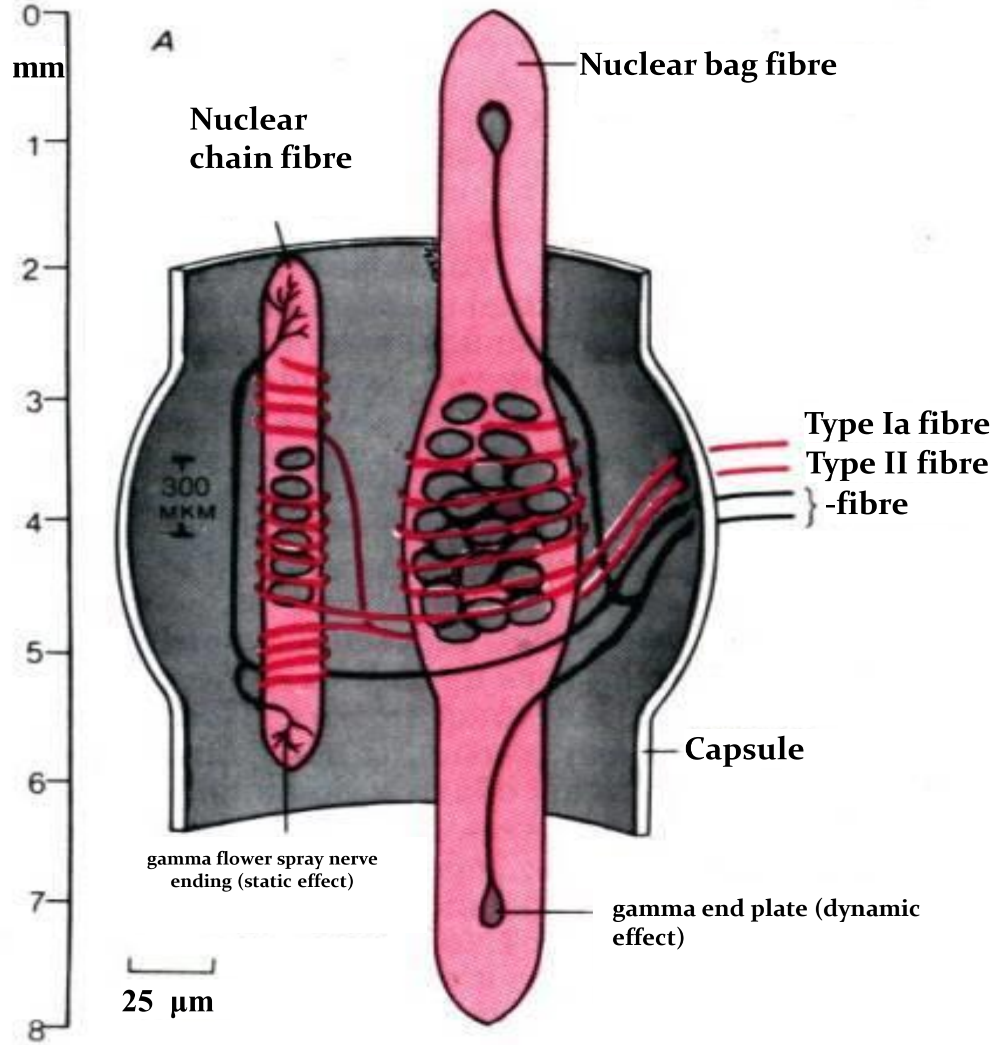
One of the main tools employed by P-DTR is the Manual Muscle Testing, a procedure for the evaluation of the muscle tone in a state of tonic contraction.

It serves to assess the muscles of the affected area, identify hypotonic and hypertonic muscles, and find an indicator muscle that has normal tone.

