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METHODICAL RECOMMENDATIONS

for application of Individual
Stress Resistance Trainer

«INTENS»

Taganrog

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INTRODUCTION

The individual stress-resistance trainer INTENS is intended to train self-regulation and stress-resistance skills being important in stress situations.

For example, is it difficult to go on the board of 15 cm width?

It is easy to do it if this board is on the ground. It is more difficult to keep balance on the sport “boom”. If the board is of 2-3m height, not everybody can go on it.

The mistake is expensive, our consciousness is “afraid” of incorrect action and the error probability rises steeply. The similar problems appear at exams, interviews and in any abnormal situations.

What to do?

The unordinary situation should be modified and become an ordinary one. But it is impossible to provide for every eventuality. So, it is necessary to perform trainings with nonspecific stimulant, one abstract quintessence of danger.

This is provided by INTENS (Individual Trainer of Emotional Nonspecific Stress Resistance).

The method implemented in the trainer INTENS is based on the bio-feedback mechanism. Its target object - not a single body function but an integral behavior act – to develop a skill of the voluntary coping of stress state.

INTENS not only helps to develop the resistance to stresses of various origins in a patient. The self-regulation skills considerably raise the efficiency of treatment and prophylaxis of functional and psychosomatic diseases such as migraine, insomnia, depressions, neuroses, psychosis, fears and phobias, sexual disorders, panic attacks, attention disorders, rapid fatigability, hyperactive-child syndrome, irritable bowel syndrome, hypertension, ischemic heart disease, gastric ulcer, gastritis, glaucoma and many others.

BASIC INFORMATION

INTENS-Training Method

The self-regulation training by INTENS method consists of 3 basic levels.

The aim of the *first level* is to make the patient's unconditioned orientated reflex to 2 new stimulants – high and low pitch sounds – fade away. The level is completed when **at the beginning of a new session the psychoemotional response to BOTH irritants is rather weak.**

At the *second level* the patient is exposed to the same 2 stimulants, and the high pitch sound is accompanied by a discomfort electric stimulation. So, a conditioned reflex to a high pitch sound – **danger** – develops in a patient. This level is considered to be completed when at the beginning of a new session the psychoemotional response (without discomfort stimulation) to the high pitch sound considerably exceeds the response to the low pitch signal.

At the *third level* the patient is shown his/her response to both stimulants and a threshold value, which it should not exceed. The patient applies his/her conation to suppress the body response to the high pitch sound. If the response does not exceed the current threshold, the threshold for the next comparison is decreased. If the response does exceed the threshold, the discomfort stimulation is given automatically and the threshold is not changed.

The level and training course as a whole are considered to be completed if the threshold decreased at every step has never been exceeded i.e. there is no electric stimulation within the session.

The training results in the stress-resistance improvement. The patient gets a skill of self-regulation in stress situation, suppression of reflex responses and fear with conation. This allows not only to provide appropriate behavior in a live stress situation but also to prevent from its negative consequences.

The patient's response is evaluated by measuring his/her galvanic skin response (GSR), generally accepted indicator of human emotional state.

INTENS-Training Levels

The training levels are described in detail below. The level may be selected automatically (the automatic mode), manually using the database (the semiautomatic mode), manually without using the database (the manual mode).

Preliminary Level

In addition to three basic levels, the preliminary (zero) level is added. This level is intended to study the patient's spontaneous (background) responses. These responses include the ones not connected with any external stimulants action.

At this level there is no stimulation and the patient's responses will be fixed for about 4 minutes.

Now the zero level is intended to evaluate the spontaneous responses by the specialist (instructor) carrying out the procedure. If the responses are of high level, it is impossible to perform training – the patient's state normalization and his/her anxiety reduction are required. In the future we plan to add the mechanism applied for expert evaluation of spontaneous responses, which will determine the capability to pass training and calculate the individual *thresholds* for this patient (GSR levels being significant for training).

No conclusions should be made based on the level results provided that this data may be saved and reviewed later.

