

Pearls from TCVM Practice

The Components of the Pulse Controlled Laser Acupuncture

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ABSTRACT

The pulse controlled laser acupuncture concept (PCLAC) has four components. The first component is a basic understanding of traditional Chinese veterinary medicine theories and the use of Channels and acupoints to diagnose and treat disease. The second component is a basic understanding of auriculotherapy and the use of auricular (ear) points to diagnose and treat disease. The third component is the diagnosis and selection of acupoints to treat based on changes in the arterial pulses when “active” (unbalanced) auricular and body acupoints are stimulated with a special device such as a 3-volt hammer or a low-level impulse laser therapy (LLLT) unit. Modern LLLT units have a wide range of frequencies and have both diagnostic and treatment capabilities. The changes in the arterial pulse when “active” acupoints are stimulated are due to vascular autonomic reflexes, called “reflex auriculo cardinal” or vascular autonomic signs. Sensory nerves near the acupoint in turn stimulate sympathetic nerves to blood vessels that alter the pulses. The concept is called pulse-controlled (pulse-guided) acupuncture because the pulse changes determine the acupoints to be treated. The final component of the PCLAC is the use of LLLT to stimulate acupoints and treat local tissues. The PCLAC combines ancient TCVM wisdom, recent advances in diagnosis and treatment, conventional medical knowledge and modern technology to further expand TCVM diagnosis and treatment to improve animal health and recovery from disease.

Key words: acupuncture, laser acupuncture, pulse controlled laser acupuncture concept, impulse laser, autonomic reflexes

ABBREVIATIONS

Bfr	Bahr laser frequency (usually followed by a number e.g. Bf-1)
LLLT	Low level impulse laser therapy
Nfr	Nogier’s laser frequency (usually followed by a letter e.g. Nf-A)
PCLAC	Pulse controlled laser acupuncture concept
RAC	Reflex auriculo cardinal (VAS)
RAO	Recurrent airway obstruction
Rf	Reininger laser frequency (usually followed by a Channel abbreviation e.g. Rf-LIV)
TCVM	Traditional Chinese veterinary medicine
VAS	Vascular autonomic sign (RAC)

Acupuncture has become an effective therapy for many different disorders in both human and veterinary medicine.¹⁻⁶ Acupuncture treats not only the symptoms, but also the “root” cause of the disease, which explains successful outcomes even in previously untreatable disorders. The pulse controlled laser acupuncture concept (PCLAC) is more than just the treatment of acupoints with laser light instead of needles, but can be viewed as an expansion of traditional acupuncture. Autonomic reflexes, called reflex auriculo cardinal (RAC)

or vascular autonomic signs (VAS) result from stimulation of “active” (unbalanced) acupoints and a sensitive diagnostic system using the RAC (VAS) has been developed to assist veterinarians to choose the best acupoints to treat (pulse controlled or guided acupuncture). The PCLAC is also a synthesis of two very effective therapies: acupuncture and low-level impulse laser therapy (LLLT) that not only stimulates the acupoint, but provides local laser treatment of diseased tissue.

The PCLAC is based on identifying the underlying “root” cause of the disease and not just treating the symptoms, especially important for chronic illnesses. Auricular (ear) acupoints can be very useful to quickly detect underlying patterns, as the ear is a detailed small-scale representation of the whole body. All the relevant acupoints are close to each other and can be easily evaluated in a brief period of time. The sensitive or “active” auricular points are useful for diagnosis. Treatment of auricular points may be added to the regular treatment of acupoints elsewhere on the head and body to provide an intense treatment for many musculoskeletal and internal medicine problems. The PCLAC therefore has four components:

1. Traditional Chinese veterinary medicine (TCVM) theories and the use of acupoints on the head, body and limbs to diagnose and treat disease

From: Veterinary Acupuncture Clinic, Melle, Germany

2. Auriculotherapy and the use of auricular points to diagnose and treat disease
3. Detection of pulse changes as auricular points and acupoints of the head, body and limbs are stimulated to formulate the diagnosis and guide the selection of acupoints to treat (pulse controlled acupuncture)
4. Treatment with low level impulse laser therapy of acupoints and local tissues

Traditional Chinese Veterinary Medicine and Acupuncture of Head, Body and Limb Acupoints

The primary component of PCLAC is TCVM diagnosis and treatment of acupoints on the head, body and limbs based on 3000 years of tradition, experience and research since the time of Sun Yang (Bo Le), the father of veterinary acupuncture.³ The Channels and TCVM functional cycles play fundamental roles and are responsible for the smooth transport of *Qi* (e.g. the sum total of the substances and physiological activities of the body). The current understanding of conventional anatomy and physiology can be useful to increase the understanding of ancient TCVM concepts. One form of *Qi* from a conventional perspective is adenosine triphosphate (ATP) produced by the citric acid cycle (tricarboxylic acid or Krebs cycle) responsible for aerobic respiration within the mitochondria of the body. Aerobic respiration produces ATP that provides the body with energy (*Qi*) for all life processes from the synthesis of enzymes to the relaxation of muscles. In all diseases there is a disturbance of the optimum flow of *Qi* that results in a loss of balance between *Yin* (e.g. the parasympathetic nervous system) and *Yang* (e.g. the sympathetic nervous system).

