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GREENFIELD FITNESS SYSTEMS

Strong Feet Make Healthy People

Latest Knowledge on the Biomechanics of the Human Gait

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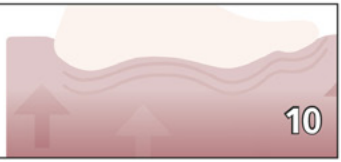

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Background of the kybun MechanoTherapy

For over one hundred years, the principle that the shoe has to support and guide the foot, has been valid in the shoe industry. This basic principle has been deeply imbedded in the conciousness of physicians, shoe manufacturers and consumers. Even today physicians prescribe orthopedic arch supports for problems with feet, knees, hips, and back. The causes of the complaints, such as lack of strength, coordination, and movement of the foot, are often not recognized and only the symptoms are treated.

In the nineties, the Swiss Karl Müller, discovered the health enhancing advantages of walking on elastic clay ground when he lived in the middle of the rice paddies in Korea. To bring the rice paddy feeling into the everyday life of modern man, the engineer developed the shoe with the round sole. This unsteady sole was contrary to the shoe industry's basic principle of 'supporting, guiding, absorbing' and it was massively attacked by science, medicine and the shoe industry.

Karl Müller in a paddy field in the mid-1980s

Thanks to the mostly positive reactions for the body, the round, unsteady sole became a worldwide success and to this day has sold over 10 million times. It has turned the shoe industry upside down and is copied by over 100 companies today. But Karl Müller wanted more. He envisioned developing the perfect rice paddy feeling when standing and walking for the everyday life of modern man, because he believes that the therapeutic reaction is more positive, the more perfectly the feeling on the foot complies with the elastic rice paddy feeling.

Therefore he sold his share in MBT in 2006 and again started from scratch with the kybun concept. After having researched and developed for years, Müller and his team succeeded in perfectly imitating the rice paddy feeling and in bringing it into civilized man's everyday life for any kind of use.

The technologies of MBT and kyBoot differ fundamentally. While the MBT has a crescent sole with a hard disc, the kyBoot sole consists of a elastic air-cushion. The elastic kyBoot sole activates the foot muscles when walking. This is the main prerequisite for a natural walking position because the foot, the foundation of the human body, must be dynamically strong in order to absorb shocks and to guide the body into an upright posture.

The Foot - Key to Every Healthy Body

The foot is the key to the solution of the most common back, knee, vein, and foot problems as well as the prevention of overweight and falls at an advanced age. This is due to the fact that most problems of the musculoskeletal system (signs of overexertion in the front and back area of the foot as well as knee, hip and back problems) start at the foot. This can be demonstrated schematically by means of two bottles. When the bottle is on the ground, it is stable. On ever sky scraper the foundation is the widest part and the construction becomes narrower towards the top.

The foundation must still be buoyant and dynamic to be able to withstand an earthquake for instance. Just like the sky scraper, the foundation (the foot) must be the strongest component of the human body to keep it in good shape for a long time to come.

When the foot is weakened, the body reacts like a bottle which is standing on its cap. In this position the bottle is no longer stable. The same is true for the body. A weak foot leads to signs of overstress in all joints, e.g. the iliosacral joint (point at which the spinal cord and the pelvis are joined) and the spinal cord.

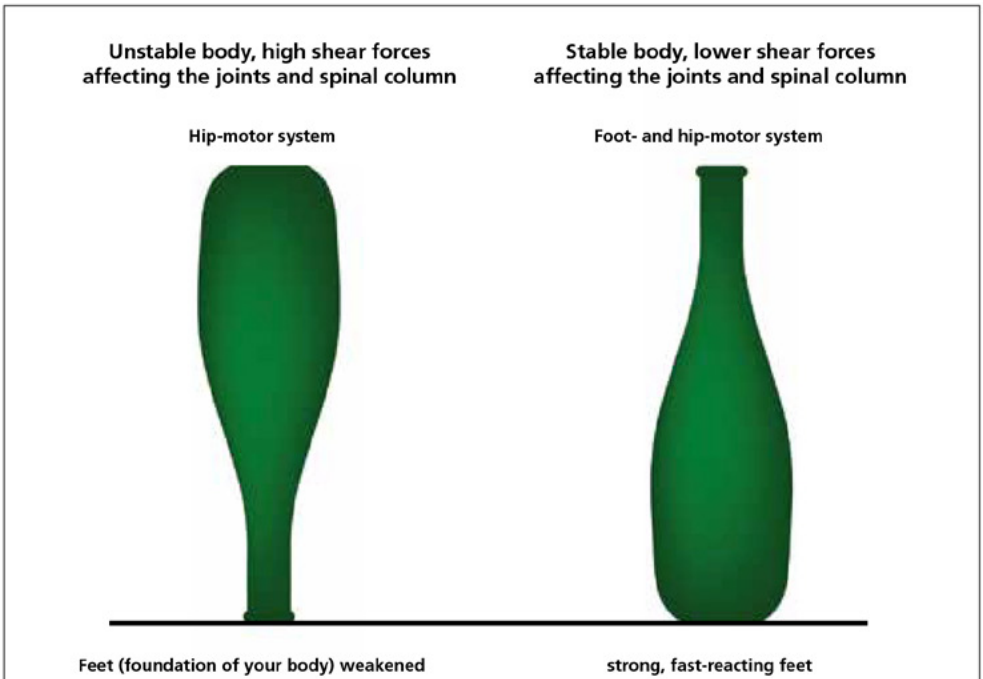


Fig. 1: The foot as the foundation of your body

Causes of a Weak Foot

The Quantity of Movement

100 years ago, man walked 15 km a day, today just 800 m. In the present time, people spend the day mostly sitting down. This does not only lead to an insufficient training of the foot but also to shortening of the muscles, dysbalances and tensions in the entire body. Daily exercise is essential for strong feet, a relaxed musculature, and healthy joints. Apart from the quantity of movement, the quality, i.e. the correct pressure on the joints and the spinal cord plays a vital role. Hereby two gait and posture patterns can be distinguished: the foot-oriented gait and the hip-oriented gait.

The Quality of Movement

What the engine is for the car, the muscles are for the human musculoskeletal system. The muscles move the joints. The muscles which power the foot, knee, and hip joints, supply the main contribution to the locomotion of the human gait. Without arms man could not move along so fast and dynamically. A runner without arms would be slower and would get neck pain because the impetus of the arms contributes in no small measure to loosening the neck muscles. This way, each muscle contributes to the propulsion of the human gait but the two main motors which contribute to the gait are the ‚foot motor' and the ‚hip motor'.

