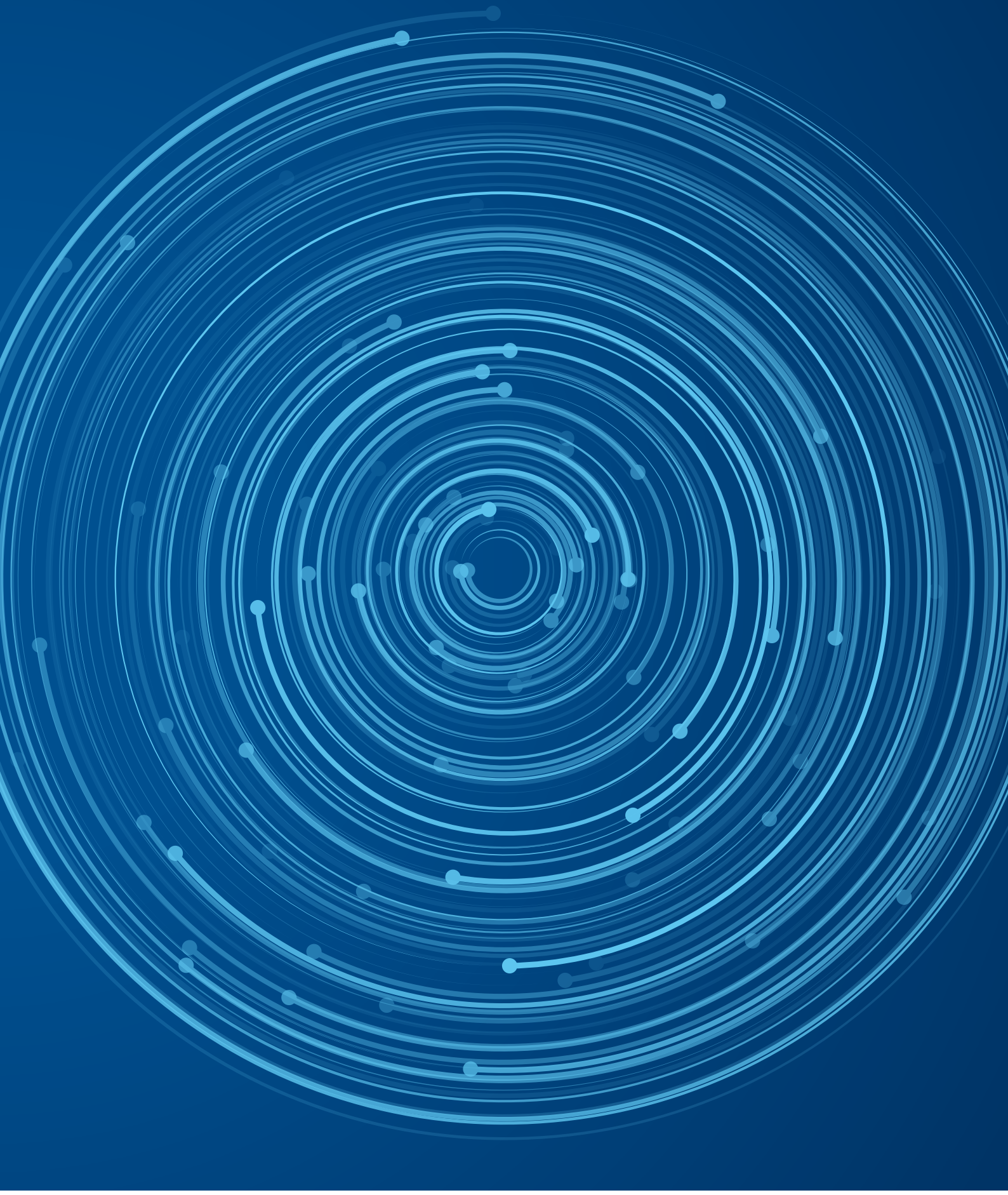


NHC Cyclo-Therapy®

Staying Healthy at Home

NHC Cyclo-Therapy® Staying Healthy at Home

CONTENTS

Introduction to NHC Cyclo-Therapy®

Welcome to the NHC Cyclo-Therapy® guide, this will help explain the principles, applications, and benefits of NHC Cyclo-Therapy®.

Medically certified NHC Cyclo-Therapy® is only available in our range of products and is supported by research undertaken in hospitals and universities in the UK and world-wide. This guide refers to a small selection of the medical evidence we hold that has been published or presented in medical journals or conferences.

It will explain some of the benefits of using our NHC Cyclo-Therapy® products and provide information on how and when to use the products to their full potential. The benefits obtained may well vary from one individual to another and we hope you get the full benefits of using our products.

It is recommended that you try our products by having a qualified advisor demonstrate the various options available. This will help with the techniques of using each one of our products before deciding which option is best and most suited to you.

OUR CONTRIBUTION – Staying Healthy at Home

We are passionate about helping those in need, especially those most vulnerable - children. Our Crown Pin Foundation was developed with the sole aim of donating therapy products and raising money to benefit the lives of children and young adults throughout the UK. Managed by a committed group of employees, the foundation raises funds throughout the year, through various activities involving our employees. 100% of the money raised goes to several children's charities or in product donations to worthy causes.

Crown Pin Foundation

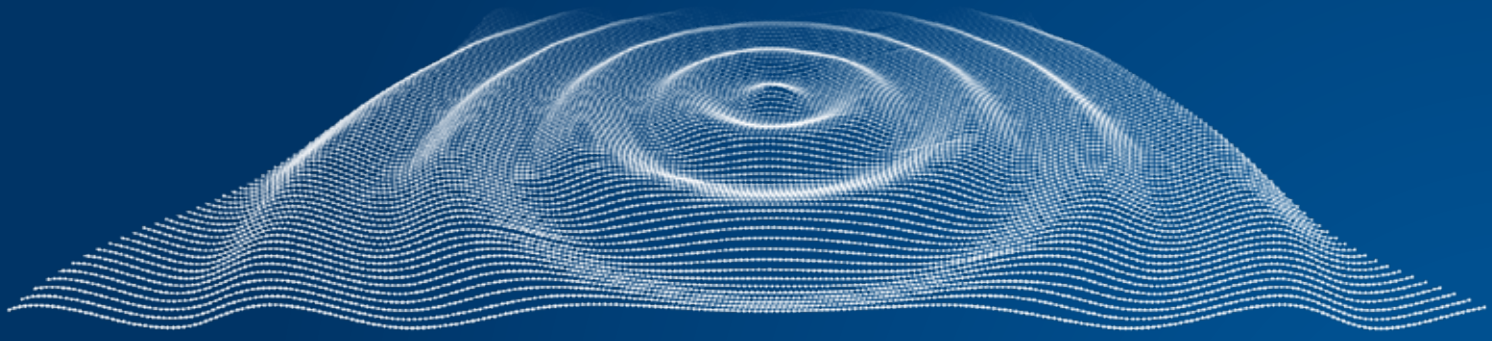
We have donated **over £20,000** to children's charities.

NHC Cyclo-Therapy® Designed, Developed, Researched and Manufactured in the UK

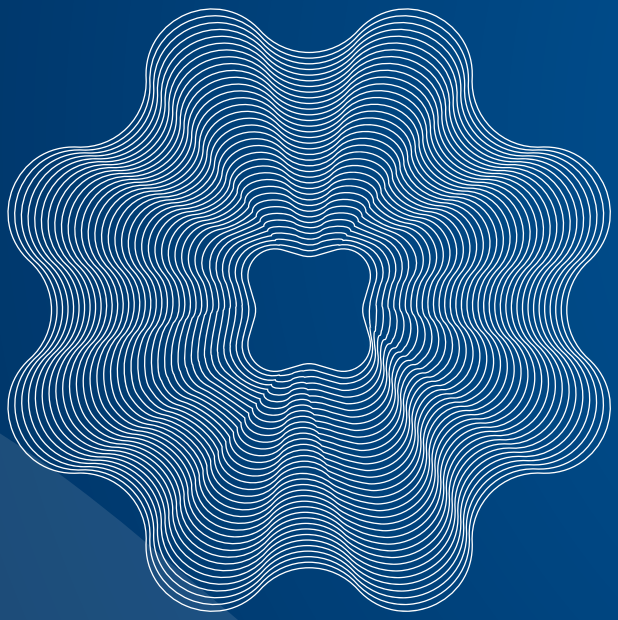
What is NHC Cyclo-Therapy®?

NHC Cyclo-Therapy® is a unique three-dimensional vibration generated by a sinusoidal electromechanical oscillator.