When a disease irritates afferent nerves, pain and reflex contraction of local muscles and blood vessels restricts the free flow of *Qi* (ATP) and Blood and *Qi* Stagnation results. The *Qi*/Blood Stagnation results in Deficiency of *Qi* (ATP) and Blood (nutrients) to local tissues. Since *Qi* (ATP) is necessary for muscle relaxation, a vicious cycle of contraction and vascular occlusion occurs and further worsens the Stagnation of *Qi* and Blood. Further, autonomic reflex connections to internal organs can be affected that result in organ *Qi* and Blood Stagnation and Deficiency (e.g. disease of the upper thoracic vertebrae can affect the autonomic control of the heart). Thoracic nerve root irritation not only produces local pain and BL-15 sensitivity, but also can result in cardiac arrhythmias that can have life-threatening consequences, as illustrated in the following case study.

While at a horse show, the author was called to evaluate a ten-year-old Hanoverian mare that had collapsed while competing. The horse was in lateral recumbency, unable to stand and drenched in sweat. The pulse was difficult to feel and extremely erratic with pauses and extra systoles and the rate was over 80 beats/min. The horse was experiencing extreme pain and

panicked as the shoulder area was approached. The pain was localized to an area behind the scapula at BL-15, the Back *Shu* Association point for the Heart that influences cardiac rhythm in TCVM theory. To stabilize cardiac function and relieve pain, the author used LLLT to treat BL-15 and the auricular (ear) points (see discussion on auricular therapy below) associated with HT-9 (ear Heart tonification point), HT-4 (ear Heart vegetative point), PC-6 (ear Stellate ganglion point), GB-41 (ear Prostaglandin point), BL-40 (ear Histamine point) and LI-4 (ear Thalamus point). The extreme pain instantly disappeared. After a few minutes the horse was able to stand and within 15 minutes, the horse was able to safely move about and the sweating had stopped.

Once the acute situation had been controlled the history was obtained. The horse had not competed for the past three years, because the pain had made her intolerant of being ridden even casually. Several different conventional treatments for pain had failed. Six months prior, the horse experienced a similar, but less severe episode of collapse while attempting to be ridden. During that episode, the horse received fluids and conventional medications for several days that helped to stabilize the circulatory system, but the severe pain remained.

The day after the initial LLLT treatment, the horse was stable, but LLLT of the same acupoints was provided and then three more times at 4-5 day intervals. Following these five treatments, the horse was pain-free, had stable cardiac function and began to perform in small competitions with no problems. In this horse, *Qi* Stagnation of the thoracic vertebra in area of BL-15 led to dysfunction of the Heart. The author has found many such instances in horses and dogs where chronic musculoskeletal pain (*Qi* Stagnation in the Exterior Channels) also lead to dysfunction of the associated organ through the Interior Channel system and autonomic reflexes. Knowledge and application of the TCVM principles, theories, anatomy and physiology are the essential first component of PCLAC.

Auriculodiagnosis and Auriculotherapy

The second component of PCLAC is auriculodiagnosis and auricular acupuncture (auriculotherapy).^{2,4} Although there were previous references to auricular treatments of disease in China as early as 450 BC, in the late 1950's, Dr. Paul Nogier, a French neurologist trained in acupuncture, identified the somatotopic arrangement of points on the ear that corresponded to various body regions in humans.^{2,3} Dr. Nogier created a sophisticated methodology using palpation of these points for diagnosis and acupuncture of these points for treatment of many musculoskeletal and internal medicine disorders. He described his techniques in a format easily understood by conventionally trained physicians. Because of his contributions to auricular acupuncture, he is described as the "Father of modern auricular acupuncture". Rather

than fixed points, Nogier recognized that auricular points were fluid within a zone and their position changed slightly based on the chronicity of a disease. These point zones were named based on their sphere of influence (e.g. knee point, elbow point, hip point, lung point, heart point, kidney point and others). In the last decade, the neurological connections of auricular points to the central nervous system have been shown in studies using fMRI (functional magnetic resonance imaging).¹

Dr. Frank Bahr, a German medical doctor and acupuncturist, further developed auricular acupuncture with the German Academy for Acupuncture (DAA) in the decades to follow.² Dr. Bahr described auricular points for nerves, ganglia, the spinal cord, endocrine and exocrine glands and various parts of the brain. He also described auricular points that had special systemic effects, which he called superordinated points (e.g. Endorphin point, Histamine point, Prostaglandin point, β -adrenergic point, ACTH point and others).

The author studied with Dr. Bahr and began formulating auricular maps in horses and dogs in 1989 (Figure 1).³ Nearly all of Nogier's and Bahr's human points have now been identified on the ears of dogs and horses and the author has used these points for diagnosis and treatment of musculoskeletal and internal medicine disorders for the past twenty-five years (Figure 2).³ The location of "active" auricular points and knowledge of the corresponding region or organ of the body are useful for diagnosis. For ten years, the author compared the orthopedic lesion locations in lame horses determined by nerve blocks to lesion locations determined by "active" auricular points based on the auricular maps (Figures 2

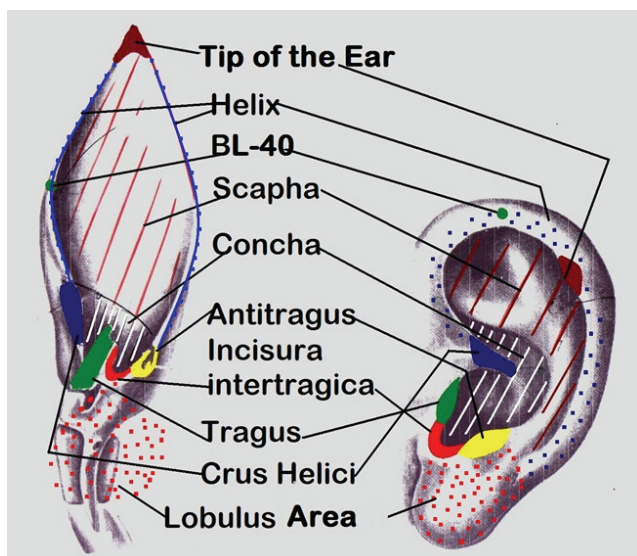


Figure 1: Comparison of the anatomy of human and dog ear. BL-40 is noted as it is here that the thoracic and pelvic limbs comes together instead of the tip in the author's experience (Reprinted with permission from Petermann U. Pulse Controlled Laser Acupuncture Concept (PCLAC). 2007: www.akupunkturtierarzt.de)

