Initial fixation of implant plays a crucial role for long term survival of implant and the overall success of the surgical procedure. The main objective of proposed paper is a preliminary study of ability of the vibrational technique for assessing the initial fixation of implant. The experimental results show a correlation between status of initial fixation of implant and evaluation of frequency response of bone - implant structure. The vibrational method has a potential to assess the initial fixation of implant, but the feasibility, repeatability and sensitivity testing are required.

**The values of viscoelastic parameters of hair at different places on the head surface**

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Most works do not even consider the dependence of mechanical and viscoelastic parameters on the sampling places on the surface of the head, but it shows that these parameters significantly depend on the sampling places, as has been shown in our work (Šimková et al., 2013). This paper deals with describing this dependence on other viscoelastic parameters such as activation energy, the work necessary to break the hair, relaxation times, the Young's modulus, the ultimate strength and elasticity. The samples were taken from 40 women and the values determined for 600 hair. In addition to the previously found dependence of the hair diameter on the sampling places, dependence of two other parameters has been found.

**Risk types of landing in volleyball for ACL injury**

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Anterior cruciate ligament (ACL) injuries frequently occur in landing from a jump on one or both legs near full extension (0-30Â° knee flexion). The aim of the study was identified the type of landings after volleyball block where knee flexion is found under critical value at the instant of first peak of resultant GRF. Subjects were required to land on force platforms using eight types of landing after performing a standing block jump movement. One-sample t-test (critical value 30Â°) was use for compare between types of landing and critical value 30Â° of

knee flexion. The One-sample t-test showed significantly lower knee flexion angle in sagittal plane then 30 degrees in go landing ($p = 0.0$) and reverse landing only. The reverse and go landing may be harmful for ACL due to single-leg landing in mediolateral direction with significantly lower knee flexion at instant of first peak of GRF.

**Determination of dependence of radiographs magnification on the BMI**

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X-rays are used for preoperative planning and clinical studies. X-rays have different magnification depending on the distance of the subject from a shield. The aim of the study was to determine whether there is a correlation between images magnification and the BMI. About 60 images of the standard (a ball of known diameter and constant distance from a shield) and the implanted hip joint heads from three hospitals were measured. The result of this study is that the magnification of standard is constant. The dependence of the measured hip joint head magnification on the BMI is statistically significant. Each set of images has a different magnification but the gain of magnification per unit of the BMI is similar.

**Effect of the different positioning of Proximal Femur Nail on fixation of proximal femur fracture during cyclical loading**

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The objective of this work is to compare the effect of the different positioning of Proximal Femur Nail (PFN) on fixation of proximal femur fracture during cyclical loading. The subject of analysis is an unstable fracture with large posteriomedial comminuted area. We considered five possible positions for the PFN fixation system, where one of them is known as the optimal position. We carried out a stress analysis of the bones, stress analysis of the PFN and the preservation of the proper behavior of the PFN. For this work we undertook a computational analysis using Finite Element Method.

**The effect of destabilization upright positions on human respiratory function**

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THIS ACTION IS REALIZED BY THE PROJECT NEXLIZ – CZ.1.07/2.3.00/30.0038, WHICH IS CO-FINANCED BY THE EUROPEAN SOCIAL FUND AND THE STATE BUDGET OF THE CZECH REPUBLIC.