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# Low back pain – a Serious Field in Sports Medicine

*Rückenschmerzen im Sport und in der Allgemeinbevölkerung –  
eine Herausforderung für die Sportmedizin*

**A**n increase in prevalence and incidence as well as costs due to low back pain is reported from nearly every country all over the world (1, 3, 7).

Therefore, approaches in prevention and rehabilitation are widespread but rated incomplete regarding evidence, compliance and adherence. Based on several publications it is accepted that structural alterations, as mostly diagnosed in imaging techniques, cannot predict and explain resulting pain in most of the cases (4). Among others, insufficient neuromuscular control is discussed to be responsible for muscle-tendon strain and microtrauma, leading to pain or pain aggravation (5, 6). Taking this approach into account low back pain has to be considered a field of main interest in sports medicine since knowledge, techniques and interventions might be implemented in therapy as well as valid prevention programs.

Recently physical activity has been proven to be the most effective intervention, at least in the population suffering from chronic and repetitive non-specific low back pain (1, 3, 6). Furthermore, exercise is considered a main part in multimodal therapy regimens in almost every low back entity. Even high-performance athletes benefit from differentiated optimization of segmental neuromuscular control of the lower back, as less trained patients will do even more. However, type of exercise as well as detailed dose-response was not finally addressed in the majority of studies and is therefore still a matter of debate. Since the combination of evident clinical diagnostics, functional evaluation and sports therapy is efficient in return-to-play in athletes it seems to be promising to transfer this procedure to low back pain patients out of the general population as well. However it has to be discussed if intensities and programs can be transferred from sports to the general population as well.

## Exercise Intensity in Low Back Pain Therapy

Does it make sense to exercise involving high intensities, even in therapy? There is lot of discussion whether isolated muscle strengthening is effective enough or whether exercises more close to the situation where load appears in sports and daily life might be beneficial. Furthermore, it is not clear if (moderate) intensities predominantly used in therapy are adequate and sufficient to reduce and prevent pain under external load, at least in high-

performance sports. Clinical and experimental studies including comparable loads to real live situations should address this important and practically relevant issue.

Is there a need to train situations where high and unexpected loads are applied? Since unexpected and sudden as well as repetitive application of load is known to be one reason for lower back overload a recent approach mimicking and exercising these unexpected situations in therapy and prevention seems to be promising. Even if there is often the assumption that high intensities additionally aggravate symptoms it has to be clarified if approaching these loads slowly and progressively will finally help athletes and patients to prevent overload. In sports medicine, these types of (sports and load specific) exercises are frequently addressed in different therapy regimens, return-to-play strategies as well as injury prevention programs, mainly of the lower extremities. Learning from this the transfer to therapy and prevention of low back pain is valid, not only in athletes but also in the general population.

## Moderating Factors

Besides neuromuscular control and individual training level, psychosocial factors have been shown to significantly participate in lower back pain perception, behaviour and pain chronification (2). Furthermore, compliancy to interventions as well as effectiveness of interventions is relevantly influenced. These results mainly have been described in clinical populations as well as chronic non-specific pain patients. From a sports medicine perspective, it is highly interesting to combine these two approaches taking into account how psychosocial factors will influence the effectiveness of load-specific training interventions in patients and athletes. In addition, it can be discussed if stratified screening procedures might help to predict which persons will benefit from isolated physical training and which persons have to be approached from the psychosocial side before training is initiated in therapy and prevention.

## Medicine in Spine Exercise [MiSpEx]

The recent issue of "German Journal of Sports Medicine" emphasizes on different aspects of an 8-year research program called "Ran Rücken" conducted by the national research network "Medicine in Spine Exercise" (MiSpEx). MiSpEx consists of ➤



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sports medicine and orthopaedic specialists, sports scientists, physiotherapists and athletic coaches as well as experts in sports psychology and social science. All study centres are involved in clinical patient's care as well as prevention and rehabilitation of athletes organised within a local Olympic training centre.

To date, the network developed a new peer reviewed training program following the approach mentioned above progressively addressing situations where low back pain is elicited in (high-performance and leisure) sports as well as activities of daily living and work (5). Based on available knowledge new strategies focussing on neuromuscular control to compensate external loads on the lower back are validated as well as clinically implemented. Further, the definitions of a minimum dose of training in prevention as well as the effectiveness in low back pain therapy, moderated by biopsychosocial factors are focussed.

### Translational and interdisciplinary Research

Building up a national network combining high-performance sports medicine, sports science, social sciences and clinical care of the general population was ambitious, but necessary to fulfil all requirements of this interdisciplinary program. On top, we are very grateful to all our partners and co-workers mentioned and acknowledged in the different papers in this issue as well as the funding authorities, namely the Federal Institute of Sports Science. It has to be pointed out that the main advantage of this research network is to thoroughly work on a relevant and specific field for eight years in a row. To date this type of funded research in sports medicine is rare even though it provides the possibility of translational and interdisciplinary research from basic to applied science, clinical and sports application, as well as transfer of results and knowledge to the populations addressed. Combining different approaches out of cooperating disciplines in combination with a consecutive translational transfer will basically help our athletes as well as patients of the general population. It forcefully has to be recommended to continue such programs not only to emphasize science but also to strengthen the transfer from sports and sports medicine to the general population.

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