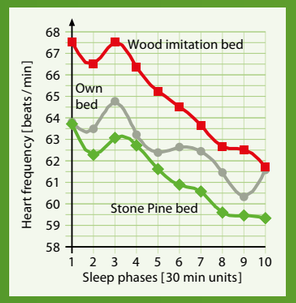
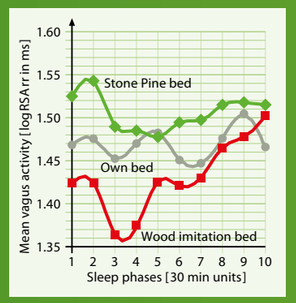
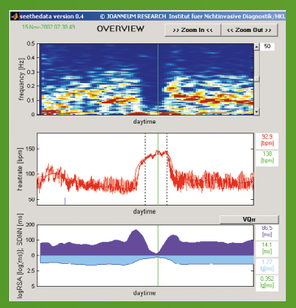
HUMAN RESEARCH



Heart frequency during the course of the night



Autonomic recovery during the course of the night



Harvard step test to determine biological cost of stress

Inter-regional project partners

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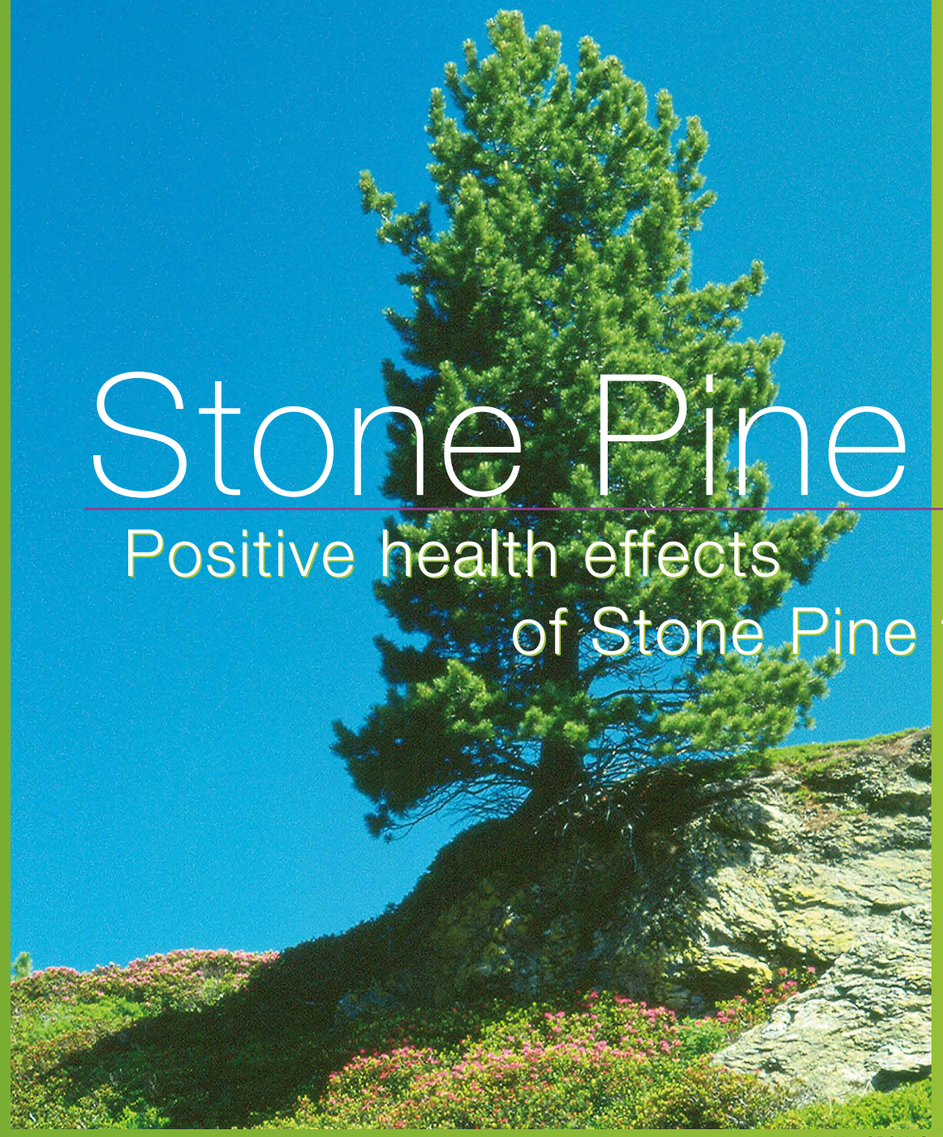
a TRADITION of INNOVATION



