

**COMBINATION THERAPY**



# CASE STUDIES





## Alternative therapy for the treatment of windgalls

### Success with heat and low-level light

Ways of treating windgalls on the fetlock joint aim to reduce any increase in circumference, soften pre-existing hardening, and prevent possible lameness in the longer term. One option derived from alternative medicine is "low-level light therapy", as this case study demonstrates.

The example of Amadeus, a 19-year-old Dutch pony gelding, is used to present a treatment - namely a combination of heat and light - that can be applied on its own or as an adjuvant to conventional therapy. Amadeus has been trained to a level where he can compete in dressage, but for quite some time has only been ridden for pleasure. He is kept in a stall in freestanding outdoor stable and has access to pasture for at least three hours every day. In the spring of 2014 he developed a typical joint windgall for no apparent reason. Although this didn't lead to actual lameness, Amadeus was no longer able to move in perfect step; lameness only set in after more substantial exertion.

The initial therapy consisted of protecting the area with the usual stable tendon boots. This had no effect whatsoever: the windgall visibly grew, and tended to harden as well. Treatments used by the local veterinarian included corticosteroids, embrocations to increase the flow of blood, leeches, acupuncture, and Chinese herbs, yet none of them produced any lasting success: after a temporary improvement, the windgall hardened again.

In October 2014 it was decided to commence a combination of low-level light and heat therapy. In order to achieve this, tendon boots containing 45 LEDs with an emission wavelength of 632 nm are applied; these LEDs are simultaneously incorporated into a carbon fiber which is heated by electricity, producing wide-area heat with a wavelength in the 8–12 µm range.

When the treatment began, the leg manifested a circumference of 28.5 cm over the windgall. Immediately after the first treatment, the circumference had reduced to 26 cm, although after roughly one hour it had swollen again to 28 cm. Amadeus subsequently received this treatment every day for four weeks; in the second month this was reduced to twice a week, and then only once a week.

The circumference over the windgall fluctuates between 25 cm and 26 cm; there is still a slight swelling, although it is very soft. Amadeus no longer shows any evidence of being unable to move in perfect step, let alone lameness.

The invigorating and energizing effect of a long-wave red light lamp is common knowledge, although in this case the red light heat isn't produced by the small LEDs in the tendon boot, and is instead transferred to the skin by means of a carbon fiber. This means that the heat radiation is no longer restricted to a beam (as is the case with a heat lamp), but is emitted onto a wider area. This in turn improves the circulation in the area that is irradiated. The medical utilization of light in a specific wavelength has already been practiced for over 40 years. Near-infrared light is used to alleviate pain, treat inflammation and edemas, and heal wounds and other damage.

This type of therapy is very controversial among adherents of classic medicine. This is probably down to the fact that knowl-

apy depends is incomplete, and studies examining wavelengths, radiation density and strength, treatment intervals and so forth vary greatly.

#### Photobiological effects

In any case, the impact of low-level light therapy (LLLT) depends on the dose that is administered. Numerous studies have nevertheless observed a "two-phase dosage effect" whereby lower light energy produces better results with regard to the stimulation of tissue cells and repair processes. However, this also makes it clear that radiation using light is not based on thermal activity, and that - similar to plant photosynthesis - photochemical effects have a role to play: light is absorbed, and this initiates a chemical change.

If this low-level visible light is to produce photobiological effects, the first prerequisite is that the photons should be absorbed by a specific receptor at the molecular level. Examples of this kind of photoreceptor (or chromophore) can be found in chlorophyll, hemoglobin, myoglobin, flavoproteins, porphyrins, and cytochrome c oxidases.

The second prerequisite relates to the optical characteristics of the tissue, where there is a so-called "optical window" through which a maximum amount of radiation can penetrate into the body; this window can be found at a wavelength of approximately 600 to 1200 nm. For example, the cytochrome c oxidase - a vital catalyst in the respiratory chain - responds to a wavelength of 630 nm. This theoretical background allows one to conclude that low-level light therapy enjoys numerous indications. Its therapeutic effect - amongst other things in relation to epithelial tissue, connective tissue, damage to peripheral nerves, tendons, muscles and joints - has undoubtedly been proven in countless studies.

