

# Reflex 34

The Kieser Training Magazine

## Your muscles... ... make you smart

Sometimes our grey matter lets us down: we miss appointments, forget words or mix up names. However, we can take effective action to stop this insidious loss of memory – yes, you've guessed it already, it's sport. If we just sit and moulder in front of the screen, we not only get fat but stupid to boot. The brain, just like the body, needs regular exercise to prevent its decline as we grow older.

Numerous studies have shown that sport is good for brain fitness; it improves intellect, concentration and reaction. Up there in our head we have data highways. Each time we learn a new movement, we lay down a new highway and every time we repeat this movement, we reinforce that highway. If we feed the brain



Photo: © Michael Ingenweyen

with unaccustomed patterns of movement, the brain produces new nerve cells and pathways in which to store this new data. In particular, sport can train the brain and boost blood flow and brain metabolism. This process continues to work well even as we get older and beats any medication available to slow down Alzheimer's, dementia, depression, etc.

**So for budding masterminds, it's time for some strenuous mental exercise!**



## When did you last have your back tested?

**Do you know how strong your back muscles are? Strong enough to effectively support your spine?**

In many cases, it is a lot easier to prevent a problem than cure it. That's one of your likely motivations for doing Preventive Strength Training at Kieser Training. However, weaknesses of the deep spinal muscles often go undetected until it is too late and the pain has set in. While younger, the larger muscles of the back often compensate for these weaknesses and it is only with the onset of middle age that the instability of your spine shows up as pain. Even if you are pain-free at present, you may have such specific weaknesses that are not yet apparent. (See page 2 for more information on the workings of the spine.)

This is where our analytical tools come into play. With our Lumbar Extension and Cervical Extension machines, our specially trained therapists can measure with great accuracy the strength, mobility and endurance of your deep spinal muscles. The resulting graph depicts the complete active function of the spinal extensors, providing easy-to-understand information on muscle weakness and abnormalities, the

tendency of muscles to fatigue and their ability to recover. Individual results are compared on screen with results from the general population of people of your age and gender.

Should a specific weakness be detected, our on-site medical professional will advise you on the best way forward. For example, this may be a set of sessions on the Lumbar Extension machine. To measure and then improve the strength of the lumbar extensors it is essential to immobilise the gluteals and the leg muscles. This is done by anchoring the pelvis much more firmly than is possible on the F3 lower back machine, which was designed to train healthy backs without the 1:1 assistance of a therapist.

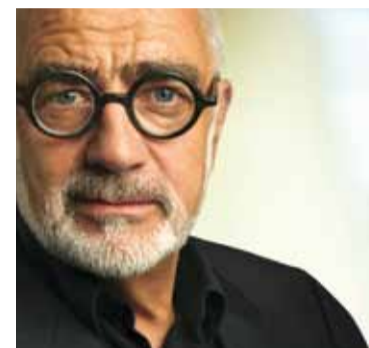
In any case, a regular analysis of your back's strength provides an ideal basis for writing your personal training



programme and gives you an objective measure of your progress. Ask at your facility's reception for details of a back test.

Kieser Training is currently in the closing stages of the development of a system that will allow the measurement of the strength of individual muscles throughout your body. The Delphex Sensor System (DSS) is currently being piloted in a few of our facilities and we plan to roll it out worldwide in the course of 2010 to help make your training with us even more effective.

## Dear Reader



It was 1999: Swiss-based Kieser Training had expanded successfully into the German market. Why not keep up the momentum and give it a go across the Channel? After all, the English have back pain, too. And we need a foothold in the English-speaking world for our international expansion plans, if only for staff training.

But the English seemed to find it hard to see the connection between muscular weakness and back pain. Painkillers are easier and not so strenuous. But things are changing. The facility in London is now making a profit and is a good showcase for those interested in our Master Franchise concept. And eventually, even the message will get through on the British Isles: A strong back knows no pain.

## Kilimanjaro



Kieser Training London customer Emily Hyland, has climbed the Kilimanjaro in August in support of a charity for Tanzanian street children. The 17-year-old was accompanied by her father, Per, also a KT customer. She knew at the summit that the ascent would have been a lot harder, if not impossible, without the proper preparation. So she unrolled a tribute to the idea that had helped with her preparation... More about the charity on [www.msamaria.org](http://www.msamaria.org). Should anyone wish to support the Kilimanjaro Street Children's Fund, they can do so by contacting [kilimanjarokids@gmail.com](mailto:kilimanjarokids@gmail.com).

