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Reflex 46

The Kieser Training Magazine

Does vitamin D prevent falls?

It is well known that bones need muscle activity and enough calcium and vitamin D if they are to remain healthy. A more recent discovery is that vitamin D is also important for muscle training and function. It stimulates the protein synthesis that provides the building blocks for muscle development. At the same time, vitamin D stimulates the release of calcium into the muscle cell that is needed for muscle contraction. We now have

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scientific evidence that a vitamin D deficiency is often a cause of reduced muscle strength and pain. It also reduces the stability of the body and so makes us more likely to fall or fracture bones. Vice versa, studies have shown that vitamin D supplements increase muscle strength and makes us less likely to fall.

Particularly interesting are the results of a study at the Fürstenhof Clinic in Bad Pyrmont. It involved 242 pensioners with an average age of 77, who for 12 months took a daily supplement of 800 International Units (IU) of vitamin D and 1,000 mg of calcium. The control group took the same dose of calcium but instead of vitamin D took a placebo. The researchers did not know who took the vitamin D and who took the placebo. At the end of the 12 months, the participants were monitored for a further 8 months.

The result: after 20 months, quadriceps strength had increased by 8% in the group who had taken the combined supplement and body instability had dropped by 28%. Compared with the control group, the number of recorded falls had declined by 39%.

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“Without sunlight, plants wither – so do humans.”

Vitamin D is created when sunlight comes into contact with the skin. Vitamin D is essential for a range of bodily functions, including muscle function. However, the body can only produce enough vitamin D for its needs if there is enough UVB radiation.

Prof. Dr. Worm, is it right that vitamin D is actually not a vitamin?
Vitamins are essential nutrients, which the body cannot produce on its own but which are obtained from foodstuffs. The body can produce up to 95% of its requirements – provided it is exposed to regular UVB radiation. Foodstuffs on their own cannot meet our vitamin D requirements – to do that we would need to eat 1 lb of oily sea fish per day. In fact, vitamin D in its activated form is a hormone that switches on thousands of genes in our cells.

Dr. Nicolai Worm is a qualified dietician, nutritional scientist and creator of the Logi Method of nutrition. Since 2009 he has been a professor at the German Applied University for Prevention and Health Management. His publications include “Heilkraft D” which deals with the healing power of vitamin D.

What is the effect of vitamin D?
Vitamin D aids the absorption of calcium from foodstuffs into the intestines. It also stimulates calcium absorption into the bones – essential to ensure that bone mineral density remains sufficiently high. Children who absorb insufficient vitamin D develop rickets and adults osteomalacia (bone softening).

Research has shown that vitamin D also plays a role in muscle function.
If we fail to absorb enough vitamin D, our coordination and muscle strength starts to decline. However, if the loss of coordination and strength is the result of a vitamin D deficiency, we can easily reverse it, by simply taking adequate doses of vitamin D.

Are there other health benefits?
A vitamin D deficiency increases our risk of developing lifestyle diseases such as cardiovascular disorders, many types of cancers, diabetes, Alzheimer’s, Parkinson’s, multiple sclerosis and depression. It also makes us more susceptible to infections, etc.

How can we make sure we absorb enough vitamin D?
From mid-April to mid-October, the body can absorb enough UVB radiation for the body to produce enough vitamin D simply by being exposed to moderate but regular sunlight. All it takes is about 10-15 minutes of exposure to the midday sun with bare arms and legs. Do not stay out in the full sun for any longer and certainly not long enough to redden the skin.

And in winter?
In winter, UVB radiation is not strong enough. We need to obtain our vitamin D from elsewhere. Most women can achieve adequate vitamin D levels with a daily vitamin D supplement of between 1,500 and 3,000 International Units (IU). For men, the figure is between 2,000 and 4,000 IU per day. However, it’s important for both men and women to have their vitamin D status tested before starting.

Dear Reader,

following on from the new B3 and B4 foot machines, Kieser Training has recorded yet another world first with the introduction of the A5, a machine that strengthens the pelvic floor muscles.

In the past, training for this muscle group was the preserve of yoga and Pilates, both of which focus on the strength of this “powerhouse”. In contrast to those techniques, the A5 machine displays the “work” of the pelvic floor muscles on a screen allowing progress to be measured.

