

## **Abstract**

**Title:** Muscle activity analysis during the violoncello play

**Objectives:** This thesis focuses on analysing and comparing specific back muscles of a bowing violoncellist. The findings can help understanding pathologic mechanisms and back pain caused by violoncello playing. It may be useful in choosing suitable preventive compensatory exercise as well and for future research. Eventually, the analysis could be applied in playing ergonomics and designing a proper seat. The thesis also aims on evaluating suitability of the chosen measuring method in this branch.

**Methods:** The theoretical part reviews contemporary knowledge about musculoskeletal system disorders linked with violoncello playing. The practical part aims on evaluating data obtained from 3D kinematic analysis and surface EMG of specific back muscles of professional violoncello player during playing. Several conditions are assessed.

**Results:** The experiment has shown that when playing a violoncello there is an asymmetric loading of the back muscles. Loading of specific muscles has is affected by way of bowing, string location and the seat. The experiment was done on a single proband, so these conclusions may not be generally valid.

**Keywords:** violoncello playing, musicians, surface electromyography, 3d kinematic analysis, violoncellists' diseases, overuse syndrome