It is incorporated into various unique products manufactured in the UK by our company. These may be easily used at home by an individual or by a medical or physical therapy professional in the home or clinic setting.



This illustration shows the three dimensional circular movement created by cycloidal vibration.



This illustration shows the three dimensional circular wave transverse movement. (A transverse wave is a moving wave that consists of oscillations occurring perpendicular, or at right angles to the direction of energy transfer.)

IMPORTANT TO NOTE: to make medical claims a product has to be audited and meet specific European medical device quality standards. This assessment ensures quality, safety and proof of effectiveness. All NHC Cyclo-Therapy® products are registered as medical devices. As such they are UKCA marked, and are audited to standards regulated by the UK medicines and healthcare regulatory authority.

Our Therapy products Meet Medical Device Standards

We believe we are the only company in the UK manufacturing consumer therapy furniture to medical device standards.

All our therapy products are quality checked and adhere to the highest UK standards. We are registered with the UK Government's Medicines and Healthcare Regulatory Authority (MHRA) and have ISO 9001:2015 and ISO 13485:2016 accreditation.

Where Can I find NHC Cyclo-Therapy® to stay healthy at home?

NHC Cyclo-Therapy® is featured within products from our group of companies including Adjustamatic Beds, Niagara Therapy, Vibrant Medical, NHC Technology and Niagara Equissage.

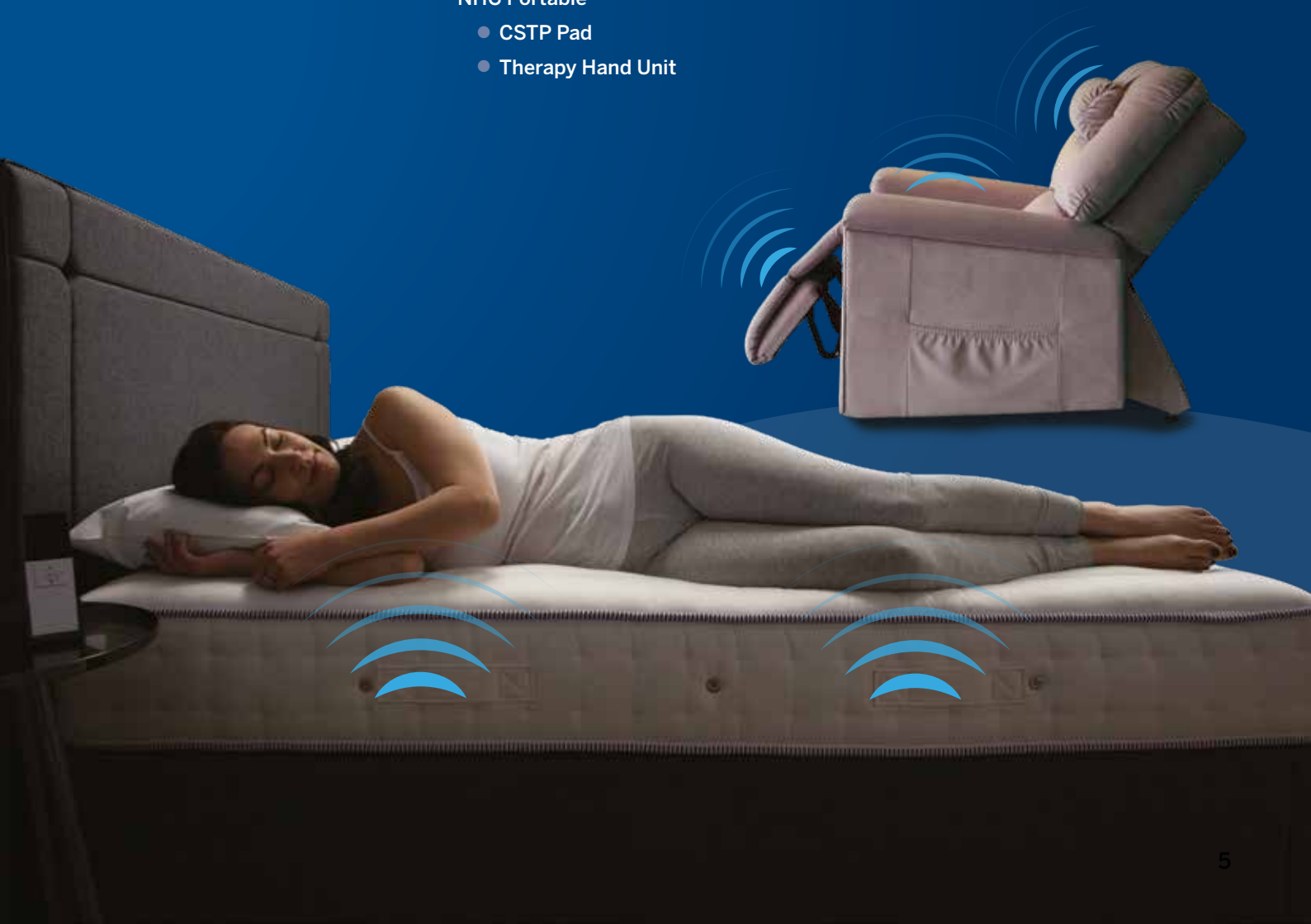
NHC Holdings Ltd

Adjustamatic – COMFORT YOU CONTROL
Therapy Beds & Chairs

Niagara Therapy (UK) LTD
Therapy Beds & Chairs
NHC Portable
- CSTP Pad
- Therapy Hand Unit