The A5 machine has an integrated computer that provides direct “biofeedback” and ensures that we do the exercise correctly. For the first time we can now target these crucial muscles and so strengthen them.

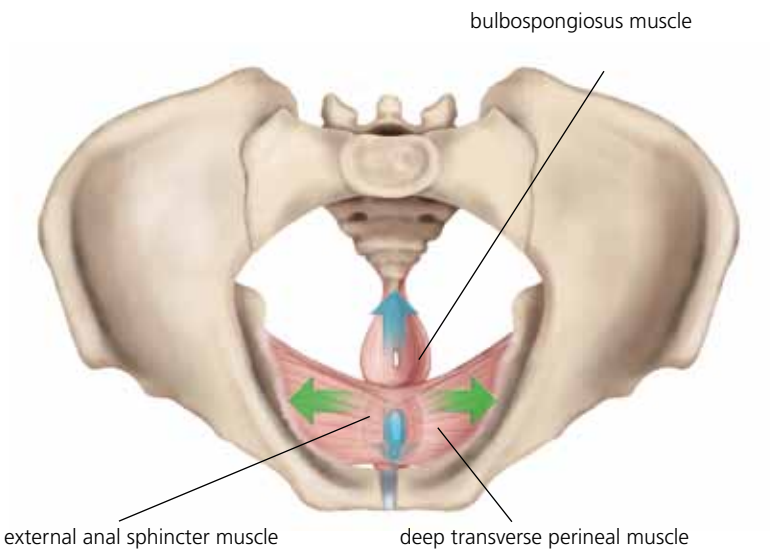
Women are already familiar with the role played by pelvic floor muscles in their quality of life. For them, it’s quite natural to train them – with men less so. When talking to men, it soon becomes apparent that they are often unaware that they have an entire sheet of muscles down there – unfortunately, their muscles are often weak as well. In this edition, we explain the benefits of strong pelvic floor muscles for all. Read also how vitamin D and creatine help muscle function.

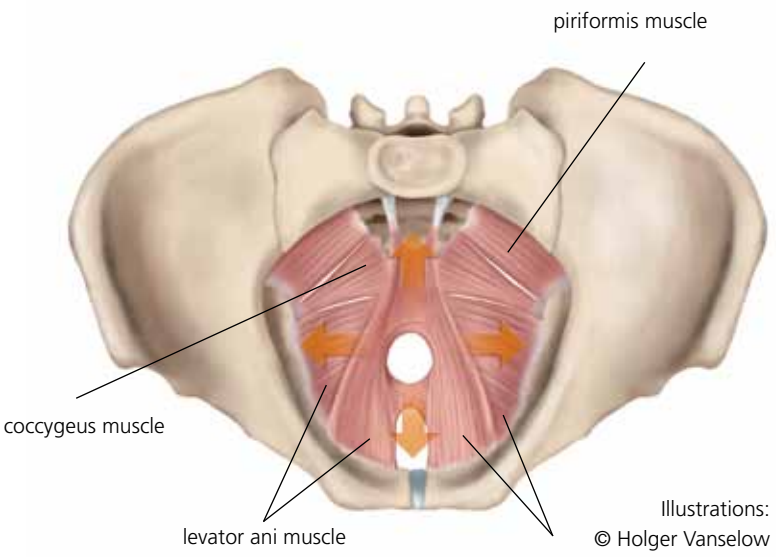
It’s about “pleasure and not pain”. Enjoy!

Patrik Meier
Chief Operating Officer
Kieser Training AG Zürich

Out with a taboo, in with a focus!

Strong pelvic floor muscles support and protect the pelvic organs and the sphincter muscles in the bladder and intestines. They also play a crucial role in ensuring a successful sex life and improving the voice quality.





Illustrations:
© Holger Vanselow

The pelvic floor consists of three layers of longitudinal and transverse muscles. These muscles span the area between the inferior pubic rami, the ischia and coccyx. The bladder and bowel outlets – the urethra and the rectum – pass through the pelvic floor. Women have a third outlet – the vagina.

In women, a strong pelvic floor keeps the uterus and vagina in place and for both men and women these muscles support the bladder, stomach and intestines preventing involuntary leakage of urine or stool. They are also important for our sex life. When men ejaculate, the muscles in the neck of the bladder and the pelvic floor contract causing the sperm to be ejected with considerable force through the urethra.