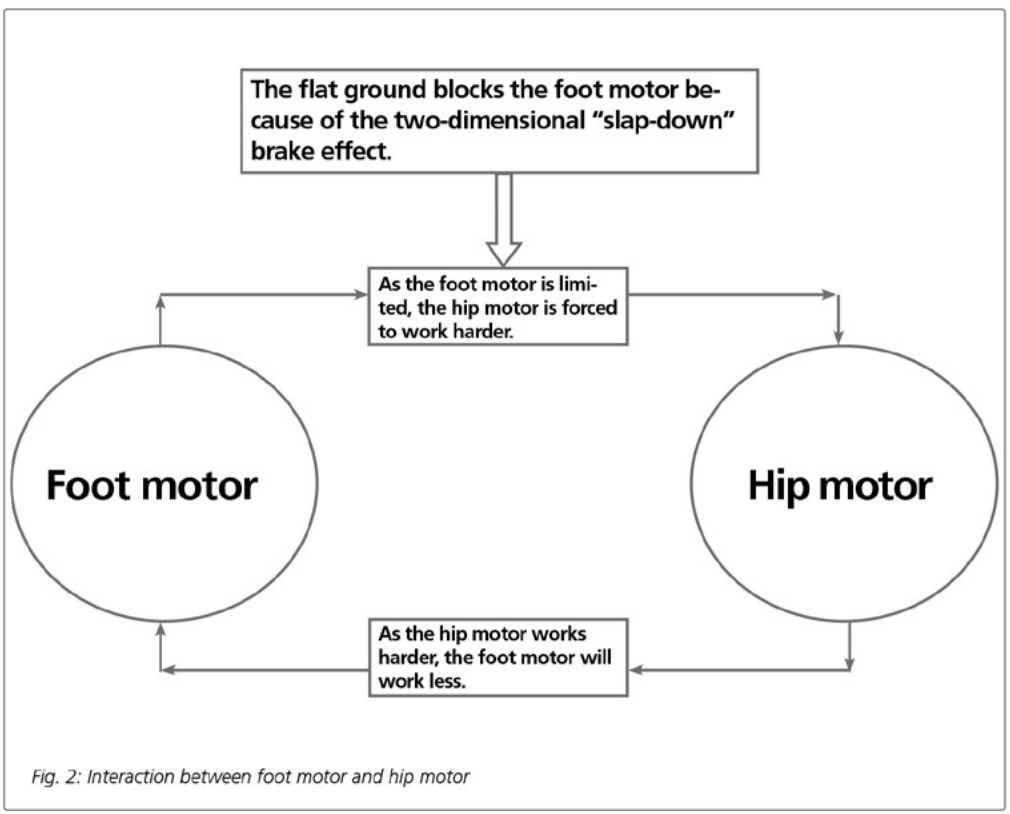


Fig. 2: Interaction between foot motor and hip motor

The Hip Oriented Gait

Cause

Civilized man moves on flat streets in mostly heeled footwear. This limits the mobility of the foot joint and therefore inhibits the foot motor. Arch supports further block the movement of the foot.

When the foot is limited in its mobility, the hip motor compensates in order to still move forward fast and forcefully. For this reason, civilized man mainly uses the hip motor for walking. Thigh muscles are activated to take one step forward and to more or less put one foot in front of the other. Hereby the foot motor is less active then when the primitive people walk barefoot.

As a reaction to intense hip activity, the hip flexors pull the upper part of the body forward which, after some time, produces the typical, forward bent old-age gait with shortened muscles, tension, strain on joints, and relieving postures.

On the other hand, a strong, foot-oriented gait straightens the posture, stretches and relaxes the muscles, evens out dysbalances, and breaks the vicious circle of relieving posture and overstress.

When primarily the hip motor is active and the foot motor limited, the foot motor switches itself off completely after some time. This "switch" is often visible in the gait of older people. They just lift the hip and use the foot only to put it down.

Not the foot is moving the body forward but the force of the hip. The hip is very active, whereas the feet, which should actually be the main motor, are practically no longer functioning.

Impact

A lifelong of high hip activity often results in overstress in the hip and lumbar vertebra areas. Blockages in the iliosacral joint are the result. This is called a hip-oriented as opposed to a foot-oriented gait pattern.

Flat surfaces and heeled shoes limit and weaken the foot. The shear forces (horizontal forces in the joints) are very strong. Musculoskeletal system disorders, e.g. back and joint problems, inflammation of the Achilles' tendon, and overstress of the foot, are mostly caused by a weak foot and unnatural gait and posture patterns.

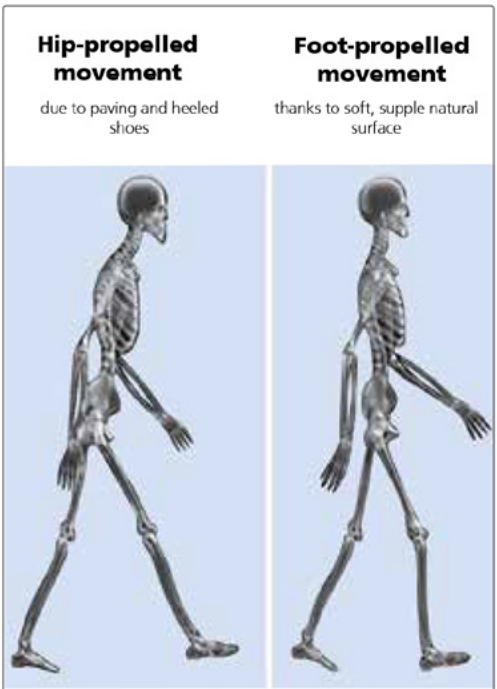


Fig. 3: Human hip- and foot-propelled movement

The Natural, Upright Gait

When walking barefoot on natural, uneven ground, foot motor and hip motor interact in an ideal way. This is shown by observations of primitive people who move as nomads on natural ground. They have a tall, slim stature and show an even musculature, as well as an upright posture. Their foot motor does most of the work. The hip motor rather turns backwards, i.e. the thighs push away to the back more than pulling the step forward. The natural cooperation between the two motors allows the musculoskeletal system to stay healthy as long as possible.