# KIESER TRAINING

STRENGTH FOR HEALTH

# The spine: load bearer and buffer

7 cervical vertebrae, 12 thoracic vertebrae, 5 lumbar vertebrae, sacrum and coccyx – that’s it when it comes to the body’s support system. Not quite: we must not forget our intervertebral discs, ligaments and muscles without which the spine would be a wobbly assemblage of 24 vertebrae. The spine only functions properly and muscles only provide the required stability if all components work well together.

## Its double S-shape gives it elasticity

The spine is not straight. If we look at it from the side, the cervical and lumbar vertebrae curve slightly towards the front of the body whereas the thoracic vertebrae curve to the rear. This double S-shape gives the spine its elasticity: it acts as a flexible shock absorber by distributing the mechanical stresses caused by movements such as running or jumping by tightening or loosening the “S”. A slight lordosis (hollowing of the back) is therefore desirable and is not in itself harmful.

## Vertebrae – load bearers

The body of each vertebra is permanently fixed to its neighbouring intervertebral discs. As you get lower down the spine, the vertebrae become larger because the lumbar spine has to support heavier loads than the cervical or thoracic spine. A

series of vertebral arches form a vertebral canal, through which runs the spinal cord and from which the spinal nerves exit. Muscles must be capable of leverage and so each vertebral arch has a spinous process, which is the point of origin or insertion for many back muscles.

## Ligaments, muscles and facet joints for stability

In addition, vertebrae are connected to each other by numerous ligaments and muscles, which keep the vertebrae firmly lashed together. In addition, each vertebra is connected to the one above by small facet joints, which together form the chain link that allows movement. It means the body can rotate around its spinal axle, bend forwards, backwards and sideways. Muscles provide the stability required for these movements and the ligaments and discs the necessary support.

## Intervertebral discs cushion the spine

Intervertebral discs account for about one-quarter of the spinal column’s length. Discs consist of fluid-rich nucleus pulposus, which is held in place by an annulus fibrosus, a fibrous ring that absorbs pressure and impacts. The disc is restrained above and below by two fixed plates consisting of hyaline cartilage. However, very high pressure can stretch the fibrous ring so that in certain circumstances it can tear. This is known as a herniated disc (popularly also known as a “slipped disc”). If the nucleus pulposus reaches the vertebral canal or the intervertebral foramen, the result is pain, sensory problems or even a motor dysfunction. However, if the nucleus pulposus does not press on the nerves, a herniated disc may go unnoticed.