Finally, the pelvic floor muscles form the sounding board for a powerful and melodious voice. Orators and singers use the interaction between the pelvic floor and abdominal muscles, the diaphragm and breathing to boost the voice and so create that expansive sound that fills the room. As with all other muscles, the pelvic floor muscles are not solo players. Working in synergy with the back and abdominal muscles, they give the spine its stability and are the basis of good posture.

Unfortunately, most of us only become aware of the importance of pelvic floor muscles when problems arise. The subject remains a taboo and we often fail to tell even our doctor if we experience involuntary leakages of urine during physical exercise or if we have problems with erection or ejaculation – even though these problems are common: A survey involving 28,000 people showed that 12% of women under 30 years of age experienced incontinence and in women between 50 and 54, that figure had risen to 30%. Amongst older women, 50% had experienced the involuntary leakage of urine and 50% of those had so-called "stress incontinence". Even low levels of physical exertion can cause urinary leakage. This incontinence often affects libido and sexual sensation and so affects our personal relationships. Problems with male erection are equally common: They affect 7% of men between 20 and 29 years of age, 48% of those between 50 and 59 and 64% of men over 70 years of age. Erectile dysfunction reduces self esteem and is harmful to relationships.

Five good reasons for men and women

- Strong pelvic floor muscles prevent incontinence. Particularly in stress situations, e.g. laughter, coughing, sneezing or physical exertion, they support the abdominal cavity and reduce the strain on the sphincter muscles.
- Strong pelvic floor muscles improve trunk stability and posture. They work in synergy with the abdominal, deep gluteal, thigh and back muscles.
- Pregnancy and childbirth put a severe strain on the pelvic floor. Strength training improves the tone of pelvic floor muscles both before and after pregnancy.
- Following prostate surgery, pelvic floor training improves the control of the urethral sphincter.
- Healthy pelvic floor muscles promote sexual function and can reduce erectile dysfunction.

What effect does Kieser Training have on ...

... the pelvic floor?

Pelvic floor muscles have always been important at Kieser Training even though we did not have a dedicated exercise machine for them. The pelvic floor muscles work in synergy with the back and abdominal muscles and so exercises for those muscles also benefit the pelvic floor. This benefit can be increased further by deliberately contracting the pelvic floor muscles when you do trunk, hip and leg exercises. Use the "A", "F" and "B6 exercises for this purpose. The principle is simple: before starting each exercise, contract the pelvic floor muscles and keep them contracted during the entire exercise.

However, the new A5 pelvic floor machine (see Page 3) is a genuine advance: For the first time in the history of strength training, there is a machine that isolates the pelvic floor muscles and allows targeted training. The machine – suitable for both men and women – has computer controls. This makes it easy to learn which muscles to contract. In addition, it allows the training gain to be displayed on the screen.

This new machine will not only help to eliminate the taboos surrounding these muscles but it also represents a major advance in preventing and treating the many problems associated with weak pelvic floor muscles. In particular, strengthening these muscles can prevent or treat prolapses of the bladder or uterus. These problems frequently start during pregnancy. The additional load can put an undue strain on these muscles – often already weak – causing the pelvic organs to sag. Provided the pregnancy is progressing normally, you can continue sub-maximum strength training during pregnancy as it is good preparation for the recovery process following childbirth.

Text on this page: Dr. med. Martin Weiß

Doctor's Tip

What to do about incontinence and improving sex?

First of all, be prepared to talk about it! Incontinence can affect women of any age and men are particularly at risk after prostate surgery. As men get older, they are more likely to experience erection problems and impotence but the condition can affect younger men as well. Many sufferers – both men and women – can be helped. Firstly, you must ask your doctor for an examination as incontinence and erectile dysfunction can be caused by a myriad of factors. It's important to exclude urinary infections or testosterone deficiencies. However, if urological and gynaecological

Dr. med. Martin Weiß

investigations find nothing that needs treatment, it's time to start strength training on the A5 (see Page 3).

Recent research has demonstrated the benefits of such training: 50% of women with stress incontinence eliminated the problem completely by doing strength training and improved their sex life: sexual desire, vaginal lubrication and levels of sexual satisfaction all increased.