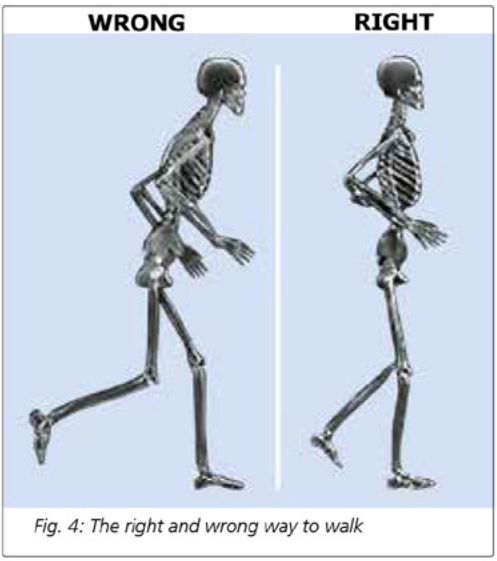


Fig. 4: The right and wrong way to walk

Change of the Gait Pattern through Strengthening of the Foot

A switch to a natural, foot-oriented gait is recommended for everyone. When changing the gait and posture pattern the reactivation of the foot motor as well as the loosening of the hip motor is the priority. The body straightens up. The hip motor is naturally integrated in the propulsion system.

With the switch to a foot-oriented gait, there is a great chance that complaints about the musculoskeletal system are soothed or vanish altogether because the cause of the complaints, an incorrect gait and posture pattern, is herewith eliminated.

This change in the gait and posture pattern can be demonstrated with the Leaning Tower of Pisa.

Should you want to straighten the Leaning Tower of Pisa, its foundation would need to be straightened from the bottom using a considerable amount of strength.

Fig. 5: From a hip-oriented to a foot-oriented gait

The Asymmetry of the Body and its Consequences

Man functions unequally on the right and the left side. Therefore, the right and left hand, as well as the right and left foot are different with regards to strength and coordination. Each person has a supporting leg and an jumping leg. Out of habit, man always stands on the same leg. Because civilized man walks on flat, hard surfaces most of the time, the strong foot becomes stronger and the weak foot weaker. The asymmetry is increased. This can lead to vast differences between the left and the right regarding strength and coordination.

This uneven strength in the left and the right leg is joined in the iliosacral joint and the hip area and can lead to a functional pelvic obliquity which can look like uneven length of the legs. As a consequence scoliosis, tension in the lumbar vertebra area, overstress of the back, hip and knee joints as well as of the feet can appear. Would man walk daily on natural ground, the asymmetry of feet and legs would be evened out.

The left and the right foot motor would be evenly trained so that both feet work likewise. The transition to a foot-oriented gait and posture pattern is made possible by elastic materials. How the special characteristics of this material strengthen the foot is explained in the following chapters.

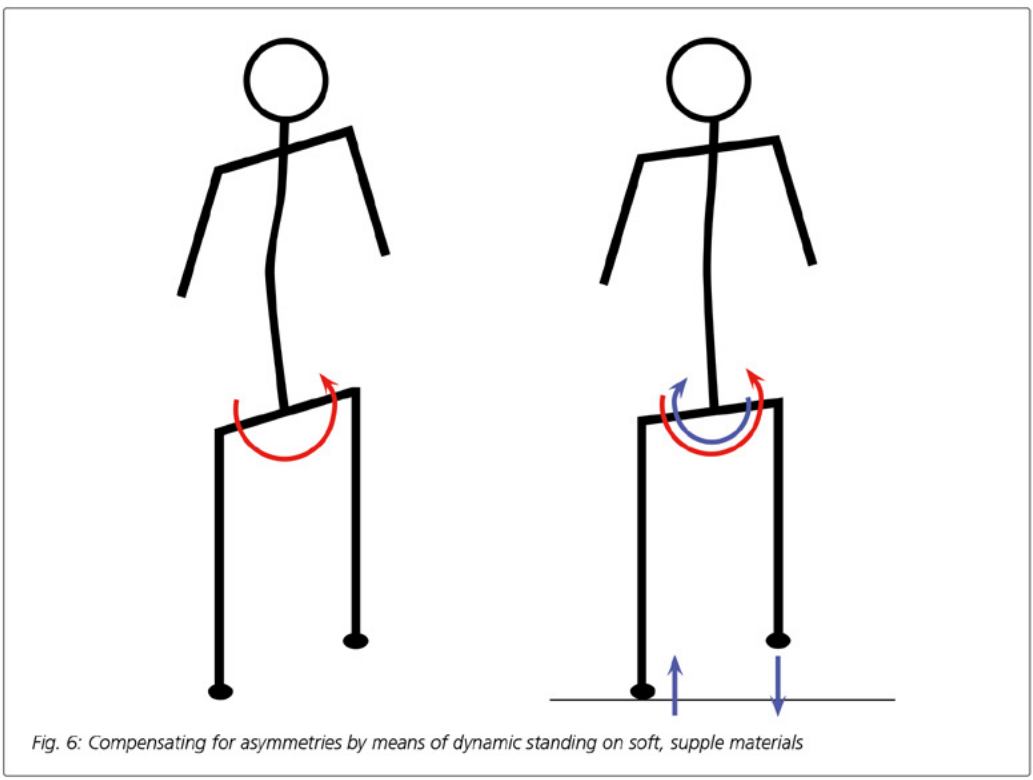


Fig. 6: Compensating for asymmetries by means of dynamic standing on soft, supple materials

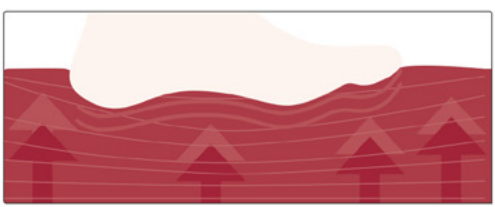
The Special Characteristics of Elastic Materials

During his many years in Korea, Karl Müller discovered the clay ground of the rice paddies. Especially when the water is slowly draining from the rice fields, the clayey ground is extremely pleasant to walk on. Karl Müller researched for years to find which artificial surface is the most similar to this elastic clay ground. Thereby he found materials which consist of multi-component polyurethane (PU).