Stone Pine

Positive health effects of Stone Pine furniture

Institute of Health Technology and Prevention Research

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The positive characteristics of the wood known as "the Queen of the Alps" (Stone or Cembran Pine; lat.: pinus cembra) has been valued and used for centuries. For the first time this know-how has been subjected to an experimental scientific analysis. In a blind study on 30 healthy adults – under the auspices of an inter-regional research program – scientists of HUMAN RESEARCH evaluated the effects of Stone Pine on stress and the ability to recover.

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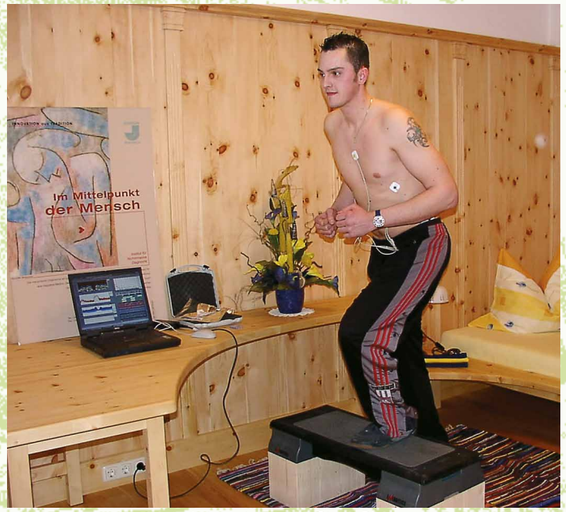
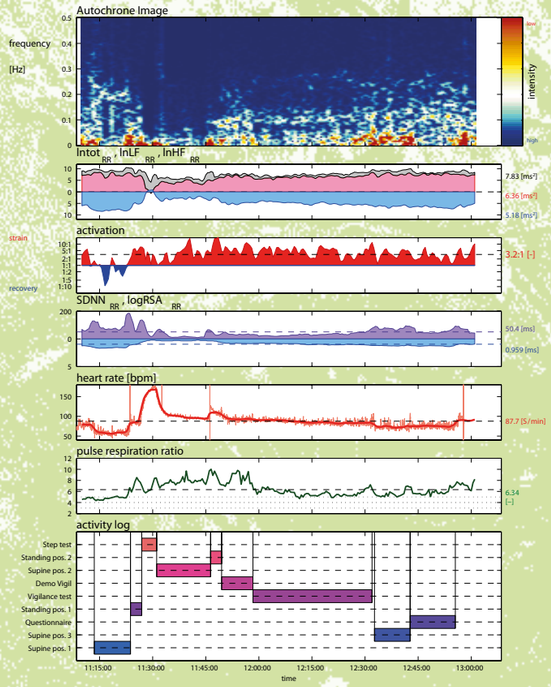
HeartMan – high resolution ECG recorder

Institute and methods



Physical stress test in the Stone Pine room



AutoChrone image of the entire measurement in the Stone Pine room

The application of the most modern sensor technologies and evaluation methods of the Human Research Institute (HRI) opens new possibilities in the measurement of stress and recovery in the normal daily routine, whether at work, during spare time or during sleep. The measuring method repertoire used and constantly further developed at the Institute makes it possible (among other things) to observe the autonomous nervous system as well as functions of the brain-stem in a non-invasive manner.

The heart frequency is the most important control variable in a complex regulatory network, in which heart, blood circulation, respiration, temperature, metabolism and psychosomatic influences are involved. This gives the heart frequency its typical temporal structure, which becomes measurable as heart frequency variability.

