

C O N T E N T S

1. Introduction	9
1.2 Discovery and classification of circulatory rhythms	9
1.2.1 Heart rate fluctuation at frequency of respiration	11
1.2.2 Blood pressure fluctuation at frequency of respiration	12
1.2.3 Low frequency components in heart rate fluctuation	12
1.2.4 Low frequency components in blood pressure fluctuation	13
1.3 Circulatory rhythms in sleep	14
1.3.2 Circulatory rhythms during adaptive processes	14
1.3.3 Circulatory rhythms in patients suffering from neurocirculatory asthenia	15
1.3.4 Power spectral analysis of heart rate variability in patients with cardiovascular disorders	15
1.3.5 Power spectral analysis of heart rate variability in autonomic neuropathy	17
2. Methods	19
2.1 Spectral analysis	19
2.2 Measurement procedures	21
2.2.1 Blood pressure	22
2.2.2 Finger blood flow	24
2.2.3 Cardiac intervals	24
2.2.4 Respiration	25
2.3 Data pre-processing	25
2.3.1 Data qualification and stationarity	25
2.3.2 Interpolation	25
3. Resting variability of blood pressure, heart rate and acral blood flow	29
3.1 Relationship between circulatory spectra at rest	29
3.2 Cross-spectral analysis of resting waves in circulation	37
3.3 Individual features of circulatory variability	40
4. Relationship between the variability in circulation and respiration	47
4.1 Relationship between the spontaneous fluctuation in depth and rate of respiration and circulatory rhythms	47
4.2 Influence of voluntarily modified respiratory rhythm on fluctuations of circulation	53
4.3 Baroreflex sensitivity at various respiratory rates	61
5. Relationship between spontaneous fluctuations in diastolic pressure and in the rate of blood pressure decrease during diastole	65
6. The effect of thermal variations on circulatory and respiratory parameters	71
7. Influence of mental load on power spectra of circulatory and respiratory parameters	77
8. Fluctuation of circulatory parameters during static exercise	87
9. Ontogenesis of heart rate variability in man	93
10. The application of heart-rate variability analysis in pediatrics	97
11. Summary	107
Souhrn	111
Резюме	114
12. Reference	117