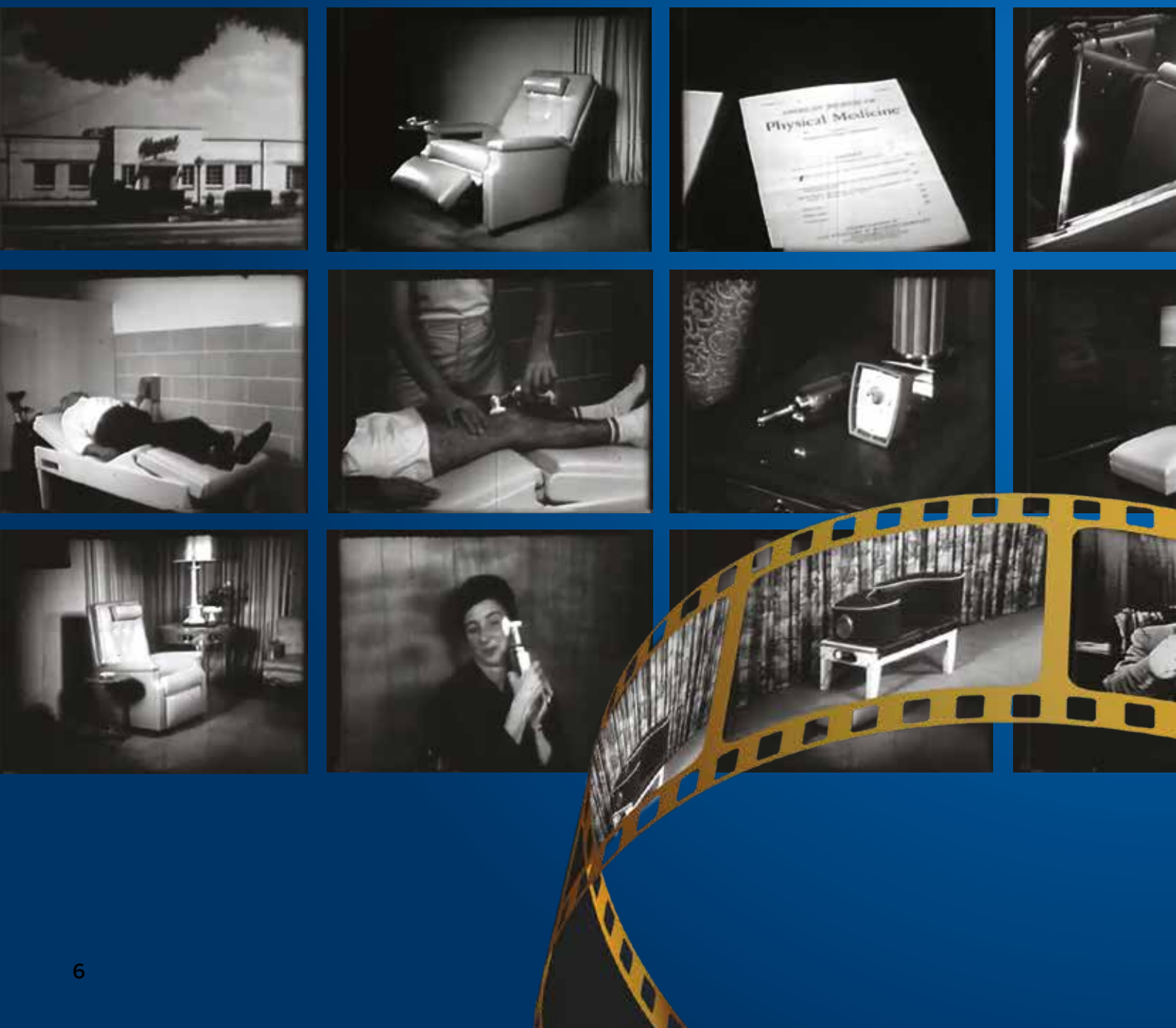
Vibrant Medical Ltd
Healthcare Products

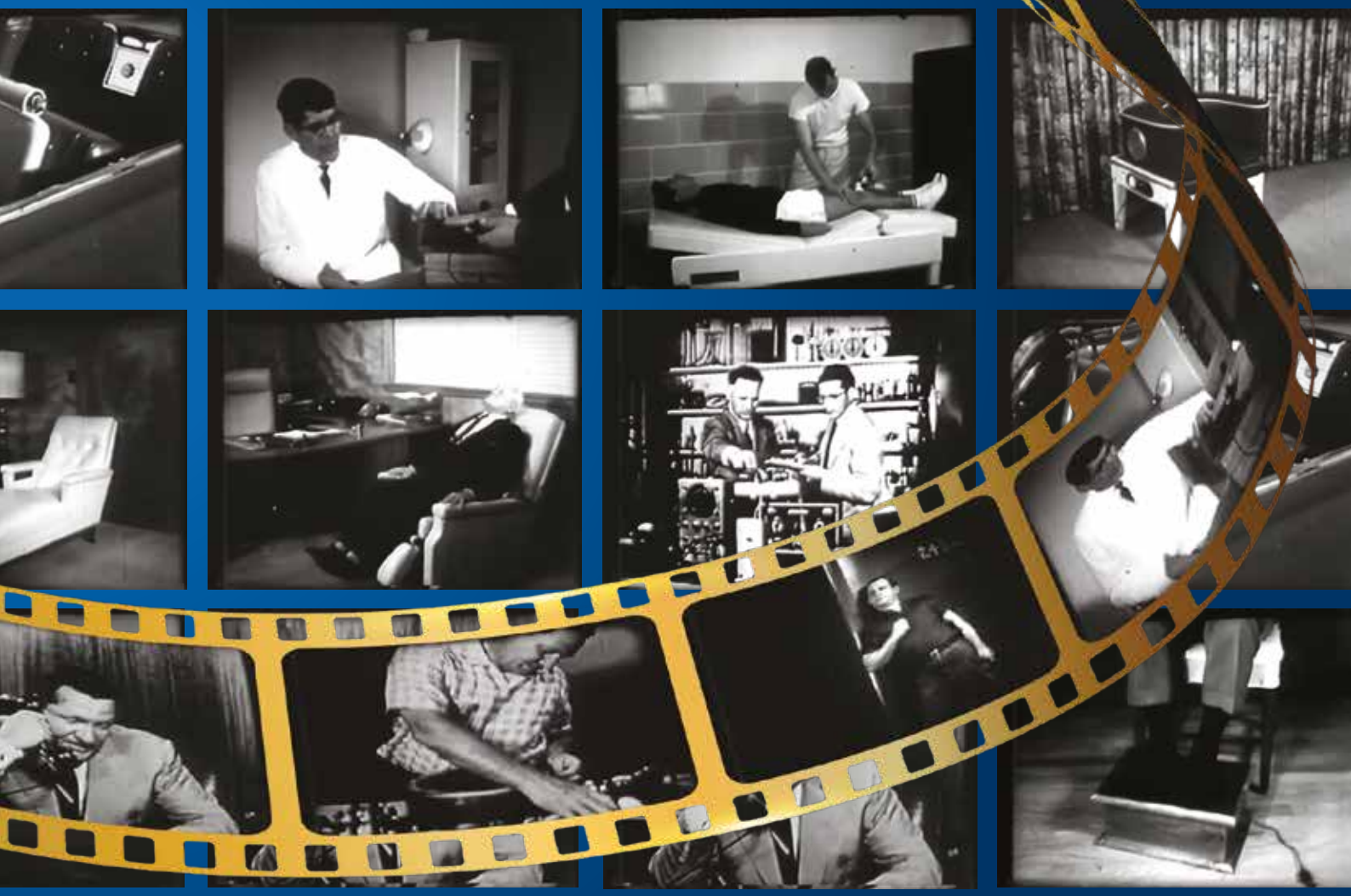
Niagara Equissage Pulse Digital
Equine Health



NHC Cyclo-Therapy®: A short history, where did it start?

Owen K Murphy was born and brought up in Carmel, Pennsylvania. An entrepreneur from a young age he applied his interest in business with the knowledge he gained in understanding physical health as a pharmacist's mate and working with plastic surgeons in the navy during World War II. He developed an avid interest in blood flow and circulation in helping injured GI's knowing that an injured man stood a good chance of losing a limb if blood flow could not be restored. In 1948 in a chance encounter at an auction house in New York, Owen met and eventually purchased a patent and rights to the first cycloidal vibration prototype device to help circulation. From a converted barn behind his house, he started to make the first products and started to market and sell them to consumers and hospitals across the USA developing into a USA healthcare company. Over the last 70 years of development and research cycloidal vibration has evolved into NHC Cyclo-Therapy® helping people with symptom relief across three continents.

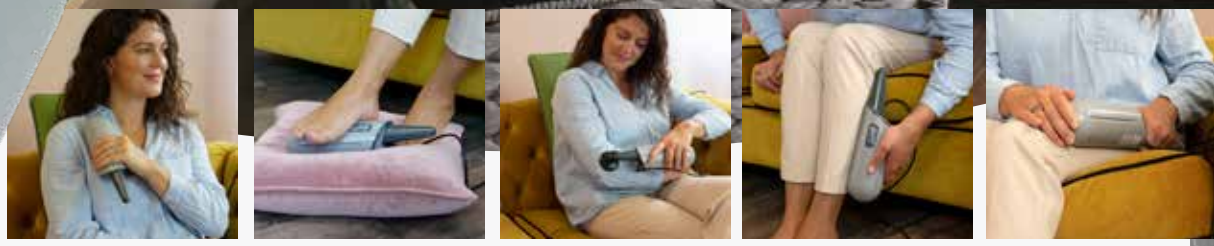




NHC Cyclo-Therapy® Product Range: Beds, Chairs, Hand Unit and CSTP Pad

CSTP Pad

Hand Unit



NHC Cyclo-Therapy® has been extremely beneficial for my arthritis. I experience arthritis in my hand and ankles and have felt that the Hand Unit has been helping in alleviating the symptoms. I was really happy with the service and the delivery was perfect, having expreienced no issues. Mrs Bell, Buckinghamshire

Blenheim Riser Recliner Chair with
built in NHC Cyclo-Therapy®

Adjustable bed with
built in NHC Cyclo-Therapy®

NHC Cyclo-Therapy® has been extremely helpful. I found that since using it I did not need to take as many painkillers! It has helped in relieving the aches and pains I experience. I am overall very happy with my purchase. Mr Drake, Bradford

Why is NHC Cyclo-Therapy® Different?

Initially there is no obvious difference between the feel of conventional vibration and the cycloidal vibration in our NHC Cyclo-Therapy® products.

However, conventional vibration can produce an aggressive slapping or pounding at a high amplitude in a single direction of motion and at a high frequency. Cycloidal vibration's acceleration rate is very low compared to other vibration techniques which can be up to 50 x higher. This often produces an uncomfortable sensation that may be damaging to muscle and soft tissue.

An NHC Cyclo-Therapy® unit has a very special suspension system, which is the reason it generates a three-dimensional motion like a cyclone "cycloidal vibration" in a circular rising and falling motion. This causes the energy to penetrate both gently and deeply into the body.

