The objective of this study was to investigate the health and nutritional conditions of people in Nagasaki Prefecture, and reflect the findings in the activities of 'Kenko Nagasaki 21'.

Persons with a BMI of 25 or over accounted for 34.9%, which was higher than the Japanese national average (28.4%), being particularly high in men aged 40–60 years. The rate of persons with an exercise habit was 31.1%, similar to the national average, but lower (about 20%) in men and women aged 30–50 years. The rate of those who are habitually active in daily life was very low in men in their 30s and 40s, suggesting that daily activity levels are related to obesity. The mean number of steps per day was fewer than the national average, suggesting its relation to the high number of persons with a BMI of 25 or more. This study suggested that daily activity levels and the number of steps are associated with obesity, and middle-aged to elderly men's education is an important task of 'Kenko Nagasaki 21'.

Reproducibility of the Heart Rate Response to Exercise Test in Patients with Ischemic Heart Disease

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The purpose of this study is to clarify the reproducibility of I-ECOH (inclination of exponential curve-fitting model for oxygen uptake and heart rate during graded exercise), which we have previously proposed for evaluation of cardio-pulmonary functional reserve in patients with ischemic heart disease (IHD). In twelve IHD patients, cardiopulmonary exercise testing was performed according to Bruce or Modified Bruce protocols twice within one week. Peak oxygen uptake ($\dot{V}O_2$peak), anaerobic threshold (AT), oxygen uptake efficiency slope (OUES), $\dot{V}E/\dot{V}CO_2$ slope and I-ECOH were measured. The test-to-retest reproducibility was evaluated by linear regression analysis, Bland & Altman plot and coefficient of repeatability (COR). As a result, the test-to-retest reproducibility was found to be in order of $\dot{V}O_2$peak, I-ECOH, $\dot{V}E/\dot{V}CO_2$ slope, OUES and AT.

Confirmation regarding Secular Trend for Height Growth of Mongolian School Boys and Girls—Comparison between 1985 and 2005—

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In the present study, author attempts a confirmation regarding the secular trend for height growth in the Chinese Mongolian race by comparing school boys' and girls' height growth in the Mongolian between 1985 and 2005. In the previous analytical technique, however, the growth distance curve was analyzed but the growth velocity curve was not. In an analytical technique like this, it is impossible to verify early maturation. Therefore, age at maximum peak velocity (MPV) during adolescence is specified from describing the height growth velocity curve by applying the wavelet interpolation method (WIM) proposed by Fujii (2006), and the secular trend for early maturation of height growth in Chinese Mongolian is confirmed by analyzing the secular trend for age at MPV and MPV. In regard to the secular trend from 1985 to 2005, as a finding derived from the trend of age at MPV, MPV and the adult height based on comparing with 1985 in boys, though it is not so big change in Japanese, the adult height increased 3.72 cm and the MPV (Maximum Peak Velocity) increased by 0.5 cm/yr in the Han Chinese. In the Mongolian, the adult height rose by 2.3 cm, the MPV increased 0.4 cm/yr and the age at MPV became 1.2 years earlier. As a finding derived from the trend of that in girls, the age at MPV became 1.1 years earlier in Japanese. In the Han Chinese, the height at 7 years of age increased 3.63 cm, the adult height by 1.37 cm, the age at MPV became 2.8 years earlier and the MPV decreased by 1.58 cm/yr. In the Mongolian, the height at 7 years of age increased 2.81 cm, the adult height by 2.1 cm, the age at MPV became 0.9 years earlier and the MPV increased 1.62 cm/yr. In a short, the secular trend of height growth in the Mongolian evidenced a similar tendency to the Japanese growth promotion phenomenon following World War

Therapeutic Effects of Shinrin-yoku (Taking in the Atmosphere of the Forest) II: Physiological Data from the Field Experiments

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The purpose of this study is to examine the therapeutic effects of Shinrin-yoku (taking in the atmosphere of the forest) from field experiments. In Japan, Shinrin-yoku has been proposed as a comfort promoting activity. We conducted physiological experiments at 12 locations in 2005. Twelve subjects at each experiment (120 in total; male; university students; 22.1 ± 1.5 years old) walked around (15 minutes) their given areas. On the first day, six subjects were sent to a forest area, and the others to a city area. On the second day, the subjects were sent to the opposite areas for a cross check. Salivary cortisol concentration, pulse rate, blood pressure and HRV (Heart Rate Variability) were used as physiological indices. The results of the experiments show that walking in forest areas leads to lower concentrations of cortisol, lower pulse rate, lower blood pressure, more active parasympathetic nervous activity and lower sympathetic nervous activity than those in city areas. The results show that Shinrin-yoku was an effective form of relaxation.