Müller optimized these materials with regard to three parameters. He was looking for a multi-component PU which:

- is extremely soft but
- still has a high rebounce force and
- hardly tires

This elastic multi-component PU is used by the kybun MechanoTherapy. Its special characteristics make it the ideal material to walk and stand on.



Dynamic standing on elastic material:

- ✓ enables standing for hours without exertion or tiring
- ✓ eases tension
- ✓ trains the foot motor
- ✓ keeps joints constantly in motion without overstressing
- ✓ stretches shortened muscles
- ✓ evens out relieving postures and straightens posture

Standing on Elastic Materials

Standing on elastic material has three main effects. Firstly, the sole of the feet is completely filled due to the softness. Because of the elasticity there is, however, no static support effect compared to arch supports rather there is a dynamic springing of the foot. The foot is relieved, constantly moved and practiced. Standing for a long time is effortlessly possible. A further positive effect of the elastic material is the reduction of asymmetries in the body.

The second effect is the training of the foot and entire muscle chains with respect to strength and coordination. The third effect is due to the elasticity of the material. When standing, one slightly vibrates (similar to a trampoline). Thereby small power impulses are sent through the musculature which keeps the musculoskeletal system in a constant springing movement.

The muscles relax because the slight springing encourages the intra-muscular cooperation. The muscles transfer the forces from one muscle area to another. This cooperation of the muscles has a tension easing effect. You already feel this effect after a few seconds of vibrating on the elastic material.

A further positive effect of the elastic material is the reduction of asymmetries of the human body. Dynamic standing on elastic materials trains the

Thus:

- ✓ tensions and blockages in the iliosacral joint can be alleviated
- ✓ pelvic lopsidedness is reduced
- ✓ joints are evenly stressed
- ✓ painless walking and standing at an advanced age becomes possible

left and right foot motor likewise with regard to strength and coordination.

kybun MechanoTherapy utilizes the positive characteristics of the elastic material on the human body. The surfaces in our civilized world are flat and hard. Therefore there is a need for footgear with which, in everyday life, man can walk just like on natural ground. Walking on elastic material is made possible by the kyBoot aircushion sole.

Your foot muscles are strengthen daily by standing on the kyBounder, elastic spring base and thus allow for a change to a natural, foot-oriented gait pattern which holistically improves your health.

The Elastic Spring Base kyBounder

The kyBounder is a elastic spring base from high-quality multi-component PU. While a traditional PVC mat only feels soft at the surface and deeper down quickly appears hard and inert, on the kyBounder the foot sinks in deeply and softly. At the same time the PU material allows the foot to bounce back like on a trampoline.

Because of the natural foot movements on the soft spring base, the posture is balanced. This specifically addresses the deeper lying muscle layers.

The material does not tire even after intensive use for long periods of time. The PU has a very high depth of sinking in and at the same time a high rebound. Whereas the PVC surface is soft but the foot only sinks in slightly.

Due to the very high, ‚impulse active' crush zone of the PU material which the foot sinks into, the muscles contract much more slowly than on the lower sink in depth of the PVC mat, which leads to benefits such as less limping, better relaxation, comfortable standing, and more motivation to stand rather than sit.

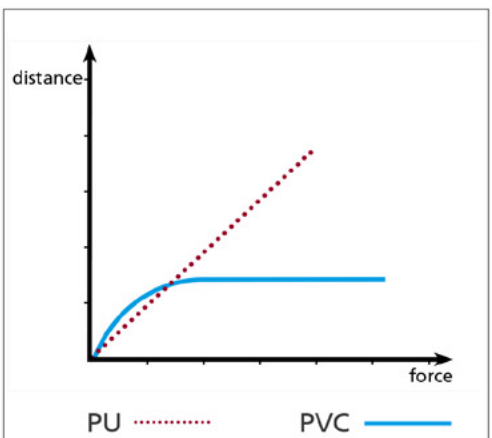


Fig. 7: Force-distance curve; comparing PU and PVC

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Fields of Application of the kyBounder

The kyBounder can be used manifold. With pre-existing orthopedic problems three basic exercises should be regularly performed at the beginning to strengthen the musculature.

These exercises train the coordination between the foot, lower leg, and thigh musculature and improve the shock absorber effect of the musculature with respect to the knees. When executing the exercises standing up, there is less risk of incorrect pressure on the body than when walking. Because when walking incorrect pressure can occur due to steps which are too long or too much vigorous rolling motion of the foot. The kyBounder additionally offers the possibility to just integrate it into everyday life, thereby reducing passive sitting. Making phone calls, watching television, working at the computer, and many more activities can be executed on the kyBounder, upright in motion.

The three basic exercises to strengthen the musculature

The uprightly stretched vibration exercise

Very fast vibrating with stretched knees and upright body. Take a short break after vibrating on the kyBounder for 10-20 seconds.

The exercise can be repeated as often as desired.

Stepping in place in an upright posture

Marching in place for 20-30 seconds. Then take a short break. Hereby, a high body tension is important.

The exercise can be repeated as often as desired.

Light trotting in place in a stretched posture

Trotting in place for 20 seconds. Hereby the thighs are totally loose and are hardly lifted. The body is upright.

The exercise can be repeated as often as desired.

The kyBounder makes everyday life more active

At Home

At home there are many possibilities of standing on the elastic spring base: ironing, making phone calls, hairdrying, writing or playing an instrument. the kyBounder trains the small muscles, dissolves tension and positively influences one's wellbeing.

At the Office

Many people who work in an office suffer from tension, dysbalances, and complaints in the shoulder and neck area. Reason for the physical complaints: passive sitting. Working on the kyBounder at an height-adjustable desk is a healthy alternative.

At School

Children have a natural urge to exercise. In the classroom however, they are told to sit still; and that for several hours a day. High desk and kyBounder are the alternative at school. While standing softly on the elastic spring base, muscles from head to toe are being used to ensure a natural, upright posture. With an height-adjustable desk, a bad posture, such as when sitting, is a thing of the past.

In Sports

Professional and amature athletes train and regenerate on the kyBounder. Training on the kyBounder improves acceleration speed and coordination skills. Professional clubs, such as HC Davos, Young Boys Berne and HSV, integrate the kyBounder into their training program. In the area of rehabilitation and during a regenerative phase, the kyBounder actively promotes relaxation and accelerates the healing process after injuries.