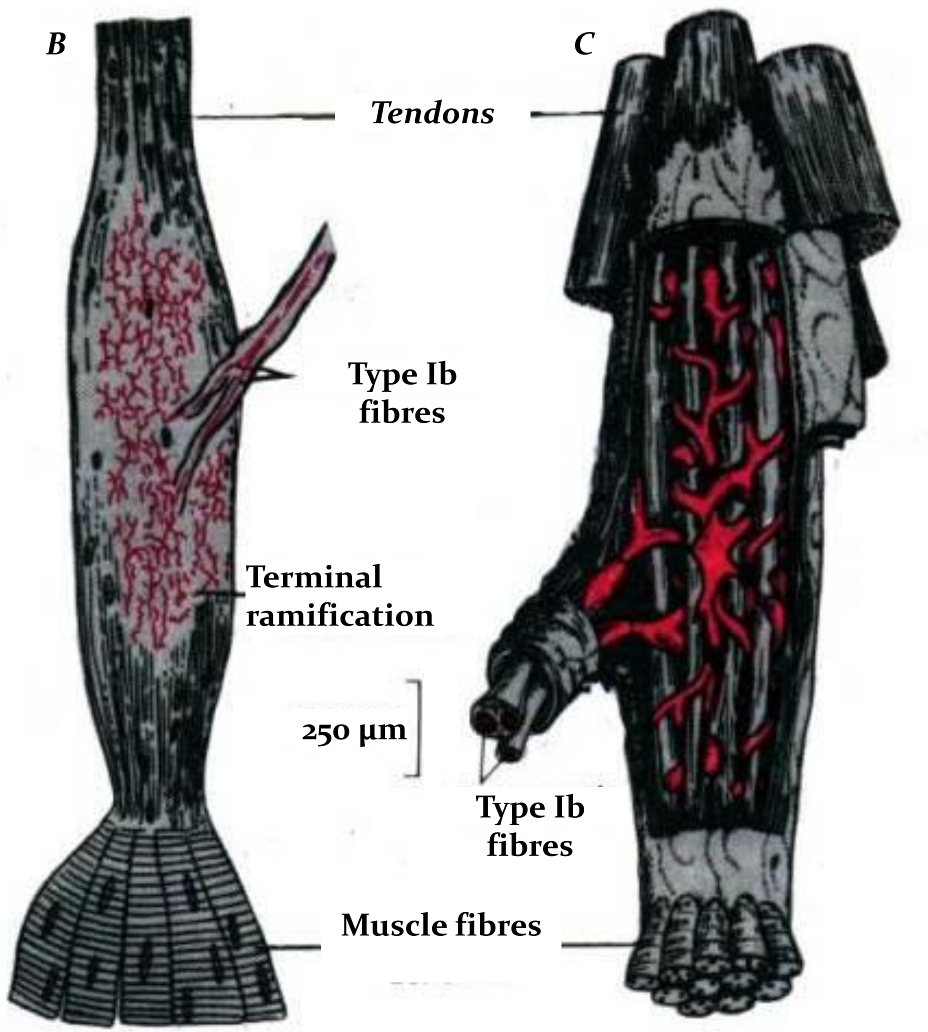

γ-Motor neuron
Type Ia and II afferent fibres
α-Motor neuron
Extrafusal muscle fibres
Intrafusal muscle fibres



Pyramidal tract
Reticulospinal tract
Golgi tendon organ
Muscle spindle
II-fibre
Ib-fibre
α_2-fibre
γ_2-fibre
Ia-fibre
γ-motor neuron
α_2-motor neuron



0
mm
1
2
3
4
5
6
7
8
A
Nuclear bag fibre
Nuclear chain fibre
300 MKM
Type Ia fibre
Type II fibre
} -fibre
Capsule
gamma flower spray nerve ending (static effect)
gamma end plate (dynamic effect)
25 μm



B
C
Tendons
Type Ib
fibres
Terminal
ramification
250 µm
Type Ib
fibres
Muscle fibres

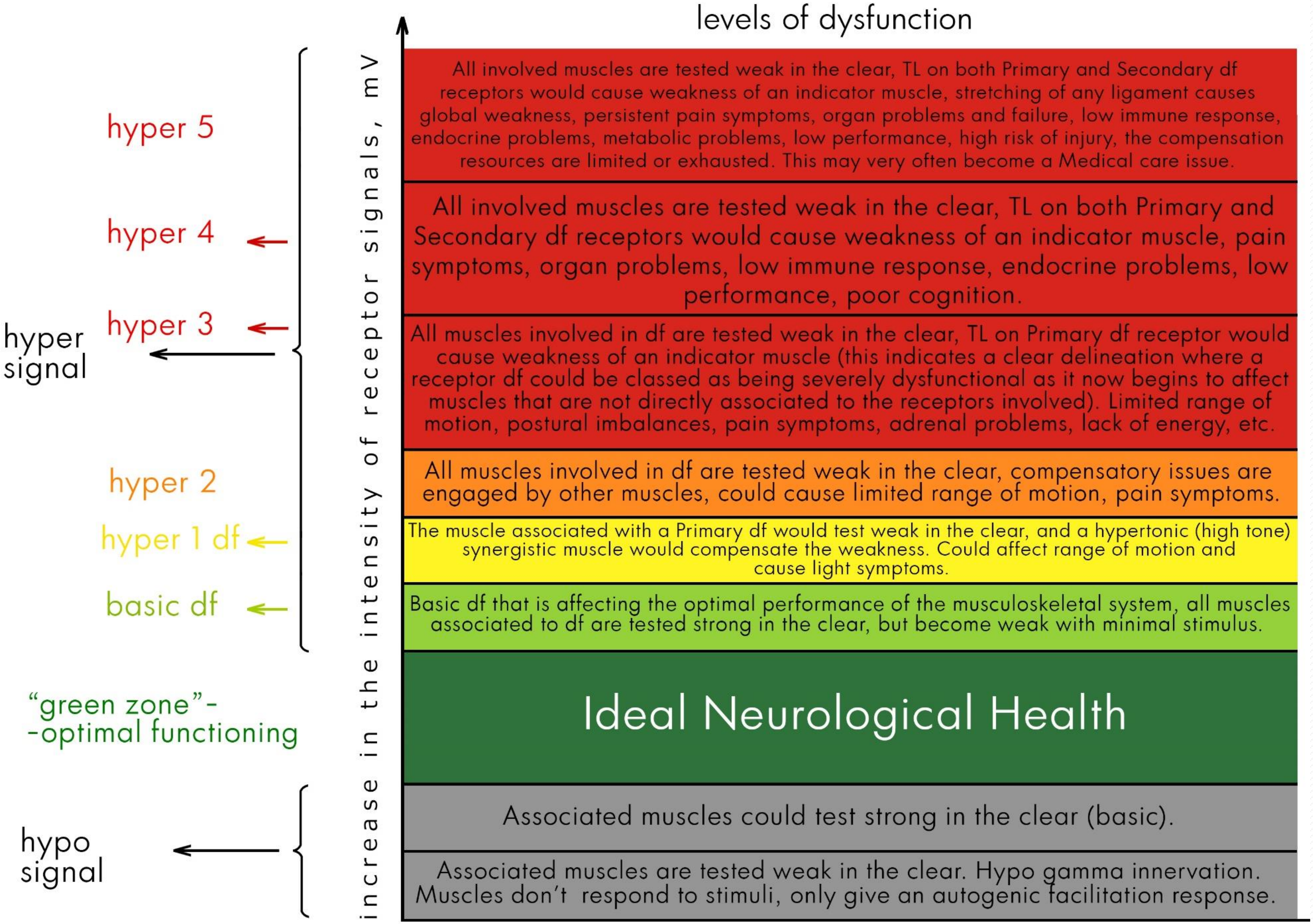
The Manual Muscle Testing helps to determine muscle tone in a state of isometric contraction. When a physician brings together the fibres of a muscle in isometric contraction, the afferent signal temporarily decreases thus resulting in decreased tone of the muscle itself. In the course of his studies, Dr. Palomar found out that the tone of a muscle in isometric contraction changes following different stimuli applied to various body areas. These findings prompted research and practical studies of the human body's receptor system. Afterwards, Dr. Palomar created an entire system of neurological provocations to affect certain receptors; in particular, Golgi receptors respond to extension, so a slight stretch is enough to stimulate a certain receptor area of a ligament, tendon, or fascia. These neurological provocations are rather specific and diverse.

