

# MTS MEDICAL

## What is a Tensile Wave?

The tensile wave, the undesirable companion to the pressure wave, can be explained in terms of the action of the waves in a stormy sea. In MTS Spark Wave® the tensile wave content is very low. **2**

## Help for Diabetic Foot Ulcer

When dealing with this chronic, supposedly incurable disease, the MTS Spark Wave® can be a valuable treatment for diabetic feet, helping to prevent irreparable consequences such as immobility and disabilities. **3**

## The Detective Boss

He is delighted if he hasn't heard from his customers in a while, because that's a really good sign. And he takes even greater pleasure in finding faults that have driven many others to utter despair. **4**

## Kidney-friendly lithotripsy – ESWL From Lake Constance to Asia



MTS once again shipped the proven lithogold380® system to Indonesia. It will be used as an advanced therapy system in a medical center in Jakarta.

The delivery of the system to Indonesia is no coincidence: The Land of a Thousand Islands lies in the so-called "stone belt", a region which extends around the entire world and includes South Asia and the USA, as well as other areas in the tropics and subtropics. There is an especially high incidence of kidney and ureteral stones in the "stone belt": The prevalence is a substantial ten to 15 % – a figure which is almost twice as high as in Germany. Three factors are assumed to be the main causes: The sweaty and dehydrating climate, eating habits which encourage deposits in the kidneys, as well as an unfavorable genetic predisposition.

In some parts of the world kidney stones are a so-called lifestyle disease, because people who suffer from obesity or who have a diet that is high in oxalates and animal protein are affected more than average. Oxalates are the salts and esters of oxalic acid and occur in coffee and tea,

for example. Generally men suffer from kidney stones twice as often as women.

Kidney stones can cause extremely painful colic as well as nausea and vomiting. An inflamed stone in the ureter is a life-threatening condition.

The lithogold380® system enables an effective, safe and cost-effective treatment of kidney stones. The stone is shattered directly in the kidney by means of extracorporeally generated shock waves. The stone fragments can then be flushed out with the urine. The fact that the treatment of kidney stones is non-invasive is a particular advantage, as post-operative risks are avoided. Another reason to choose an MTS-Spark®-Wave-System is the experience that these systems are extremely kidney-friendly and the haematoma risk after treatment is very low.

MTS customers have access to a worldwide network of service points. In addition, MTS systems are low-maintenance and have a robust design and construction, which is a clear advantage for sales far away from the production site on Lake Constance. 

## Editorial

### High Tech fighting High Cost

*While politicians rack their brains how to bear the high costs of modern high-tech medicine, and how constant progress is possible at acceptable costs, we take action.*

*Bone fractures that do not heal or are hard to heal, so-called pseudarthroses, are protracted and costly complaints, which are very stressful for the patient. Since more than 20 years they have been successfully tackled with shock waves: in 1991, Professors Valchanou and Michailov from the Military Medical Academy in Sofia, Bulgaria, published his experiments for the first time. The idea of the researchers was to stimulate the hardened edges of the pseudoarthrosis, which prevent the bone from joining, whilst at the same time keeping the periosteum intact. Retention of the bone-forming tissue stimulates the rapid formation of small blood vessels and fresh bone cells. The latter migrate to the fracture gap, where they can multiply.*

*In 2005 it was discovered that shock waves encourage the growth factors necessary for this process. It was a real pleasure for me to have the opportunity to meet researcher and pioneer Professor Valchanou at the Congress of the International Society for Medical Shockwave Treatment ISMST 2017 for a valuable and illuminating exchange.* 

Today, 29 years after the first report this therapy has gained acceptance: The treatment of non-healing bone fractures with shock waves is successful, virtually free of complications and causes minimal stress to the patient. In addition, the treatment is cost-effective in comparison to other therapies, such as surgery, for example. However, its use in clinics is not yet established: The wheels turn slowly in medicine. Perhaps it's no surprise that cost-effective methods have a particularly hard time...?

MTS plays a leading technological role in the field of pseudarthrosis treatment. With orthogold280® we offer a sophisticated and effective treatment system – the only one currently available, in fact –, which can cure over 80% of patients with

just one treatment. With the now recognized protocol for orthogold280®, developed by Prof. Dr. med. Wolfgang Schaden, a pioneer in shock wave therapy at AUVA trauma clinics, among others, many thousands of patients in Austria have been spared extensive periods of suffering, surgery and high costs. Today this method is the therapy of choice in Austria – and MTS is the market leader.