In a study of men between 22 and 78 years of age with erectile dysfunction, 50% were able to achieve a normal erection and a further 35% reported improvement following strength training.

Reflex

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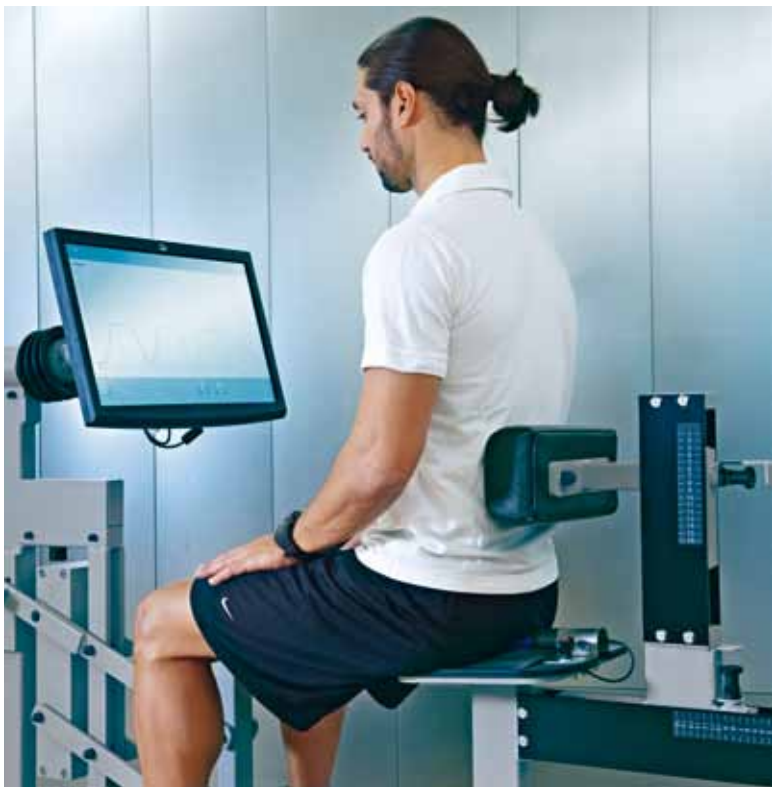
A5 – Contracting the pelvic floor muscles

"The pelvic floor machine is a real innovation," was the verdict of Fitness Tribune (Edition 138) on the latest machine developed by Kieser Training when it awarded the A5 its "2012 Fitness Tribune Award for Innovation". The A5 is a global first as it isolates and provides targeted training for these important muscles and display the resultant muscle activity on screen. Although the effects are spectacular, the process is actually quite simple. To the observer, it looks as though customers – both men and women – are just sitting in the machine. In reality, they are contracting and releasing the pelvic floor muscles in accordance with the pattern displayed on the screen. The machine has an integral sensor located on the seat. The sensor, manufactured by MSYS, registers the minor pressure changes beneath the pelvic floor and displays them on a screen. This visualisation ensures that the customer contracts and trains the correct muscles. We recommend that not just women but men as well include the A 5 in their training repertoire – at least for a temporary period. The health benefits are considerable (see Page 2).



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Expert's Tip

The development of the Nautilus Pullover Torso Machine in 1971 marked a revolution in training machine design. This machine, "the mother of the C1", convinced many sceptics that such training machines actually worked. Normal pull-ups simply cannot exert a direct resistance on the humerus if the latissimus dorsi muscle is trained through a 240° range of motion! So what attributes are required for an effective and safe training machine?

1. The machine should expose the muscle to a resistance high enough to trigger muscle contractions in excess of the stimulus threshold.
2. The machine should expose the muscle to an adequate resistance in its effective direction throughout its entire range of motion.
3. As far as possible, the resistance should be experienced by the part of the body to which the muscle being trained is attached.
4. The machine should offer the maximum possible safety – particular when training to complete fatigue.
5. The machine should allow the resistance to be adjusted in small increments.
6. As far as possible, it should be impossible to do the exercise incorrectly.

It is these 6 attributes that give strength training machines the edge. Training with dumbbells or doing calisthenics does not meet the above criteria in full. That's why they are particularly appropriate for strength training for health.