Luisa Bartholomé, Erhard Schulze, 44627 Herne, Germany

#### Windgalls:

Windgalls are increases in the circumference of synovial structures. Idiopathic synovitis leads to a chronic contusion affecting joints as well as tendon sheaths or synovial bursae. Possible causes include incorrect posture, non-physiological strain, pulled muscles, or minor trauma.

# Heat and light – a therapeutic combination

When applied individually, the use of heat and light is extremely widespread in human as well as veterinary medicine. When it comes to heat, everyone is familiar with the therapeutic benefits of warming substances, warming compresses, and heat lamps in particular. They generally take effect by promoting the circulation, and this can for example relax the musculature, improve lymphatic drainage, and so forth.

If one compares heat lamps with products that combine heat and light, one is initially struck by the fact that they both radiate red light. In the case of heat lamps, this red light nevertheless merely serves to raise the temperature. By contrast, the red light in the therapy devices that are currently available - such as tendon boots or flat pads - is produced by LEDs which only heat up to a negligible extent: what matters here is the wavelength of the light.

Ever since the 1960s there have been numerous scientific studies concerning treatment with low-energy light; nonetheless, this form of therapy still has something mystical or “esoteric” about it, particularly from the standpoint of academic medicine. The fact that the latter takes a very critical view - to say the least - of this form of treatment is firstly because the studies that have examined wavelengths, the strength and density of radiation, the length of treatment (and the intervals between treatments) have varied greatly; secondly, the mode of action has not yet been fully explained.

If white light is passed through a prism, it is refracted twice and the colors of the spectrum (from short-wave ultraviolet right through to long-wave infrared) are displayed, i.e. with wavelengths ranging from approx. 370 nm through to approx. 800 nm.

Or to put it another way: the light from an incandescent bulb (for example) - namely white light - is composed of

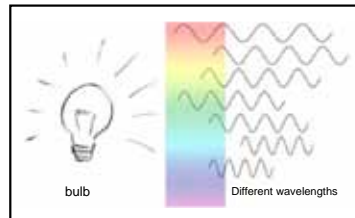
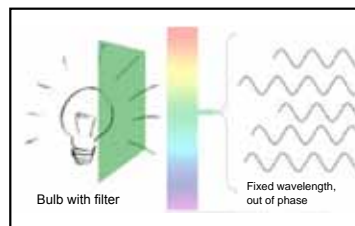


Fig. 1: White light

many different colors, and thus different wavelengths too.

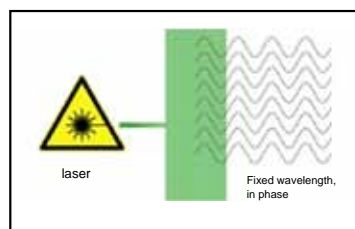
The photons are not only to be found on different wavelengths: in addition, some of them are located in the trough of the wave, some on the peak, and most of them somewhere in between.

However, if we add a color filter we end up with a uniform wavelength, whereas the energy state of the photons still lacks any sort of order.



Abf. 2: gekleurd licht

This changes if - in addition to the color filter - the phases of the waves are synchronized, thereby producing laser light.



Abf. 3: Laser light

Almost as soon as the laser had been developed, studies were able to demonstrate that synchronization of the individual phases is not required for most indications; it is often sufficient to use the corresponding wavelength.

But why red light in particular? Whenever light hits the skin, it is absorbed to a greater or lesser extent and the rate of absorption is firstly determined by the wavelength of the light and secondly by the substance that the light comes into contact with. Three components of the skin/cells should primarily be mentioned at this point: water, hemoglobin, and melanin. The corresponding absorption curves are shown in Fig. 4.