In Therapy

The kyBounder does not heal any illnesses but can soothe the pain of many ailments or even make them disappear. Standing and walking on the elastic kyBounder stretches and strengthens deep lying muscles, improves coordination, and supports the blood flow.

Initial Reactions when using the kyBounder

Chaning to the foot-oriented gait is recommendable for everybody. This change is facilitated by the kyBounder.

The reactivating and strengthening of the foot motor as well as the loosening of the hip motor are in the foreground. With the change to a foot-oriented posture, there is a great chance of reducing musculoskeletal system pains or making them disappear entirely because these ailments are connected largely to the fact that man has acquired an incorrect gait and posture pattern through walking in normal shoes on flat ground.

With this transition of the gait and posture pattern, initial reactions can occur with some people. With this change, the body reverts to the total stretching and completely executes the motion. For joint and back problems irritations may occur or inflammation may increase at the beginning.

Also in the hip area which is now no longer spared but rather activated, irritations may occur. These initial reactions can be largely prevented by a slow training build-up and specific exercises. If orthopedic problems already exist, it is recommendable to regularly execute the basic exercises presented in the previous chapter.

Walking on Elastic Materials

Elastic material lets the foot sink in deep while walking. It also has a large crush-collapsible zone. This way the musculature and the joints are stressed sparingly. The elasticity enables a high coordinative training effect.

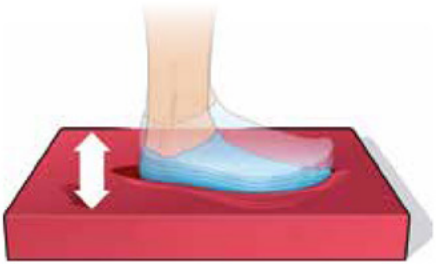

Fig. 8: The kyBounder's trampoline effect

This can be shown with a test on a scale which is fitted to the floor. When walking over this scale at a normal speed with one foot, the indicator immediately jumps to the top and quickly falls back down to zero again.

On the blue curve you can see that at the moment the heel touches the scale, the indicator temporarily darts over the actual body weight. For a man of 75 kg, the indicator would show up to 90 kg. Then the indicator falls down because the other leg gives the impetus so that the weight falls below 75 kg. When accelerating over the first toe, the force is again a bit higher than the body weight.

When we put a elastic material on the scale, the course of the indicator is the same as the red curve. The indicator does not redound as much. The stress is less. It is important to note that the increase of the curve is much flatter. At the beginning, the force does not jump high so quickly. This is a sign that the musculature relaxes much slower and therefore the joints are spared.

These specific characteristics of the elastic material have a positive influence on limping. One usually limps to avoid pain; one only stands very shortly on the painful side und stresses the relieving side more and longer. On the elastic material, the leg ‚spared' beforehand automatically

stands longer. The stress on the right and left side evens out. The muscles which are unconsciously "afraid" of stress and pressure, feel the pleasant softness and contract more slowly. The painful side can be stressed much longer with less pain. Here tension and blockages in the iliosacral joint area are dissolved. Blows to the knee and hip joints occur less. One walks more upright. At an advanced age one can walk much longer without pain.

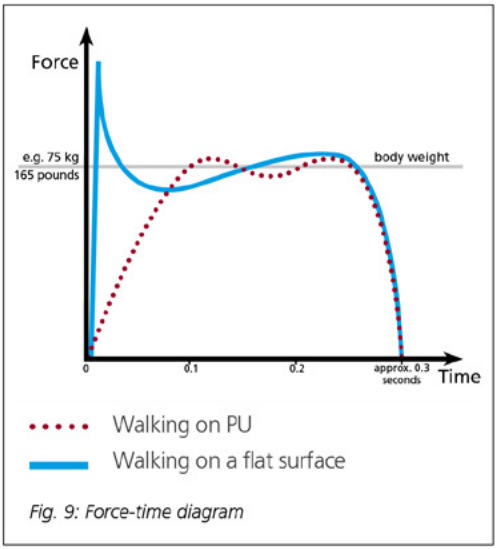

Fig. 9: Force-time diagram

The kyBoot

In the kyBoot the foot stands directly on a elastic mat, which gives the foot the freedom of movement in all directions. Through the elasticity and the instability upwards, downwards, to the outside and inside, the musculature is optimally trained. The joints are spared and the back musculature relaxed as in no other footgear.

Fields of Application of the kyBoot

The kyBoot is an everyday shoe which can be worn the entire day. It is particularly suitable for people who stand at work or have physically strenuouos jobs. The elastic kyBoot sole (aircushion sole) prevents heavy legs, burning feet, back pain, and vein ailments. Because the elastic material always dynamically adapts to the form of the foot's sole, the kyBoot is also ideal for all foot problems.

For athletes the kyBoot is suitable for warming up and for cooling down after training or competitions.

Fig. 10: "Walking on air" in kyBoots

Initial Reactions to the kyBoot

When changing the gait and posture pattern with the kyBoot, the body reverts to the total stretching, completely executes the movements again, and carries out the movements completely. Due to this sudden change, initial reactions can occur. For all medical indications, overexertion, irritations or even inflammations can occur due to the changed stress on the "weak spot".

It is recommendable to wear the kyBoot with care for the first few days to see whether the body shows any initial reaction. In case of reactions, it is advisable to precede according to the recommendations of the indication descriptions, to only slowly increase the training in the kyBoot and to regularly repeat the relevant exercises. For some it is recommended to start the training with the kyBounder (see chapter 4) and to wear the kyBoot only when the feet have already been sufficiently trained on the kyBounder.

The homepage www.kybun.com/en/faq.html gives detailed information on the background of such initial reactions and tips for the use in problem cases.

Individual consultations for medical problems are available for customers via email: beratung@kybun.ch

The kyBoot and the kyBounder for medical Indications

Causes of common medical indications and how the kyBounder and the kyBoot can be used as a therapeutic and training instrument, are explained in the following chapters.

Hallux Valgus

Hallux Valgus is a chronic crookedness of the first toe in the first metatorso-phalangeal joint. This incorrect position is either inherited or ‚trained' by overexertion (bad footwear, i.e. shoes that are too high or too tight).

In therapy, foot gymnastics has proven valuable because the foot musculature must be strengthened. In addition, the person affected should avoid supporting and guiding shoes as well as orthopedic arch supports because these relieve and weaken the foot musculature. As a consequence, the Hallux Valgus becomes worse. The kyBoot offers the foot sufficient space. The toes are not constricted and can move freely. Due to the supple aircushion sole, the foot muscles are permanently activated and trained.