During subsequent studies, Dr. Palomar revealed that the nervous system attempts to compensate for high afferent signals affecting the central nervous system, and he came up with a whole system that allows to identify the type of the receptor with abnormally high signals (dysfunctional receptor) and its location. Dr. Palomar found out that each dysfunctional receptor has a counterpart that tries to compensate by sending additional stimuli to the central nervous system. For instance, excessive afferentation of diffuse pain (paleo receptors) may be compensated by stroking (crude touch).

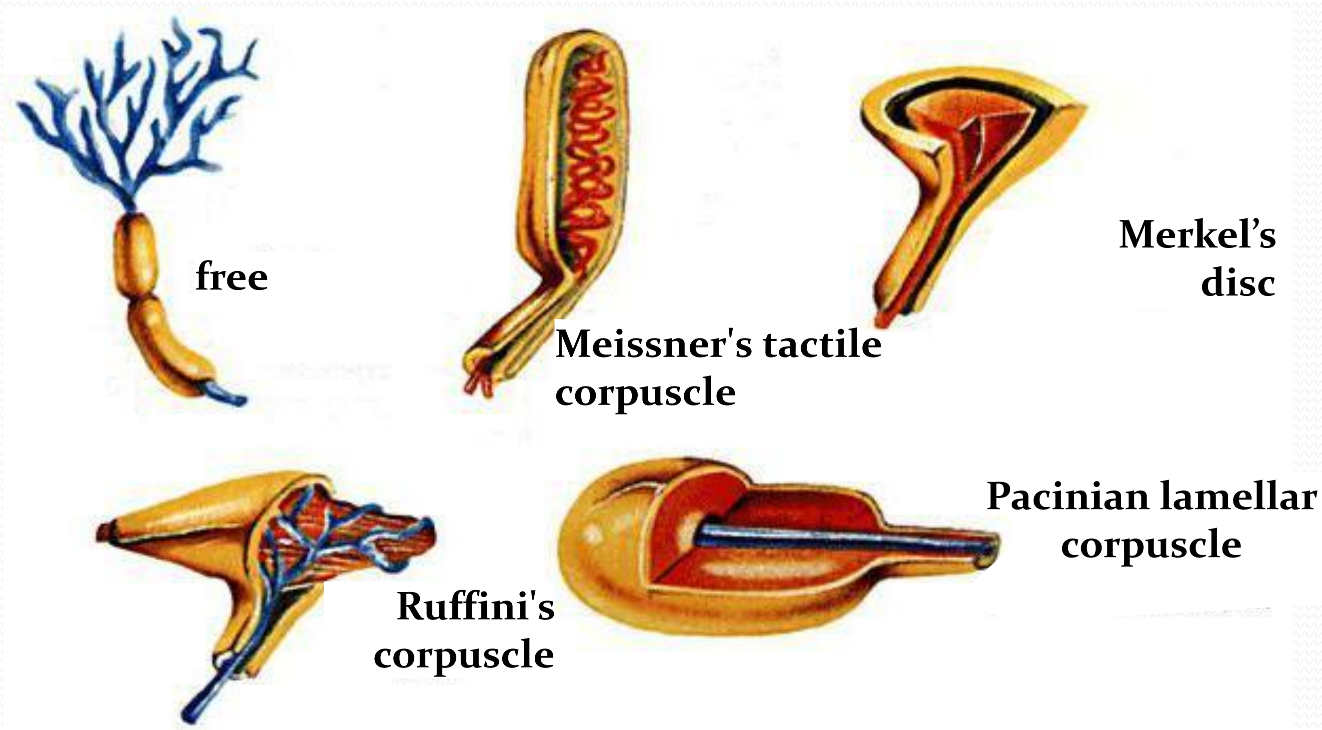
The receptor (receptive field) that originally has an abnormally high signal is called ‘primary’ in P-DTR, while the receptor that tries to compensate this signal is ‘secondary’. Each receptive field, either primary or secondary, controls tertiary muscles, which change their tone as a result of reflex influences and become either hypotonic or hypertonic. These tertiary muscles (called ‘associated’) change biomechanics of the body and cause static and dynamic pain. Instead of affecting the muscles themselves, P-DTR rather works with the causes of the changes in their tone. Eliminating the excessive afferent signal and eliminating the dysfunction itself, one can achieve a normal reflex muscle response, a normotonic muscle, bringing the biomechanics back to normal.

Depending on how excessive the afferentation of the receptor signal is, the number of possible compensations may vary considerably, so an enormous amount of various compensations may occur. Sometimes these compensations form the entire fractal trees composed of branches of various dysfunctional receptors which attempt to compensate for a specific problem that is highly significant for the body.

Dr. Palomar classifies receptor dysfunctions in the following manner:


levels of dysfunction
increase in the intensity of receptor signals, mV
hyper 5
All involved muscles are tested weak in the clear, TL on both Primary and Secondary df receptors would cause weakness of an indicator muscle, stretching of any ligament causes global weakness, persistent pain symptoms, organ problems and failure, low immune response, endocrine problems, metabolic problems, low performance, high risk of injury, the compensation resources are limited or exhausted. This may very often become a Medical care issue.
hyper 4
All involved muscles are tested weak in the clear, TL on both Primary and Secondary df receptors would cause weakness of an indicator muscle, pain symptoms, organ problems, low immune response, endocrine problems, low performance, poor cognition.
hyper signal
hyper 3
All muscles involved in df are tested weak in the clear, TL on Primary df receptor would cause weakness of an indicator muscle (this indicates a clear delineation where a receptor df could be classed as being severely dysfunctional as it now begins to affect muscles that are not directly associated to the receptors involved). Limited range of motion, postural imbalances, pain symptoms, adrenal problems, lack of energy, etc.
hyper 2
All muscles involved in df are tested weak in the clear, compensatory issues are engaged by other muscles, could cause limited range of motion, pain symptoms.
hyper 1 df
The muscle associated with a Primary df would test weak in the clear, and a hypertonic (high tone) synergistic muscle would compensate the weakness. Could affect range of motion and cause light symptoms.
basic df
Basic df that is affecting the optimal performance of the musculoskeletal system, all muscles associated to df are tested strong in the clear, but become weak with minimal stimulus.
“green zone”-
-optimal functioning
Ideal Neurological Health
hypo signal
Associated muscles could test strong in the clear (basic).
Associated muscles are tested weak in the clear. Hypo gamma innervation. Muscles don’t respond to stimuli, only give an autogenic facilitation response.

