

## **Research and treatment at Hannover Music University**

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The Institute for Music Physiology and Musicians' Medicine of the Hannover University of Music, Drama and Media focuses on research and treatment of movement disorders in musicians. The most relevant movement disorders are task specific musician's dystonia (MD) and task specific tremor (TST), both conditions that are highly disabling for the affected person and often threatening a professional career. More than 700 patients have been seen during the last 19 years. Treatment comprises injections of Botulinum-toxin under EMG and sonographic control as well as Trihexiphenidyl medication after a complete neurological examination and an assessment of the movement disorder at the instrument. The main research interest lies in epidemiology, pathophysiology and new treatment options for task-specific musician's dystonia (MD) and in the description of task-specific tremor (TST) in musicians.

In a recent study the effect of bi-hemispherical tDCS on MD was investigated. The hypothesis was that bi-hemispherical tDCS with mirrored movements could help restore fine motor control in pianists with unilateral MD by facilitating cross-talk between hemispheres. The affected side was anodally and the healthy side cathodally stimulated. During stimulation patients played a sequence of notes on the piano with both hands synchronously and symmetrically. After the multiple stimulation

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sessions, an improvement was found that was stronger for pianists that started at a later age. Another recent study investigating the effect of retraining found a similar efficacy in comparison with treatment with Botulinutoxin or Triheyphenidyl and could show that retraining is rated subjectively as most effective by the patients in comparison with other therapies. This is of importance, since it is non-invasive and easily applicable by the patients. A study that is in preparation will investigate the effect of cannabinoids on MD.

Primary bowing tremor (PBT) is a TST that occurs in bowed string players. In a recent study we investigated 4 professional violinists with a focal task-specific tremor of the right bowing arm, measuring tremor with an accelerometer and muscle activity with EMG. In comparison with healthy controls we found a significantly stronger tremor-activity in the 3-8 Hz frequency range as compared to slower (1-3 Hz) or faster (8-12 Hz) frequency ranges. The mean frequency was 6.6 Hz. Furthermore a coactivation at the in the same frequency-range was found.