Anika Stephan
Kieser Training Research Department

Latest research – creatine instead of strength training?

Prof. Dr. Theo A. Wallimann
© Photo: Michael Ingenweyen

No! It's not that simple. However, creatine can help strengthen muscles. It was Eugène Chevreul who in 1832 discovered creatine, a substance which occurs naturally in the body. However, not least thanks to the baseline research by Professor Dr. Theo A. Wallimann of the Institute of Cell Biology at the Swiss Federal Institute of Technology in Zurich, the importance of creatine kinase and creatine and phosphocreatine for energy metabolism of cells is being recognised. In addition, the European Food Safety Authority (EFSA) has now classified creatine as a natural, nutritional supplement and in 2011 recognised its health benefit.

"At last" says Wallimann. "For years, there has been a veritable flood of scientific studies showing the importance of creatine for the human organism. It simulates muscle growth, increases the strength and endurance of muscles and shortens regeneration periods." In addition, creatine is extremely important for the health of our heart, bones, skin, brain and nerve and sensory cells. It increases physical and mental performance, delays mental fatigue and increases stress tolerance.

So why do we need creatine? "It supplies cells with the energy they need", explains Wallimann. The pancreas, liver and kidneys produce about 50% of the body's daily requirement and the other 50% is absorbed from food. Blood circulating through the body transports creatine to the cells where it is converted into a high-energy store of so-called phosphocreatine. This provides the body with the phosphate it needs for producing adenosintriphosphate (ATP). ATP is the fuel for all biological processes.

However, we would need to eat in excess of 300 gm of meat or fish per day to meet the adult daily requirement of 3 – 4 gm. Meat and fish are the main source of creatine and the reason why vegetarians – but also the elderly – are often deficient in creatine. Wallimann recommends daily supplements of 3 gm creatine (for a body weight of 75 kg/165 lbs). This can generate a 5% – 20% increase in the energy stored in cells. Supplements are particularly important for athletes with high energy needs but they are also important for vegetarians, the elderly or rehabilitation patients – particularly in conjunction with strength training. I'm afraid that you can't avoid exercising.

Training theory – the basics

The 5 Instruction Boards – remember them? When you first started Kieser Training, we used them to explain the main principles of training theory. Successful training is based on adherence to these principles and so reason enough to revise them.

The strength of individual muscles varies depending upon the angle of the relevant joint. For example, the biceps are stronger when the arm is bent than when it is straight. We depict these strength variations in what is known as a strength curve. The Kieser Training machines reflect these differences and the resistance to be overcome by a muscle through its range of motion changes in line with the strength curve.

This ability to vary the resistance is a major benefit of machine-based training compared with ordinary strengthening exercises or dumbbell training. Try it for yourself: Select a 40 lb weight on the B1 and move the lever arm with your hand. Can you feel the change in the resistance? It decreases as you raise the lever arm. This is because your knee extensors are weaker with straight knees than with bent knees. However, that would not work if the weight sleeve were at the bottom because the muscle would have to overcome the maximum resistance precisely where it is naturally weakest. Training would be ineffective.

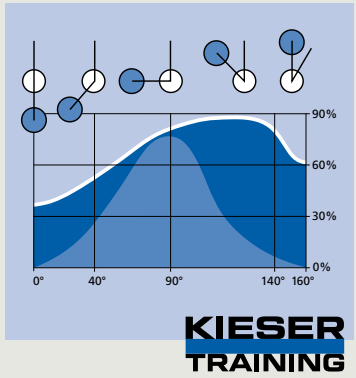
As a result, almost all Kieser Training machines have an eccentric cam that allows the resistance to change as the strength within a muscle changes. Training then works because each muscle has to overcome the right levels of resistance.

At the start of training, strength curves are often far from ideal. Individual curves are "distorted" by the repetitive loads of everyday life. In the longer term, you are more prone to injury and the distortion can cause wear and tear and pain.

This is why we give you a "corrector programme" when you first start training. This corrector programme remedies the distortions and provides a solid foundation for subsequent build-up training. We repeat the corrector programme (i.e. one containing the relevant exercises) on a regular basis.