At the University of Brussels Medical Department, research by Professor P. Lievens demonstrated that cycloidal vibration energy effectively penetrates the human body and that:

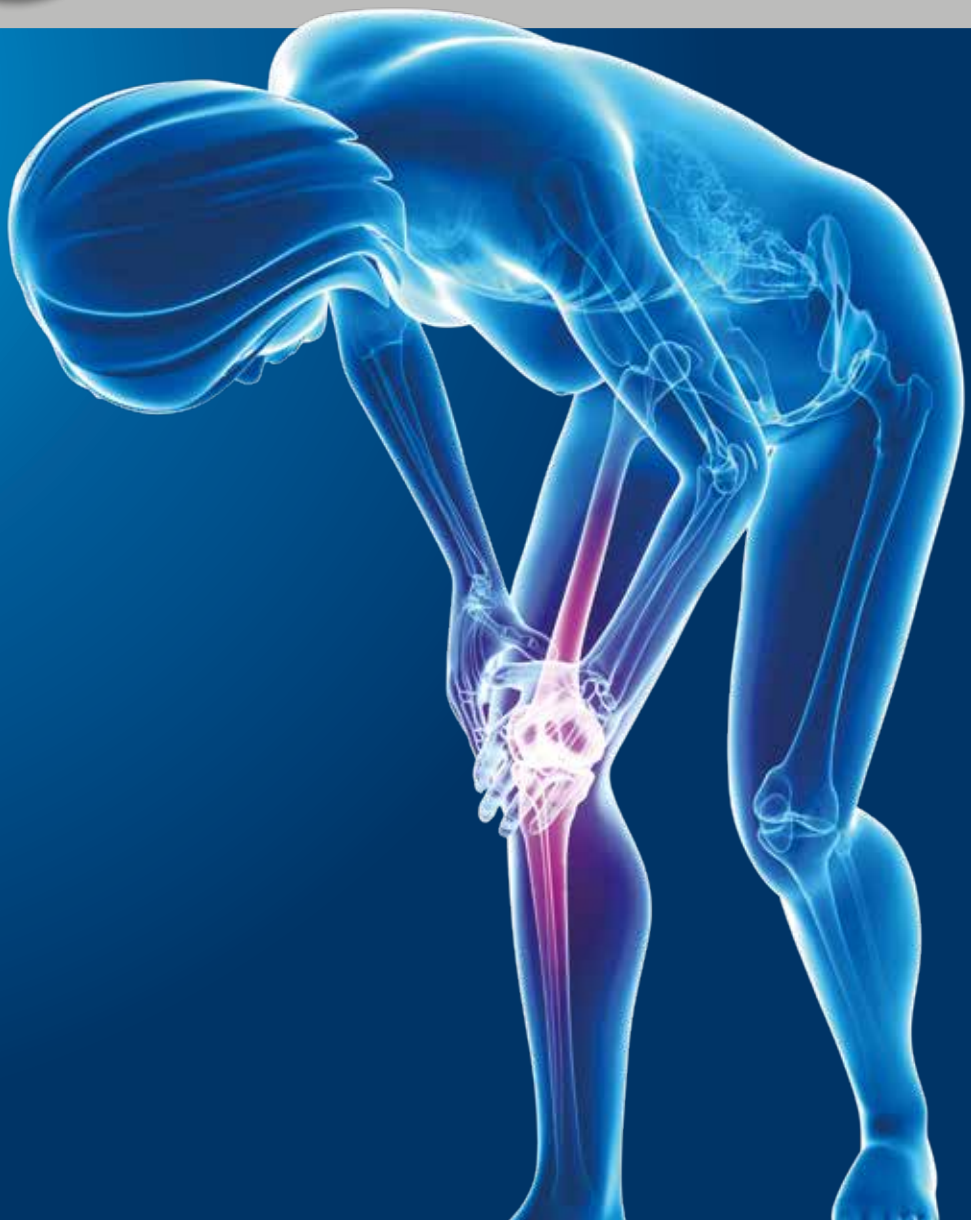
- **The Cycloidal vibration acceleration rate is very low – approximately twenty eight meters per second squared**
- **Other techniques of vibration can produce around one thousand two hundred and ninety meters per second squared. That is about 50 x greater than a Cycloidal vibration generator**
- **This is what sets cycloidal vibration apart .... It is a Non- Aggressive technique**

NHC Cyclo-Therapy® affect the muscles by way of stimulating mechano-receptors in the muscles causing a very gentle contraction, the intensity of a contraction is determined by the intensity of the stimulation. A muscle spasm is a result of too much stimulation and muscle contraction. Because the intensity of an electrical or tactile stimulation determines the intensity of the reaction or contraction of a muscle. Research has found that vibration with high acceleration rate will cause too much stimulation and can stress, traumatise or fatigue a muscle. This is akin

to straining or stressing a muscle, which will then produce additional metabolic waste in an area. This can cause soreness and swelling with too much load on the lymphatic system.

With NHC Cyclo-Therapy®'s small amplitude and low acceleration very high muscle motor response is obtained. However, it has been found that vibration with a large amplitude, as found in other products, will not obtain a muscle motor response; i.e. the muscle will not react. In other words, to be beneficial, the vibratory amplitude must remain within normal physiological (reactive) range. It has been found that because of the very high motor response (without stress) which occurs with cycloidal vibration, muscles begin to react and perform in a very positive manner. This is due to the use of cycloidal vibration having an effect on the muscle's electrical sensitivity; i.e. after using cycloidal vibration on a muscle, the muscle will react with less electrical input required. In scientific studies, the conclusion reached was that on human subjects, the rheobase (the lowest possible electrical impulse necessary to cause a muscle reaction) was reduced by 20% after just fifteen minutes of cycloidal vibration application. The benefits of this are of great importance for sports medicine and muscle toning, allowing greater mobility, especially with continued usage.

I use the NHC Cyclo-Therapy® Handheld Massager twice a day, for six minutes in each hand and I have definitely noticed the benefits. The massage function has improved the circulation and movement in my hands meaning I can firmly grip and pick up small items, which I would have struggled with before. Mrs Skinner, Newcastle



NHC Cyclo-Therapy®: The Benefits

CLINICAL PAPERS

The following is a guide to cycloidal vibration therapy and refers to a small selection of the medical evidence from presented and published clinical trials and investigations. Well over 50 clinical papers have been presented and published to date involving over 3000 testers and patients investigating the benefits.

Results of independent research show that the NHC Cyclo-Therapy® range of vibration applied in our products:

- Generates pain relief
- Raises pain thresholds
- Soothes most rheumatic pains
- Can help rest and relaxation
- Help muscle relaxation
- Ease simple nervous tension
- Help to ease high and low back pains
- Improve local blood circulation
- Improve venous drainage
- Improve lymphatic drainage
- Help reduce swelling
- Improve joint mobility in most instances

The body is a balanced system. Changes in any one area, can upset another and can alter the physiological balance, this can lead ultimately to debilitating symptoms.

Symptoms that include:

- Chronic or acute pain
- Tension and muscle spasm
- Poor circulation
- Poor venous or lymphatic drainage

Although we cannot say that the use of our products are a cure for a specific medical condition, NHC Cyclo-Therapy® combined with the positional adjustments of our products can help relieve common resulting symptoms.

Chronic and acute pain associated with Musculo-Skeletal conditions such as:

- Arthritis
- Rheumatism
- Frozen shoulder
- Tennis elbow

- High/low back pain
- Myalgia/nerve pain
- Fibromyalgia
- Muscle pain pre- and post activity

Nervous system problems associated with:

- Restless Legs
- Tension
- Anxiety
- Insomnia

Circulatory problems associated with:

- Oedema e.g. lower leg/ankle and foot swelling
- Leg ulcers
- Poor circulation due to diabetes
- Walking pain
- Cold feet

Respiratory problems associated with:

- COPD
- Bronchiectasis
- Asthma

Used by Professionals, available for you at home

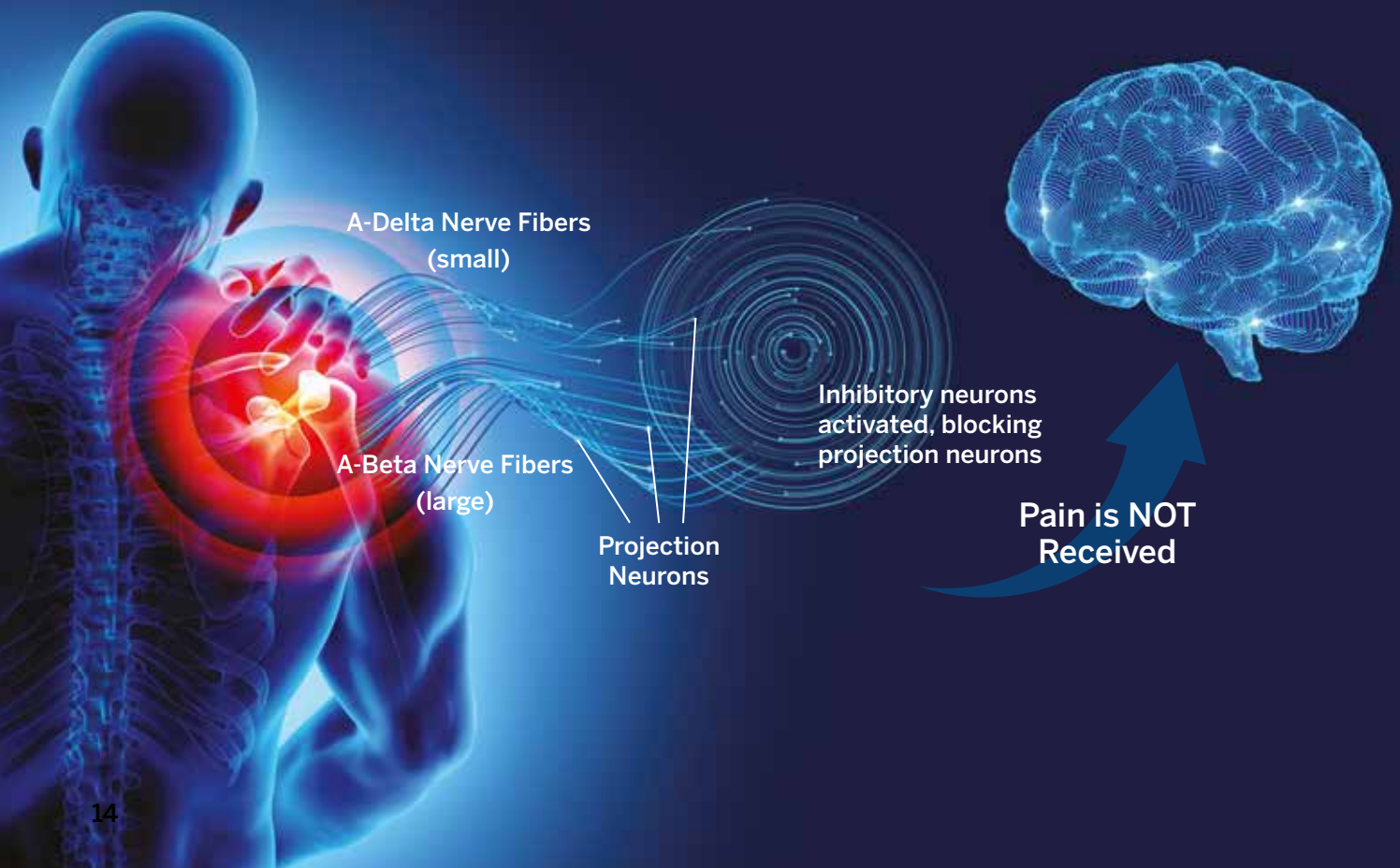
"At the West Yorkshire Physiotherapy Centre, we work with a wide variety of musclo-skeletal conditions, from post-operative orthopaedic problems to professional athletes sporting injuries. We are actively using NHC Cyclo-Therapy® in the treatment of connective tissues within our range of professional massage techniques. This promotes increased blood flow, reduction in swelling, decreased pain perception and as a result increased joint mobility and function." Janine Midgley - MCSP, HCPC, Grad Dip Phys, Dip App Sports.

NHC Cyclo-Therapy®: Reducing Pain

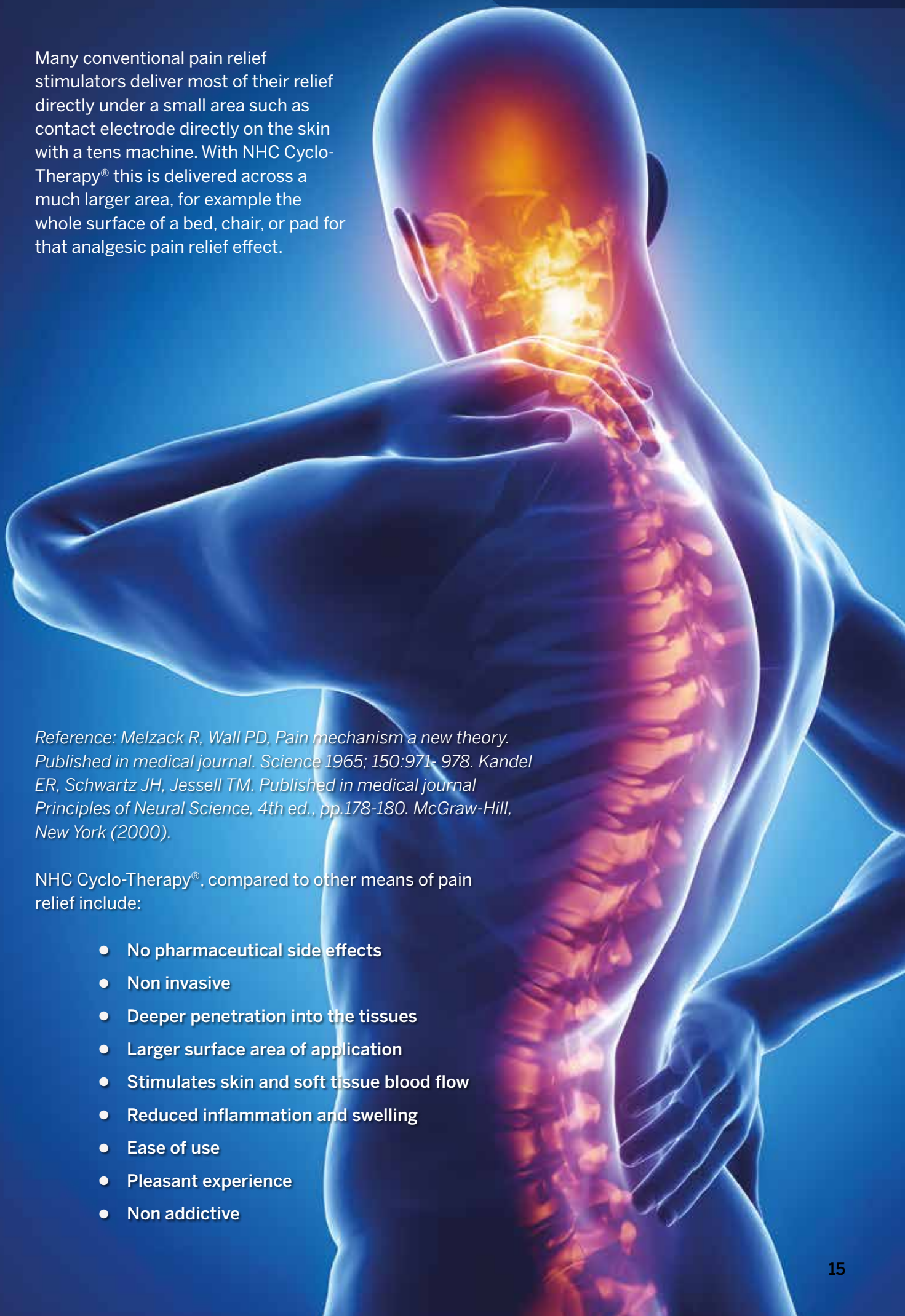
When applied, directly to or surrounding an area of pain, NHC Cyclo-Therapy® is a non pharmacological aid to both generate pain relief or increase pain threshold.

The cycloidal vibration generates an anaesthetic effect to reduce pain. HOW? It is a sensory stimulant for parts of the nervous system that regulate the feeling of pain.

It stimulates through the skin and into the body the fast-conducting large diameter myelinated A-Belta fibres nervous system. These in turn block the slower conducting nervous system that carry the pain signals. As a result this then triggers (inhibitory interneurons) these control pain transmission resulting in pain relief or an analgesic effect and potentially raised pain threshold.



Many conventional pain relief stimulators deliver most of their relief directly under a small area such as contact electrode directly on the skin with a tens machine. With NHC Cyclo-Therapy® this is delivered across a much larger area, for example the whole surface of a bed, chair, or pad for that analgesic pain relief effect.



Reference: Melzack R, Wall PD, Pain mechanism a new theory. Published in medical journal. Science 1965; 150:971- 978. Kandel ER, Schwartz JH, Jessell TM. Published in medical journal Principles of Neural Science, 4th ed., pp.178-180. McGraw-Hill, New York (2000).