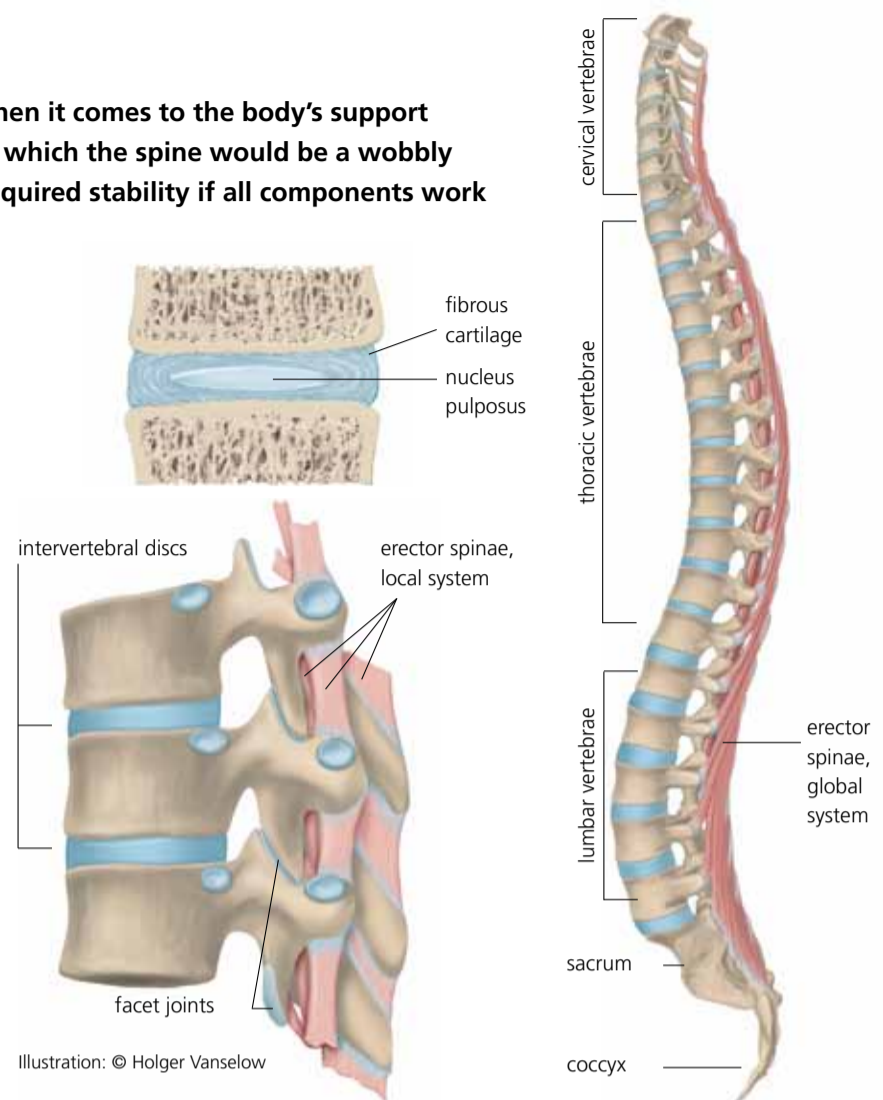


Illustration: © Holger Vanselow

## What effect does Kieser Training have on ...

# ... the spine?



Photo: © Michael Ingenweyen

deep back muscles and stimulates muscle metabolism. Strength training increases the stability of the spine making it less prone to wear and tear and reducing the risk of symptoms. In addition, training eliminates imbalances and improves posture. Strength training also stimulates the process of bone metabolism in the vertebrae, helps retain a compact bone structure and so prevents the loss of bone density typical of osteoporosis.

## Strength training keeps discs healthy

First we need to get a preconception out of the way. It’s not loads that damage the spine. Quite the reverse, they actually prevent back pain, etc. If a load is exerted on the spine, this triggers an exchange of nutrient rich fluids through the collagenous fibres of the intervertebral discs rather than just blood. This is a continuous process, which alternates between load and non-load and can be likened to the action of a sponge. When you squeeze a sponge, it immediately absorbs more fluid. With strength training, this happens automatically, e.g. when you train on E1 (neck press), this exerts a load on the discs whereas training on D7 (seated dip) releases that load.

head to pelvis and that straighten the torso. These muscles are also known as the erector muscles of the spine. The shorter erector muscles form what is known as the “local system”. Its role is to provide a direct connection between individual vertebrae. The longer erector muscles together with other torso muscles are known as the “global system”. Its prime role is to facilitate more extensive movements. Back pain often occurs if the local system in particular is overloaded, i.e. the connection between individual vertebrae is unstable. In addition, untrained muscles are more susceptible to injury and take longer to regenerate than trained muscles. If the response to minor symptoms is the avoidance of certain movements, the symptoms can soon become more serious.

## Back pain as a result of a lack of strength

The spine is stabilised and moved by the muscles that run to the right and left of the spinal column from

## Muscle training as prevention

Effective machine-based strength training helps prevent back pain as it provides targeted training for the

# Doctor’s Tip:

**In most cases you can prevent back surgery with targeted strength training.**

Many of the back-pain patients who attend our practice have already tried numerous other treatments in their long quest for an end to their suffering including acupuncture, physiotherapy, massage and injections to name but a few. However, these therapies treat the symptoms and can only bring short-lived relief. In principle, any change to the spine – unless congenital – is caused by a weakness in the erector spinae muscles. The culprit in terms of pain is the increased pressure on spinal joints and intervertebral discs resulting from muscle weakness. To compensate for this lack of stability, the spine tends to ossify, which in turn leads to spinal stenosis (narrowing of the spinal canal) and facet joint arthrosis (wear on the vertebral body).

We conducted a study of 1,200 patients for whom surgery was indicated. The results were conclusive: thanks to Medical Strengthening Therapy 89% of them no longer needed surgery, i.e. only 11% still needed it.

However, surgery is not always avoidable. Indications for lumbar surgery include paresis (partial paralysis) of the muscles that lower and raise the foot, paresis of the quadriceps but also bladder/rectum problems and intolerable pain over a long period. However, numbness or tingling sensations are not initially surgical indications.

