Hamamatsu photonics K.K). The TRS-10 gives absolute values of reducedhemoglobin (HHb), oxyhemoglobin (O2Hb) and total haemoglobin (tHb), but the NIRO-300 gives relative values only.

This paper investigates the applicability of cerebral blood flow in evaluating the techno-adaptability for operating industrial products including a car. Fourteen male and nine female subjects (19–51 yrs) volunteered in the present experiment. The procedure of the experiment was explained to the subjects and informed consent was obtained from them. Seven male and seven female subjects (19–22 yrs) operated the destination set up task of a car navigation system. Blood flow of frontal region was measured during tasks. Cerebral blood flow of frontal region and heart rate were measured from eight male subjects (21–51 yrs) during driving. Cerebral blood flow of frontal region was estimated by measuring HHb, O2Hb and tHb using the TRS-10. Room temperature and relative humidity were 25–28 degrees Centigrade and 40–65%. Background noise was 45–50 dB(A) at resting state and 50–85 dB(A) whilst driving.

HHb, O2Hb and tHb of male subjects were significantly higher than that of female at resting state. Changes of cerebral blood flow were observed during operating a car-navigation system and at the time of stopping for a traffic signal and the heart rate showed the similar changes whilst driving.

In this paper we discussed the possibility of physiological evaluation for technological adaptability using the brain hemodynamics measurement.

Suppression of nocturnal salivary melatonin induced by exposure to bright light and sleep habit

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Melatonin hormone is secreted from the pineal grand during the night, and it is assumed to have close relation to sleep initiation. The aim of this study was to determine the relationships between individual differences in suppression of salivary melatonin concentration (SMC) induced by exposure to bright light and sleep habit. Twenty healthy males (22.4 years old) participated in this study. In the first experiment, the subjects spent all night in a dark experimental room (10 lx) and saliva samples were collected every one hour to determine peak SMC. In the second experiment, the subjects slept for three hours from 5 hours before the time of peak SMC. Then they were wakened and exposed to bright light (1000 lx) for two hours. Saliva samples were collected before exposure to the light and every one hour during the period of exposure. The rate of suppression of SMC induced by the light was calculated. The subjects answered a questionnaire on sleep habits (bed time, rising time, sleeping time, etc.). Significant correlation was found between the rate of suppression of SMC 2 hours after exposure to the bright light and habitual bed time (r=0.65). No significant correlations were found between the rate of suppression of SMC and habitual rising time and between the rate of suppression of SMC and habitual sleeping time. It was suggested that individual differences in sensitivity of suppression of SMC to bright light affect a habitual bed time.

Effect of time of day on ERP to different frequencies of sound stimulus for moderately evening-type subjects

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On the basis of morningness/eveningness questionnaire, seven moderately evening-type (E-type) subjects were selected. Auditory stimulus standard/target frequencies (250/500 Hz and 1000/2000 Hz) were manipulated factorially to assess their effects on the P300 of event-related brain potential (ERP). Subjects were tested during an evening (17:00) and midnight (1:00) session I the same night and were asked to press a button when the target stimulus was detected. Accuracy and reaction time (RT) data were recorded for each target tone presentation. Significant diurnal variations in P300 amplitude in response to a high frequency stimulus was significantly smaller than that to a low frequency stimulus, and the amplitude at 1:00 was significantly smaller than that at 17:00. The P300 latency in response to a high frequency stimulus at the Fz electrode site was significantly longer at 1:00 than at 17:00. These results suggest the existence of diurnal variation in human cognitive functions.

Accommodation of human anthropometric variability in military cockpit design

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The physical accommodation of military pilots in their cockpits is necessary during normal aircraft operation as well as in emergency situations that might arise during flight or on the ground. Variation in pilot body size and proportion, which is relevant to cockpit accommodation, has been characterized using a multivariate anthropometric analysis on the intended