I am proud of this success. With our high-tech systems we meet and exceed not only the safety and efficacy requirements prevailing in medicine, but also the demands on cost-effectiveness!

Sincerely yours,  
Nikolaus Hopfenitz,  
CEO MTS



## Physics

### What is a Tensile Wave?

Not everyone has an in-depth and passionate interest in the physics of the shock wave. What is sometimes overlooked is the fact that pressure waves have an of-

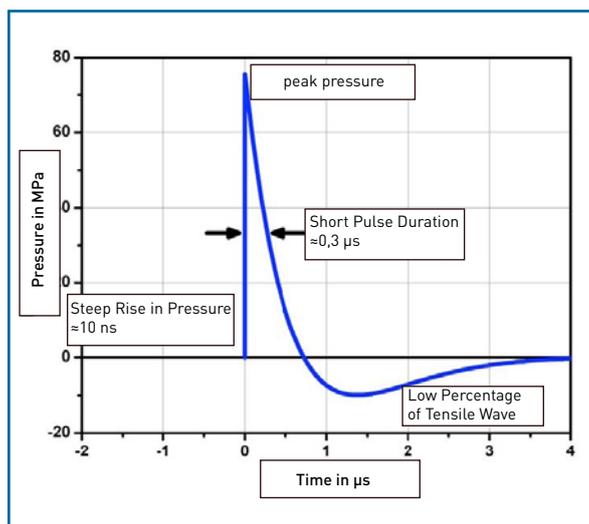
ten powerful partner: All shock waves consist of two parts – a pressure wave and a tensile wave. This can be simply illustrated by a wave which crashes onto the coast from a stormy sea: The wave does not remain on land, but retreats back into the sea. Both, the impact of the wave on the shore (positive portion of the wave) and the “sucking” retreat (negative portion of the wave), have a specific effect.

There is a similar behavior in extracorporeal shock wave lithotripsy (ESWL) and extracorporeal shock wave therapy. Tensile waves develop because the pressure impulse of the shock wave drops very quickly and sharply and changes to a negative pressure, which can be explained with the abovementioned “suction”.

When treating calcifications which are accessible with shock wave therapy, the pressure portion of the shock wave compresses the stone. The released energy breaks the calcification. The tensile portion causes the gas bubbles and haematoma.

In electromagnetically and piezoelectrically generated shock waves, the negative portion, the tensile wave, is often as large as the positive portion, the pressure wave portion. SparkWave®, the patented electrohydraulic shock wave generation from MTS, is setting new standards in the quality of shockwaves.

The tensile wave is not important for the stimulation of growth factors, which is the aim in certain therapies. Therefore, and because the tensile wave portions of the shock wave can produce pain and bruising, MTS Spark Wave® is designed so that the tensile portion remains very small.



#### Imprint:

MTS Medical UG  
(limited liability)  
Robert-Bosch-Str. 18  
78467 Konstanz  
Phone: +49 (0)7531 36185-0  
Fax: +49 (0)7531 36185-70  
info@mts-medical.com  
www.mts-medical.com  
www.mts-science.com

Authorized representatives:  
Nikolaus Hopfenitz,  
Ralph Reitmajer  
Court of Registration:  
Freiburg District Court  
Registration number: HRB  
708104 sales tax identification  
number according to § 27a  
Sales Tax Law: DE 282675972

Coordination: Jürg Hurter,  
www.hurter.com,  
Collaboration: Christina Hauf,  
Composition: Ines Filipp  
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from us; the PDF version is  
available at  
www.mts-medical.com

To ensure regular delivery  
please contact  
info@mts-medical.com.  
MTS Medical develops  
and produces Spark-Wave®  
therapy systems for  
highly effective shock wave  
applications with outstanding  
treatment results in ortho-

pedics, traumatology, wound  
healing and urology - as well as  
in areas which have previously  
been difficult to treat. Thanks  
to its participation in various  
clinical studies, MTS Medical is  
one of the pioneers in the field  
of non-invasive tissue healing  
and regeneration.

## Wound Therapy

# Help for Diabetic Foot

If it doesn't hurt, ignore it. This is fatal for diabetic feet: Because the sensitivity of diabetic feet is often limited, pain which would normally serve as a clear warning sign often goes unnoticed for a long period of time. Incorrect weight bearing, chronicity and the associated cracks in the skin as well as nerve damage result in injuries, cell damage, ulcers and necrosis. In Diabetes Mellitus the diabetic foot is a frequent complication, which can severely affect the patient's quality of life and even lead to amputation. Around one in fifteen diabetics suffers from so-called diabetic foot syndrome (DFS). A quarter of a million people are affected in Germany alone.