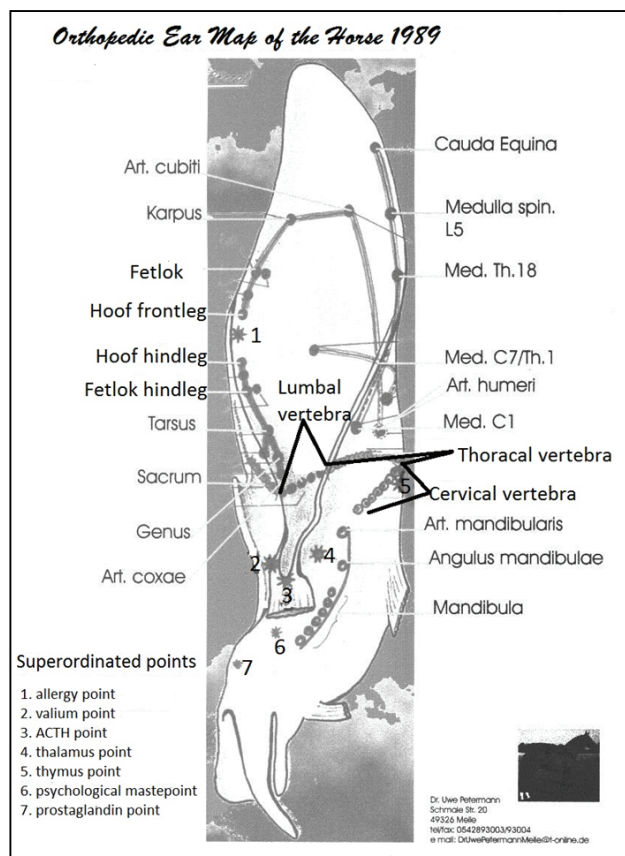


Figure 2: Skeletal structures identified by the author and an auricular map of these created in 1989. Points 1-7 on the auricular map have been found to have special effects and are superordinated points in microsystems acupuncture (ear, scalp, mouth, hand) (Reprinted with permission from Petermann U. Pulse Controlled Laser Acupuncture Concept (PCLAC). 2007: www.akupunkturtierarzt.de)

and 3).³ There was such a high correlation of lesion location between the two techniques that the author no longer uses nerve blocks to localize the lesion during lameness evaluations and relies solely on auricular diagnosis.³ Other investigators concur with these findings.⁴ The auricular points on the left and right ears correspond to the left and right limbs respectively. The author has also transposed the Channels and traditional acupuncture points of the body to the ear. Complete auricular maps^a for the horse and dog are available elsewhere, but an example of the Heart Channel and acupoints is shown in Figure 4.³

The author then compared auricular points with known acupoints on the body and auricular organ correlations were also found (Figure 5). When the Lung Channel was transposed to the ear, LU-7 was in the same place as the auricular Lung organ point. When the Kidney, Liver, Stomach and Spleen Channels were transposed, the author found that the auricular KID-7 was also the Kidney auricular organ point, LIV-8 was



Figure 3: Skeletal structures identified by the author and an auricular map of these created in 2006 (Reprinted with permission from Petermann U. Pulse Controlled Laser Acupuncture Concept (PCLAC). 2007: www.akupunkturtierarzt.de)

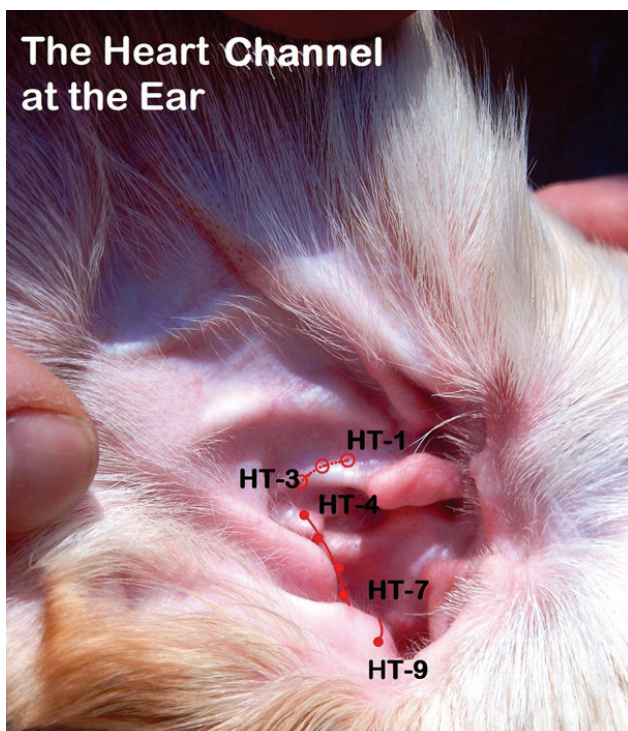


Figure 4: The location of the Heart Channel and Heart acupoints of the ear (Reprinted with permission from Petermann U. Pulse Controlled Laser Acupuncture Concept (PCLAC). 2007: www.akupunkturtierarzt.de)