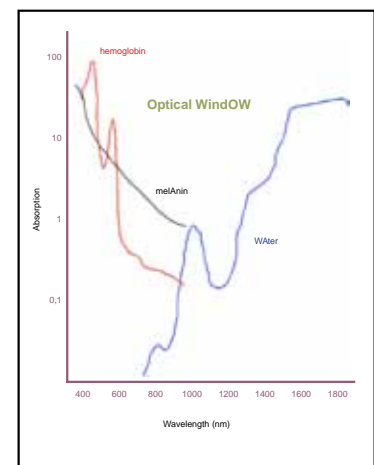


Fig. 4: Absorption curves

One is thus left with an “optical window” via which the light can penetrate the skin; maximum penetration is achieved if the wavelength is approximately 1200 nm. However, we also need a receptor for the photons in order to register any effect.

The individual cells contain mitochondria (in the form of organelles), and this is where energy is obtained by means of the respiratory chain. Cytochrome c oxidases are some of the most important enzymes in the respiratory chain, and they all respond to wavelengths of approx. 630 nm. One therefore needs to realize that this light therapy is not based upon thermal activity, but chemical activity instead. Activating the cytochrome c oxidases via the light of a defined wavelength initiates a chemical reaction which is similar to photosynthesis in plants.

These processes are identical in every

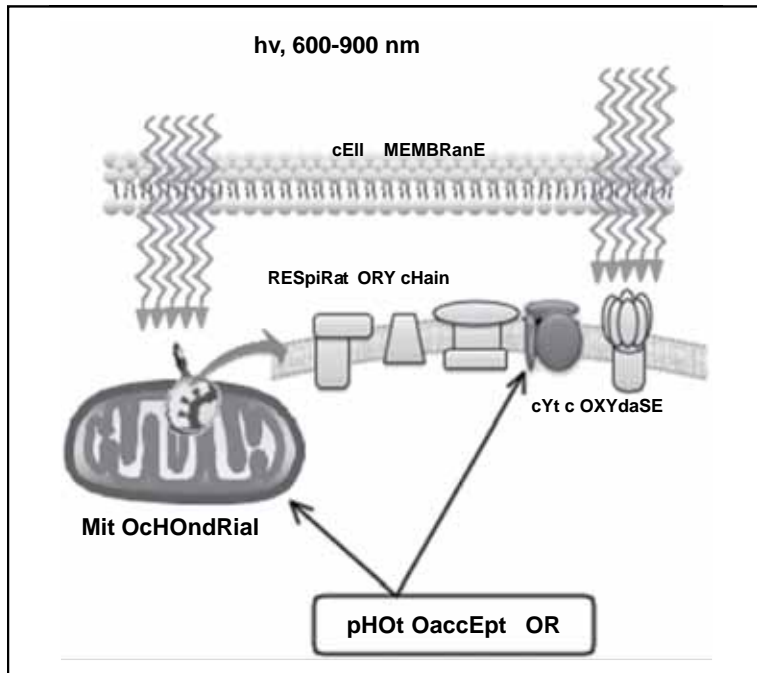


Fig. 5: Light therapy

## Erhard Schulze, Veterinarian

Erhard Schulze had his own practice from 1984 to 2010, specializing in horses and small animals. Since 1992 he has devoted himself to acupuncture and an additional qualification in "Acupuncture" from the Chamber of Veterinarians. He has published numerous articles about gold acupuncture and Yamamoto New Scalp Acupuncture in various journals and magazines. He has made regular presentations at national and international conferences such as IVAS (International Veterinary Acupuncture Society) and WATCVM (World Association of Traditional Chinese Veterinary Medicine), and has written a book about Yamamoto New Scalp Acupuncture. In 2014 he founded the Veterinary Center for Traditional Chinese Veterinary Medicine in Herne - [www.tiecam.de](http://www.tiecam.de)

cell, regardless of whether one is dealing with muscle cells, nerve cells, connective tissue cells, and so forth, so we can positively stimulate the respiratory chain

in the various types of tissue.

Some case studies should serve to illustrate the possible range of therapies.

## Case Study 1

### Froni

Froni is a Leonberger, and her problem is profound, active spondylosis which occasionally makes it almost impossible for her to stand up or lie down, as one can easily imagine if one looks at the X-ray. Drug-based pain therapy is out of the question for Froni because she can't really tolerate any sort of medication. She comes to the practice at irregular intervals and receives the combined heat and light therapy, which already leads to a significant improvement after only 20 minutes. Further measures are not required for the time being.

