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Polysomnographs

from apnea screening at home to an elite sleep laboratory

Polysomnography is a "gold standard" for sleep disorder diagnosis

The International Classification of Sleep Disorders (ICSD) describes different types of sleep disorders, such as obstructive or central sleep apnea syndrome, snoring, Cheyne-Stokes respiration, restless legs syndrome (RLS), bruxism, insomnia, hypersomnolence, parasomnias, and over 90 types of other sleep disorders.

Chronic sleep disorders can cause:

- cardiac pathologies, such as arterial hypertension, arrhythmia, congestive heart failure (CHF);
- metabolic changes, hormonal regulation, and, as a result, obesity, diabetes, and other diseases;
- neurological and psychosomatic disorders, such as epilepsy, chronic cerebrovascular insufficiency, dysregulation of excitation and inhibition, depression, anxiety.

AASM (The American Academy of Sleep Medicine) **classification defines four types of polysomnographs:**

Type IV – for continuous recording of 1-2 physiological parameters – arterial oxygen saturation SpO_2, pulse rate and airflow.

Type III – for monitoring of 4 or more cardiorespiratory parameters, such as airflow, respiratory effort (thoracic and abdominal); heart rate or ECG, SpO_2, snore, body position. **Do not record the signals required to determine sleep stages or sleep disruption.**

Type II – for performong full PSG outside of the laboratory. 6 or more EEG channels for the analysis of phasic sleep structure and hypnogram building.

The presence of a technologist for types IV, III and II devices is not necessary. Data is recorded onto the polysomnograph's memory card.

Type I – for performing in-laboratory, technician-attended, overnight polysomnography. EEG recording by 6, 19 or more channels to diagnose sleep-related forms of epilepsy and other neurological diseases. Can include extra channels for ECG, EMG, motor activity, and other parameters (GSR, PPG, temperature, wetness, etc.).

Sleep signals recorder "ApnOx"

"ApnOx-04" model

for respiratory screening (apnea screening)

Type IV

Signals and parameters:

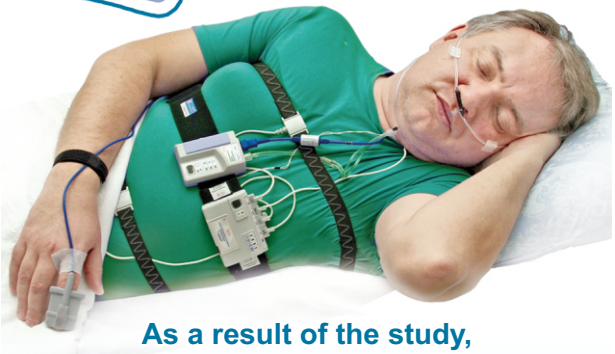
- oxygen saturation (SpO_2);
- respiratory rate and conventional respiratory amplitude, as well as snore and airflow velocity (using pressure airflow sensor (P-Flow);
- pulse rate and perfusion index (based on photoplethysmogram using SpO_2 sensor);
- body position and total movement activity (integrated movement activity sensor);
- CPAP Pressure.

Recording modes:

- autonomous – data recording onto memory card;
- telemetric – data transmission into computer via wireless Bluetooth® channel.

Basic modules "ApnOx-04" and "ApnOx-10"

Over 10-hour record of physiological data onto the memory card



As a result of the study, necessary reports on sleep statistics are generated based on automatically detected events

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"ApnOx-10" model

for apnea screening and cardiorespiratopry monitoring

Type III

Supplemented with wireless module Poly-4

Signals and parameters:

- respiratory effort from thoracic and abdominal sensors;
- electrocardiogram;
- heart rate (based on ECG);
- snore (accelerometer sensor);
- airflow (thermistor airflow sensor);
- pulse wave transit time and indirect assessment of the blood pressure dynamics (based on ECG and PPG);
- motility (accelerometer sensors or surface EMG sensors);
- skin conductance;
- signals from DC-inputs.

Electroencephalograph-recorder "Encephalan-EEGR-19/26" Type II/I

with "Encephalan-PSG" software for somnological studies

Modification "Mini"

Models: *AT-Somno* **Type II** *, AT-Somno-Video* **Type I**

Provides telemetric and autonomous record of physiological signals (from 13 and more channels in various combinations), including 2, 6 or 8 EEG derivations using **autonomous patient transceiver-recorder ABP-10**, wireless pulse oximeter module, other modules, electrodes, and sensors.

Provides cardiorespiratory disorders analysis, displaying brain rhythms power indices, EOG and EMG amplitude, parameters of respiration, movements, snoring and ECG in a form of trends for quick search of EEG patterns, identification of sleep stages, as well as for manual and automatic hypnogram building.

Automatic calculation of additional sleep statistical parameters by EEG, such as:

- sleep stages duration;
- sleep efficiency;
- total sleep time;
- sleep latencies and stages latencies;
- number, index and duration of EEG arousals;
- number and duration (WASO) of awakenings.

Electroencephalograph-recorder "Encephalan-EEGR-19/26" Type II/I

with "Encephalan-PSG" software for somnological studies

Main modification

Models: *AT-PSG* **Type II** *, AT-PSG-Video* **Type I** *, AT-PSG-Video-Poly* **Type I**

Provides telemetric and autonomous record of physiological signals (from 26 and more channels in various combinations), including 6, 11, 19 or 32 EEG derivations using **autonomous patient transceiver-recorder ABP-26**, wireless pulse oximeter module, other modules, electrodes, and sensors.

Provides cardiorespiratory disorders analysis, displaying brain rhythms power indices, EOG and EMG amplitude, parameters of respiration, movements, snoring and ECG in a form of trends for quick search of EEG patterns, identification of sleep stages, as well as for manual and automatic hypnogram building.

Additionally provides detection of epileptic patterns, classification of spike-waves in relation to sleep structure, as well as various methods of EEG quantitative analysis.

Extended package of reports in accordance with international standards generally accepted in somnology (AASM).

Kits of video equipment

When working with a PC in telemetric mode with the oversight of a sleep technologist, polysomnographs can be supplemented with **a kit of video equipment** (mobile or stationary) with "Encephalan-Video" software **for synchronized night video monitoring**.

Provides visual analysis of paroxysmal activity synchronously with EEG for differential diagnosis of epilepsy and detection of symptoms of sleep disorders.

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