the Liver auricular organ point, ST-41 was the Stomach auricular organ point, SP-5 was the Ovary auricular organ point and SP-6 was the Uterus auricular organ. The detection of “active” auricular points has also been useful to diagnose internal organ disorders and can even detect abnormalities prior to conventional diagnostic methods. For internal organ disorders, the side of the “active” auricular point will vary with each organ and the side of the affected organ. “Active” organ auricular points on both sides are found in Liver and Stomach disorders (Figure 5). The Spleen is usually represented on the left ear and the Pancreas on the right ear (Figure 5). However in patients with Spleen Deficiencies, the auricular points of the both Spleen and Pancreas are “active”. If only one Ovary or Kidney is affected, the “active” auricular point will be located on the same side. If the disorder is generalized then the auricular points on both sides will be “active”. Treatment of these “active” points using needles or LLLT can balance the autonomic nervous system regulation (e.g. *Yin* and *Yang*) and resolve disorders of *Qi*/Blood Flow and organ dysfunction.

The auricular point discoveries are an example of the harmony between ancient and modern concepts of TCVM and the interconnectedness of the body. Based on these findings acupuncture can be performed on the ear without also having to treat acupoints on the body. In the

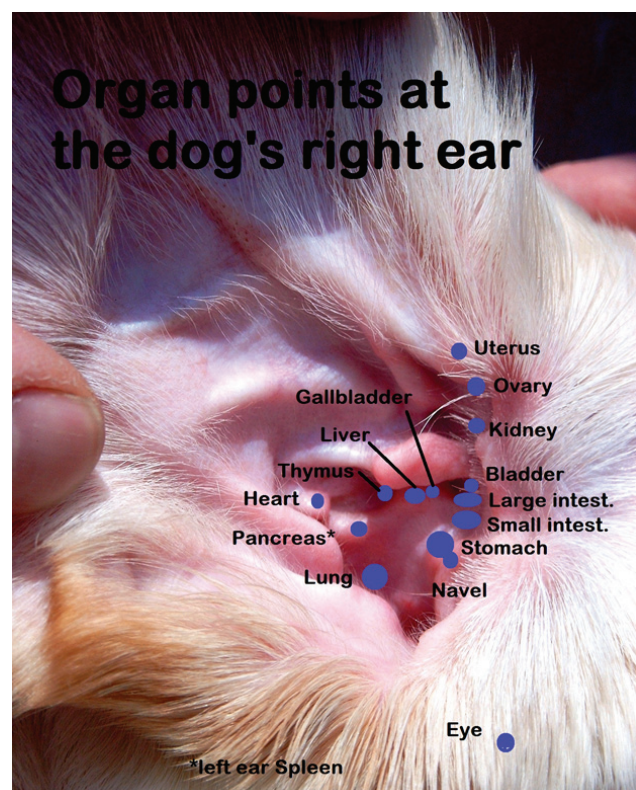


Figure 5: The primary auricular organ points of the dog (Reprinted with permission from Petermann U. Pulse Controlled Laser Acupuncture Concept (PCLAC). 2007: www.akupunkturtierarzt.de)

author's experience, it does not matter if the auricular point or the corresponding acupoint on the body is treated the result is the same. For Lung infections the auricular Lung point and two superordinated auricular points, the Interferon point and the Thymus point are treated to fight the infection (Figure 2). Treatment of LU-7, SP-4 and TH-5 acupoints on the body can achieve the same effect. In the author's experience auricular points and acupoints can be used interchangeably or together for a strong effect.

Auricular points are often treated with needles, semi-permanent needles and LLLT. For chronic disorders, gold bead implantation of auricular points can be performed. In 2001, Colonel Richard C. Niemtzwow, a human physician and acupuncturist, applied Dr. Bahr's principles to develop an auriculotherapy protocol for use on the battlefield to control pain.⁵ Dr. Niemtzwow's protocol called for the stimulation of auricular points with semi-permanent needles and other methods that have been used to successfully not only to treat pain and injuries in battlefield situations but also to treat other disorders seen in routine acupuncture practices.⁵

Vascular Autonomic Sign (VAS) or Reflex Auriculo Cardial (RAC)

The third component of the PCLAC is the TCVM diagnosis and selection of acupoints to treat based upon carotid, femoral or surrogate pulse changes when acupoints are stimulated.^{2,3} A 3-volt hammer^b or an LLLT unit^c with both diagnostic and treatment capabilities are used to stimulate acupoints and determine which ones are "active" (unbalanced or reactive). Dr. Nogier was a master of Chinese pulse diagnosis and he noticed distinct changes in the qualities of the radial pulses of his patients, when different auricular points were stimulated with palpation or acupuncture needles. He initially called these "reflex auriculo cardiac" (RAC) or auricular cardiac reflex (ACR), but later changed the name to vascular autonomic sign (VAS), when he realized that these pulse changes resulted from stimulation of autonomic nerves associated with arteries. By observation of the pulse reaction for different points, he realized that acupoints that induced a strong VAS (RAC) were not only useful for diagnosis, but also had the best therapeutic effect for his patients. Further, he found that there was directionality to the VAS. A "positive VAS," was defined as instances when the pulse became fuller, vibrant, bulging or harder when a point was stimulated and a "negative VAS" was when the pulse became weakened, soft, hollow, or duller when a point was stimulated.