First level

At this level the stimulating high and low pitch sounds are given. The high pitch (hereafter– «dangerous» stimulus) is accompanied by red color signal, and the low pitch (hereafter– «neutral» stimulus) – by green one. In the course of session, not less than 8 stimuli of each type are given.

At every session beginning, the capability to switch to the **second level** (*Level 2 admission*) is checked. To do this, the patient's responses to stimuli of both types are evaluated – if they are rather weak, it is assumed that the orientated reflex faded away and one may start developing a conditioned reflex (second level). Otherwise, the patient continues passing the first level.

In the course of admission, from three up to five stimuli of each type are given. The successful admission criterion – the response exceeding the *threshold for Level 2 admission* less than twice.

The threshold values may be set by selecting the **Thresholds** item in the **Settings** menu or pressing the **Thresholds** button on the control panel. Set the threshold values in the pop-up dialogue box. The default values for Level 2 admission – 20 (expressed as a percentage of calibration value).

Second level

At this level the aim is to develop a conditioned defensive reflex to the “dangerous” stimulus. To do this, each “dangerous” stimulus is accompanied by a discomfort electric stimulation. In the course of session, not less than 8 stimuli of each type are given.

At the session beginning, the capability to switch to the *third* level (**Level 3 admission**) is checked. To do this, the patient’s response to the “dangerous” stimulus is evaluated (without electric stimulation) – if it is rather strong, it is assumed that the defensive reflex has been developed and its suppression may be started (third level). Otherwise, the patient continues passing the second level.

To develop the conditioned reflex, it is required to pass the second level not less than twice. So, if the level is selected in the automatic or semiautomatic modes, Level 3 admission is provided starting from the third performance of Level 2. The admission is provided every time in the manual mode.

In the course of admission, a single “dangerous” stimulus (without electric stimulation) is given. The successful admission criterion – the reaction exceeding the *threshold for Level 3 admission*.

The researches approved that some “dangerous” stimuli without electric stimulation support are often sufficient for oriented reflex fading. So, to maintain the oriented reflex, the electric stimulation is given at any admission result: if the response to the stimulus was strong – just after the threshold was exceeded, otherwise – after the response measurement was completed.

If at the second level there were more than three significant (exceeding Level 2 admission) patient’s responses to the “neutral” stimulus, it will be suggested to go back to the first level and pass it again.

The default value of the threshold for Level 3 admission – 50 (expressed as a percentage of calibration value).

Third level

At this level the patient should apply his/her conation to suppress body responses to the “dangerous” stimulus. The patient is shown not only his/her reactions but also the *threshold for Level 3*. The aim of this level is to train a patient to control his/her responses and suppress his/her sensation of fear (i.e. to keep GSR below the threshold).

In the course of session, not less than 8 stimuli of each type are given. If the response to the “dangerous” stimulus does exceed the current threshold of Level 3, the electric stimulation is given (the patient gets “punishment” because he/she could not keep his/her response in the required limits). If the response does not exceed the threshold, the electric stimulation is not given and the threshold is decreased (the patient has successfully performed the current “task” to control his/her responses and the next “task” will be complicated).

Warning! The third level is a principal training level. Just at this level it requires patient’s maximum concentration, motivation and understanding of what’s going on!

The level is considered to be completed successfully if the patient could keep his/her responses to all “dangerous” stimuli within the session (i.e. no electric stimulation was given). To pass the third level successfully, 10 and more sessions may be required, so neither instructor nor patient himself/herself should not be disappointed with negative result.

The default value of the threshold for Level 3 – 105 (expressed as a percentage of calibration value).

Warning! In the course of the third level as the patient could keep his/her response below the threshold, the threshold will be decreased. The threshold change is adaptive (i.e. it depends on the patient’s response to the “dangerous” stimulus) but it also depends on the constant reduction factor. One may set it in the **Thresholds** dialog box (the field – **Threshold Reduction Factor**, the value range from 75 up to 99 percents, the default value – 90). The lower the factor value is, the more difficult it is to pass the third level.