After some time, the pain of the inflammation decreases because the musculature is strengthened and becomes more resistant. The training of the foot musculature by the elastic aircushion sole can initially increase the inflammation because the musculature is strongly challenged.

Therefore it is important that the training is planned individually. The customer should not stand in the kyBoot for too long, but rather walk in it. When walking, a vigorously rolling foot motion needs to be avoided. Stepping down with the entire sole would be ideal. It is recommendable to start the training with the kyBounder and to wear the kyBoot only when the musculature has already been strengthened with the three basic exercises on the kyBounder.

If the musculature is too weak or the customer has trained too much, temporary wearing of normal shoes is recommended (possibly even with the arch supports), i.e. the customer alternates between the kyBoot and the shoes he has worn so far. For some customers the change between kyBoot with arch supports and without arch supports is also advisab-

Fig. 11: X-ray of a bunion (Hallux Valgus)

Fig. 12: X-ray of a stiff big toe (Hallux Rigidus)

le. Standing for too long must be avoided.

A regular training with the kyBoot and the kyBounder is important. However, training with the kyBounder and the kyBoot should never be done to the point of overexertion. At the beginning, the foot should therefore rest regularly in a normal shoe. The longtime goal is to wear the kyBoot as an everyday shoe.

Hallux Rigidus

The Hallux Rigidus is a pain due to overexertion, i.e. arthrosis of the first metatorso-phalangeal joint. The conventional therapeutic measure is the use of an arch support which supports the foot. The arch support limits the mobility of the first metatorso-phalangeal joint and therefore diminishes the pain.

This measure is counterproductive in the long run. After some time, the first metatorso-phalangeal joint reacts even more sensitive to movement and as a consequence hurts even sooner. The arch support therefore also creates compensatory movements when walking. The foot does not completely execute the rolling motion. Instead the motion is compensated for in the knee and partly transferred to the other side so that the other joints can become overexerted.

! For existing orthopedic problems, the three basic exercises to strengthen the musculature should be done regularly (see page 13).

The kyBoot has the following effect:

- ✓ the distribution of the pressure when rolling is essentially more even
- ✓ the forces are more evenly distributed
- ✓ the first metatorso-phalangeal joint is spared but not limited in its mobility
- ✓ the first metatorso-phalangeal joint is still movable but with less force
- ✓ the mobility stays intact and the cartilage tissue can reconstruct itself
- ✓ the pain diminishes or disappears

A slow increase in training is important. In addition to the kyBoot, the regular execution of the three basic exercises on the kyBounder is advisable. Secondly, the same measures as for the Hallux Valgus have to be carried out.

Chronic Inflammation of the Achilles' Tendon

The chronic inflammation of the Achilles' tendon is a consequence of overstress. Very often it occurs to athletes, mainly runners and football players, due to incorrect stress or overexertion. For non-athletes inflammation of the Achilles' tendon occurs due to relieving postures. When a person has knee pain, this knee is unconsciously relieved, the other side overstressed, and in that way an inflammation of the Achilles' tendon is often triggered. Relieving postures also always occur by back pains or foot problems.

Therapy for chronic inflammation of the Achilles' tendon is done in three steps:

- ✓ stretch lower leg muscles
- ✓ reduce irritation and stress on the tendon
- ✓ increase blood flow to the tendon tissue

Walking on elastic materials causes a gentle stress to the musculature. Thus the tendon is no longer irritated and the inflammation can subside. With every step on elastic materials, the tendon is stretched. In addition, muscle pump and veins are activated. The tendon tissue has a better blood flow, fresh blood and oxygen can reach the tendon which supports the healing of the inflammation.

It is important not to change into normal shoes as long as the inflammation of the Achilles' tendon still exists. The customer should wear the kyBoot all the time because in normal shoes the tendon is irritated again and again and the inflammation cannot subside.

Varicose Veins

Varicose veins are veins in which the venous valves are insufficient. Venous valves are particularly numerous in those veins in which the blood must be transported contrary to gravity (e.g. in the legs).

Venous valves act like a valve and are responsible for the blood flowing towards the heart. As the blood flow in the veins mainly takes place through forces from outside veins (contractions of the musculature) the venous valves are also responsible for the blood not to flow backwards during resting periods but is transported, step by step, towards the heart.

Through frequent sitting and incorrect walking, the venous blood is not pushed upwards sufficiently and the weight of the blood destroys the venous valves. When walking, the veins are squeezed more, the harder the foot motor is working. When the ankle is active, the muscular pump of the lower leg musculature is at work.

The venous tubes are squeezed and the blood is pressed upwards. When walking in supporting, guiding shoes on flat surfaces, the motion of the ankle is limited and therefore the activity of the muscular pump is also reduced. When standing on flat surfaces, the muscular pump is hardly working either. The weight of the blood pushes the venous valves through and produces varicose veins.

This can be thwarted when the foot motor is activated by walking on elastic materials, such as e.g. on the kyBoot sole. Thereby the muscular pump is vigorously activated and the venous blood forcefully pumped towards the heart again. Equally, when standing on the elastic kyBounder, the lower leg musculature is constantly moved whereby pumping the venous blood upwards and relieving the veins.

The kyBounder cannot cure varicose veins. The pressure on the remaining functioning veins is better distributed, though. This way the veins are relieved which counteracts the development of new varicose veins.