Based on his knowledge of electrical potential changes around acupoints and experiments evoking positive and negative VAS (RAC) with various electrical currents, Dr. Nogier developed a 3-volt device with a positive and negative pole that would consistently induce positive or negative pulse changes (VAS) from "active"

points. The diagnostic tool became known as the 3-volt hammer^b (Figure 6). Using the 3-volt hammer to detect "active" points in patients with various diseases, Dr. Nogier was able to develop more detailed maps of the joint and organ auricular points and a sensitive diagnostic system useful for musculoskeletal and internal medicine disorders. If the auricular Hip point evoked a strong RAC (VAS), then that auricular point should be treated, as hip function was abnormal. Similarly, if the auricular Liver point evoked a strong RAC (VAS) then that auricular point should be treated, as an underlying imbalance in the Liver was present. The diagnosis and treatment strategy can be applied to other joint and organ points. An advantage of the 3-volt hammer device is that it can differentiate between the type of imbalance of a point because the device has positive and negative poles. If the positive pole of the hammer is held near a point and causes a weakened pulse or negative RAC (VAS), this indicates the point is Deficient (e.g. has a negative charge). If the negative pole of the hammer is held near a point and causes a strengthening of the pulse or positive VAS, this indicates the point is Excess (e.g. has a positive charge).

The author has found that the RAC (VAS) is also a reliable diagnostic method in animals and is not only useful to evaluate auricular points, but can also be used to evaluate acupoints on the rest of the head, body and limbs. For diagnosis, the author uses a 3-volt hammer as well as the Physiolaser Olympic^c and LaserPen^c LLLT devices. These modern LLLT devices can be set in a



Figure 6: The author approaching the ear with the 3-volt hammer to diagnose "active" auricular points (Reprinted with permission from: Petermann U. Kontrollierte Laserakupunktur bei Hund und Pferd. Sonntag Verlag in MVS Medizubverlag. Stuttgart, Germany: Thieme Verlaggruppe 2011)

diagnostic mode and have many specific frequencies useful for RAC (VAS) detection. Following diagnosis the LLLT device can be easily switched to the treatment mode to deliver the specific frequency needed for LLLT acupuncture and topical treatment. The auricular points can be quickly scanned with one of these diagnostic devices to detect any “active” points and then the corresponding body acupoints can also be evaluated to confirm the findings. A technique often used by the author is to hold the device to test the auricular points and body acupoints with the right hand and to feel his own left temporal artery pulse (surrogate pulse) with the fingers of the left hand to detect an RAC (VAS) (Figure 6). In the author’s experience, the result has been the same as palpating the carotid and femoral pulses directly to detect a VAS. To obtain a quick overview of the health of the internal organs, the 3-volt hammer can be passed along the Bladder Channel to detect “active” Back *Shu* Association points. “Active” Back *Shu* Association points can reflect a disorder in the local areas of the back as well as the specific internal organ represented by the acupoint. The RAC (VAS) localizes the “active” points and determines the acupoints to be treated with LLLT and other forms of stimulation. “Pulse controlled” therapy refers to the treatment guidance provided by monitoring the pulse changes as different auricular points and regular acupoints are evaluated with the 3-volt hammer or the LLLT device.

Low Level Impulse Laser Therapy

The fourth component of the PCLAC is stimulation of acupoints and local tissues with low-level impulse laser light.^{2,3,6} Dr. Nogier also developed the use of low-level impulse lasers for acupuncture. He used the RAC (VAS) pulse changes to determine the most effective wavelengths of laser light within the infrared spectrum and frequency of light pulses. He developed a range of laser frequencies, called Nogier Frequencies that proved particularly effective for acupoint stimulation and other clinical applications (Table 1). These frequencies are characterized by special resonances with specific tissues, tissue conditions and acupoints that varied based on location. Nogier’s laser frequency A (Nfr-A) is particularly useful for treating wounds, inflammation and irritable foci in the body and teeth. Laser frequency Nfr-B has a special affinity for ligaments, tendons and all organ acupoints (e.g. body KID-7 and auricular Kidney point). Laser frequency Nfr-C is useful to treat disorders of joints and bones and to treat all body acupoints except those on the feet. Laser frequency Nfr-D is useful to treat all acupoints of the feet. Laser frequency Nfr-E is useful to stimulate nervous tissue function and is especially good for the spinal cord disorders. Laser frequency Nfr-F is useful to treat temporomandibular and brainstem disorders. Laser frequency Nfr-G is useful to treat cerebral disorders and mental diseases.

Some years later Dr. Bahr with the help of the RAC

(VAS) found another very important range of frequencies that were useful for diagnosis and treatment of tissues, Channels and acupoints (Table 1). The RAC (VAS) associated with the different Bahr Frequencies is also useful to determine the single most important acupoint to treat. According to Dr. Bahr in every patient there is one “deep point” where illness starts. For example, in recurrent airway obstruction in horses, the organ point for the Lung (i.e. the auricular Lung point or LU-7 on the body), is usually not the “deep point”, but the auricular Kidney point or KID-7 on the body is the “deep point” as determined by the VAS that is evoked. The Bahr laser frequency 1 (Bfr-1) affects deep tissue layers and is useful to detect and treat the “deep” point of a disease. Laser frequency Bfr-2 affects the central tissue layer and is useful to treat hormonal and nervous system disorders. Laser frequency Bfr-3 affects surface tissue layers. Laser frequencies Bfr-3 and Bfr-4 affect Channels described by Dr. Bahr as the Omega *Ren* and Omega *Du* Channels. Laser frequency Bfr-5 is useful to treat the Cardinal or Opening points of the Eight Extraordinary Channels or Vessels (LU-7, KID-6, SP-4, PC-6, SI-3, BL-62, GB-41 and TH-5). Laser frequency Bfr-6 affects the Governing Vessel and Bfr-7 affects the Conception Vessel. Laser frequency Bfr-7 is also a special frequency for detecting and treating abnormal foci in the teeth. Some chronic clinical disorders will rapidly recover after Bfr-7 treatment of the affected teeth (See Case example 2 below).