There are two simple tests that you can do to determine whether surgery is required:

1. Keeping one hand held firmly

onto something for stability, stand on one leg. Raise your foot until you are standing on your toes and then lower it and stand on your heel. Repeat with the other leg.

2. Sit on a chair in front of a table and with both hands placed on the table stand up, firstly with the left and then with the right leg.

If you can do both exercises, surgery is likely to be contraindicated.

Of course, a DIY test is no substitute for a specialist examination. However, my tip is clear: Don’t put up with the pain for too long! Build up the strength of your autochthonous back muscles by doing Medical Strengthening Therapy at Kieser Training. You will soon notice the benefits; the pain quickly declines and with every additional session, the risk of surgery will also decline.



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## Reflex

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## F1 – an exercise that goes to the core Expert's tip

F1, the rotary torso trains the external and internal oblique muscles of the abdomen. These muscles act like a corset around the abdomen and give your waist its shape: the firmer the muscles the firmer the abdomen. However, if you have accumulated a layer of fat over your muscles, then F1 on its own will not help. In this case, success depends upon three factors: a controlled diet, increase in calorie consumption through sufficient physical activity in everyday life and regular strength training.

Training on F1 requires considerable concentration. To keep your upper body straight, imagine a vertical line running through your body and make sure that your hips stay still.

As you turn to the left, you contract the right external abdominal muscle

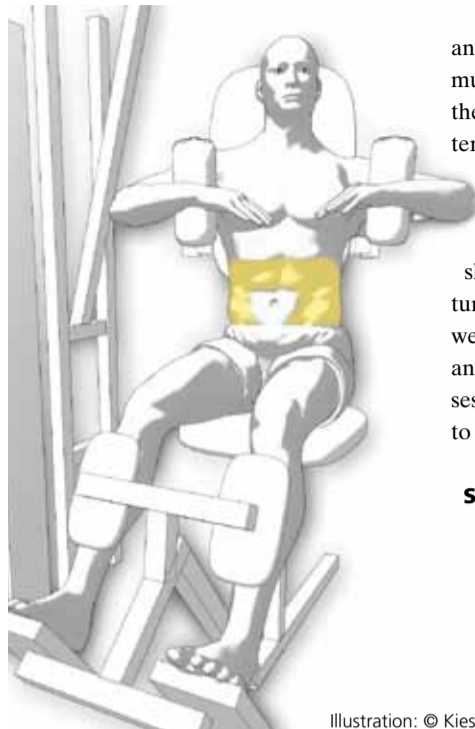


Illustration: © Kieser Training AG

and the left internal abdominal muscle. Similarly as you turn to the right, you work the left external and right internal abdominal muscles. The first time that F1 is included in your training programme, you should limit the amount you turn the torso. It takes about 10 weeks to get used to this exercise and so by the date of your check session you will be in a position to increase the angle of rotation.

See this graph animated on:  
[www.kieser-training.com](http://www.kieser-training.com)

→ Training Preventive training  
→ Exercises  
→ F1

The rotary torso a complex movement that is performed in the facet joints of the lumbar and cervical spine. In addition, the muscles running diagonally between the spinous and transverse processes support the oblique abdominal muscles and so F1 is also a back exercise.

F1 is particularly effective for those with a scoliosis or juvenile kyphosis. Isolated training of the muscles that rotate the torso helps eliminate muscle imbalances and prevents the condition deteriorating.

**Golfers also swear by the F1**

Some 80% of those whose sport involves an asymmetrical movement (javelin, tennis, golf) have muscle imbalances and posture problems. For them, strength training for the



muscles that rotate the torso is important for maintaining trunk stability. However, keen athletes should also include F1 in their programme as it not only eliminates imbalances but also improves swing.

Anika Stephan  
R&D Kieser Training

## Significant strength gains after just 17 training sessions

Newcomers to Kieser Training say they soon experience its positive effects: they feel stronger and have an improved sense of wellbeing. But is there hard evidence to back up this perception? FAKT, the Research Department of Kieser Training recently carried out some research on this and we now have the results.

The study lasted just 9 weeks and involved 22 men and 22 women between 35 and 70 years of age. All participants completed the same training programme. According to Anika Stephan from FAKT, who was in charge of the study “the aim was to see whether there was objective evidence of the strength gains reported by customers after a few weeks of training”? What was needed was documentary evidence and so Stephan measured the maximum strength of participants’ biceps, triceps and quadriceps at the start and end of the study.

