Performing Arts Medicine in Europe: The Institute of Music Physiology and Performing Arts Medicine

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The Institute of Music Physiology and Performing Arts Medicine of the Academy of Music and Drama in Hannover is a unique institution in Europe. The scope of the institute is:

1. Teaching the basics of music physiology and performing arts medicine.
2. Research into the physiologic and neurobiologic principles of professional music making and music perception.
3. Research into the causes of occupational injuries in musicians.
4. Prevention, diagnosis, and treatment of such injuries.

The institute was founded in 1974 as “The Institute of Experimental Music Pedagogics” under the chairmanship of Prof. Richard Jakoby. Dr. Christoph Wagner, who directed the institute from 1974 until 1993, renamed the institute in 1984 “The Institute of Music Physiology.” In 1994 Dr. Eckart Altenmüller succeeded Dr. Wagner as head of the institute. To emphasize the medical aspect of the institute, it is now called “The Institute of Music Physiology and Performing Arts Medicine.”

COURSES OFFERED

It is essential to teach future instrumental teachers to recognize and prevent performance-related injuries. Therefore, the curriculum not only teaches the basics of music physiology, but also provides students with information about the pathophysiology of injuries caused by instrumental playing.

Course in music pedagogy. Biological foundations of music making and music perception. Main foci are: sensorimotor aspects of music playing, motor learning, musculoskeletal injuries, stage fright, hearing, protection, and central nervous auditory processing.

Course in rhythmic studies and dance. Main aspects are: anatomy and physiology, with special emphasis on musculoskeletal injuries.

Small group seminars. Main aspects are: physiology of movement, motor learning, and efficiency in practicing.

BASIC RESEARCH

Areas of concentration include:

Analysis of motor learning, especially as demonstrated in the highly specialized movements requisite to playing an instrument. Methods: three-dimensional motion analysis at high temporal resolution, electromyography, and recording of cortical activity. The objective of the analysis is to accurately describe mechanisms of motor learning, and to apply this knowledge to optimize learning strategies for instrumental teaching.

Analysis of brain activation patterns during music processing and music learning. Methods: multichannel recording of electroencephalography, event-related potentials, and slow waves with subsequent source analysis. The main focus of recent research was the demonstration of changes in brain activation patterns induced by ear training and piano training.

Analysis of impairment of receptive musical functions in unilaterally brain-damaged patients (in cooperation with the Department of Neurology of the Hannover Medical School).

APPLIED CLINICAL RESEARCH

Areas of concentration include: the causes and prevention of medical problems of musicians, especially neurologic disorders such as impaired coordination and focal dystonia.

CLINIC FOR PERFORMING ARTS MEDICINE

The institute offers medical care to students at the Academy of Music and Theater in Hannover and also holds a special outpatient clinic for musicians with playing-related problems. The clinic specializes in the diagnosis and therapy of musculoskeletal injuries and neurologic disorders. Diagnostic equipment is available for measuring nerve conduction velocity, electromyography, electroencephalography, and biomechanical parameters (e.g., keyboard pressures during piano playing). Services at the clinic, directed by physician Dr. Altenmüller, and assisted by Dr. Maria Schuppert, are provided by other physicians, therapists, physiologists, and other experts in performing arts medicine. Patients come from all over the world for consultation and treatment.

BIBLIOGRAPHY

Listed below are some recent publications from the institute in English-language, refereed journals. Other publications, including book chapters, are available from the author.

1. Altenmüller E, Berger W, Prokop T, Trippel M, Dietz V: Modulation of sural nerve somatosensory evoked potentials during stance and different phases of the step-