Also using the auricular and acupoint RAC (VAS) pulse diagnostic system, Dr. Manfred Reininger, an Austrian human physician and acupuncturist developed a range of laser frequencies that can be used to treat acupoints of specific Channels and organs (Table 1).³ In Dr. Reininger’s laser frequency system the Liver acupoints are treated with the Liver Channel frequency, the Stomach acupoints with the Stomach Channel frequency and other frequencies are used to specifically treat disorders of that organ system (Table 1). The Reininger frequencies provide more specific and effective stimulation of acupoints than Nfr-C or Nfr-D. Using the cluster probe of the Physiolaser Olympic[®] LLLT unit or some other LLLT device, the Reininger frequencies can also be used for topical treatment of organs. The Kidneys may be treated with Reininger frequency for Kidneys (Rfr-KID) and the Heart with Rfr-HT and so forth. The Nogier, Bahr and Reininger Frequencies are pre-programmed into most modern LLLT delivery devices[®] and are commonly used by LLLT practitioners for both diagnosis and treatment, because they resonate well with acupoints and tissues and have excellent therapeutic effects.³

The author uses the Physiolaser Olympic[®] and LaserPen[®] devices for LLLT.⁶ The Physiolaser Olympic LLLT unit[®] has several different probes to treat auricular points, head, body and limb acupoints and tissues in larger areas. The LaserPen 40 W/904nm[®] is a small compact unit for LLLT of auricular points and acupoints

Table 1: Comparison indications and attributes of the Nogier, Bahr and Reininger frequencies used for low-level impulse laser therapy

Nogier Frequencies												
Frequency	A		B	C		D		E		F	G	
Hz	292		584	1,168		2,336		4,672		73	146	
Indications	Wounds, inflammation, irritable foci in body and teeth		Tendonitis, arthritis, fractures, organ acupoints	Tendonitis, arthritis, fractures, all body acupoints except feet		Acupoints of the feet		Nerve and spinal cord diseases		Mandibular joint and subcortical brain disorders	Cerebral cortex and mental disorders	
Bahr 1 Frequencies												
Frequency	1		2	3		4		5		6	7	
Hz	599.5		1,199	2,398		4,796		9,592		19,184	38,368	
Indications	Deep tissue layer, “deep” points (source of illness)		Central tissue layer, hormonal and nervous system	Surface tissue structures, Omega <i>Ren</i> Channel		Omega <i>Du</i> Channel		Opening acupoints of the Eight Extraordinary Channels		Governing Vessel	Conception Vessel, abnormal foci in teeth	
Reininger Frequencies*												
Channel	LIV	ST	HT	PC	LI	GB	KID	BL	SP	TH	SI	LU
Hz	442	471	497	530	553	583	611	667	702	732	791	834

*Used for treatment of acupoints on specific Channels and topical treatment of related organs; LIV=Liver, ST=Stomach, HT=Heart, PC=Pericardium, LI=Large Intestine, GB=Gallbladder, KID=Kidney, BL=Bladder, SP=Spleen, TH=Triple Heater, SI=Small Intestine, LU=Lung Channels

elsewhere on the head, body and limbs as well as delivering LLLT to tissues.³ Along with LLLT of acupoints and auricular points, the author also uses LLLT of local tissues for wound healing, inflammation, tendonitis and peripheral nerve lesions. The advantages of laser acupuncture over needle acupuncture are that it is usually painless and even contactless and has a shorter acupoint stimulation time of only 20 sec. The LLLT expedites treatment of acupoints that might be painful, difficult to reach and possibly dangerous for veterinarians to treat (e.g. treatment of LIV-8 in a nervous stallion). The LLLT also provides direct treatment of diseased tissues. The author recently reported on the use of LLLT of acupoints and topically for treatment of acute and chronic laminitis in horses.⁶

Case Examples

The following case examples illustrate the application of PCLAC, pulse controlled (guided) laser acupuncture concept. First the auricular points are checked (scanned) with the 3-volt hammer to quickly evaluate the whole body for “active” points. Next the corresponding body acupoints and in some cases the teeth (Case 2) are scanned with the 3-volt hammer, the Physiolaser Olympic[®] or LaserPen[®] LLLT devices on specific diagnostic frequency settings (e.g. Bfr-1 at 599.5 Hz to determine the “deep” point). Next the treatment strategy and acupoint selection are made based on the pulse changes and knowledge of basic TCVM. Finally all “active” acupoints on the head, body and limbs as well as acupoints with special effects and in some cases the auricular points are treated with LLLT

using the Physiolaser Olympic[®] or LaserPen[®] devices at the optimum frequency for the acupoint, Channel, organ or dysfunction. All acupoints are treated for 20-30 seconds. Local tissues on the body or organs are usually treated with the Physiolaser Olympic[®] LLLT unit using the cluster probe (large areas) or single probes (teeth) for 1-5 minutes.