There are about 20 receptors and neurological challenges affected by P-DTR, each receptor responds to stimulation of a certain modality. P-DTR is also a system helping to search for the needed receptive fields, priority of dysfunctions and their treatment.



P-DTR uses the anatomy and physiology of pathways to explain why exactly specific receptor pairs are formed. Some anatomical and physiological similarity of certain pathways is observed. They, in turn, carry information to the integration centres at different levels, and this information is in a way competitive. This is the essence of the receptor compensation according to the Palomar theory.

The theoretical basis of P-DTR is a paired afferent stimulation.

Excessive afferent information comes to the central nervous system from paired receptive fields. A quantitative change of the information coming from a receptive field unavoidably results in a quantitative change of the information coming from another receptive field. In other words, any stimulus sent by a receptor to the central nervous system is compensated.

And if the CNS receives dysfunctional, aberrant signals of high intensity from receptors, it will continue compensating these signals, but this compensation will be done with different functional receptor systems, which may result in unstable, abnormal biomechanics of the human body, limited range of movement, and pain syndrome.

One field with excessive afferent information is the Primary Dysfunction zone, and the other is the Principal Secondary Dysfunction zone. The latter may carry excessive afferentation as well, but only to compensate the afferentation of the former one. If the compensation of the Principal Secondary Dysfunction zone is insufficient, the central nervous system will produce additional secondary compensations, and their amount may vary considerably.

The P-DTR system allows to identify dysfunctional receptive fields, work with them at a receptor level changing the intensity of their bioelectrical signal, normalize this way the performance of the dysfunctional receptor pair and, consequently, the function of the involved muscles, change the biomechanics of the body, and eliminate the pain syndrome.

P-DTR to helps resolve an enormous amount of purely functional problems, changes the patient's biomechanics and posture, treats functional pain syndromes, and augments the efficacy of other treatment options, such as massage and remedial gymnastics. This method may be used either alone or as an adjunct.

Our Department is conducting a research study titled “**Specifics of the electroneuromyography parameters in patients with musculoskeletal pain syndromes before and after the use of the Proprioceptive-Deep Tendon Reflex method (P-DTR)**”.

The number of studied diseases is rather high, and study subjects all have a pain syndrome, usually muscle and fascia pain; 100 % of subjects has a clinical improvement - the pain syndrome was relieved or eliminated, while the range of movements increased after the use of P-DTR.

The electroneuromyography study was conducted according to a special programme and formulated goals:

- to study the mutual effects of the primary and secondary dysfunctions on each other;

- to confirm the existence of paired receptive fields and compensatory effects of secondary dysfunctional fields on primary dysfunctional fields.

The paired receptive field theory was assessed by registering the bioelectrical activity of the zones of primary and secondary receptor dysfunction. An application package was used to register the total bioelectrical receptor activity of a certain area, excluding the PDE muscles. Needle electrodes were used in this study; they were applied to the anatomical location of a certain type of receptors (for instance, Golgi tendon organ).

The bioelectrical activity study was done using two channels, according to the following programme:

- Channel 1 - from the primary receptor dysfunction zone,
- Channel 2 - from the secondary receptor dysfunction zone.

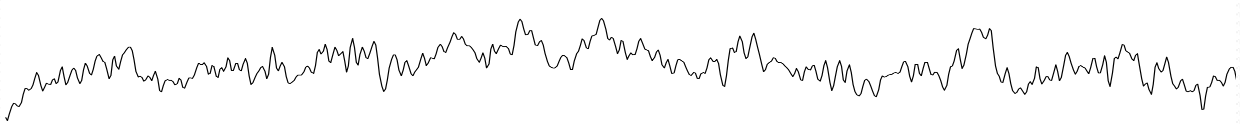
Measurements:

- 1 – without stimulation
- 2 – following stimulation of the primary dysfunction zone with a proper stimulus
- 3 – following stimulation of the secondary dysfunction zone
- 4 – following stimulation of the primary dysfunction zone with an anti-stimulus
- 5 – following stimulation of the secondary dysfunction zone with an anti-stimulus
- 6 – following stimulation of a non-dysfunction zone
- 7 – following the P-DTR treatment

Clinical example of a receptive field bioelectrical activity study. Patient M., male, 44 years old

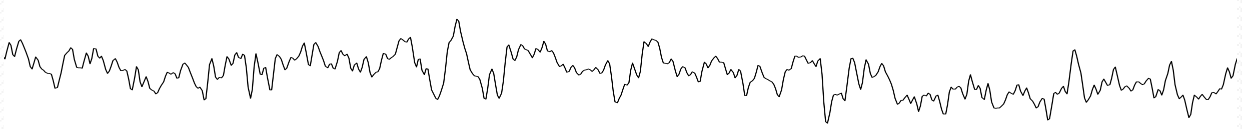
Primary dysfunctional receptive field zone, average amplitude 66 µV:

Primary dysfunctional receptive field zone following stimulation of the secondary field zone, average

