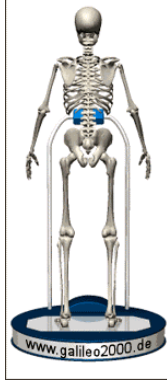




Patient specific musculoskeletal modelling: so can we beat osteoporosis?

In the ageing population nowadays, the problems related to musculoskeletal disorders, such as osteoporosis – a problem characterized by the loss of bone density, reducing the bone strength and increasing the risk of fracture, are on the rise. As such it is of crucial importance to the public health and well-being in general to offer a strategy that can explain, analyse and perhaps reverse these disorders. Computational modelling strategies are needed to enable the viability of treatment for bone degradation, namely using mechanical vibrations of low magnitude to trigger bone regrowth.



The impact of the Whole Body Vibration on muscles toning and increasing the bone mass was first mentioned in ancient Greece. It was picked up again much later in end of the 19th century by Dr. Kellogg (USA) and in 20th century by Dr. Biermann (Germany) and Prof. Nazarov (Russia). Nowadays vibrating platforms can be found in most of the gyms and fitness centres (most probably you have seen them as well). The range of these vibrating platforms includes sideways vibrations, back-front vibrations and up-down vibrations. Using the work of gravity force the latest platforms are considered to be most effective.

The project will be concentrated on a numerical analysis of the up-down vibration platforms and their benefits on the bone remodelling process, which is of a special importance for the elder patient, and patient with osteoporosis.

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