Preparation for Training

Before to start the procedure, the patient shall be sitting or be in a comfortable position.

It should be quietly in the room while the training is performing. The mobile phones and other audio sources should be switched off.

To get correct results, the probes should be put on the index and ring fingers of the same hand, the electrode should be fixed on the wrist of this hand. The probes are applied for GSR measurement. The electrode is intended to give discomfort electric stimulation.

The headphones or speakers are applied to supply sound stimuli.

It is important to explain to the patient how the training will be performed and at the expense of what the efficiency is achieved. It requires patient's understanding of what's going on, maximum motivation and result interest.

Performing Training Sessions. Basic Information

This section includes information being sufficient for the majority of users to provide successful trainer operation. The default settings are assumed i.e. the following check boxes are selected in the **Setting - >Parameters** menu:

- **Autosave Report, Give automatic name to a report and save** – the report is created based on every session results and saved under self-generated name;

- **Autostart Protocol, Disable the protocol automatically after the level is completed, Give automatic name to a protocol and save** – every session is recorded, the protocol is saved under self-generated name;

- **Autosearch Device** – at program start, the device search starts automatically;

- **Cancel electric stimulation at the session beginning, Reset electric stimulation** – after a patient is selected, the values of electric stimulation level and duration will be loaded from the database;

- **Cancel amplification at the session beginning, Reset amplification** – after a patient is selected, the GSR amplification value will be loaded from the database;

- **Reset thresholds** – after a patient is selected, the threshold values will be loaded from the database.

These settings values are optimum for the majority of users.

Before Starting a Session

Before starting a session, the calibration type should be selected: based on the breath or electric stimulation (the menu **Settings->Calibration**). The last variant is more preferable because it usually provides response manifested in higher degree and allows the majority of patients to pass calibration. This is set by default.

To start a session, select a patient and press the **Level** button. In this case you may set the values for thresholds and amplification before starting a session.

You may act in another way: first, press the **Level** button, then select a patient from the database in the pop-up dialog box. In this case one cannot change the thresholds and amplification – the values saved in the database will be loaded.

At the first session performance, the database contains the default values of the thresholds and minimum value of the amplification.

Start the session with electric stimulation setting. The selected level should be maximum which the patient agrees to bear. Sometimes it is worth to prolong the electric stimulation duration – at relatively low amplification of patient's subjective sensations, his/her response to the electric stimulation often becomes stronger and stable.

After the electric stimulation is set, press the **Confirm** button. The calibration starts.

Calibration

The calibration aim is to provide scale adjustment of patients' personal responses. To do this, the value of patient's response to normalized test stimulation (deep breathing or electric stimulation) should be defined. The maximum GSR value will be defined (*calibration value*) for the specified time (**Measuring time**) after the stimulation was started. Later, in the course of session the relative GSR will be applied (expressed as a percentage of calibration value) that allows to compensate the difference between patients' responses.

The attentive user may observe that if the average GSR level was about the scale center (about 500 units) before starting a session, it was about 0 for most of the time at calibration. It is connected with the fact that GSR is differently displayed in different modes:

- **out of the session**, GSR is displayed within the range 0-1023 units; the level corresponding to the quietude – about the scale center;

- **at calibration**, GSR is displayed within the range 0-1023 units, but GSR=0 corresponds to the quietude because GSR is displayed as minus isoline (slightly fluctuating level of GSR corresponding to the patient's quietude) in this mode;

- **at the level**, GSR is displayed in percentage of the calibration value within the range 0-255 units (the calibration level corresponds to 100 units), GSR=0 corresponds to the quietude.

The calibration is considered to be completed successfully if the got value is great (more than 256). Otherwise, the GSR amplification increases automatically and the calibration will be repeated. If the amplified response to the normalized action is not sufficient to provide normal operation (less than 128), the session will be aborted. It is recommended to remove the probes and be relaxing for 3-5 minutes. If the calibration is performing at electric stimulation, its level and/or duration should be increased.