Case 1: A two-year-old crossbred stallion with a tarsal joint infection

At another veterinary clinic, a bone fragment was found in the left tarsal joint of this stallion, during routine radiographic examination and was removed endoscopically. A post-operative joint infection developed and was treated with joint lavage, different antibiotics and parenteral steroids and non-steroidal anti-inflammatory drugs (NSAIDs). Over the next six months, the client sought help from three other veterinarians who treated the infected joint in a similar manner with no response. The author was finally consulted six months after the onset of the infection. On initial examination, the circumference of the infected tarsal joint was 61 cm, while the healthy tarsal joint was 42 cm (Figure 7a). The horse could not put weight on the affected limb and hobbled along on three legs with great effort.

PCLAC diagnosis and treatment

1. First the auricular points were scanned for an RAC (VAS) using Bfr-1 (599.5 Hz), the best frequency to detect “deep” points. The auricular point for the hock was “active” and determined to be the “deep” point (Figure 3). Therefore the hock appeared to still be the primary area affected and treatment of that



Figure 7a: A right tarsal joint infection of 6 months duration in a two-year-old crossbred stallion. On presentation the hock circumference was 61cm (Reprinted with permission from: Petermann U. Kontrollierte Laserakupunktur bei Hund und Pferd. Sonntag Verlag in MVS Medizubverlag. Stuttgart, Germany: Thieme Verlaggruppe 2011)

region was performed first.

- a. Topical LLLT, using a 5 x 30 Watt impulse laser with the Physiolaser Olympic[®] cluster probe was applied to the dorsal, medial and lateral surfaces of the hock joint for 5 minutes each, using Nfr-A (292 Hz) known to reduce inflammation.
2. An RAC (VAS) scan of local tissues was also performed using Nfr-A (292 Hz, for inflammation) and a strong reaction was found at the tracts where the endoscope was inserted.
 - a. These areas were treated with Nfr-A (292 Hz) with a 90 Watt LLLT single probe for 1 minute each.
 3. The Tendinomuscular Meridians (TMM or Sinew Channels) are a system of superficial Channels that control the tendons, muscles and skin and are related to the regular Channels. The TMM of the Liver and Gallbladder Channels that passed by the joint infection were treated with Rfr-LIV (442 Hz) and Rfr-GB (583 Hz).
 4. Then acupuncture points on the body were tested for an RAC (VAS) reaction with the positive pole (red side) of the 3-volt hammer and with the LLLT device on the diagnostic setting at specific frequencies to detect Deficiencies and LIV-1, LIV-8, GB-44, GB-43, SI-18 and CV-3 were “active” acupoints.
 - a. LIV-1 (*Ting* or *Jing*-Well point) and LIV-8 (Liver tonification point) were treated with Rfr-LIV (442 Hz) for 20-30 seconds.
 - b. GB-44 (*Ting* point) and GB-43 (tonification point) were treated with Rfr-GB (583 Hz) for 20-30 seconds.
 - c. SI-18 (Reunion point of the *Yang* TMM of the foot) with Rfr-SI (791 Hz) for 20-30 seconds.
 - d. CV-3 (Reunion point of the *Yin*-TMM of the foot) was treated with Bfr-7 (38,368 Hz) for 20-30 seconds.
 5. The Cardinal (Opening) points of the Eight Extraordinary Channels (LU-7, KID-6, SP-4, PC-6, SI-3, BL-62, GB-41 and TH-5) were tested for an RAC (VAS) with Bfr-5 (9,592 Hz) useful for detecting “active” Opening points.
 - a. GB-41 and TH-5 were detected as “active” Opening points and were treated for 30 sec with a 90-Watt impulse laser.
 6. Back *Shu* Association points were tested with the positive pole of the 3-volt Hammer to detect Deficiencies.
 - a. BL-18 and BL-23 were found to be “active” and were treated with Nfr-C (1,168 Hz) for 30 seconds.

The same treatment was given seven times over a 2-week period and the circumference of the joint reduced to 47 cm and the horse walked without lameness (Figure 7b). After 5 minutes of trotting, he could also trot

without lameness. He was doing so well that the client began exercising him, but within 3 days of beginning the exercise program, inflammation of the joint re-appeared and the body temperature increased to 41°C (105.8°F). The horse was not treated with antibiotics or any other drugs. Again only local LLLT and pulse controlled laser acupuncture were used as before, but treatment of SP-4 (Interferon point) with Rfr-SP (702 Hz) was added to the next four treatments to further reduce the inflammation.

After approximately one month and twelve additional treatments, the patient had recovered. Over the following three months, training was gradually increased to full capacity. The horse was then sold six months later as a competition horse and passed purchase inspection by a veterinarian.

Case Example 2: A 13-year-old Arabian mare with recurrent airway obstruction (RAO) for nine years.

The mare's RAO had become so severe in the past few years that the client and referring veterinarian were considering euthanasia. As a last resort the horse was referred to the author for acupuncture. On the initial examination, the respiration rate was 56 breaths/minute and the horse had extreme abdominal contraction on expiration. The horse had respiratory distress and the nostrils were severely flared and panic showed in his eyes (Figure 8a). Loud wheezing respiratory sounds could be heard, 20 meters away from the patient. The lung percussion field had dilated to about two hands width and loud percussion sounds could be heard in this area. Bronchoscopy could not be performed because of the critical condition of the horse. Only after the second



Figure 8a: A 13-year-old Arabian mare that had suffered from recurrent airway obstruction (RAO) for the past 9 years duration. On presentation the horse had severe respiratory distress with flared nostrils and an expression of panic in her eyes. Her respiration rate was 56 breaths/minute. (Reprinted with permission from: Petermann U. Kontrollierte Laserakupunktur bei Hund und Pferd. Sonntag Verlag in MVS Medizubverlag. Stuttgart, Germany: Thieme Verlaggruppe 2011)

LLLT acupuncture treatment was the horse's condition stable enough for bronchoscopy. On bronchoscopy there were cobweb-like threads of high viscosity mucous inside the trachea and the stem bronchi. The mucous membranes were very reddened especially at the bifurcation of the trachea. The stem bronchi sometimes would collapse during expiration.