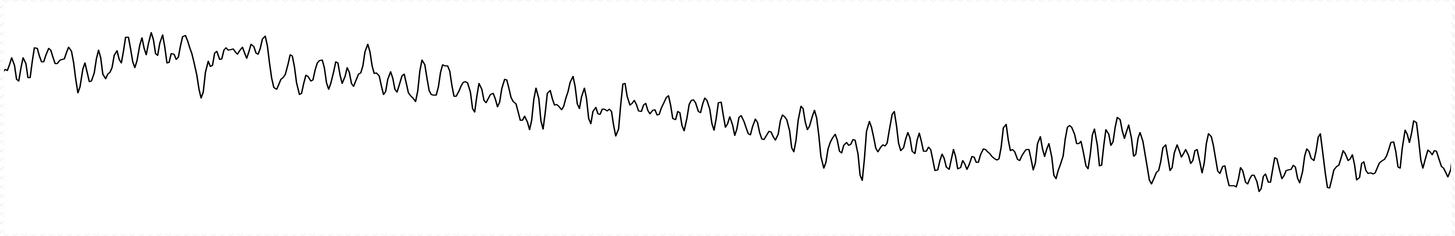


Primary dysfunctional receptive field zone following anti-stimulation, average amplitude 48 μV:

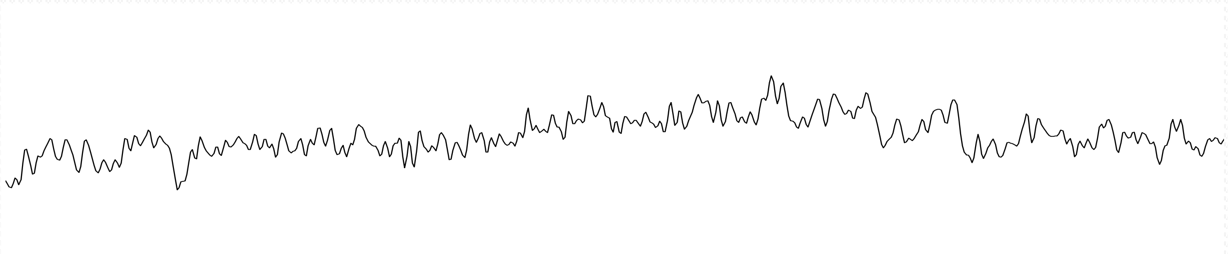
Primary dysfunctional receptive field zone, after P-DTR treatment, average amplitude 46 μV:



Secondary dysfunctional receptive field zone, average amplitude 48 μV:



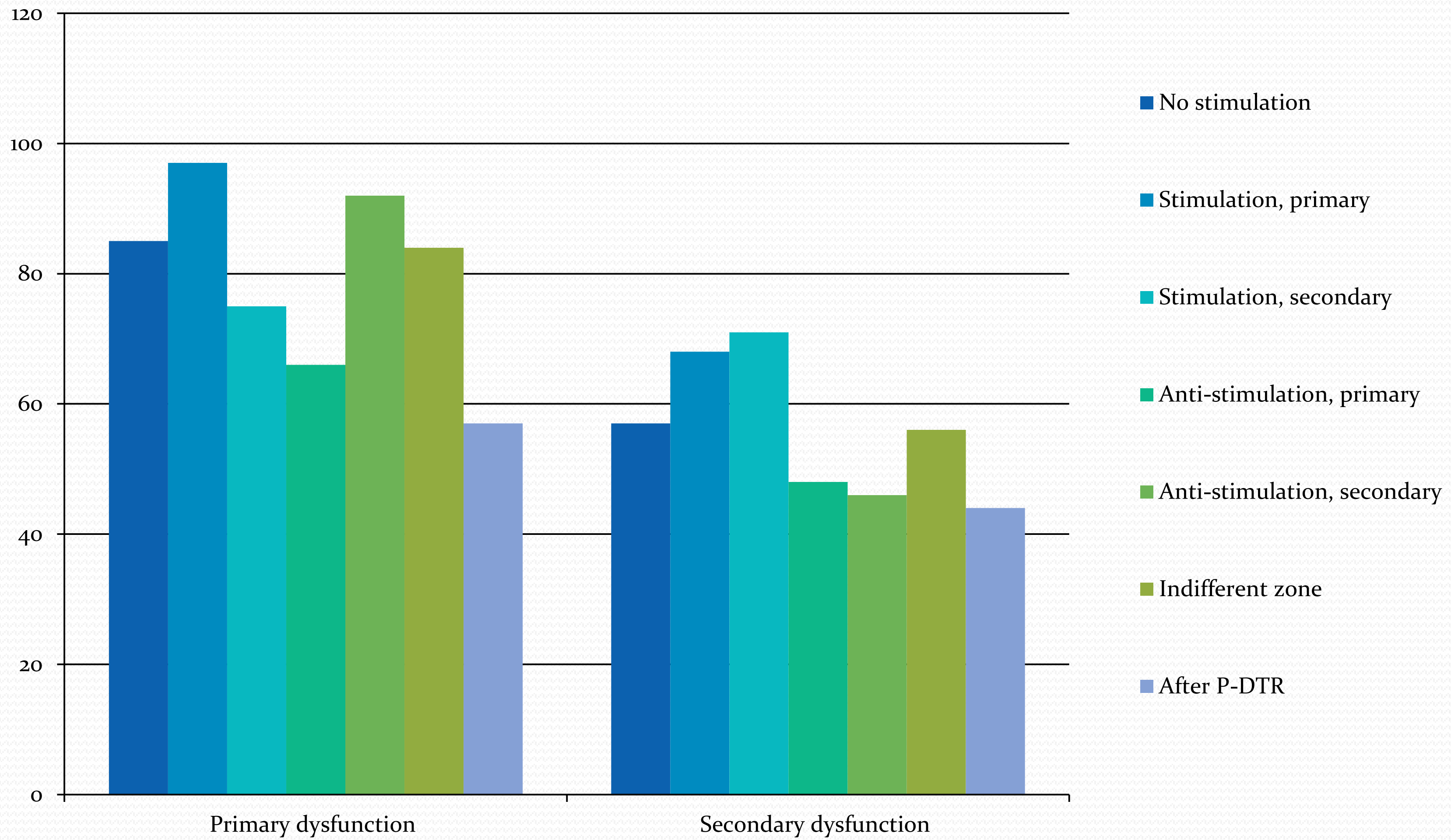
Secondary dysfunctional receptive field zone following stimulation of the primary field zone, average amplitude 55 μV:



Secondary dysfunctional receptive field zone following anti-stimulation, average amplitude 38 μV:

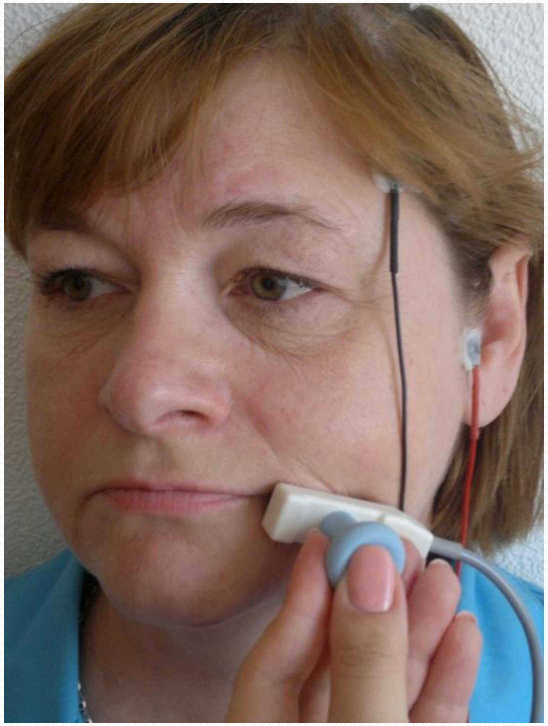
Secondary dysfunctional receptive field zone, after P-DTR treatment, average amplitude 33 μV:

Study data obtained in 96 patients were used to obtain a diagram showing the change in the bioelectrical activity of the receptive fields (interferential EMG amplitude):

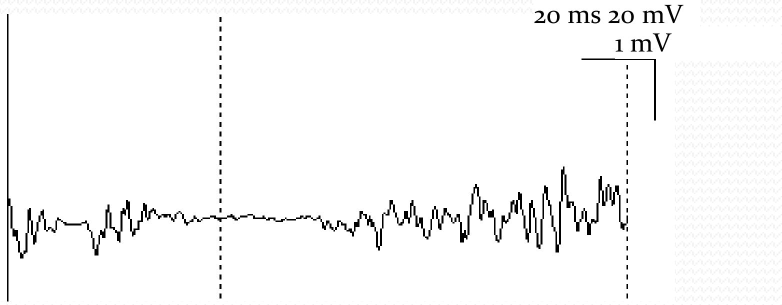


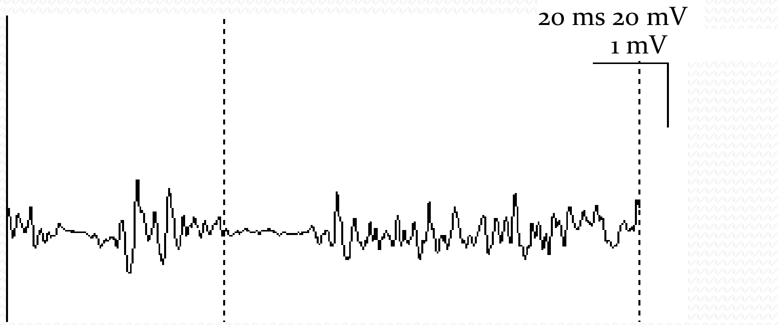
Exteroceptive suppression of voluntary muscle activity before and after the use of P-DTR was used to evaluate the effects of this method on the suprasegmental antinociceptive systems. The electrodes were applied in the following manner:

The active electrode was placed on the temporal muscle, the reference electrode at the tragus level, and the stimulant electrode at the mouth angle level.
An electrical impulse is delivered while
The teeth are strongly pressed together.
The ES periods appear as periods of suppressed voluntary muscle activity.