Level

After the calibration is completed successfully, the level itself starts. The stimuli may be given automatically (at random, at random time periods) or manually (the stimulus type and its injection time should be selected by instructor or patient himself/herself).

The stimulus injection method may be selected in the **Settings->Stimuli injection** menu – **Manual** or **Automatic**. The stimuli injection method may be changed before starting a session or within the session.

There is no telling that one of the injection methods is more preferable. The researches approved that if the stimuli are given manually at the second and third levels and the patient observes the instructor's actions, the responses are found to be manifested in higher degree.

The session is completed when the stimuli quantity required at this level was given.

At the session end, the **INTENS report viewer** program is recalled automatically and it shows the report on the performed session (visualization of responses to stimuli). The patient's attention may be paid to the features how he/she passed the level, his/her responses dynamics from one level to the other. It allows to provide a patient with clearer representation about the training course.

The patient may have several sessions in succession. If the probes were not removed, at the beginning of a new session the program will consider the patient to be the same and will not suggest to select it again. It is not recommended to perform more than three sessions in succession.

INFORMATION FOR “ADVANCED” USERS

Modes of Training Level Selection

The level may be selected in one of the modes:

1) Automatic: the program selects a level; the database (see **Database Operation**) may be used to select training parameters (level and duration of electric stimulation, thresholds, GSR amplification); the session results are saved in the database.

2) Semiautomatic: the instructor selects a level; the database (see **Database Operation**) may be used to select training parameters; the session results are saved in the database.

3) Manual: the instructor selects a level, the database is not used.

The above-mentioned modes are described in detail below.

Automatic Selection of Level

The automatic selection of a level is convenient for the majority of users and it is the simplest and useful one.

In this mode, the program selects a level based on the available information about the patient. The following rules apply.

1 First two sessions – preliminary level.

2 The first level starts from the third session.

3 After the Level 2 admission is obtained – second level.

4 If the significant patient’s responses to the “neutral” stimulus are revealed at the second level, it will be suggested to go back to pass the first level.

5 After the Level 3 admission is obtained, the patient passes the third level.

To operate in the automatic mode, one should select **Automatic selection of level** check box in the **Database** menu.

To pass the session, one should select a patient from the database and if the patient has training for the first time – add him/her in the database.

If a patient was not selected before, the dialog box for patient’s selection appears after the **Level** button is pressed.

Semiautomatic Mode of Level Selection

The semiautomatic mode is convenient to pass the level in the mode differing from this one the program sets in the automatic mode. For example, if at the Levels 1-3 the responses, which seem not to be connected with stimuli and stimulators action appear, the patient is advised to pass Level 0 to analyze his/her spontaneous responses.

To select a level in the semiautomatic mode, one should deselect **Automatic selection of level** check box and select **Apply cardfile** check box in the **Database** menu.

To have a session, one should select a patient from the database and if the patient has training for the first time – add him/her in the database.

If a patient was not selected before, the dialog box for patient selection appears after the level is selected.

To select a level, press the appropriate button on the left panel in the program window.

Manual Mode of Level Selection

The manual mode is convenient to pass the level in special cases when it is not required to save information in the database.

To select a level in the manual mode, one should deselect **Automatic selection of level** and **Apply cardfile** check boxes in the **Database** menu.

To select a level, press the appropriate button on the left panel in the program window.

Database Operation

To use the database, select **Apply Database** check box in the **Database** menu. The following operations are available:

- 1 adding and selecting a patient;
- 2 view and editing of information;
- 3 loading of training parameters from the database.

All these operations are described in detail in the passport. Let's review the most important methodical aspects.

Adding and Selecting a Patient

The patient may be added/selected at the session beginning or in advance. The first variant is convenient if the check boxes for parameters loading from DB are selected (**Settings->Parameters** menu, **Reset amplification**, **Reset thresholds** check boxes) and some of these parameters

should be changed before starting a session. To do this, select a patient before selecting a level (**Database->Select a patient**). The parameter changes will be saved in the database.