Stephan was delighted with the results: “The results show significant strength gains after just 17 training sessions. This confirms the subjective reports received from customers.”

Female participants recorded average increases of 23.2% in the strength of that showcase muscle, the biceps. The equivalent increase for men was 19.5%. For the quadriceps, the maximum strength gain for women was 20% and 22% for men. However, for both sexes, it was the triceps, i.e. the elbow extensors, that came out on top in terms of strength gains. This is not surprising because the triceps is a muscle that quickly

loses strength if it is not trained. According to Stephan, “the female participants were particularly pleased with the increase in their upper-arm strength, as it is often an area that causes problems.”

Female participants showed amazing strength gains of 40.6% and for men it was still a very respectable 25.8%. The results showed that this muscle responds quickly to training.”

However, the study was not just about absolute strength gains. We also wanted to find out how quickly differences in the strength of muscles on the left and right side of our

body could be corrected”, explained Stephan. “And so we measured the strength of the extensors and flexors of the left arm and leg and compared them with similar measurements for the right arm and leg”. An imbalance of up to 10% between left and right is quite normal. However, many of us put a greater load on one side than the other because of work, day-to-day activities or sport. At the beginning of the study, 17 of the 44 participants displayed a marked difference between the strength of the muscles in the left and right arms and 13 had an equivalent imbalance in the strength of leg muscles. After

training for just 2 months, the results were convincing: 83% of participants showed a clear reduction in muscle imbalances.

The study produced extremely good results – what’s more, the participants were also well pleased. “I can confirm what Werner Kieser says, you simply feel better after doing strength training for just a short period”, said Andreas Baidl. He was one of the participants and has been training twice a week at Kieser Training in Schaffhausen since the study ended.

## 5 questions... on training intensity

Strength training works like a cooking recipe: you take a little bit of this, a bit more of that and finally that certain something that gives it the edge and produces the final delight. It’s the same with muscles: if they are to acquire that certain something from training, both ingredients and load must be right.

**But surely it’s the weight that counts?**

Of course, the first thing you feel when you train is the weight you have to lift. However, training success depends upon more than just the weight. We talk about the “training stimulus”: this is a combination of weight, time under load and the quality of the final repetition. In other words, it’s the level of intensity, the time under load and the stop criterion. Each parameter is given a different weighting depending upon your aims, age and any medical problems. However, the decisive factor in ensuring successful training is an “effective” training stimulus, i.e. the stimulus

must be enough to trigger the body’s adaptive response and so produce the desired increase in strength.

**How do you define effective training?**

Training can be a waste of time: If the weight selected is too low, muscles are not subject to an adequate load and so the body fails to respond. To increase strength, the load intensity must be at least 30% of maximum strength. The definition of maximum possible strength is the weight that a person can lift once but only once. So, if you can lift 100 lbs once on B1, that is your maximum and for effective training you need a minimum weight of 30 lbs.

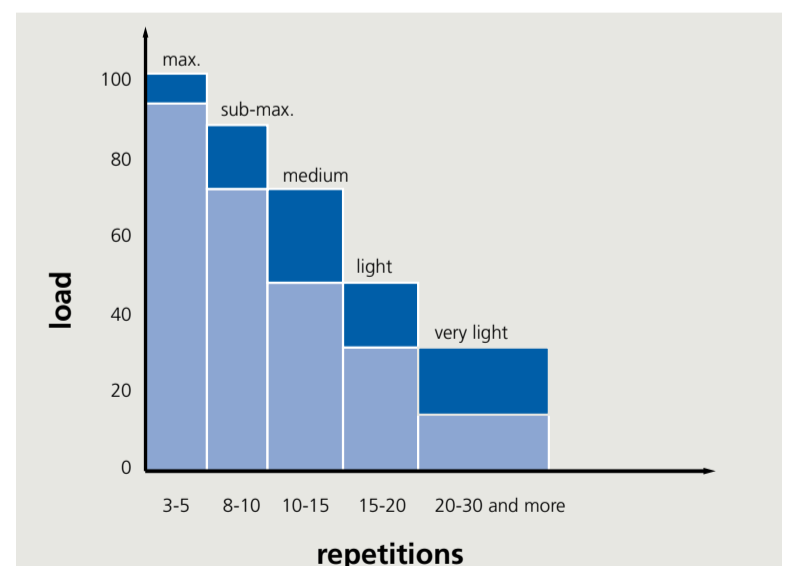
**Great, then it’s enough to train with low weights?**

Not necessarily: minimum weight is not the same as optimum weight. This requires a little more effort. If the training stimulus is low then the effect on muscles is low. It may be enough to maintain existing levels of strength but

strength does not increase. The ideal load, i.e. the one that stimulates an effective response from your body is between 50% and 80% of maximum strength. On the diagram, this is the area marked by hatching and is called the medium to sub-maximal range. If you have a specific medical condition, it may be sensible to reduce the load to “low”. The Kieser Training doctor will determine whether this is necessary.