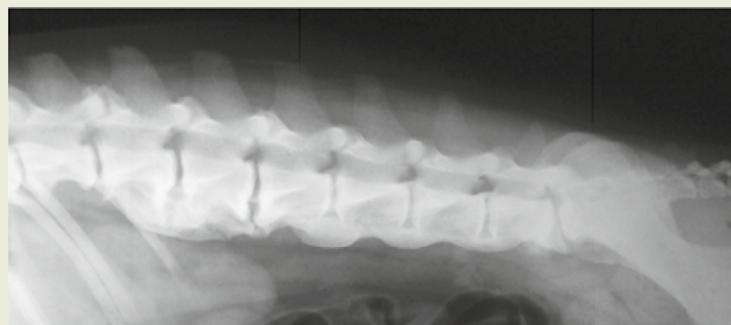


Fig. 6: X-ray of Froni: spondylosis



Fig. 7: Froni with Flat Pad



## Case Study 2 Amadeus

Amadeus is a 19 year-old Dutch riding pony which has been trained to compete in dressage. A gall on the fetlock joint developed without any discernable external cause, and failed to properly respond to any kind of

treatment. The circumference reduced from 28.5 cm to 26 cm after the first treatment, although it swelled to 28 cm after 30 minutes. Amadeus duly received this treatment every day for a period of one month.

Treatment then became weekly, and after 3 months the gall on the fetlock joint had disappeared (Fig. 10).



Fig. 8: Amadeus beforehand



Fig. 9: Amadeus with tendon boot



Fig. 10: Amadeus afterwards

## Case Study 3 Jamie

Jamie is an example of the fact that one can not only treat pain caused by orthopedic problems, but that internal medication can be supported too. This tomcat suffers from Feline Urolo-

gical Syndrome (FUS), and tenses his entire back as a reaction to the pain in his kidneys; he noticeably relaxes while the treatment is being applied.



Fig. 11: Jamie

## Summary and conclusions

This combined heat and light therapy provides us with a tool that can be used on its own as well as to support other therapeutic measures; it can also be used for prophylaxis. The various indications are derived from the mechanism that underlies light therapy. It can principally be applied to muscles and fasciae, tendons and joints, localized nerve damage, and for the treatment of pain. One major advantage is that heat and light can be controlled separately, thereby enabling one to also treat those cases — such as suppurating wounds — where the addition of heat is contraindicated.

New, innovative therapy options make it relatively simple and uncomplicated to use.

*Erhard Schulze,  
Veterinarian, Herne, Germany*

# Treatment of acute severe tendonitis and tearing of tendon fibrils



According to a preliminary report, the 22-year-old pony called Rübezahl had suffered severe tendon damage (front right-hand side) while in the paddock on 5 June 2015.

An ultrasound examination enabled one to diagnose severe tendonitis of the superficial flexor tendon, with large-scale tearing of tendon fibrils (see Image 1).

Following acute treatment with a support bandage and the administering of non-steroidal antiphlogistics, the horse was given an intratendinous injection of an E-PET platelet concentrate on 18 June 2015. This procedure involves blood being taken, filtered, and recovered with the help of the return flow of an elution solution. Using ultrasound to support the process, a needle is introduced into the core of the lesion on the affected tendon and the solution is administered.

The necessary rehabilitation program was supported by ultrasound examinations. Following treatment of the acute injury, the owner carried out daily therapy of the affected area using a combination of low-level light and infrared: light in the visible red wavelength range (632 nm) and medically relevant infrared heat penetrate the tissue. Increasing the circulation and activating the cytochrome c oxidases stimulates the cells and the way they function. This leads to the more rapid removal of tissue water in the case of swellings, but also the more rapid repair of damaged cells. These processes are identical in every cell, regardless of whether one is dealing with muscle



Image 1: Tendonitis of the superficial flexor tendon, with large-scale tearing of tendon fibrils (8 June 2015)



Image 2: Regeneration of tendon fibers following combination therapy (16 July 2015)

Photo: © Dr. Andreas Sendhofer

Photo: © Dr. Andreas Sendhofer



Low Level Light IR-Therapy



Rübezahl with animal owner



Dr. Sendlhofer

Photos: © C. Streitmeier

cells, nerve cells, connective tissue cells, and so forth, so we can achieve a positive impact on the various types of tissue.