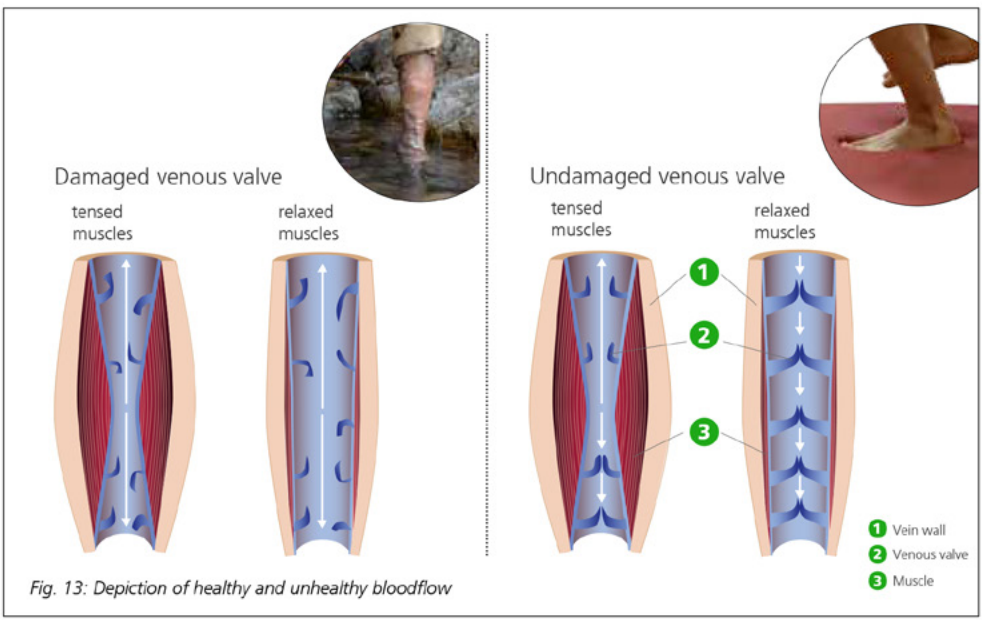

Fig. 13: Depiction of healthy and unhealthy bloodflow

Back Pain

The spinal column is a very complex construction. It consists of 24 vertebrae. Facet joints join the vertebrae, transverse processes at the thoracic spine join the spinal column with the ribs of the thorax. The intervertebral discs between the vertebrae are very flexible and resilient.

The ligaments join the bones and guide the movements. Many small and large muscles move the spinal column. The main function of the spinal column is the facilitation of motion and the protection of the inner organs.

Back pains signal that tension pulls the highly complex structures of the spinal column into malpositions. Due to the malpositions, the nerves which are sending pain signals to the brain, are irritated.

The tensions develop through overexertion, muscle dysbalances, incorrect and relieving postures which in turn occur because of incorrect walking and too much sitting.

Frequent sitting shortens the hip flexors and pulls the spinal column into a relieving posture. This develops a tendency to bend forward which pushes the intervertebral discs out of the vertebrae and irritates the nerves.

Walking on hard surfaces in shoes with heels has similar consequences. Even a small heel prevents the physiological rolling motion of the foot and limits the movement of the foot. Thereby the movement of the knee and the hips is also limited and the bending posture of the back is increased.

Bending forward of the spinal column has the consequence that the center of gravity of the body falls forward thereby lengthening the step. More hip activity develops. The hip flexors are strengthened even more, the back thigh musculature and also the deep abdominal muscles are relieved which leads to a vicious circle of even more relieving and bending.

The forward relieving posture is complemented by a sideway relieving posture because the left and the right sides of the human body are asymmetrical. The left or the right side additionally goes into a relieving posture which leads to a contorsion in the pelvic area.

Tensions develop through bending, incorrect and relieving postures, muscle dysbalances, and shortening of various muscle groups. These muscular problems can be improved or even solved by movement.

The more optimal the quality of the movement is, i.e. the more accurately the movement is scurried out, the better the muscular problems are solved. Correct movement means walking, very light jogging (trotting), or even better, a change between walking and trotting. Hereby it must be noted that the body is in a stretched posture and does not fall into a relieving posture. A lopsided strain (e.g. limping) and bending are to be avoided.

The correct execution of the exercises is explained in the exercise videos and in the documentation to the kybun MechanoTherapy. An optimal aid in executing the movements properly and increasing the quality, is offered by the kyBounder and the kyBoot. On the elastic spring base kyBounder, the foot is neither supported nor guided and can therefore move freely. The kyBounder additionally offers the possibility to be integrated into everyday life and herewith reduces passive sitting. Making phone calls, watching television, reading the newspaper, and many more activities can be carried out on the kyBounder in an upright motion.

The air-cushioned kyBoot sole can reduce back pain and

- ✓ exercise the fine, deep muscles in your stomach, back and buttocks
- ✓ give your body an erect posture
- ✓ stretch (shortened) muscles, especially the hip flexor (Iliopsoas)
- ✓ compensate for muscle imbalances, especially in the lower leg and thigh area
- ✓ improve asymmetries between the left and right legs, as the foot can sink down deep into the air cushion

Since the kyBoot does not limit the mobility of the foot but gives it the entire freedom to move, these unlimited movements also continue in the joints (e.g. hips). The spinal column straightens itself; the joints are more ideally placed on top of each other.

The most common reasons for back pains are malposition and muscle weaknesses due to overexertion of the musculature. With the kyBoot and the kyBounder these can be solved. By loosening the musculature, the pain can be relieved most of the time.

The transition from supporting, guiding shoes to the kyBoot can trigger initial reactions due to the change from a relieving posture (bending) to a pressure posture (stretching).

This can result in the body being overstrained because of the corrected posture (e.g. stretching of the hip flexor, stretching of the lumbar spine) at the beginning. As a consequence there can be pain.

Therefore it is important to build up the training individually. The customer should not stand too long in the kyBoot but rather walk, maybe even alternate between trotting and walking. Before wearing the kyBoot in everyday life, it is recommendable to build up the musculature with specific exercises.

For some customers it is advisable to start the

Fig. 14: Model of the human spinal column

training with the kyBounder and wear the kyBoot only when the musculature has been strengthened on the kyBounder with the three basic exercises..

Knee Pain

There are three kinds of knee pain, e.g. meniscus and patella fiber problems and arthrosis. These are wear marks on the knee, which are a consequence of longtime misapplied force on the knee joint. These misapplied forces occur when civilized man moves on hard, flat surfaces. Wearing shoes with heels leads to passivity of the foot.

When walking on hard, flat surfaces most people take unduly long steps. This irritates the knee joint because the foot does not actively take on the forces but stressing shear forces impinge on the knee joint.

Often the knee is additionally burdened because the untrained feet have the tendency to buckle inwards so that the lateral axis is inaccurate. Therefore the meniscus is overloaded or the patella fiber is irritated. The longtime effect of knocks on the knees is arthrosis.

Would man not walk in supporting, guiding shoes on hard streets and hard surfaces but always walk barefoot on meadows, the musculature of the foot as well as the lower leg and thigh area would be trained with every step. The musculature would work as an ideal shock absorber and the length of the steps would become shorter. The foot would play a more active role in the movement and therefore mainly work as a shock absorber for the knees.