**What role does duration play?**

In the field of sports science, this is known as time under load, i.e. the length of time that muscles are under tension during an exercise. After all, lifting a weight 5 times is different from lifting it 15 times: With each additional repetition, the weight becomes heavier – or at least it feels like that. At Kieser Training, each exercise is normally done for 60 – 90 seconds, i.e. at the end of this period the muscle is no longer able to function. However, if you have a muscle imbalance or joint or tendon irritation then select



a lower weight and train for 90 – 120 seconds. Adolescents should do each exercise for 120 – 150 seconds.

**So how do I “feel” whether the load is right?**

If you are an adult with any specific health problem, it’s quite OK to extend your limit. Select a weight that means that you are unable to complete the final repetition after doing an exercise for 60 – 90 seconds, i.e. for all

practical purposes the muscles have stopped working. If you have a health problem, do not continue the exercise for longer than 120 seconds, if in so doing, you could not do the next repetition correctly.

**Finally:** To check that all training parameters are correct, we recommend a free accompanied session with an instructor after every 20 training sessions.

## How to prepare for... **skiing**

Four things are needed if you want to cruise effortlessly downhill: strength, stamina, body awareness and last but not least the right Kieser Training programme.

It's winter at last, time for the mountains and fun on the slopes! However, if you want to ensure that downhill fun is not spoiled, you need to prepare yourself properly. Otherwise, after a long day on the skis, you will have the odd twinge in your back and maybe your legs and the next day, your aching muscles will reduce your enjoyment on the slopes. The best way to prevent sick muscles is targeted strength training.

### Downhill – a feat of strength

At full pelt, you put a significant load on your knees and back. Skiing for an entire day requires both strength and

endurance. If you lack either, muscles will tire prematurely and technique will suffer. Errors will creep in and you are more likely to fall. Fatigue not only reduces enjoyment but significantly increases the risk of injury. Many skiers who are injured on the slopes are not sufficiently fit.

### Skiing calls for all-round physical effort

To keep going for a whole day, possibly in thin mountain air, requires good endurance. It also requires quick reactions and coordination so that you can avoid sudden obstacles or changes in surface conditions. Targeted strength

and endurance training is ideal preparation for winter enjoyment.

### The right winter training

In particular, skiing demands strong torso muscles in order to cope with uneven surfaces, the need to take evasive action or complete long downhill runs. A1, A2, F1 and F3 provide the required all-round stability. Fast downhill runs also require strong hips, thigh and calves - A3 and A4 together with B6 and B8 provide the necessary support. Nor should the upper body, shoulders and arms be neglected. If these muscles are strong, you can make the best possible use of ski poles: C1, C3, C7, D6 or D7 provide excellent training.

### What if I'm a beginner?

If your body is fit, then all you lack is the right equipment. Skis and boots can cost a small fortune. However, such an investment is not necessary at this stage. It makes little sense to fork out large sums if you are a beginner. This is the time to try out different types of equipment so that you can decide what's right for you. This is not a problem as good ski schools offer both taster courses and hire out equipment. You can learn the basics of skiing in a course of about three days. After that, the slopes await you.



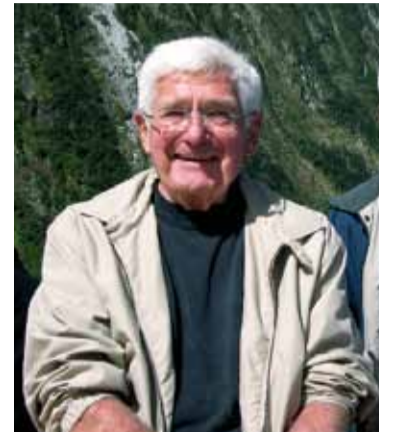
### Obituary Vert Mooney

## Prof. Vert Mooney, MD 1931-2009

Vert Mooney was a leading, internationally renowned orthopaedic surgeon and Clinical Professor at the University of California in San Diego. In 1988, he became aware of the potential benefits of the strength training for back problems advocated by Arthur Jones and focussed his research on what was then a new discipline. Dr. Mooney was Medical Director, co-founder and President of the Spine and Sport Foundation, a highly respected institution in the field of back rehabilitation.