To train a muscle correctly, it must be exposed to a resistance that corresponds to its natural strength curve. This cannot be achieved with dumbbell training or other exercise regimes. It's only possible with our machines.

The white line in the diagram illustrates the natural strength curve of the biceps. The light blue illustrates the resistance doing bicep curls with dumbbells.



- At the top of the illustration is a diagrammatic representation of the arm (upper arm, elbow and forearm holding a dumbbell). The arm is shown with the elbow at various angles and they are shown on the horizontal axis in degrees (0° to 160°).
- The vertical axis displays the strength a muscle can develop at each of the joint angles.
- The light-blue area shows the inefficiency of a dumbbell exercise: The potential strength of the biceps is far greater than that needed to move the dumbbell at the start and towards the end of the range of motion. This means that the muscle is not strengthened uniformly throughout the entire movement of the joint.

Column

Men and their pelvic floor
by Dr. med. Marco Caimi

Very few men understand their pelvic floor – yes, men do have one! The pelvic floor consists of three layers of muscles and tendons. It connects the pubic bone, the coccyx and the two ischial tuberosities and is responsible for major bodily functions.

It keeps your internal organs in place, supporting them during physical activity or when you cough, laugh or sneeze. When you lift a heavy load, the pelvic floor must be able to withstand the resultant increase in intra-abdominal pressure. Exercises that tense up and relax the pelvic floor muscles are beneficial for the prostate, which is directly adjacent to the pelvic floor.

Similarly, strong pelvic floor muscles are important during sex. Regular strength training increases the supply of blood in the lumbar region and the reduction in the backflow of blood from the veins increases sexual endurance. In addition increased blood flow heightens the feelings of pleasure and intensity of the orgasm – both in men and women. If pelvic floor muscles are weak, this can cause sexual insensitivity.

And yet, most men (still) don't know what to do about their pelvic floor muscles. It's time to challenge that taboo and give more attention to these muscles, e.g. by training on the new A5.

Kieser Training is not a "sport"

To what category does Kieser Training belong? Is it sport, fitness or medicine? Actually none of them describe it accurately. So what is it?

© Photo: Michael Ingenweyen

Kieser Training is often confused with sport. However, sport is the use and consumption of strength whereas Kieser Training is the exact opposite: it is the development and care of the musculoskeletal system. However, sports scientists still assert that sport is relevant to health.

For its part, medicine focuses primarily on the treatment of symptoms whereas the fitness industry remains wedded to the acquisition of customers and little else. The latter displays an artificial frenzy as it desperately attempts to follow trends. It has lost sight of its original objective, which was to make people stronger. None of these specialisms has a clear, objective focus based on evolutionary theory.

In fact, in the German-speaking world, Kieser Training has created a new category: effective and isolated muscle strengthening or "strength training for health". It is helping to solve a human problem, i.e. the decline of muscles once the age of reproduction is reached – the main cause of declining health and quality of life.

What you do with those stronger muscles and new strength depends upon your personal goals. You may wish to maintain or regain health or achieve excellence in your chosen sport. Alternatively, you may simply want to look good – the underlying biological principle is the same in all cases: Man grows on resistance. Kieser Training seeks to apply that resistance in a targeted and measured way and in so doing makes the following assumptions:

1. Evolution is not interested in extending human life beyond 25 years of age. According to the biologist Richard Dawkins, we are merely a disposable container created by genes to give them eternal life (Dawkins, Richard, "The Selfish Gene", Oxford University Press).

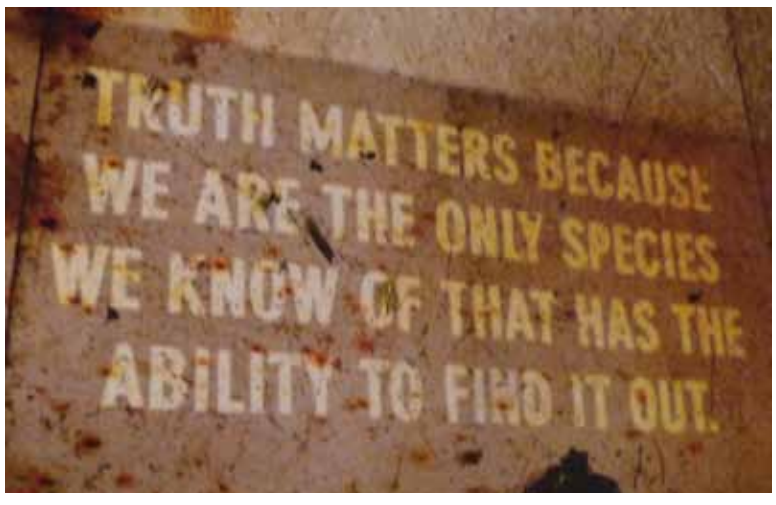
2. We not only want to live longer than 25 but want to retain a good quality of life for as long as possible.