NHC Cyclo-Therapy®, compared to other means of pain relief include:

- **No pharmaceutical side effects**
- **Non invasive**
- **Deeper penetration into the tissues**
- **Larger surface area of application**
- **Stimulates skin and soft tissue blood flow**
- **Reduced inflammation and swelling**
- **Ease of use**
- **Pleasant experience**
- **Non addictive**

Apply NHC Cyclo-Therapy® to these common forms of pain

Various types of Musclo-skeletal pain can be relieved by NHC Cyclo-Therapy® ranging from:

- **Arthritis**
- **Tendinitis**
- **Fibromyalgia**
- **Nerve pain**
- **Back and Joint pain**
- **Muscle pain**
- **Also help to prevent muscle soreness due to over activity**

Reduce Arthritis Pain

Pain in the joints has been shown to be reduced considerably and in some cases, eliminated, on a repeat basis by the application of Cyclo vibration therapy. With arthritis it can cause the build-up of metabolic waste material in the synovial fluid, resulting in irritation and increased swelling / inflammation in and around the joint. Movement is accompanied by pain and reduced mobility due to limited joint flexion caused by inflammation.

It has been noted on many occasions following the application of cycloidal vibration that joint pain and swelling is reduced, in turn resulting in improved joint and general mobility.

NHC Cyclo-Therapy® will not cure Arthritis but may help relieve symptoms such as pain, swelling and joint mobility. Key factors that can improve quality of life and general wellbeing.

RESEARCH

"Vibration therapy reduces chronic pain" Research Published in the 'European Journal of Pain'.

Vibration can help to ease certain types of pain by more than 40 percent. Scientists at the University of Florida College of Medicine found that vibration produces an "analgesic effect", according to Dr Roland Staud, a professor of rheumatology and clinical immunology at the institute. Reference - Roland Staud et al. "Attenuation of experimental pain by vibro-tactile stimulation in patients with chronic local or widespread musculoskeletal pain." European Journal of Pain. February 2011.

Helping Pain and Joint movement

Scientific research shows that: "Muscle vibration helps knee movement in people with osteoarthritis" Research published in the European Journal of Physical and Rehabilitation Medicine.

Reference: Rabini A et al. Effects of focal muscle vibration on physical functioning in patients with knee osteoarthritis: a randomized controlled trial. Eur J Phys Rehabil Med. 2015 Oct;51(5):513-20.

"Improve Joint motion with osteoarthritis of the knee" Professor Lievens demonstrated that knee flexion and extension movements, both active and passive, were significantly improved in patients with osteoarthritis of the knee receiving NHC Cyclo-Therapy® compared to the control group that did not receive NHC Cyclo-Therapy®. Lievens P, Van De Voorde J (1984) The influence of cycloidal vibrations on the knee joint mobility of osteoarthritic patients. Physiotherapy 70(6): 241-243

Reduce Back Pain

Both upper and lower back pain have been found to be considerably reduced due to NHC Cyclo-Therapy®. Pain in almost all cases, including radiating pain, is reduced by the reduction of pressure (from muscle spasm and/or swelling) on the nerves and reduction in muscle tightness.

NHC Cyclo-Therapy® (CSTP)

It has been noted on many occasions following the application of cycloidal vibration that joint pain and swelling is reduced, in turn resulting in improved joint and general mobility.

Research has shown that when applied to the low back of patients with chronic lower back pain, vibration therapy at the same levels as Cyclo-Therapy can improve back and stomach muscle control and movement and may aid exercise that can help back muscle strength.

Reference: Jean-Alexandre Boucher et al. The Effects of Vibration and Muscle Fatigue on Trunk Sensorimotor Control in Low Back Pain Patients. journal.pone. August 26, 2015 1 / 17

Pad being used behind the back

As a company, Adjustamatic and our NHC Cyclo-Therapy® beds work with Back Care, a national charity working to reduce the burden of back and neck pain by providing information, guidance and advice to all people and organisations affected by such pain.

Reduce Muscular and Nerve Pain

Some forms of pain can be more complex and difficult to manage such as fibromyalgia or neuropathic pain. NHC Cyclo-Therapy® cannot cure these conditions but for some may provide a relief for symptom pain

- Fibromyalgia is a disorder resulting in widespread musculoskeletal pain accompanied by fatigue, sleep, memory, and mood issues. Researchers believe that fibromyalgia amplifies painful sensations by affecting the way your brain and spinal cord process painful and nonpainful signals. [In some instances, it may cause allodynia – when you feel pain from something that should not be painful at all, such as a very light touch. In this instance NHC Cyclo-Therapy® is unlikely to help.]
- Nerve pain or neuropathic pain is a pain condition that's usually chronic. It's caused by chronic, progressive nerve disease (this can be due to diabetes), and it can also occur as the result of injury or infection. It can flare up at any time without an obvious pain-inducing event or factor. NHC Cyclo-Therapy® has shown to relieve pain symptoms for individuals with nerve pain.

RESEARCH

NHC Cyclo-Therapy® and fibromyalgia: Research by Pujol J in 2019 on 63 female patients with fibromyalgia was undertaken using vibration therapy. Active intervention involved extensive body stimulation with gentle mechanical vibrations administered during 3 hours at night for 3 weeks, and the placebo effect was controlled using identical instruments to simulate an alternative treatment option. The primary outcome measure combined pain, fatigue, and complaints of poor cognition.

RESULTS: Vibrotactile stimulation was significantly superior to sham in alleviating fibromyalgia symptoms globally. Vibrotactile stimulation was notably well tolerated, and sleep quality significantly improved despite the fact that vibrations were administered at night.

CONCLUSIONS: Results thus provide new evidence that non-nociceptive somatosensory stimulation may favourably act upon altered somatosensory balance in fibromyalgia. From a clinical perspective, both the degree of improvement and the easy application of our proposal would seem to support a potential role for vibrotactile stimulation in the symptomatic treatment of fibromyalgia.

Reference: Pujol J et al. Testing the effects of gentle vibrotactile stimulation on symptom relief in fibromyalgia. Arthritis Res Ther. 2019 Jun 14;21(1):148.

NHC Cyclo-Therapy® and diabetic nerve pain: Research by Stambolieva K in 2017 set out to evaluate the effectiveness of 8-week low-frequency plantar (under the feet) vibration training on patients with diabetic peripheral neuropathy (DPN). PARTICIPANTS: Twelve patients took part in the investigation. RESULTS: An increase of the nerve conductive velocity of soral and peroneal nerves of feet, increased postural stability, and disappearance of the pain and tingling were observed. CONCLUSION: The obtained results provide evidence for beneficial effects of 8-week plantar vibration training in patients with DPN.

Reference: Stambolieva K et al Positive effects of plantar vibration training for the treatment of diabetic peripheral neuropathy: A pilot study. Mot Res. 2017 Jun;34(2):129-133

NHC Cyclo-Therapy® HAS MADE SUCH A DIFFERENCE TO MY LIFE, by Dr Ahmed practising GP

Dr Ahmed told us "I was an active practising GP, in 2011 I was diagnosed with large multiple gastric tumours. I had extensive surgery to remove them followed by chemotherapy. Surgery left me with severe tissue damage and painful stomach scarring, and I ended up walking with a stoop due to my scar pain. This led to chronic back pain and a slipped disk.

A side effect of chemotherapy was joint pain and neuropathic pain in my fingers and hands. My pain continued and I was on morphine, anti-inflammatories, and daily tramadol to manage my back, scar and neuropathic pain. I was constantly lethargic, and I could hardly work for the next 5 years. I was introduced to NHC Cyclo-Therapy® by my private physiotherapist to use on my scarring and back to see if it could release the tethered tissues.

As a GP I was a little sceptical not knowing about NHC Cyclo-Therapy® but I was desperate to try anything. After the first 5 x 30-minute therapy sessions there was a huge improvement. There was a release and relaxation in my stomach muscles allowing me to walk straighter and without a stoop reducing my back pain. With continued use of the Therapy, I was nearly pain free and stopped all of my pain medication enabling me to work full time. I cannot recommend it enough the difference it has made to me."

Apply NHC Cyclo-Therapy® to prevent pain BEFORE a daily busy routine or exercise

Being overactive in daily routines such as exercise, gardening, and long walks, can often lead to muscle pain or soreness a few hours later or the following day called DOMS.

Delayed-onset muscle soreness (DOMS) is a symptom of exercise-induced muscle straining or injury that is commonly encountered in athletes and fitness enthusiasts or if muscles are generally over worked.

If you have walked a little further or exercised a little more than normal, then each movement beyond the capability of your muscles result in small microscopic ruptures within the muscle.

The subsequent healing of the ruptures creates the soreness due to the temporary changes caused in muscles unaccustomed to exercise. Other such changes include decreased muscle strength, reduced range of motion, and muscle swelling during soreness and healing.

Ten research studies on over 258 people found that applying vibration therapy to the area of the body either before or after exercise can reduce muscle pain for up to 72 hours.

