

THE OMNIKINETIC TRAINING

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The worth of the omnikinetic training and therapy in rehabilitation of sportsmen with surgical operations and injuries on the knee joint is clearly seen in the higher and highest level of performance.

The different tissues and their neurological and neurophysiological control can be burdened in a different or specific way, and we have to respect it.

In opposite to the isolated contemplation of the pure training of muscles we want to see the functional unit "the ARTERON" and to this we spend our attention. This more holistic thinking around the ARTERON should not lead to a neglect of the single parts of the system. Under this aspect, we will show the specialities of the OMNIKINETIC HYDRAULIC SYSTEM.

The certainly important attribute is the adapting resistance by a controlled velocity (50'- 350'/s) throughout the full range of motion. We call that Isokinetic, but the omnikinetic movements have additional the acceleration.

A comparison between the pure isotonic and the isokinetic movement shows the different load situations explicitly. We have some areas with underloading, some with overloading and two points with the right loading. This fact is especially important by problems on the biomechanics of a joint - whatever the reason therefore should be.

The cardiovascular effect and the local muscle endurance is possible to reach, with velocities over 250'/s., particularly if we practise it as an interval training, that is a basic-training in rehabilitation. We can do exercises with all joints on the upper body and also with the joints in the neighbourhood of partially or totally fixed joints. The workout of the longer two-joint muscles makes pressure and relieve to the hyaline cartilage. This effect is very important to this bradytrophe tissue. That's the only possibility to have a nutrition to the cartilage.

A next highpoint of the Omnikinetic System is, that the functional movement patterns are not interrupted. Dr. Kabat and Mrs. M. Knott have shown the effect of the overflow of motoric impulses in a synergistic pattern from the strength muscle group to the inhibited in their works on PNP. The same effect can be reached from one side to the opposite.

The adapting resistance, as an important fact of safety to the ARTERON, has also a neurophysiological effect, if we are using it on a double concentric way. It is not easier, to build up a physiological muscular balance, as on this way. This ballance is essential for high performance. The better the muscular ballance, the lower is the risk, to get overload or injuries.

So it is a good recommendation to build up the ballance from distal and from proximal directions to the knee.

The quality of the training should include basic endurance, maximal force and intra- and intermuscular coordination.

In a view of a functional stress to the knee-joint it is necessary to consider the static-dynamic relationship of the hamstrings and the pretibial group on one side and the gluteal group, Quads and the gastrocnemius. The volume of the last one is able to bring the tibia anteriorly. Also the other muscle groups, working in the frontal plane, must be integrated in a treatment concept. So in a combined function the three dimensional functions can be built up.

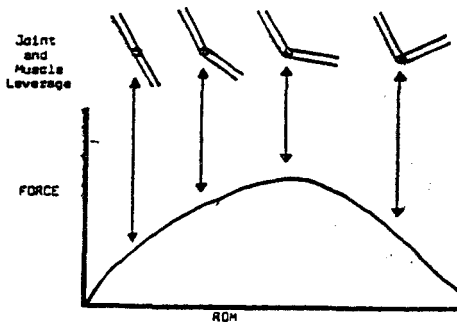
The use of the Omnikinetic System in training and rehabilitation has the advantage of doing exercises on a reciprocal, alternate way.

That is one of the highest level, to make a locomotion and a proprioceptive training.

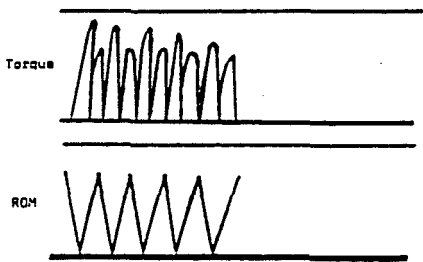
As necessary supplement we train the antigravity pattern for the dynamic function of the lower limb and for spine stabilization with the intrinsic muscles.

CONCLUSION

In conclusion we can say: Omnikinetic Trainingsystems are able to adapt biomechanics of several tissues, to make proprioceptive and neuromuscular training, they are multifunctional, effective and safe!

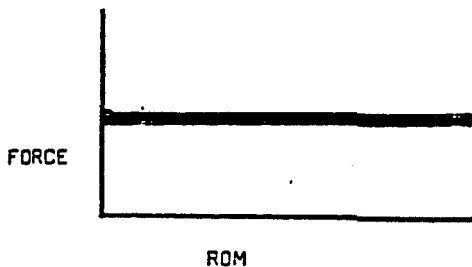


Skeletal leverage changes throughout the ROM.

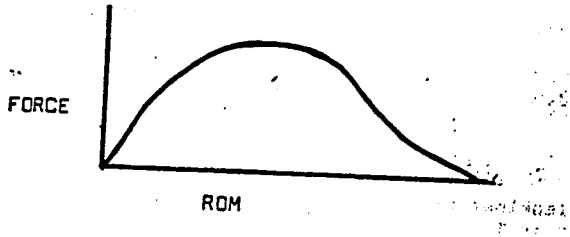


Relationship of accommodating resistance of muscular torque, ROM and muscular fatigue.

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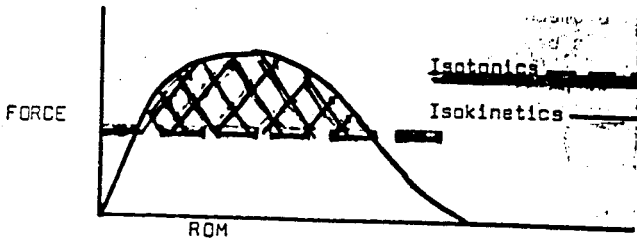
Isotonic muscle loading has a fixed resistance through the ROM.



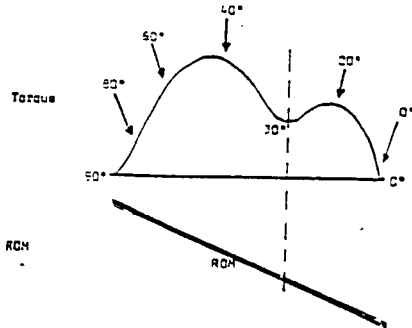
Isokinetic muscle loading has an accommodating resistance through the ROM.

Figure 1.-4. Comparison of isotonic and isokinetic resistance through the ROM.

If the two muscular contractions are superimposed in the same graph, we see the results in Figure 1-5.



Comparison of isotonic and isokinetic muscular contractions. Shaded area represents muscle potential from isokinetic contraction which is not "taxed" with an isotonic exercise.



Application of isometric exercises through the ROM with a "painful" deformation. Isometrics applied every 20° throughout the ROM. Note particularly the application of isometrics on each side of "painful" deformation.