He published more than 225 articles in scientific journals, co-authored 53 book chapters and wrote an autobiography entitled "The Unguarded Moment". Much of his work was ground-breaking, particularly in the field of restorative medicine. He was much in demand internationally as a speaker and gave presentations at some 215 scientific conferences. Together with Professor Dr. Michael Pollock from the University of Gainesville, he was responsible for laying down the fundamentals of Medical Strengthening Therapy, as introduced to Europe by Dr. med. Gabriela Kieser, the first in Europe to open a practice for Medical Strengthening Therapy.

I met Vert Mooney during my training in Medical Strengthening Therapy at



Prof. Dr. med. Vert Mooney

the University of Florida in 1989. When I told him that I was planning to introduce this form of therapy in Europe, he immediately offered his support. Vert met my ideal of a true scientist whose integrity was beyond question. Whenever we had the chance to talk, I walked away with new insights.

Latterly, Vert Mooney had been working on the use of strength training for children with scoliosis and for fellow experts his successes were both surprising and spectacular. Vert Mooney died on 13th October on his journey home from his clinic. We shall miss him.

Werner Kieser

## 10 years ago – when we launched in London

When the launch of Kieser Training London was being prepared in the summer of 1999, Gerald Dixon was one of the first to be interviewed for the position of an instructor. Like the UK market later, he proved a hard nut to crack.



Photo: © Michael Ingenweyen

Just arrived from New Zealand, he had seen our job advertisement in a trade journal and decided to give it a go without knowing anything about us. Very self-confident, he sat in front of our small panel, and immediately told us all the things that were wrong with our training principles and our concept as we tried to explain it to him.

With his various diplomas and certificates in exercise science and experi-

ence as a head fitness instructor and personal trainer in Wellington, he was not going to be won over easily by those Swiss guys whose hands-on experience he questioned there and then.

End of story – in most cases. But there was something about Gerald's follow-up questions that showed that his mind was still open to new approaches. And if he were to represent our approach with as much conviction as

he did his own, then this would be a great bonus for the fresh team we had to recruit and train for the launch at Greater London House in October 1999.

So Gerald was sent to the University of Florida on a course in spinal rehabilitation based on the therapy machines we use. That, and our own staff training courses he attended over the following months all but won him over. However, doubts remained. What really converted Gerald, was his success with patients he treated in the medical department. As therapist, and later head therapist at Greater London House, he saw so many peoples' lives change fundamentally by helping them to rid themselves of their back pain that he became what we had all hoped at the outset: a great ambassador for our concept.

And we could not have enough such ambassadors. The going in London was tough. The idea of Preventive Strength Training was a difficult idea to sell. One London customer likened his compatriots to the notoriously unreliable public transport in the UK: "We are all like British Rail; we use

the system full throttle until it breaks and then fix it at great expense. We never think of regular maintenance to prevent a breakdown."

So Gerald was the natural choice as manager of the second facility we opened in London-Fulham in 2004. While he did a good job, the facility had to be closed again only nine months later. The new main tenant of the prestige Empress State Building where we had set up as sub-tenants had other plans for our space.

Gerald had returned to manage our first London site when fate gave his career another twist in 2005. Gary Harley, then prospective Master Franchisee for Australia and New Zealand, visited London and made him an offer too good to refuse: To promote the concept and help build up the Kieser Training business as COO in Melbourne – much closer to home.

In 2006, KT Australia opened a small pilot facility in Sydenham, a suburb of Melbourne with Gerald in charge. Just 18 months later the first fully-fledged facility opened in South Melbourne. Now the Australian Master Franchisee is looking for sub-franchisees to expand further across Melbourne, then Australia and, finally,



Gerald Dixon

New Zealand. So things might go full circle for Gerald. Like many of his patients and customers, we are grateful for his commitment to making our concept work.

And London? After 10 years, we have a fine little outpost in the English-speaking world with a solid customer base where we are able to train international staff for Prague, Barcelona, Eindhoven and Singapore and whatever market may come next. But, given the right franchise partners, we would also like to focus our attention on developing the UK market, where British Rail is but a fading memory.