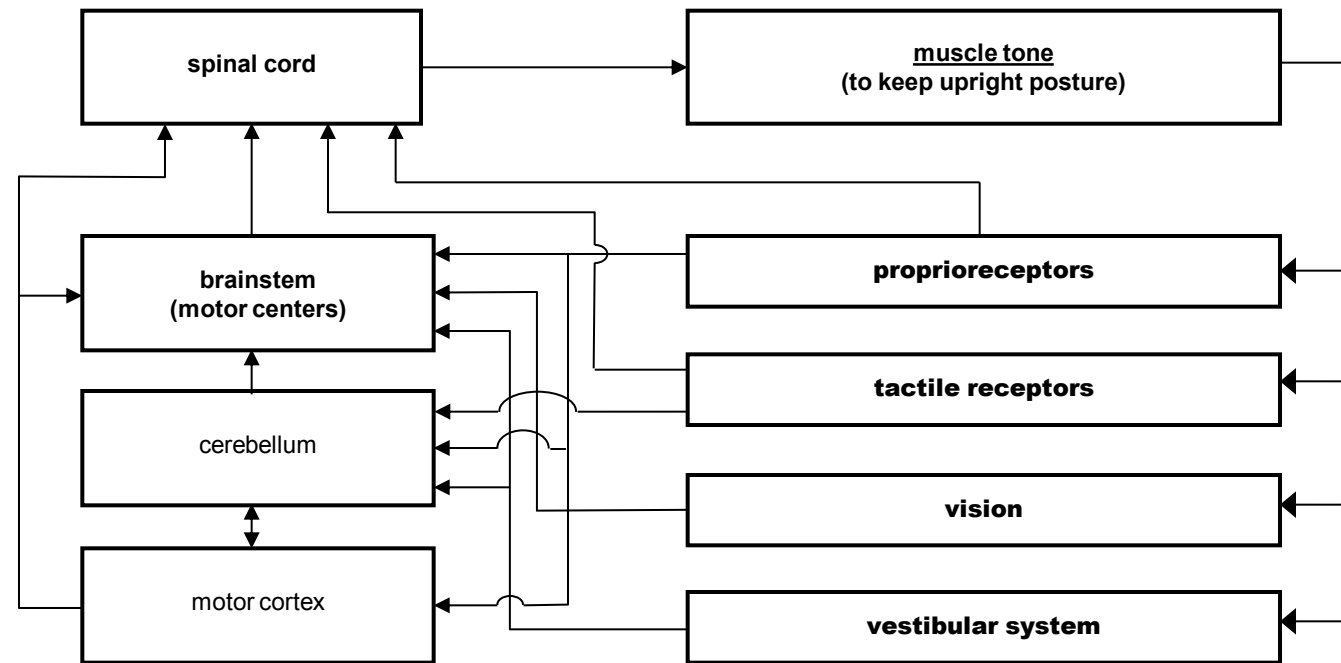


(XXIX.) Erect posture examination using stabilometry

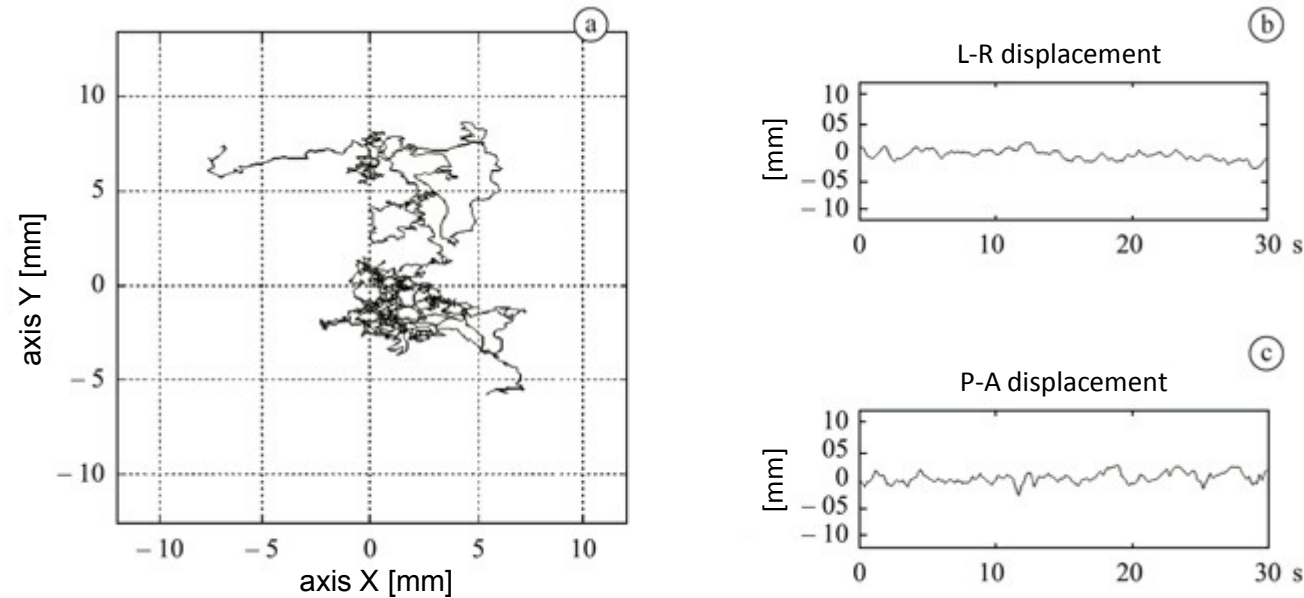
Physiology II - practices

Control of erect posture by central nervous system is manifested by permanent corrections of deviations of the body from the vertical axis, which results in changes of gravity-opposing muscle tone.