Reference: Xingang Lu et al. Does vibration benefit delayed-onset muscle soreness?: a meta-analysis and systematic review. Journal of International Medical Research 2019, Vol. 47(1) 3–18

RESEARCH

"Vibration therapy for 20 minutes produced relief of chronic muscle pain that lasted at least 3 hours but in many cases 12 hours or more."

Reference: Lundeberg T, Vibratory stimulation for the alleviation of chronic pain. Acta Physiol Scand Suppl. 1983; 523:1-51.

Vibration Therapy has been shown to be more effective at reducing Pain when compared to a placebo therapy. Published in the Medical Journal of Pain a study of 366 people with different forms of musculoskeletal pain ranging from extremity pain-arthritis, tendinitis, nerve pain, lower back pain and others.

- **69% of people reported a reduction in pain due to vibration therapy**
- **142 patients (64%) had more that 50% reduction**
- **58 patients (26%) had complete relief**
- **To obtain maximum relief of chronic pain the therapy had to be applied for about 25-45 minutes with many reporting pain relief for 3 to 6 hours.**

Reference: Lundeberg T, Nordemar R, Ottoson D. Pain Alleviation by Vibratory Stimulation. Journal of Pain 20 (1984) 25-44.

Vibration therapy can help with acute and chronic pain. Published in medical journal Acta Physiologica Scandinavica. (Scandinavian physiology journal).

- **In a study on 731 patients. 135 with acute pain. 596 with chronic pain**
- **Most of the patients had previously undergone treatments of various kinds without sufficient pain relief**

- **Vibration therapy for 20 minutes produced relief of chronic muscle pain that lasted at least 3 hours but in many cases 12 hours or more**

Reference: Lundeberg T, Vibratory stimulation for the alleviation of chronic pain. Acta Physiol Scand Suppl. 1983; 523:1-51.

Regular vibration therapy use to reduce pain can help long term research. Published in medical Journal Pain®.

- **All had suffered pain for 6 months to 8 years.**
- **All had previously tried a range of analgesics and interventions to treat the pain with little effect.**
- **68% of 267 patients with chronic neurogenic (nerve) or musculoskeletal pain such as neuralgia, low back pain, myalgia, tendonitis, epicondylitis, and rheumatoid arthritis had pain reduction due to vibration.**
- **59% had ongoing relief when followed up 18 months later, indicating that induced pain relief may have long lasting effects.**

Reference: Lundeberg T. Long-term results of vibratory stimulation as a pain relieving measure for chronic pain. Pain.1984 Sept; 20 (1):13-23.

The Lancet medical journal editorial concludes "...the treatment of pain by vibration is simple, safe, and highly effective."

Reference: Vibration therapy for pain. Lancet. 1992 Jun 20; 339(8808):1513-4.

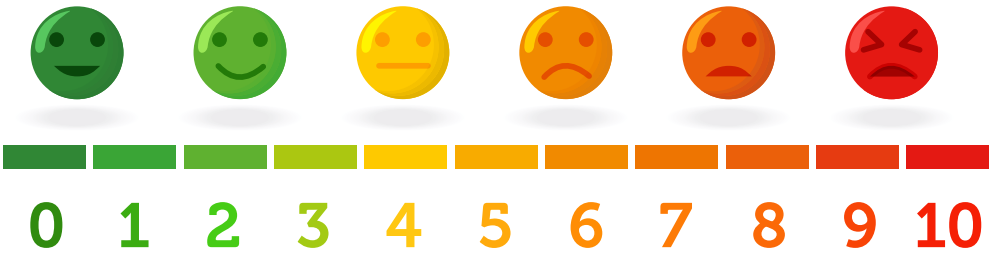
Example – Joint Pain & Fibromyalgia

Mr. C is a 66 year old male and has suffered with muscular, joint pain and fatigue in the back, neck and upper and lower limbs for over 40 years. Three years ago Mr. C was diagnosed with Fibromyalgia, he also suffers with polymyalgia, spondylosis and arthritis.

Mr C suffers permanently with varying levels of back, neck and shoulder pain, this then affects both his arms and legs. On an average day Mr C will take the following medication to help with his pain Tramadol (TDS), Paracetamol (TDS) and Amatriptaline (OD). Mr C however states he has pain all the time and that the analgesia only helps reduce its intensity. Mr C has also experienced little or no pain reduction with acupuncture and TENS.

How was NHC Cyclo-Therapy® used? The pad was used against the back and across the shoulders in the seated position over the area of pain. The pad was applied 3 times a day for 30 minutes

Result of use – Mr C recorded changes in pain using a 0 - 10 visual analogue scale, before and after applying the pad.



BEFORE On average Mr C recorded a score of 8

AFTER On average Mr C recorded a score of 5

- **A reduction in pain and intensity was noted and this could last over 2 hours**
- **Mr C also stated that he found the product comfortable to apply and very easy to use**

"It also helped with muscle relaxation; I had more mobility in my neck and shoulders. I found it very beneficial to reduce my pain first thing in the morning this made going out and daily activities more comfortable."

USER CONVIENECE: For ease of daily use our NHC Cyclo-Therapy® is built into our range of luxury therapy adjustable beds.

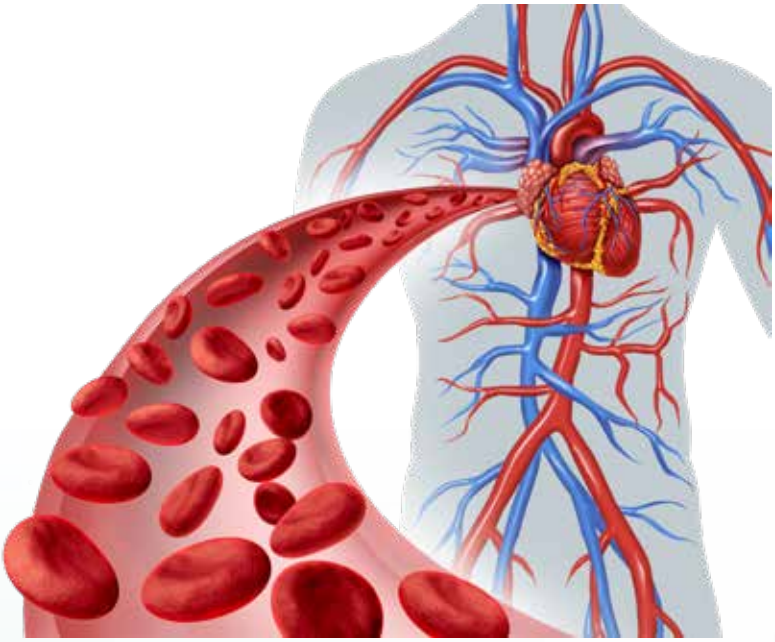
Used by Professionals, now available for you at home.

"NHC Cyclo-Therapy® products are used at specialist spinal injury centres across the country. Occupational and physiotherapists use the therapy to relax tight muscles, soften tissues reducing swelling and pain management."