Relationship between Ventilation and Excessive CO_2 Expiration during Recovery from Repeated Cycling Sprint

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The aim of the present study was to determine the relationship between hyperventilation and excessive CO_2 expiration during recovery from repeated cycling sprint. A series of four 10-sec cycling sprints with 30-sec passive recovery periods was performed two times. The first series and second series of cycle sprints were followed by 360-sec passive recovery periods (1st recovery and 2nd recovery). Blood lactate level was significantly lower during 1st recovery than during 2nd recovery. CO_2 expiration was significantly higher than O_2 uptake during recovery, indicating excessive CO_2 expiration. CO_2 expiration was significantly higher during 1st recovery than during 2nd recovery. However, pulmonary ventilation during 1st recovery was the same as that during 2nd recovery. End-tidal CO_2 pressure (PETco2) significantly decreased from the resting level during recovery, indicating hyperventilation. PETco2 during 1st recovery became significantly lower than that during 2nd recovery. It is therefore concluded that hyperventilation is not exclusively associated with excessive CO_2 expiration.

Evaluation of Physical Training on Heart Rate Response to Exercise in Patients with Ischemic Heart Disease and Normal Subjects

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The purpose of this study was to investigate the useful as evaluation of physical training on inclination of exponential curve-fitting model for oxygen uptake and heart rate during graded exercise (I-ECOH) in patients with ischemic heart disease (IHD). Ten IHD male patients and 8 normal male subjects performed physical training. IHD patients exercised physical training 30 min walking at 3 times per week for 3 months. Normal subjects exercised 30 min jogging at 3 times per week for 3 months. Exercise intensity was less than 30% predicted maximal heart rate (HRmax) in IHD patients. The other hand, it was 60% or over HRmax in normal subjects. Both groups received exercise test before and after physical training. Peak oxygen uptake ($\dot{V}O_2$peak) was increased significantly in IHD patients and normal subjects, respectively. Although I-ECOH was decreased in normal subjects, it was not change in IHD patients. There was inverse correlation between I-ECOH and $\dot{V}O_2$ peak in normal subjects, but there was no correlation in IHD patients. Therefore, I-ECOH has poor sensitivity as an index for evaluation of physical training using low intensity. However, the combination of $\dot{V}O_2$ peak and I-ECOH enables one to discrimination of important factor.

Effects of Sodium Bicarbonate Ingestion on Hyperventilation and Recovery of pH after a Short-term Intense Exercise

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To determine the relationship between hyperventilation and recovery of blood pH during recovery from a heavy exercise, short-term intense exercise (STIE) tests were performed under ingestion condition of either $NaHCO_3$ (Alk) or $CaCO_3$ (Pla). Ventilation ($\dot{V}E$)-CO_2 output ($\dot{V}CO_2$) slopes during recovery following STIE were significantly lower in Alk than in Pla. This reduction of the slope was the result of unchanged $\dot{V}E$ and a slight increase in $\dot{V}CO_2$. A significant correlation between $\dot{V}E$ and blood pH was found during recovery in both conditions. While there was no difference between the $\dot{V}E$-pH slopes in the two conditions, $\dot{V}E$ at the same pH was higher in Alk than in Pla. The values of pH in both conditions increased toward the preexercise levels of each condition. While hyperventilation was attenuated under the alkalotic condition, this could not be explained by the ventilatory depression attributed to increase in blood pH. We speculate that hyperventilation after the end of STIE is influenced by the $\dot{V}E$-pH relationship at the start of exercise or the intensity of the exercise performed.

Prognostic Significance of Heart Rate Response to Exercise in Patients With Ischemic Heart Disease: A Long-term Retrospective Cohort Study

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The purpose of this study was to investigate the prognostic value of change in heart rate response to oxygen uptake during exercise in patients with. We retrospectively studied 204 consecutive patients with ischemic heart disease (IHD) who was sent to our exercise testing laboratory between August 1983 and February 1985. Data on mortality were determined in May 2006 by examining medical records from the outpatient clinic and/or conducting telephone interviews with the patients or their families. The following equation was used to determine the relation between $\dot{V}O_2$ and HR during exercise test: $HR = a \times \exp^{b \cdot \dot{V}O_2}$, where the constant b was defined as the inclination of exponential curve-fitting model for oxygen uptake and heart rate during incremental exercise (I-ECOH).

Among the 204 study subjects, there were 54 cardiac deaths during the entire 20-year follow-up period. Multivariate Cox proportional hazards analysis revealed LVEF, $\dot{V}O_2$ peak and I-ECOH as an independent predictor of mortality. In this analysis, the prognostic power of $\dot{V}E/\dot{V}CO_2$ slope was insignificant. Our data indicate that I-ECOH provides independent prognostic information in IHD patients.