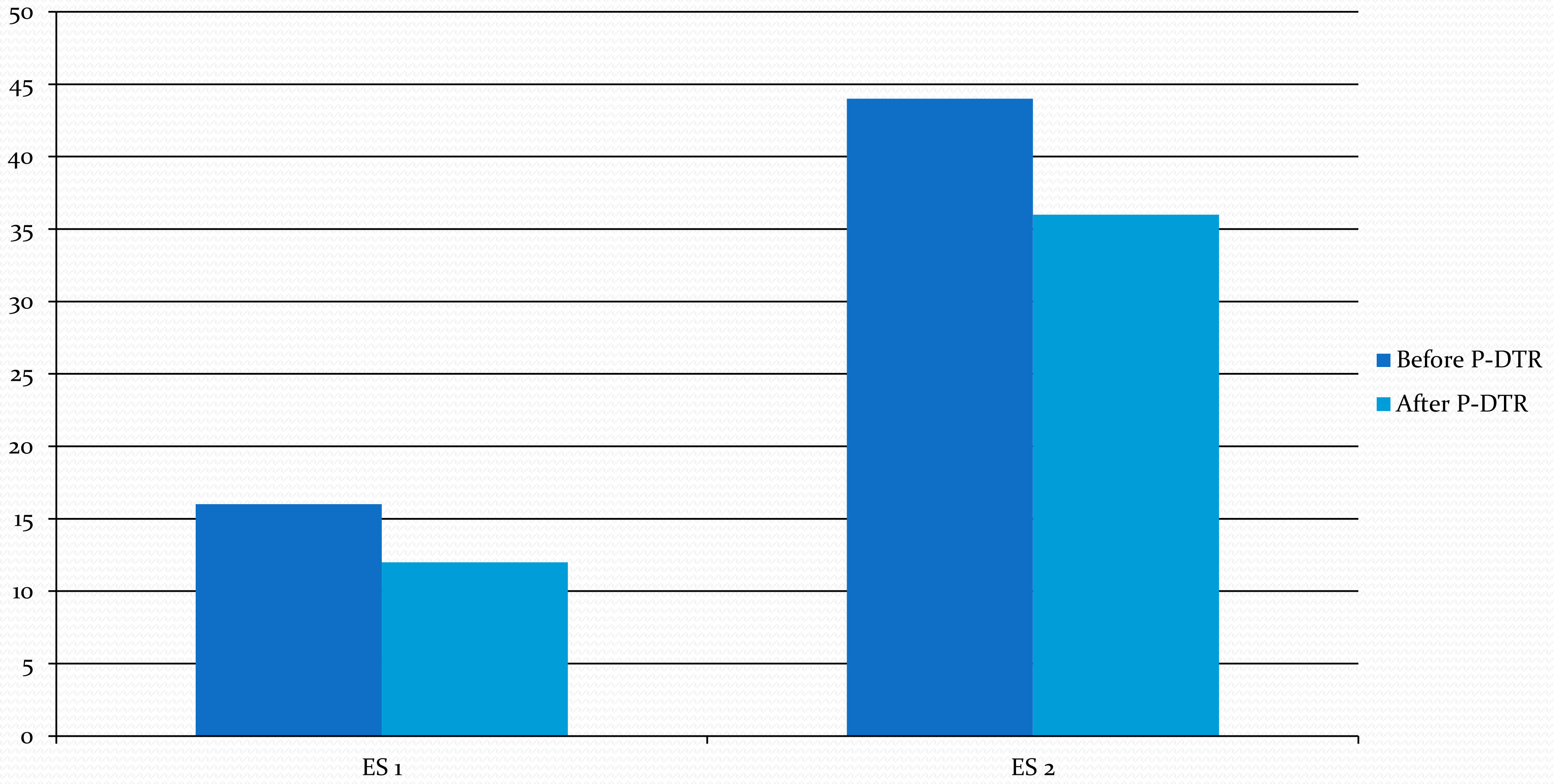
Characteristically, a decrease in the duration of the ES periods was observed in almost 100 % of the cases after the use of P-DTR. This indicates that the method exerts a direct effect on the suprasegmental structures.





ES after P-DTR

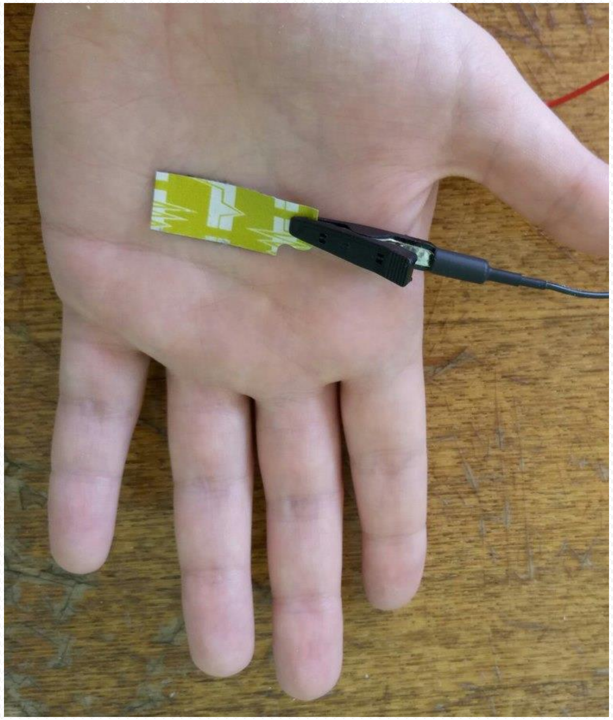
The study data obtained in 96 patients were used to obtain a diagram showing the change in the ES periods before and after P-DTR treatment

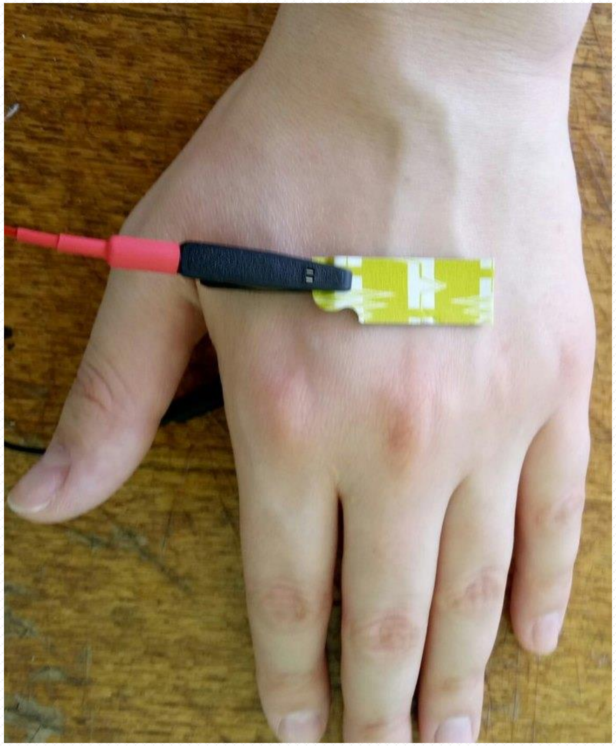


To evaluate the state of the patient's skin vegetative reactions, we used an evoked skin sympathetic potential from the upper extremities based on the amplitudes (mV) obtained before and after the P-DTR treatment, respectively.

Average values of obtained digital electroneuromyography data were calculated and further analyzed.

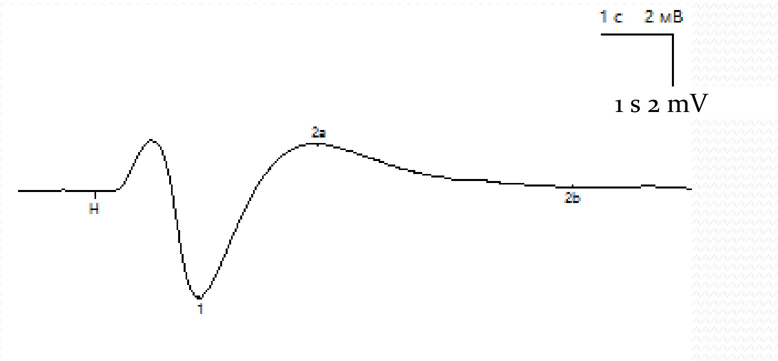
The active electrode was placed on the palm, the reference electrode - on the back of the hand; stimulation was contralateral, in the mid-forearm, outside of nerve projection areas.



