

How Resilient is the Musculoskeletal System?

Wie belastbar ist der Bewegungsapparat?

Looking at the performance development in numerous disciplines, it is fascinating to see what the human musculoskeletal is capable of. Completing an Iron Man Triathlon in less than eight hours, running 100 m in clearly less than 10 seconds, throwing a javelin nearly 100 m or raising well over 200 kg in weightlifting are feats unimaginable for most people and of course achieved by only few athletes. But in many types of ball sports as well, an increasing number of competitions lead to a situation in which the body is permanently subjected to intensive stress, an untenable situation for some athletes. According to studies on European professional soccer teams, an average of two injuries per player must be expected, whereby training interruption of at least four weeks is observed in every fifth injury.

But the leisure athlete as well, who is ambitious in his sport, can strain the musculoskeletal system to its limits. The question thus often arises for the sport-consultant orthopedic surgeon of how resilient the musculoskeletal system of the individual athlete really is.

Orthopedic Assessment of Fitness for Sport

In the assessment of the type of sport involved, it is particularly important to consider that the stress to the musculoskeletal system of course may differ greatly. The individual active in a light athletic decathlon has other requirements than the person who jogs in his leisure time. That means, the treating sports doctor must be in the position to assess the burden in the various sport types and disciplines, even if he has never participated in these types of sports himself. Contents of advanced training as a specialist in sports medicine take this requirement into account and after the course offered or after attending lectures and working at sports-medical examination centers, this knowledge should be on tap.

It is much more difficult to individually advise the athlete who is standing in front of one. The sports doctor's task is to attend the athlete and help to keep the injuries low with the lowest possible risk of later damage, and to make fun and success possible to his patient.

Deficits must be discovered and measures recommended so that the risk of damage can be reduced.

It is relatively simple in the clinical examination of performance capacity of the joints. Mobility, stability and function of the joint and torso can be evaluated and appropriate measures recommended using test procedures. The ever-improving imaging procedures for the musculoskeletal system serve to distinguish normal anatomical variants from pathological findings, disclose overexertion and injury, and they can thus deliver valuable evidence for the assessment of resiliency. It has been shown in studies that there is an elevated risk in the presence for example of hip dysplasia or disalignment of the hip-ankle axis of more than 5 degrees. In intensive sports load, premature arthrosis may so occur. In examining young cadre athletes, these factors play an essential role in the assessment of sport fitness.

How Resilient is the Cartilage?

What we still cannot satisfactorily assess, despite ever-improving imaging, is the quality of the joint cartilage. There appears to be an individually differing tolerance in exercise capacity; the same load on the cartilage may have different effects. There appears to be an individual load threshold above which the joint cartilage is damaged and does not adapt to the load without leaving damage. That the joint cartilage reacts to stress and can regenerate has been shown in marathon runners who underwent MRT of the knee joint during load. Optimal for the assessment of sports fitness would be the possibility of being able to determine by imaging not only the quality of the joint cartilage but really the individual load resilience in order to estimate in those joints stressed more in a given sport what effects years of high-performance training will have resulting solely from chronic exertion, without acute injury. If such information could be obtained, the assessment of sport fitness would clearly gain in importance, coupled with the hope of being able in good conscience to expose our young athletes to the demands of elite sports. In addition, surgery performed to repair cartilage could be much better assessed with respect to load capacity. Academic facilities must here support orthopedic departments and their scientific projects. >

EDITORIAL

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Articles are also provided in this issue which are important in working with athletes. Prof Stefan Nehrer and his team from Krems, Austria, addressed the possibilities of engaging in sports even in the presence of arthrosis.

I hope you enjoy reading this issue and gain new ideas for your daily work with athletes. I would also like to call your attention to the meeting advertised in Figure 1: The 8th Nürtinger Interdisciplinary Joint Symposium focuses on the preventive and therapeutic aspects of overexertion in sports. ■

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Unter dem Patronat:


Abbildung 1
 8th Nürtinger Interdisciplinary Joint Symposium.