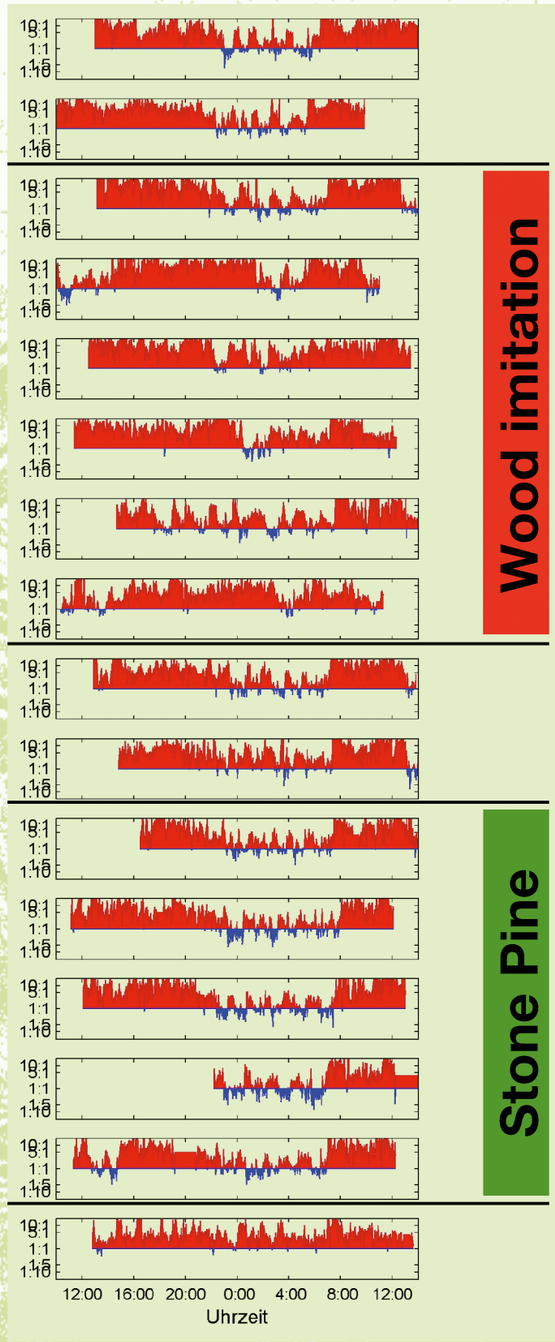
Experimental procedure

A balanced, crossed repetitive measuring design was carried out under psychological and physical stress situations in the laboratory over 24 hours in everyday life situations of the test subjects. With the help of high resolution electrocardiogram recorders the heart frequency and its variability, vegetative parameters and the biological rhythms characteristic of recovery were investigated. Psychometric methods were implemented for the measurement of well-being, vigilance and subjective sleep quality.

Stress and recovery ability in Stone Pine room

For the battery of tests carried out in the lab significant differences were found between the quality of recovery of subjects spending time in Stone Pine rooms and those in identically arranged “wood imitation” rooms. This expressed itself in a lower heart rate during physical and mental stress situations and following rest phases and/or during an accelerated autonomic recovery process. The heart frequency of the test subjects in the wood imitation room is dependent on the atmospheric pressure. This meteorosensitivity is a sign of an unstable circulation. In the Stone Pine room the heart rate seems to be independent of the atmospheric pressure.

Stone Pine – the natural way to a good night’s sleep!



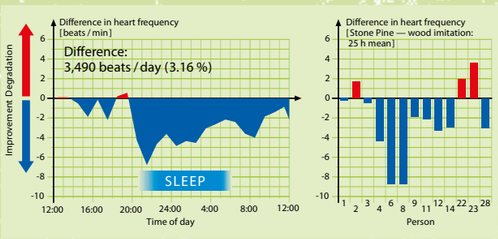
Autonomic balance in different beds (blue reflects recovery periods)

Quality of sleep in the Stone Pine bed

In the second study a possible influence of the bed material on the quality of sleep was investigated. The volunteers spent their nights, this time for a longer period (~3 weeks), first in a Stone Pine (green), then in their own bed and/or in a wood imitation bed (red). The long-term investigation confirmed a significant influence of the construction material on the physical and psychological condition. The sleep quality was clearly improved in the Stone Pine bed compared to that of the wood imitation bed.

The improved recuperation was accompanied by a reduced heart frequency and an increased oscillation of the organism in the course of the day. The average “saving” in the Stone Pine bed was about 3,500 heartbeats per day, which corresponds to about an hour’s “heart-work”. The subjective feeling of well-being of the test subjects matched these physiological results: The Stone Pine subjects reported feeling more relaxed, feeling generally fitter and, surprisingly, were socially more extraverted than beforehand. Could this be a reason why pubs and other social rooms (in this region) were panelled with Stone Pine in former times?

Material for furnishing would appear to have a more significant effect on well-being and health than hitherto imagined. This opens up new fields of application for the high-grade wood of the “Queen of the Alps”.



Saving of “heart-work” during the course of the day by sleep in the Stone Pine bed