Simplified scheme of regulation of stability

Deviation of the body from the vertical axis and following changes in muscle tone are manifested by changes in the moments of supporting forces that are registered by stabilometer.



COP displacement in the statokineziogram (a) and stabilogram (b, c)

COP (centre of pressure) is an imaginary point on the ground, where the resultant ground reaction force (opposing the resultant gravity force) is located.

Parameters of stabilometric test

- **Mean COP X,Y (mm):** the mean value of X coordinates and mean value of Y coordinates of all points of statokinesigram. It depends not only on the position of the subject on stabilometer plate but also on inclination of his/her body.
- **Mean distance from the centre (mm):** the average deviation of COP position from the mean COP X, Y in left-right (X) and front-back (Y) directions. It is proportional to size of the area determined by COP trajectory.
- **Mean velocity (mm/s):** represents the average speed achieved by moving COP. It characterizes the extent of muscular effort in maintaining the erect posture.
- **X, Y-axis movement (mm):** the total length of path that the COP followed in the left-right (X) and front-back (Y) directions. It provides information about prevailing direction of the movement.

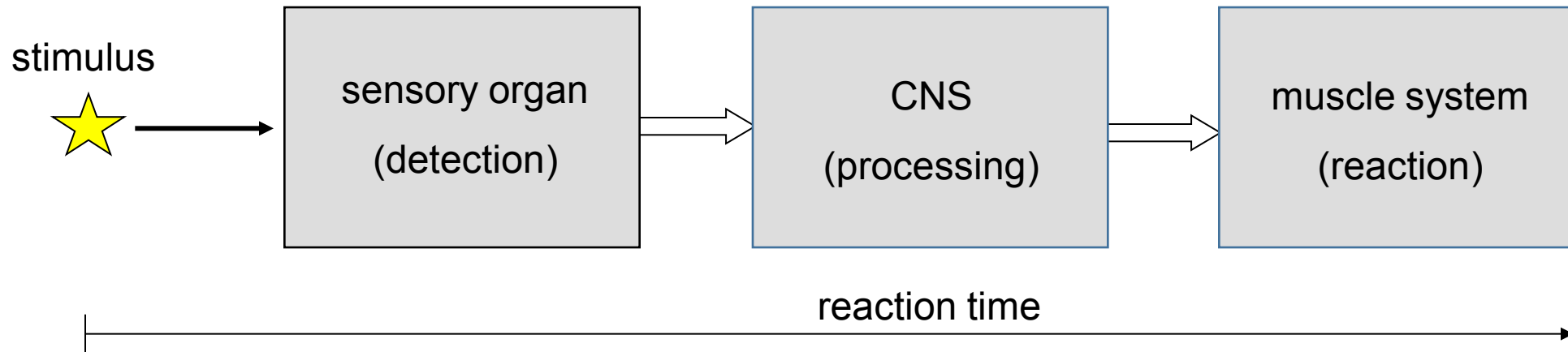
Stabilometric tests

- **Romberg's test I:** Subject's feet are 10 cm from each other, eyes open, and the head is straight ahead.
- **Romberg's test II:** The experimental subject puts his/her feet together, keeps eyes open and head straight ahead.
- **Romberg's test III:** The subject closes his/her eyes and keeps feet together and head straight ahead.
- **Stimulation of the Achilles tendons with vibrators:** The examined subject keeps eyes closed, feet together and head straight ahead.
- **Attenuation of tactile afferentation from feet:** The subject steps on the stabilometer equipped by soft pad, puts feet together, and after a short adaptation closes his/her eyes.

(XLI.) Estimation of Reaction Time Using Computer

Physiology II - practices

Reaction time is a time from application of stimulus (light, acoustic, touch, etc.) till the moment of reaction of experimental subject.



Reaction time depends on:

- modality and intensity of the stimulus,
- complexity of task (different reaction on different stimulus),
- motivation, attention, fatigue and experience of the subject.

Tests or reaction time

- **Visual and acoustic stimuli:** The test consists of repeated random presentation of visual (asterisk in the centre of the screen) and acoustic (simple sound of 1 kHz) stimuli. The examined person responds to every stimulus by pressing ENTER on the keyboard.
- **Visual stimuli:** The reaction to repeated random presentation of visual stimuli.
- **Acoustic stimuli:** The reaction to repeated random presentation of acoustic stimuli.
- **Go/NoGo centre:** The test consists of repeated random presentation of two different visual stimuli (asterisk and symbol of dollar). Every stimulus is presented in the centre of the screen. The examined person responds to every asterisk by pressing ENTER on the keyboard. The symbol of dollar should be ignored.
- **Go/NoGo periphery:** The test consists of repeated random presentation of two different visual stimuli (asterisk and symbol of dollar). Each stimulus is presented anywhere on the screen. The examined person responds to every asterisk by pressing ENTER on the keyboard. The symbol of dollar should be ignored.

Source of figures

Slide 2 – Physiology and neuroscience practicals, Masaryk University 2011