

The research was focused on finding connections stabilizing function of the body on the respiratory function. The research group consisted of 14 healthy young subjects. During the measurement, which lasted 60 " (one standing on the ground and second on balancing rotating segment), the proband of the camera to assess the variability upright positions (3D trajectories C7) and also was picked Spiro record volume of exhaled air. Watching these two phenomena that have natural variability and body resolves the situation by keeping the individual functions within a certain tolerance band. The destabilization caused by standing on unstable surface, resulted in deflections increase, especially in the anteroposterior direction, the selected reference vertebra C7. Moreover, the increased frequency corrected fluctuations in the ratio of about 1:6. The role of maintaining upright positions increased variability of individual breaths, caused an increase in isolated larger tidal volumes and shorter expiratory phase of breathing and the slight increase in respiratory rate.

### **The biomechanic influence on vessel's physiology and pathophysiology**

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The study of biomechanical characters of vessels a them modeling cause the new information about behavior this anatomical structures. Recently discovered vessel quality, angiosynizesis and self-excited wall vessel vibration have an influence on behavior understand part of cardiovascular system. Recently discovered biomechanical vessel duality has an influence on physiology and pathophysiology vessel system in different anatomical systems of body, e.g. central nervous system area. Physiological aspects: in hemodynamic regulation - Starling resistor, in hemodynamic - combination bridging veins, any venous brain system and venous brain sinuses - primarily cavernosus sinus (physiological jewelry box) - as pulsing pump, the effect on liquorodynamic brain system - increased production(plexus chorioideus), resorbcion (basal system- arachnoithelial tissue on skull base, convexity system as standby system), the effect of movement of brain on bridging veins, exchange cross-section, influence on brain microcirculation by way oncotic and osmotic pressure during local metabolism, the effect for aim increase function selected brain part- by way physical influences on muscular vein type - the contraction and exchange microcirculation into drainage areas - influence brain part with superior function in the siame time (under exam - fMRI, MSI, SISCOM, PET, SPECT).The self-excited oscilation: cleaning wall, the effect for blood flow, the inflace of physical effect between layers - biomechanical border double layers, resolution of problem imperfect absolute smoothness innersurface vessel wall, mixing fluids, at fluid with particles reduction particle clustering, the protection before Karman vortex street. The effect of Karman vortices, vortex streets, on boundary two layers of fluid with different speed come about so-call Kelvin-Helmholtz instability, which demonstrates by form Karman vortices, whose density increases by fractals, the fluid until go to turbulence mode. Pathophysiological problems:



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during trauma very gently junction between bridging veins and sinuses is gently and fragile area - venorhexis, development of hydrocephalus - influence on production and resorption of cerebrospinal fluid - hyporesoptional (influence of arachothel with combine of venous system) or hypersecretional type - the production from plexus choririoides, problem with local brain ischemia - arterial and venous type (imbibition of tissue), the problem during surgery procedures (e.g. tempobasal areas) in train of venous connection - the influence of level brain retraction on flow rate, external compression venous wall, pseudotumor cerebri - small brain ventricles, papilloedema, on CT brain oedema, any organic pathology, our premise: impairment of brain outflow - none venous trombose or sinuses trombose - none venous brain attack, more verisimilitude effect of angiosynizesis. Self-excited oscilation. The problem nonpulsing flow at artificial pump in blood circulation, which do not form pulses, participation on development angiosynizesis, the cavitation effect into adventitia and into blood flow, the effect on collagen - piezoelectric, magneostiction etc. - electromagnetic continuum. The conclusions: very small exchange of length (ca. 1%) about bridging brain veins can go to angiosynizesis, vibration of vessel wall during physiological state, facility beginning of angiosynizesis by propagation pulsing pressure wave, structural stability of bridging veins can be restore by adequate rise in pressure in given moment. The function of flow in thin wall venous system of brain is combination of angiosynizesis and pulsing venous pump of cavernous sinus, which follow into venous system pulsing flow. Angiosynizesis - the vessel's collapses, the spontaneous shut-off valve of vessel cross-section. The condition: pulsing flow into system minimalized to zero (prefentially in venous system), types: temporary and permanently. The time to a inception of effect is given by biomechanic vessel wall characters a flow fluid characters - rate pulsing, angiosynizesis has effect on hemodynamic and liquorodynamic system of brain and influence on brain microcirculation, angiosynizesis has effect on any pathology of brain (e.g. subdural haematoma and traction of veins - interhemispherhal hematoma in the first place, the cause of idiopathic benign intracranial hypertension) and biomechanical quality of bridging veins together with biomechanical quality of connection between bridging veins and venous brain sinuses are area of injury. Self-excited oscilation - the effect of commencement of double layer border. The formation at pulsing flow too, a phenomenon on layer border, is able to form on border solid elastic, viscoelastic unit and fluid (continuum), on border layer of fluid etc.

### **The effect of velocity and slope of the ground on the lower limbs and pelvis movement during Nordic and regular walking**

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Nordic walking is often considered as physical activity with many positive effects, however comprehensive assessment during various conditions is missing. The aim of this study was to