A trained foot tilts to the inside less. It moves physiologically correct, i.e. the foot performs a rotating movement. This starts at the outside of the heel area and ends with pushing off over the first toe. Hereby the knee is optimally stressed.

The elastic kyBoot sole between the foot and the hard ground enables an active movement of the foot. The musculature is evenly trained and works as an optimal shock absorber.

The elastic kyBoot sole:

- ✓ acts naturally absorbing
- ✓ optimizes the stress on the knee and makes it more physiological
- ✓ trains the fine musculature and balances it out
- ✓ trains the coordination of the foot, i.e. optimizes the movement of the foot in such a way that the forces which must be absorbed, are optimally distributed and, most of all, are absorbed by the foot

When changing from a supporting, guiding shoe to the kyBoot, initial reactions can occur because the weakened foot now stands on an unstable aircushion. The entire system can be unstable for a moment so that additional stretching stimuli, due to overstress of the foot and leg musculature, can impact on the knee.

The following points are to be noted when major problems in the knee area already exist:

The kyBoot:

- ✓ should not be worn too long
- ✓ should be worn consciously
- ✓ is a therapy and training device which trains the movement, coordination and balancing ability of the foot
- ✓ should be used as an everyday shoe only when the foot is sufficiently strengthened

Even when the pain subsides after wearing the kyBoot, it is important to limit the time of use at the beginning because extended wearing can cause overexertion which can lead to pain after some hours or even the following day.

The training should be slowly increased, i.e. the customer should wear the kyBoot 2-3 times a day and take it off when pain or irritations occur.

When the customer is without pain, he should continue wearing the kyBoot for a short time.

Tension in the Neck and Headaches

The main reason for tension in the neck is a monotonous, incorrect seating posture. Due to a rounded back, head and shoulders glide forward. The back and neck musculature is overstressed and becomes tight because it must constantly work against gravity. As there are many shoulder muscles which lead into the head, this can cause headaches. The most important measure is the reduction of ‚sitting times' to avoid monotonous postures.

Many tasks can be dealt with while actively standing on the kyBounder, e.g. office work at a high desk, making phone calls or preparing meals.

The correct posture is automatically taken up on the elastic kyBounder. It is important to pay attention to the height of the high desk so that the shoulders are loose when working at the computer. The arms are on the table at a 90 degree angle when writing with mouse and keyboard. The monitor is positioned so that the eyes are looking straight ahead or slightly downward at the monitor.

Summary

Back, hip, knee, foot, and vein pains as well as falls at an advanced age are prevalent. The cause mostly lies in the lack of strength, coordination, and mobility of the foot. Walking on flat surfaces in shoes with (mobility impairing) heels, limits the mobility of the feet and weakens the musculature. The lack in footwork when walking, is compensated for by intensive hip work. The unnatural cooperation between the foot motor and the hip motor leads to muscle dysbalances, tension, relieving and incorrect postures, which increase during the course of time. Back, hip, knee, foot, and vein complaints, pelvic obliquity as well as falls at an advanced age are therefore symptoms of lack of daily training on natural ground, for which man is built.

The analysis of the extremely upright gait of primitive people shows that their posture is directly connected to their vigorous footwork which results from walking on natural ground daily. Such people do not only walk upright, they do not know back, hip, knee, foot, and vein complaints up to an old age.

The kybun MechanoTherapy by Karl Müller is an empirical knowledge science which has recognized these connections and has developed products which make it possible to bring wellbeing and the effect of the elastic natural ground to the everyday life of civilized man.

Standing on the elastic spring base kyBounder and walking on the aircushion sole of the kyBoot trains the feet minute for minute, straightens the body, relaxes the muscles, spares the joints, and relieves the pressure on the veins.

The integration of the kybun MechanoTherapy into everyday life strengthens the foot motor so that the hip motor is relieved when walking and the active forces in the musculoskeletal system switch from the hip and pelvis area to the feet. There is a transition to an upright, foot-oriented gait during which the body moves away from the dangerous relieving and bent posture into a complete, natural stretching where all joint movements (e.g. stretching of the knee) are executed completely. The transition to a foot-oriented gait is an efficient measure to achieve a relief of pain for such prevalent medical conditions as heel spur, Hallux, inflammation of the Achilles' tendon and much more. Thereby, not only are symptoms reduced – except for diagnosed illnesses –but causes are also treated.

The kyBoot trains the musculature and the coordination. Wearing the kyBoot changes the stress on ligaments, muscles, tendons, and joints. This causes a positive change in the posture and the gait pattern. During the transition, some people can have initial reactions which occur in the form of pain or inflammations.

In this case, the kyBoot should only be worn consciously for a short time at the beginning but when possible several times a day. Mostly the daily wearing time can be already increased to one to two hours after a few days. In most cases, the kyBoot becomes the comfortable everyday shoe after a few weeks.

Detailed background information about such initial reactions and valuable tips for use in problem cases is available on the kybun website www.kybun.com/en/faq.html.

Individual consultation for medical problems is available via the email address: beratung@kybun.ch

Should your physician not recommend you the kyBoot or even advise against it, please refer the physician to us so that our biomechanic or medical specialist can inform him/her about the kybun MechanoTherapy.

The head office of kybun AG in Roggwil, by Lake Constance (Switzerland)

The kybun exercise concept

*ky*Boot

walk-on-air

What makes the kyBoot special is its air-cushioned sole. Every step momentarily launches you into weightlessness; the soft, supple sole gives your foot maximum freedom of movement.

The kyBoot:

- ✓ is kind on the joints
- ✓ relaxes your back
- ✓ exercises your muscles
- ✓ activates blood flow in your legs
- ✓ stimulates the receptors in your feet as they feel the floor surface

*ky*Bounder

your daily workout

The springy kyBounder mat is a healthy alternative to sitting passively. Its soft, supple structure encourages your muscles to make constant, minute movements.

The kyBounder:

- ✓ relieves tenseness
- ✓ improves posture
- ✓ strengthens the deep muscles
- ✓ improves your general fitness
- ✓ helps prevent falls in the elderly

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*ky*Bounder

your daily workout

Fit and healthy in no extra time at all

- ✓ Strengthens the muscles
- ✓ Relieves tenseness
- ✓ Kind on the joints

GreenfieldFitnessSystems.com/kybun