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In many situations of everyday life, vibration load occurs. Here whole body vibration in vehicles, such as boats, cars, helicopters and others as well as hand-transmitted vibration (motor saws etc.) can be named. As vibration is assumed liable to cause various threats to human health, a great number of studies in work science focussed on dose-effect relations and concepts for prevention. Although in many sports remarkable vibration load also occurs, there is very little research on the potential dangers and benefits of vibration stimuli, e.g. on whole body vibration and the implications for muscular activity and neuromuscular control in sport. In personal studies the damping behaviour and training effects under whole body vibration were investigated. Various research areas have been studied in order to approach the relevant topics: neuromuscular and posture control, energy metabolism in terms of oxygen uptake under whole body vibration and local concentration of phosphates by means of 31P-MRS. Furthermore the effects of a strength training under whole body vibration were analysed. The results underline that vibration is a neglected research topic in sport science from the preventive point of view as well as from the one focussing on the improvement of sport performance.