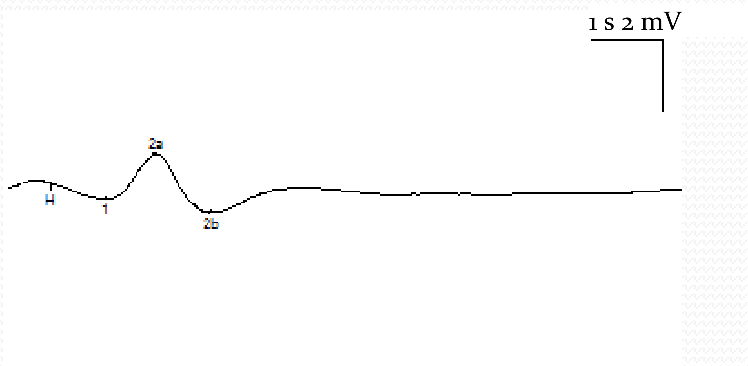


An example of ESSP change before and after P-DTR:

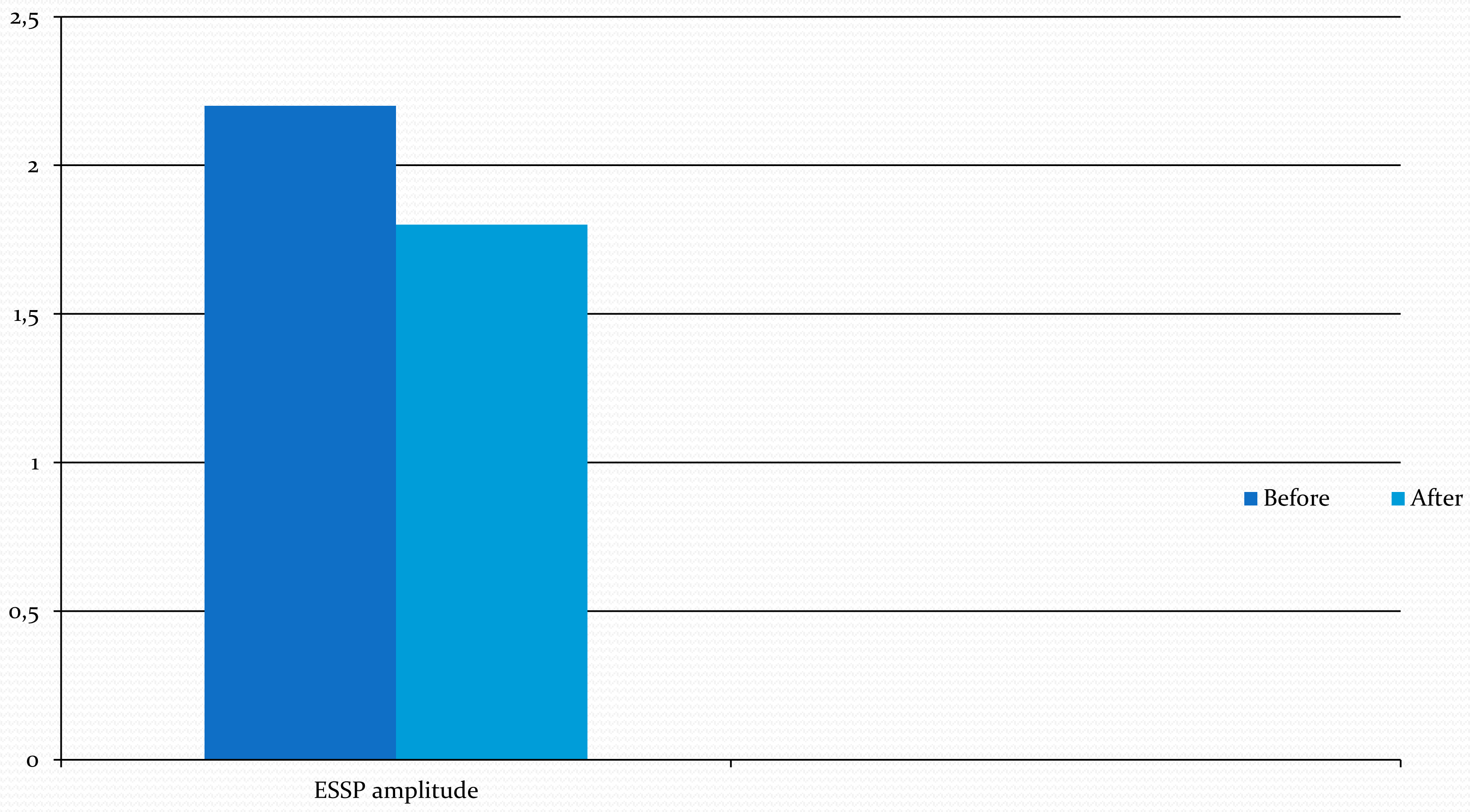
Before the P-DTR treatment, amplitude 3 mV.



After the P-DTR treatment, amplitude 1.2 mV.



Average data obtained in 96 subjects:



In conclusion, we have demonstrated the relationship between the primary and the secondary receptive fields, and have shown that a change in the afferentation of the primary receptive field entails a change in the afferentation of the secondary receptive field. The data we obtained are in agreement with the provisions of the paired receptive fields theory.

ES is an electroneuromyography method that proves the efficacy of P-DTR as a treatment for pain, including its central structures.

The ESSP changes observed before and after the use of P-DTR indicate stabilization of the vegetative manifestations of pain.

THANK YOU FOR LISTENING!

P-DTR®