The regeneration process has hitherto been monitored via a further ultrasound examination (one month af-

ter the PRP therapy); this has revealed a significant regrowth of tendon fibers in the area of the tendon damage (see Image 2).

When combined with intensive veterinary therapy, the use of this low-level light/IR combination therapy ought to

lead to the more rapid repair of tendon damage in horses.

*Dr. Andreas Sendlhofer  
Klagenfurt*

## Update 26.8.2015



Ultrasound image dated 26.8.2015 - © Dr. Sendlhofer

When he was first examined, the gelding exhibited severe lameness of the supporting leg (4/5), front right-hand side; there was obvious thickening of the surface flexor tendon in the section above the fetlock, and it was hot and painful when pressed.

## UPDATE 26. AUGUST 2015

The regeneration process had hitherto been recorded via further ultrasound examinations (5 and 10 weeks respectively after the PRP therapy in conjunction with MOYAVE); obvious regeneration of tendon fibers in the area of the tendon damage was apparent. When he was last monitored, the patient no longer showed any signs of lameness when led at a trot.



## Black labrador - Arthrosis with chippings in the joint

### Problem

- Arthrosis in the left shoulder joint of Nimrod, a 12-year-old Labrador. Treated via daily administering of 35 mg painkiller/anti-inflammatory. Nevertheless, very restricted over a period of several months.
- 30 May 2015: treatment commences with Program 2.
- 1 June 2015: owner provides very positive feedback. Nimrod is running much better.
- 12 June 2015: Nimrod is running brilliantly. Medication is reduced.
- 15 June 2015: medication is completely discontinued.
- 8 August 2015: slight limping again. Combination of Program 9 for 1 week (to inhibit inflammation) plus painkiller with active ingredient meloxicam (30 mg).
- 15 August 2015: Program 2.
- 30 August 2015: painkiller is discontinued.
- Further treatment as and when required, in order to reduce medication to the minimum.



Application of MOYAVE P45 flat pad



X-ray image

## French bulldog - wedge-shaped vertebrae and slipped disk.

### Problem

- Ronja, 6-year-old French bulldog
- Diagnosed at 14 months: several wedge-shaped vertebrae - deformed transitions on the vertebrae, constricted and modified intervertebral gaps, and compressions on the neural foramina.
- Prognosis: a severely reduced lifespan for Ronja.
- The initial therapy was conducted by an animal physiotherapist who used gentle techniques to relax the musculature.
- The muscles were built up via weekly swimming training.
- Occasional painful inflammation of the wedge-shaped vertebrae.
- Stiffening of the musculoskeletal system - could not be touched.
- The symptoms were treated with cortisone, producing slight alleviation.

### Subsequent developments

- May 2014: painful conditions at shorter intervals -> administering of cortisone.
- Since May 2015: therapy has been backed up with the MOYAVE P45 flat pad, Program 8 (continuous IR operation).
- Gradual relaxation, and free of pain after 1 week (without cortisone injection).



Ronja



## Brwon labrador – Arthrosis in both hip joints

### Problem

- Arthrosis in the right and left hip joints of Joppe, a 7-year-old Labrador. Treated via daily administering of 30 mg painkiller/anti-inflammatory (active ingredient: meloxicam). Nevertheless, very restricted movement and enjoyment of life over a period of months.
- 4 July 2015: gold acupuncture by Erhard Schulze scheduled for 11 July 2015, the objective being to relax Joppe in the week beforehand. Treatment commenced using Program 6.
- 5 July 2015: the owner is enthusiastic after just 2 treatments — “Joppe is loving it!” Joppe is finding it much easier to walk/run.
- 6 July 2015: switch to Program 2, and the medication is halved.
- 7 July 2015: Joppe enjoys walking/running, and occasionally leads the way again too.
- 10 July 2015: Joppe is doing well.
- 11 July 2015: the gold acupuncture (administered by the veterinarian Erhard Schulze in Herne) is going very well. One element of the daily after-treatment is provided by the Moyave PAD (Program 2).



