

## Therapy

# Pressure wave acupuncture

## A new method, Part 1

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Shock waves have been used in medicine for 30 years. Their original use was for kidney stone fragmentation. Some years later, doctors then learnt to treat orthopaedic disorders such as heel spurs and frozen shoulder using shock wave technology. The treatment of trigger points using shock waves has in the meantime come into wide use, both in orthopaedics and for treating pain. Since 2001, trials have been underway addressing the use of a more gentle wave type, 'ballistic pressure waves', in acupuncture. To date this technique has proved successful in treating arthrosis of the major joints, chronic pain and asthma. Below we report on the possibilities for using this mild stimulant treatment to improve athletic performance.

## Pressure waves

Shock waves occur in nature through phenomena such as lightning, which produces very hard acoustic waves, the echo of which can be heard, even at great distances, as thunder. They can be generated very efficiently using electrical discharge techniques (electro-hydraulic principle), among others, and targeted at areas of the body with the aid of acoustic lenses or reflectors. A special form of these waves is the somewhat „gentler“ ballistically-generated pressure waves. These are produced when solid bodies collide. One way of achieving this is to accelerate a projectile – in the same way as in an air rifle – and shoot it at an impact body, which releases the energy into the tissue positioned behind it in the form of waves. The harder the impact, the more powerful the resulting pressure wave. To facilitate the transmission of the pressure waves from the impact body or shock transmitter into the body, ultrasound gel is applied to the skin – pressure waves, like ultrasound, decelerate strongly in air.

Ultrasound waves are, however, around 100 times weaker than ballistic pressure waves. The energy density of the pressure waves decreases with the square of their distance from the coupling point. The point at which the waves exert their maximum effect is therefore directly below the point at which the shock transmitter is applied. The special shock transmitter for acupuncture has a diameter of just 6 mm. The penetration depth of the pulse is between 1 and 4 cm, depending on the output pressure.

Ballistic pressure waves are eminently suited for generating biological responses. Target areas are not restricted to the special pressure receptors in muscle and tendons, but encompass instead all of the pressure-sensitive areas of the body. Although the precise mechanism of action is not yet completely understood, they have already been successfully used to improve perfusion and increase metabolic processes.

The use of these waves to stimulate acupuncture points is nothing new. Positive results have already been obtained in the treatment of arthrosis, low back pain, asthma and a range of other indications. Studies to date have shown that pressure-sensitive areas in and just below the skin, which are also known from acupressure, can be successfully stimulated with ballistic pressure waves. A very low output pressure of 1.0 to 1.4 bar and a very short stimulation time of 5 to 10 seconds per point are sufficient. At a typical frequency of 11 Hz, this corresponds to 50 to 100 pressure pulses. In muscular and joint disorders, more intensive treatment tends to lead to a counter-reaction; individual areas or points should therefore be treated for short periods only. The patient should clearly feel the impulses, but stimulation should be at all times pain-free.

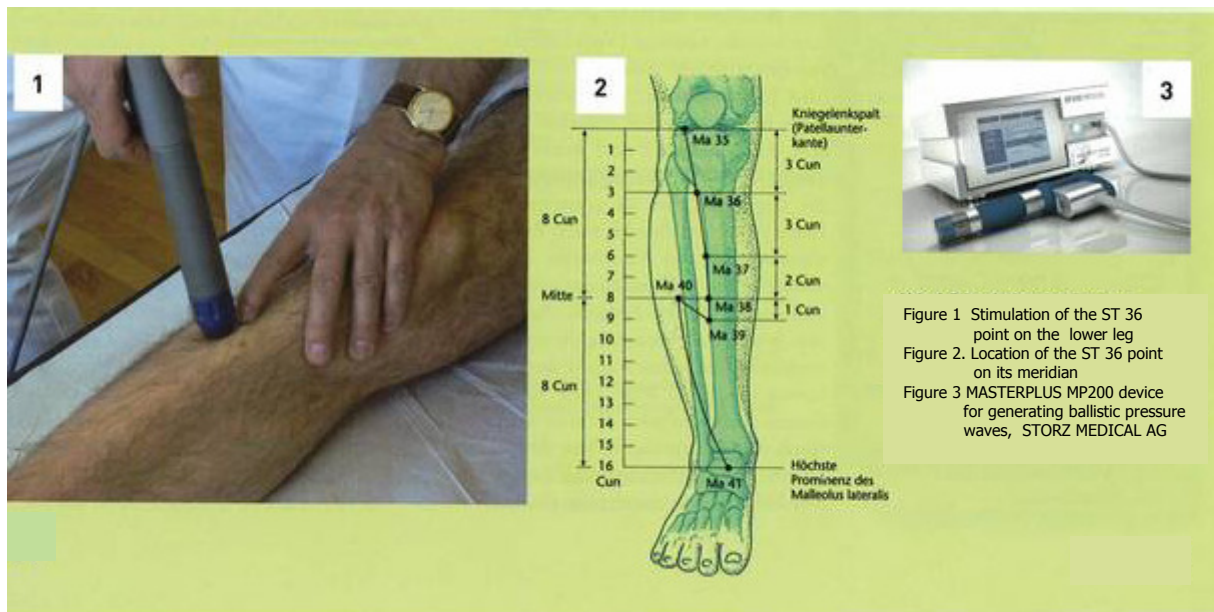


Figure 1 Stimulation of the ST 36 point on the lower leg  
 Figure 2. Location of the ST 36 point on its meridian  
 Figure 3 MASTERPLUS MP200 device for generating ballistic pressure waves, STORZ MEDICAL AG

## Improving athletic performance

In addition to the athlete's talent and training status, athletic performance also depends on an optimum oxygen supply to the muscles, muscular elasticity and tension, and excellent lung and cardiac function.

Acupuncture using shock waves can have a positive effect on these factors by ensuring optimum lung function with maximum capacity, promoting the elasticity of those muscles on which the greatest demands are made and relieving tension. The intensity of the pressure waves used for this indication is, however, much lower than, for instance, that used for treating trigger points. 100 impulses per point with an output pressure of 1.2 bar is sufficient for stimulating acupuncture points. The patient experiences a feeling of intense pressure, but no pain. Higher doses would lead to a defence reaction and tend to counteract the desired stimulant effect.

For every athlete and every type of sport, a programme of points to meet the athlete's individual needs can be selected.

There are, however, also combinations of acupuncture points which are suitable for improving athletic performance in general. Pressure wave treatment of these sensitive points, which are known from centuries-old observations, is a valuable addition to the repertoire of measures for preparing for high-level athletic achievement, as well as for achieving the fastest possible recovery following athletic exertion. Stimulation of points and areas with pressure waves has a better effect on pressure receptors in the superficial muscles than do acupuncture or acupressure.

In the next issue of MedicalSportsNetwork, Dr. Everke will discuss these sensitive points, exploring in particular the leg, arm and back areas and improving lung function. The method will be illustrated with two sample treatments (rowing and cycling).

*References available from the author*

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Read the second part of the article 'Pressure Wave Acupuncture' in our next issue.



**Heinrich Everke** is a General Practitioner and has been using acupuncture in his own practice in Konstanz on Lake Constance since 1980. He trained in Austria (Prof. Brischko), Sri Lanka (Prof. Jayasuria), at the University of Traditional Chinese Medicine in Nanying (China) and in Vietnam (Prof. Tai Thu).

His publications, presentations and lectures (national and international) deal with acupuncture and the wide-range of new therapeutic approaches which make use of it. He has been researching the use of ballistic shock waves in acupuncture since 2001. His work on this topic has been published in journals in Germany, the US and China.