The main symptom of diabetic foot is wounds that are slow to heal. It therefore makes sense to use shock waves for therapy: Shock waves stimulate the formation of tiny blood vessels and new tissue. This shows that not only do shock waves eliminate symptoms, but they also stimulate healing.

How does this work? Shock waves lead to increased endothelial nitric oxide synthesis (eNOs). This is an enzyme which regulates the blood pressure and expands the blood vessels. The vascular endothelial growth factor (VEGF) for lymph and blood vessels also increases. These are signal molecules which assist in the development of blood and lymph vessels. Due to the increased release of nitric oxide, the local blood vessels are expanded and local blood flow is improved. This is essential for



healing. At the same time the VEGF has a positive effect on the formation, preservation and function of new blood vessels. As the shock waves also have a bactericidal – bacteria-killing – effect, infections heal more quickly.

MTS recommends a ten-minute treatment with the unfocused (even action)

OP155 therapy applicator. This therapy can be repeated every one or two weeks until the wound is completely healed. Even when dealing with a chronic, supposedly incurable disease, the MTS Spark Wave® can be a valuable treatment for diabetic feet, helping to prevent irreparable consequences such as immobility and disabilities. 

## TRT at Sexual Medicine Conference

# Spark Waves® in Nashville, Tennessee



At the end of October the 20th Congress for Sexual Medicine, organized by the Sexual Medicine Society of North America (SMSNA), took place in Nashville, the world-famous city of country music in Tennessee. Internationally renowned experts for sexual medicine reported on the latest standards in research, diagnosis, therapy, prevention and training in sexual medicine.

TRT Tissue Regeneration Technologies LLC, Woodstock GA, the exclusive distributor of MTS in the USA presented urogold100 at the Congress and supported our partner Dr. Irwin Goldstein, Director of "San Diego Sexual Medicine" and Clinical Professor

of Surgery at the University of California in San Diego. He talked about the urological use of the MTS system urogold100®. Irwin Goldstein enthusiastically refers to the MTS systems as "the real shock wave therapy". He is especially impressed by the parabolic reflector from TRT and MTS, which evenly transfers the energy of the shock wave. urogold100® is successfully used in the non-invasive and non-pharmaceutical treatment of certain forms of Erectile Dysfunction (ED).

We are delighted by the great response to urogold100® at the SMSNA Congress by many critical assessors. 

## MTS Employee Profile

# Jochen Boss, the Detective

Not hearing anything from his customers is the second greatest pleasure in Jochen Boss's job. As Service Manager at MTS he heads up the Repair and Maintenance Department: If his phone remains silent, this means that everything is going smoothly. And what is his greatest pleasure? "Finding a fault that has driven others to despair!" The complex MTS systems which he deals with demand a great deal of know-how from the support staff when it comes to maintenance and repair. This challenges the detective instincts of Jochen Boss and his colleagues. The strong ambition of the qualified industrial mechanic and state-certified technician with professional experience in mechanical engineering and maintenance is to find a solution for every technical problem.

He has always succeeded in doing this so far, he says. One of his aims is to encourage users of MTS equipment to commit to a thorough maintenance program: "The maintenance of MTS systems doesn't involve a great deal of effort, and if you care for them properly you can preserve the efficiency of your systems and the value of your investment over many years!"

Jochen Boss comes from the Swabian Alps and has been with MTS for five years. He finds it more and more fascinating to see what can be achieved with shock waves, and the longer he works in his team the more enthusiastic he is about



*Jochen Boss, 31, Head of the Service, Repair and Maintenance Department at MTS Medical in Konstanz - in the place of a big catch on a fishing line we see MTS's OP155.*

the close and friendly cooperation. Occasionally he travels abroad in the capacity of MTS technician to present equipment: "I am proud to represent a medical company, which is at the cutting edge of technological development and successful throughout the world."

In his leisure time Jochen Boss pursues both loud and quiet interests: He is a passionate handball player and enjoys going to rock and metal concerts. At quieter

moments you will find him fishing for pike and whitefish on Lake Constance. Pike, as he tells his fishing pals from other areas, are considered a valuable catch on his lake. But even if he doesn't catch anything, he sees fishing as a real pleasure: "The fish survives, and I have enjoyed the tranquility of nature!" What greater pleasure could there be for Jochen Boss? When his phone rings and it's not a customer needing a repair, but a shock wave success story...! 🎣

# NEW



## Spark Wave®<sup>-</sup>

for erectile dysfunction

the key  
to happiness.



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