Editing Information in Database

The information stored in the database may be not only reviewed but also edited. In particular, the **Level data** may be also edited – information, which level was the last, if it was successfully completed and how many times it has been performed.

Warning! Necessity for level data editing is not typical! In most cases the method correctly determines which level the patient should pass. So, you should confirm your intention twice to access editing. It prevents from random changes, which may negatively affect the training course.

The level data editing may be required, for example, in the following situations.

1 The patient is admitted to pass the third level but the instructor considers the conditioned reflex to be developed insufficiently (it is required to pass the second level in addition). To do this, it is required to change the number of the last passed level from 3 for 2 and set the **Failed** status for **Performance result**.

2 As a result of high response to the calibration, the patient successfully passed the third level but the instructor thinks this to be a concurrence of circumstances and the conditioned reflex is not enough suppressed (it is required to pass the third level in addition). To do this, it is required to set the **Failed** status for **Performance result**.

The semiautomatic selection of level constitutes alternative for **Level data** editing.

Parameters Loading from Database

One of the advantages of the session performance using the database (i.e. in the automatic or semiautomatic modes) – the capability to load the basic training parameters from the database (thresholds, level and duration of electric stimulation, GSR amplification) when selecting a patient. You may select a load mode in the **Settings->Parameters** menu.

At the session beginning, it is always suggested to set a level and duration of electric stimulation but 4 variants of their initial values setting are available.

1 The initial values are loaded from the database. To do this, select **Cancel electric stimulation at the session beginning** and **Reset electric stimulation** check boxes. This variant is applied by default.

2 At every session beginning, the choice is suggested: to load the electric stimulation values from the database or apply those ones specified before starting the session. To do this, select **Reset electric stimulation** check box and deselect **Cancel electric stimulation at the session beginning** check box.

3 The electric stimulation values are cancelled to minimum (Level – 1, duration – 0,5 s). To do this, select **Cancel electric stimulation at the session beginning** check box and deselect **Reset electric stimulation** check box.

4 The values specified before the session beginning are applied as the initial ones. To do this, deselect **Cancel electric stimulation at the session beginning** and **Reset electric stimulation** check boxes.

Table 1. Variants of setting the initial values of electric stimulation

Initial values of level and duration of electric stimulation	Cancel electric stimulation at the session beginning check box	Reset electric stimulation check box
Loaded from the database	selected	selected
The choice is suggested: to load from the database or apply the current ones	deselected	selected
Cancel to minimum	selected	deselected
The current ones are kept	deselected	deselected

The GSR amplification is automatically corrected in the course of calibration if one failed to pass it at the first attempt (i.e. if the repeated calibration is required) but 4 variants of setting the initial values of amplification are available.

1 The initial amplification value is loaded from the database (one may change the amplification if a patient was selected before starting the session). To do this, select **Cancel electric stimulation at the session beginning** and **Reset electric stimulation** check boxes. This variant is applied by default.

2 At every session beginning the choice is suggested: to load the amplification value from the database or apply this one specified before the session beginning. To do this, select **Reset amplification** check box and deselect **Cancel amplification at the session beginning** check box.

3 The amplification value is cancelled to minimum. To do this, select **Cancel amplification at the session beginning** check box and deselect **Reset amplification** check box.

4 The amplification value specified before the session beginning is applied as the initial one. To do this, deselect **Cancel amplification at the session beginning** and **Reset amplification** check boxes.

Table 2. Variants of GSR amplification setting

Initial value of GSR amplification	Cancel amplification at the session beginning check box	Reset amplification check box
Loaded from the database	selected	selected
The choice is suggested: to load from the database or apply the current one	deselected	selected
Cancel to minimum	selected	deselected
The current one is kept	deselected	deselected

Two ways of thresholds setting are available.

1 The thresholds values are loaded from the database (one may change it if a patient was selected before starting the session). To do this, select **Reset thresholds** check box. This variant is applied by default.

2 The thresholds values specified before the session beginning are applied. To do this, deselect **Reset thresholds** check box.