Category: **Biowissenschaft, Pharmazie und Medizin**
Reference: **TD254**

Myotones

Description:

The device measures the passive characteristics of near-surface skeletal muscles as it would be done by palpation, checking for areas of tension and hardening in the muscles. The vibration of the muscle is measured digitally via placing a mechanical stimulus on the skin surface. The gathered data provides precise information about the elasticity, stiffness and tone of the examined resting muscle. Therefore, it is possible to determine the state of muscles objectively, quickly and easily – this hasn't been possible up to now.

The technology was developed for space applications allowing for monitoring the physiological parameters of astronauts and provides data to monitor and evaluate the success of countermeasures against muscular and bone atrophy before, during and after the astronauts' sojourn.

On Earth, the findings can be used to optimise rehabilitation and training programmes, and for the objective assessment of the success of training in fitness regimes and competitive sports. For example, around a quarter of production losses in consequence of incapacity to work (in total ~ 64 billion € in Germany in 2015) are caused by diseases connected to muscles, bones and connective tissue. Taking this into account, it is crucial to optimise therapies, training programmes and to conduct an objective and efficient evaluation.

The device was designed in collaborative project. Project management and lead is hold by German researchers focussing in space medicine. Furthermore, British experts for the musculoskeletal system are involved. Technical expertise is provided by a company from Estonia.

Innovative Aspects:

During spaceflights the astronaut's muscles cannot be diagnosed by a doctor. The project's technology fills that gap by rapidly providing consistent data about skeletal muscles by the help of a device that is easy to use.

It can also be groundbreaking for terrestrial applications. To date, medics diagnosis bases on palpating the musculature. This is subjective to some extent and no consistent data is provided. Detailed information, e.g. about muscular efficiency, required to remove muscular components and to analyse them in the laboratory.

Space Heritage:

- Accelerated muscle and bone atrophy
- Observe aging processes in fast motion
- Good basis for clarification of involved processes