BREAKING POINT OF BREATH HOLDING AND TOLERANCE TIME IN REBREATHING

小林庄一, 佐々木智恵子

抄録

The physical and mental factors which concern the determination of the breaking point of breath holding and of rebreathing were investigated in normal human subjects.

The hyperbolic intensity-duration relationship of ventilatory stimulation of CO₂, which has been revealed about the breaking point of breath holding, applies also in the onset of diaphragm activity during breath holding. The basic tolerable CO₂ level, which corresponds to the rheobase in electrical stimulation, was almost the same as, or a little lower than, the normal resting PA₇CO₂ level for the breaking point as well as for the onset of diaphragm activity, and showed few individual variations and training effects. It is considered that in the intensity-duration relationship the basic tolerable CO₂ level dominantly related to the chemosensitivity of the respiratory central structures, and the time factor may be in larger part related to mental or psychological events. The onset of diaphragm activity during breath holding is mainly attributed to physical factors.

The tolerance time of rebreathing with a restricted tidal volume and at a definite rate was longer than breath holding time, even when the tidal volume was as tightly restricted as to 0.11. Single deep rebreathing at the breaking point caused a great relief from distress and made several successive breath holding possible.

In the successive breath holding, however, the period of absence of the rhythmic respiratory activity could hardly be observed. These increasing effects of respiratory movement upon the tolerance time are not ascribed to changes in physical conditions, but probably relate to some unexplained neural mechanisms.
If rebreathing is a contributing factor in some SIDS deaths, then given that different bedding materials presumably differ in rebreathing potential, the risk of SIDS for prone sleeping infants should be unevenly distributed across bedding types, after adjustment for known risk factors. Evidence of such an association was reported, showing that the risk of SIDS was six times greater among Australian infants who slept prone on natural fibre mattresses (filled with ti-tree bark or kapok fibres) than among those who slept prone on other types of mattresses, including foam mattresses. 1 These natur The non-rebreathing oxygen mask enables the delivery of high concentrations of oxygen and is recommended for use in patients who are critically ill. The deadline for the Nursing Times Workforce Awards has been extended to 5 April but if you are involved with innovation in workforce planning and management – do not delay in entering. Jobs. Visit Nursing Times Jobs. time frame: once a week. Breath Hold Tolerance. time frame: once a week. Spirometric values. time frame: once a week. Eligibility Criteria. Male or female participants from 18 years up to 70 years old. Inclusion Criteria: Chronic idiopathic hyperventilation, i.e.: - PCO2 level below 4.7 kPa AND - SBE value more negative than -1.0 Exclusion Criteria: - Oxygen saturation of 95% or lower at rest. Additional Information. Official title. CO2 Rebreathing by a Partial Rebreathing Mask as a Treatment of Chronic Idiopathic Hyperventilation - a Pilot Study. Principal investigator. Ronald Dahl. Trial inf