

# Printing record

## Definition

In medical terminology, the term "polygraphy" means simultaneous recording of biosignals of different (physical) nature. Not to be confused with a term from the printing industry! The overall polygraphic record has the final form of a graph or table of values, which clearly and concisely expresses the data obtained.

## Polygraph

It is a device that records several physiological values at once. E.g. blood pressure, heartbeat and pulse, breathing, electrical resistance of the skin (to which sweating is related, for example), pupil size, etc. Sometimes its use is accompanied by stimulation, an intentional stimulus (flashing lights, a physical action, a logical task). In a forensic context, this device is popularly referred to as a lie detector and can be part of forensic analysis.

## Practical use

Polygraphic recording is mainly used in cardiology, angiology, physiology and psychiatry; from non-medical fields as well, e.g. in criminology and psychology.

### 1. Sleep Lab

Sleep is a complex physiological state, the processes of which can be monitored using polygraphic recording for the purposes of sleep research or diagnosis of sleep disorders (insomnia, sleep apnea, etc.). Sleep has several phases, the most important of which is the so-called *REM* phase (rapid eye movement), during which rapid movement of the bulb occurs under closed eyelids (measured by the electrooculography method), the pulse and breathing rate is irregular, sometimes even accelerated, body temperature drops. Muscle tone decreases, but motor activity of the muscles in the form of twitches may still occur. Dreams typically occur in the REM phase. The second main phase is *NREM* (non-rapid eye movement) sleep. During it, blood pressure, heart rate and breathing rate decrease. Muscle tone is also reduced. The REM phase serves primarily for mental relaxation, the NREM phase rather for tissue relaxation. Some patient discomfort associated with the examination is expected. A key physiological function is the electrical activity of the brain as measured by EEG.

### 2. Stress laboratory

They are widely used in sports medicine, diagnostics and practical medicine. It takes on great importance in stress tests required for certain occupations – firefighters, professional soldiers, etc. The polygraph record is (unlike a sleep laboratory) taken during physical stress. We monitor heart rate, ventricular activity using EKG; also respiratory activity, lung vital capacity, energy consumption, thermoregulation, total body blood flow, etc. Based on these data, movement speed, expended force and overall performance can be measured.

### 3. Sexological laboratory

This type of polygraphic record is used especially in forensic medicine or psychiatry. The recording mainly focuses on the change in the intensity of blood flow to the genitals and their volume and temperature changes. To measure the volume, a so-called sexological plethysmograph/phalometer is used, which can also contain temperature sensors. So-called stimulus sets, audio or visual media are used as stimulation signals, in which neutral stimuli gradually transition to erotic ones. The polygraph record is part of an objective expert opinion, which can decide on the degree of guilt of the defendant in cases of rape, etc.

### 4. Psychophysiological Laboratory

On the basis of the polygraphic record, psychosomatic and somatopsychic links of the psyche and biological functions can be assessed. This area has a wide range of uses, both in scientific analysis and clinical diagnostics. It examines "brain strain", activation of individual centers during various activities, emotional stress. It is also used in forensic medicine. The key signal here is EEG.



Polygraph1

## Links

## Related Articles

- Biosignals from a biophysical perspective

## External links

## References

- HEŘMAN, Petr. *Biosignály z pohledu biofyziky*. 1. edition. Praha : Dúlos, 2006. 63 pp. ISBN 80-902899-7-5.
- cs.Wikipedie. *Spánek* [online]. [cit. 2012-12-27]. <<https://cs.wikipedia.org/w/index.php?title=Sp%C3%A1nek&oldid=9405286>>.