PCLAC diagnosis and treatment

1. Since abnormal foci in the teeth are often responsible for hyperactivity of the immune system and RAO, the teeth were tested for an RAC (VAS) with the laser Bfr-7 (38,368 Hz), the optimum frequency to evaluate abnormal teeth foci. The 2nd molar of the upper jaw on each side induced an RAC (VAS) and so were treated with topical LLLT at the same frequency (Bfr-7) for 3 minutes with the Physiolaser^c 90w/904nm LLLT single unit.
2. An RAC (VAS) using Bfr-7 was detected at LU-1 bilaterally (suspected to be due to abnormal 2nd molar foci) and the points were treated with LLLT at Bfr-7 with the LaserPen 40W/904nm for 20-30 seconds.
3. An RAC (VAS) was found at the following auricular points using the Bahr frequencies as indicated and were treated with the same frequencies.
 - a. The "deep point" was the auricular Kidney point (KID-7) diagnosed and treated with Bfr-1 (599.5 Hz) for 20-30 seconds.
 - b. The auricular Lung point (LU-7) was diagnosed and treated with Bfr-2 (1,199 Hz) for 20-30 seconds.



Figure 7b: The right tarsal joint infection of 6 months duration in a two-year-old crossbred stallion; After seven LLLT treatments over a 14 day period, the circumference had reduced to 47cm. (Reprinted with permission from: Petermann U. Kontrollierte Laserakupunktur bei Hund und Pferd. Sonntag Verlag in MVS Medizubverlag. Stuttgart, Germany: Thieme Verlaggruppe 2011)

4. An RAC (VAS) was found with the positive pole of the 3-volt hammer to detect Deficiencies on the following auricular points and their corresponding body acupoints and were scanned and treated with the following frequencies:
 - a. Auricular β -receptor point (ST-40) was diagnosed as Deficient with Rfr-ST (471 Hz) and ST-40 on the pelvic limbs was treated for 20-30 seconds with the same frequency.
 - b. The auricular *Yuan* Source point for Kidney (KID-3) was diagnosed as Deficient using Bfr-5 (9,592 Hz) and KID-3 on the pelvic limbs was treated for 20-30 seconds with the same frequency.
 - c. The auricular Thymus point (Opening point for the *Yang Wei* Channel) was diagnosed as Deficient with Bfr-5 (9,592 Hz) and TH-5 on the thoracic limbs was treated for 20-30 seconds with the same frequency.
5. The Back *Shu* Association points were evaluated with the positive pole of the 3-volt hammer and BL-13 (Lung), BL-17 (Diaphragm) and BL-23 (Kidney) were all "active" acupoints diagnosed with Nfr-C (1,168 Hz) and their Deficiencies were treated for 20-30 seconds with the same frequency.

During the treatment of the teeth with topical LLLT, the horse sighed and breathing began to improve. By the end of the complete LLLT treatment, the respiration rate had decreased by 50% to 28 breaths/minute, the panic was gone and the nostrils were no longer flared (Figure 8b). Seven similar treatments were given every three to four days. A month after the seventh treatment, the horse



Figure 8b: The same 13-year-old Arabian mare in Figure 8a after 40 minutes of LLLT acupuncture treatment. Her breathing had improved and the rate had decreased to 28 breaths/minute. She was no longer panicked and her nostrils were not flared. (Reprinted with permission from: Petermann U. Kontrollierte Laserakupunktur bei Hund und Pferd. Sonntag Verlag in MVS Medizubverlag. Stuttgart, Germany: Thieme Verlaggruppe 2011)



Figure 8c: The same 13-year-old Arabian mare in Figures 8a and 8b shown galloping across the field and feeling great one month after completing seven LLLT treatments every 3-4 days. The horse continues to do well 2 years later. (Reprinted with permission from: Petermann U. Kontrollierte Laserakupunktur bei Hund und Pferd. Sonntag Verlag in MVS Medizubverlag. Stuttgart, Germany: Thieme Verlaggruppe 2011)

was clinically normal and capable of galloping across the fields without any problem (Figure 8c). Bronchoscopy was repeated and no abnormalities were observed in the airways. The lung field detected by lung percussion had returned to normal. The horse has remained healthy now for approximately two years and according to the caretaker has been healthier than she had ever been.

Conclusion

The contributions of Drs. Nogier, Bahr and Reininger to human laser acupuncture and the author's application to veterinary acupuncture add new diagnostic and treatment methods that further our understanding and use of the ancient TCVM concepts and treatments, by applying conventional technology and knowledge. The PCLAC can be used in combination with classical veterinary acupuncture techniques and Chinese herbal medicine to provide new options and modalities, to better diagnose and treat animal diseases.

FOOTNOTES

- ^a Dog and horse auricular maps are available at: www.akupunkturtierarzt.de (select English version if necessary)
- ^b 3-volt hammer available in the Florida at: <http://www.acu-market.com/3-Volt-Hammer/productinfo/76001/>; Canada at: <http://shop.easterncurrents.ca/P-AA520/3-volt-hammer>; Europe: <http://www.schwa-medico.com/cms/upload/pdf/catalogue-aku-en.pdf>
- ^c RAC Diagnostic and LLLT delivery devices: http://www.rj-laser.com/english/index_laser_therapy.html

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