3. Movement on its own has no training effect. The effect comes from the resistance that the movement has to overcome. Astronauts move enough during their daily work but still lose muscle and bone strength – because of the absence of gravity in space.

4. Muscles are crucial to quality of life. Internal organs are merely the "servants" of muscles. They supply them with nutrients and oxygen and dispose of metabolic waste products. If muscles are not subjected to resistance, internal organs lose their purpose and degenerate. That is why strength/muscle loss is a primary cause of pain and disease.

The range of benefits from strength training for health continues to expand – from orthopaedics, cardiology, endocrinology through to psychiatry. Although not surprising, it is still to be welcomed that the world is starting to understand the connection between muscles and the brain. When I founded Kieser Training 45 years ago, little did I realise that it would take so long for the value of strengthening exercises to be recognised. However, it is reassuring that it is happening – albeit slowly.

Text: Werner Kieser



Strong muscles on Mount Everest

Andreas Wolf had a dream: To climb on the world's highest mountain. He did it – thanks to Medical Strengthening Therapy (MST) and Kieser Training.

Andreas Wolf

"I need to be pain-free and fit enough to climb Mount Everest and time is short" It was the beginning of February 2012 and the man casually expressing this wish during a consultation with Dr. Matthias Frank at his MST Practice in Würzberg was no Reinhold Messner. He was not even a top athlete or extreme mountaineer. He was not in good health and certainly not free from pain. A full medical examination diagnosed two acute herniated discs in the lumbar region plus a thoracolumbar scoliosis. Andreas Wolf's spine was far from stable. Dr. Frank was not even able to do a back test because of the pain.

Mount Everest – at 29,029 feet high – is the world's highest mountain. He could just as easily have been talking about an easy Alpine walk. However, what the 41-year old really wanted was to climb high – he wanted to reach Base Camp at 17,700 feet. "I once saw a film about a man who wanted to experience ten adventures before he died," he explains. Of course, Andreas Wolf was not terminally ill. However, he did not want to get to a point in his life where he regretted not doing it.

We drew up a therapy and training plan for him," explains Dr. Frank, "to build up the autochthonous muscles in the spine and strengthen the main muscles used in mountain climbing".

And so, Wolf started intense training on the lumbar extension therapy machine and other machines. He underwent regular medical checks and had some treatment from a chiropractor. "He responded well to the strength stimuli and the mobilisation," confirms Dr. Frank. By dint of an iron will and hard work, Wolf achieved the basic fitness he needed for the trip within a month.

He landed in Kathmandu on 5th March 2012 and three days later arrived in Lukla, where the trek started. However, after two days walking, he developed altitude sickness, including shivering fits, stomach pain and diarrhoea. A fellow German from Karlsruhe gave him some medication but despite that Wolf was hardly able to eat any solid food after that.

Dr. med. Matthias Frank

The village of Namche Bazar – starting point for tours of the Mount Everest

As a result, he shortened his planned route and took a more direct route to Base Camp. The back – he wore a support bandage as a precaution – withstood the test.

"Nevertheless, I needed to reduce the weight in my rucksack. Initially it was just over 25 lbs," reveals Andreas Wolf, "and once you climb above 10,000 feet, you cannot manage more than 1,300 feet per day and every single ounce in your rucksack counts". But he managed it. "I cried, when I reached Base Camp on 18 March," he explains proudly. "Without the MST from Dr. Frank and Kieser Training, I would never have done it".

It took Andreas Wolf 11 days to walk to Base Camp and the return took a further 3 days. He had achieved his Mount Everest dream. "My next ambition is to dive and see a Great White Shark – but only in a diving cage."

Text: Thomas Müller