Application of MOYAVE P45 flat pad



X-ray image

## S-dressage horse - swelling in the area of the suspensory ligament

### Problem

- Competitive sport has been impossible for 6 weeks due to a swelling in the area of the suspensory ligament.
- 5 April: the injury was caused by the rear hoof hitting the front right leg above the tendon boot.
- Consensus is subjected to a detailed examination; all of these investigations fail to come up with any noteworthy findings. The area manifests severe swelling together with moisture between the tendons, combined with lameness in the first week.
- At this point in time it's expected that the swelling will gradually subside.
- Various mainstream therapeutic measures with no noteworthy reaction.
- Nothing was visible on the scans (apart from liquid between the tendons).
- The knee was fine.
- According to the clinical diagnosis, everything was fine too.
- No noteworthy decrease in the swelling and

moisture. To some extent slightly thinner in the morning, but hot and thick again after being subjected to brief exertion.

- Inflammation in the area of the suspensory ligament can be excluded via injection of anti-inflammatories at intervals of several weeks.

### Subsequent developments

- 20 May 2015: using Program 7 — infrared + pulsed cold red light (5 Hz) – high intensity.
- 22 May 2015: in the morning — swelling of the leg. The swelling increases during the course of the day.
- 10 June 2015: the leg is much thinner. Switch to Program 2.
- 27 June 2015: the leg remains thin and Consensus feels great.
- 10 July 2015: commencement of training sessions.
- Ongoing: use of MOYAVE VET, mainly for prophylaxis prior to training.
- 26 July 2015: despite heavy training sessions, the leg is – and remains – thin again (as normal).



Swelling in the area of the suspensory ligament.



Therapy using MOYAVE H45 tendon boot.



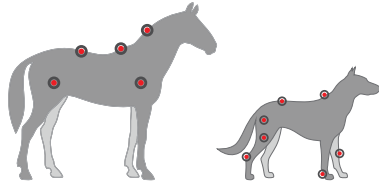
Use of therapy tendon boot.



After therapy.

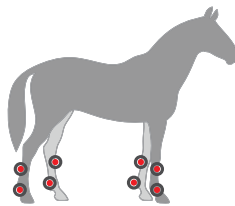


## MOYAVE P27 FLAT PAD



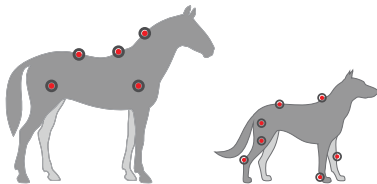
- 27 high-performance LEDs with 632 nm
- Treatment area: 240 cm<sup>2</sup>
- Li-Ion battery with 1500 mAh
- 4 treatment programs
- Treatment lasts for 25 to a maximum of 30 minutes
- Animal owners will use the MOYAVE P27 flat pads

## MOYAVE H27 TENDON BOOT



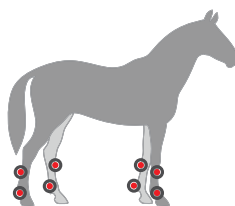
- 27 high-performance LEDs with 632 nm
- Direction: left or right
- Treatment area: 240 cm<sup>2</sup>
- Li-Ion battery with 1500 mAh
- 4 treatment programs
- Treatment lasts for 25 to a maximum of 30 minutes
- Animal owners will use the MOYAVE P27 flat pads

## MOYAVE P45 FLAT PAD



- 45 high-performance LEDs with 632 nm
- Treatment area: 240 cm<sup>2</sup>
- Li-Ion battery with 2200 mAh
- 9 treatment programs
- Treatment lasts for 15 to a maximum of 30 minutes
- The MOYAVE VET P45 therapy devices should only be used by veterinarians or animal therapists

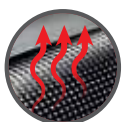
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LOW-LEVEL-LIGHT  
HIGH POWER LEDs



CARBON INFRARED HEAT  
240 cm<sup>2</sup> TREATMENT AREA



3D FUNCTIONAL MATERIAL  
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