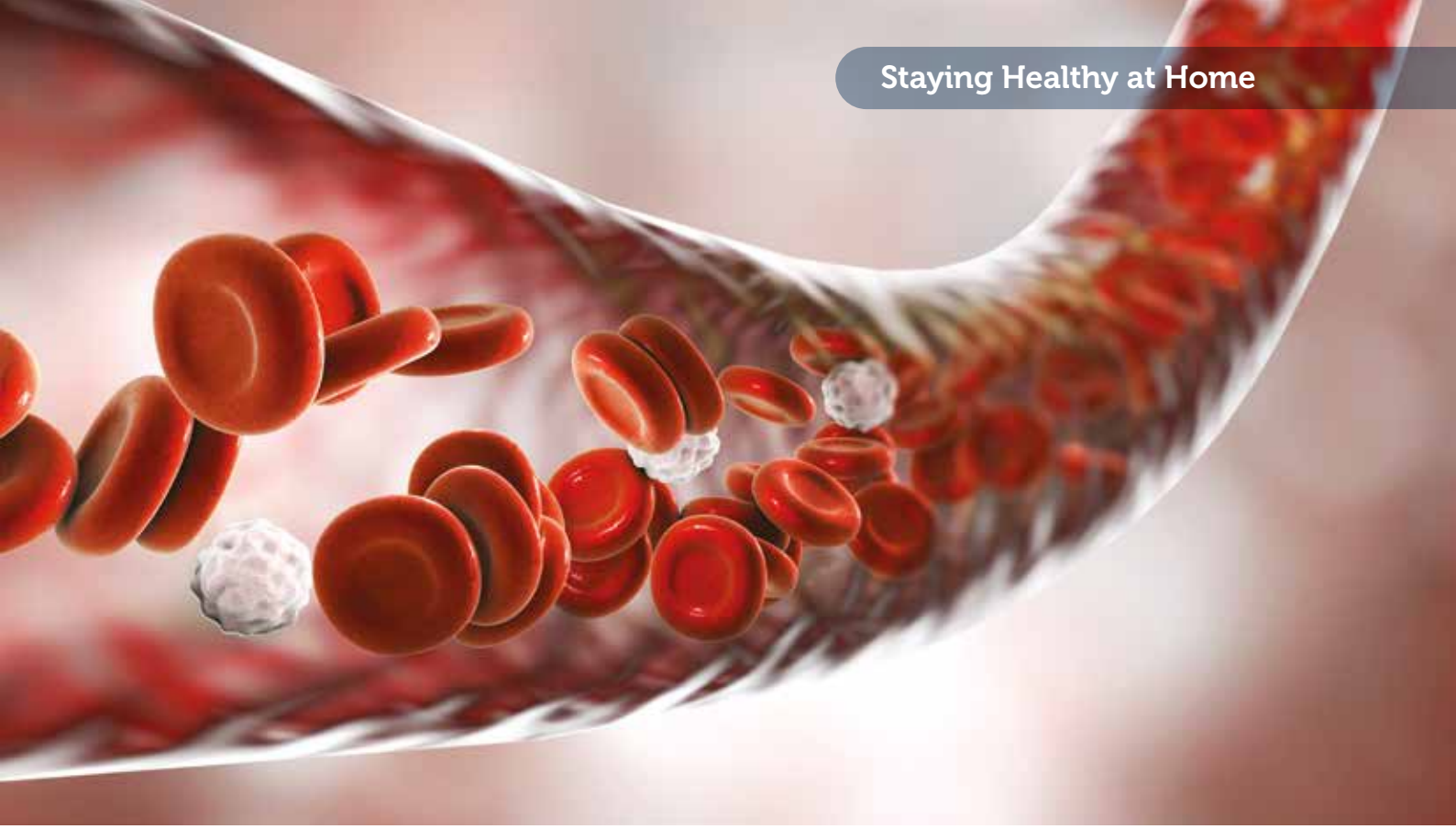
Staying Healthy at Home: Dealing with circulatory problems

Poor circulation is common as we get older or become less active, blood vessels become less elastic, valves can start to fail, and arteries can narrow or become blocked. All can affect the blood vessels and restrict the normal flow of blood causing poor circulation and can lead to:

- **High blood pressure**
- **High cholesterol**
- **Diabetes**
- **Varicose Veins**



Mobility in your legs is increasingly important as you age to maintain healthy circulation as your leg muscles help the circulation to your heart.



Poor Circulation especially in the limbs and extremities can cause a range of problems not only cold, numbness and tingling feet and hands but also.

- **Pain in legs and feet**
- **Pain and muscle cramps when walking**
- **Tired aching legs**
- **Swollen feet and lower legs. (Oedema)**
- **Slow to heal foot and leg wounds / ulcers**
- **Dry itchy pale skin**

NHC Cyclo-Therapy® has shown in research to improve blood flow and circulation.

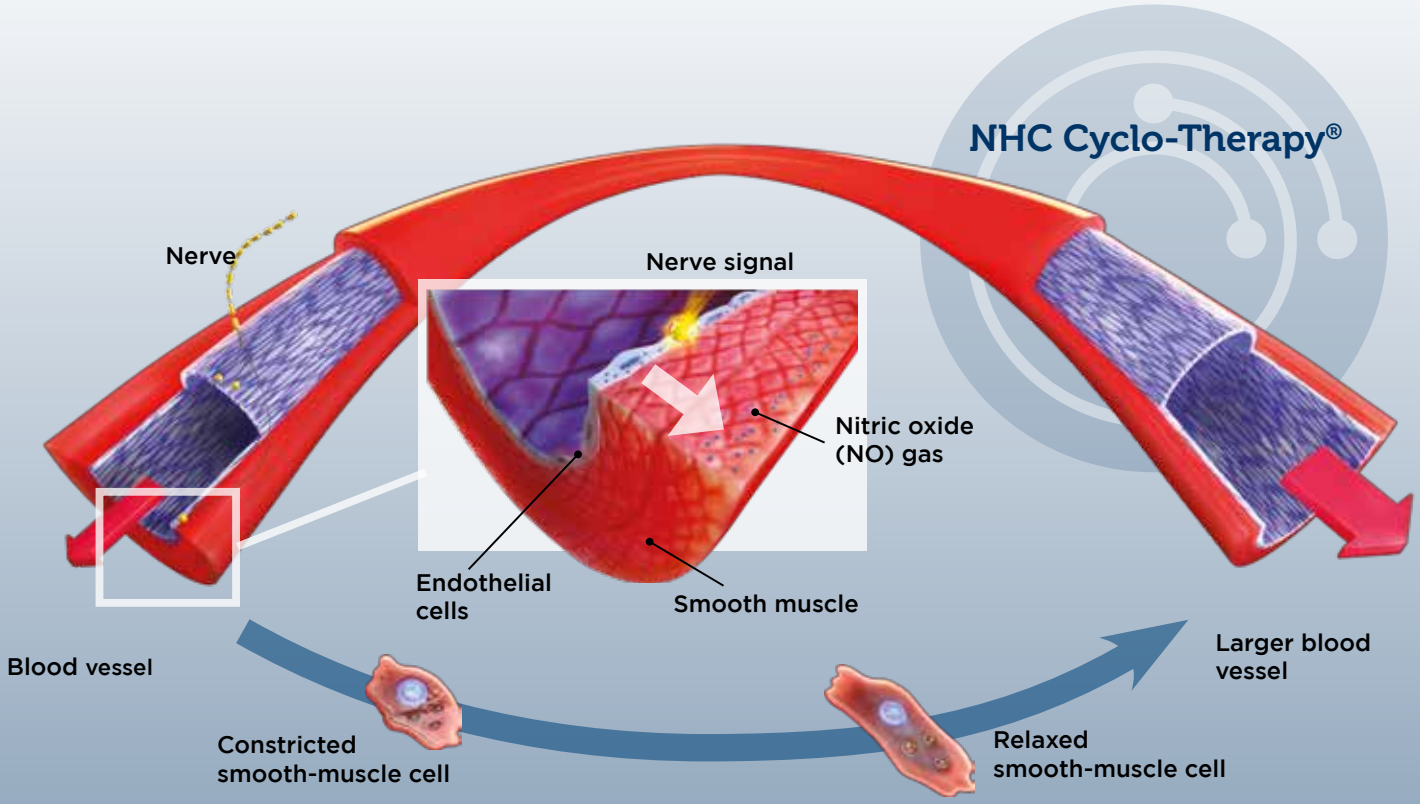
How does NHC Cyclo-Therapy® increase circulation?

The non-invasive application of NHC Cyclo-Therapy® vibration results in a process called mechano-transduction, the process of cells converting mechanical energy (vibration) into chemical activity.

The therapy penetrates into the vascular cells that line the blood vessels results in the stimulation of a number of chemical reactions. This includes the release of the chemical nitric oxide; this chemical is a natural relaxant of smooth muscle.

Nitric Oxide relaxes the smooth muscle walls of the blood vessels, this can increase the diameter and size of the blood vessels (veins and arteries), resulting in dilation and allowing more blood to flow in the area treated with NHC Cyclo-Therapy®.

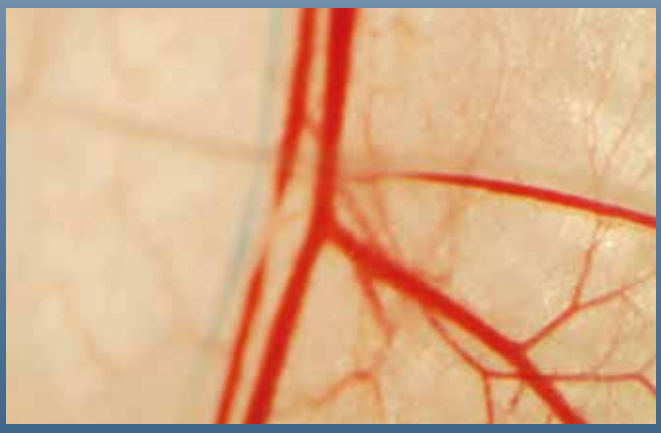
Reference: Clinical Reference. Sackner MA, Gummels E, Adams JA. Mount Sinai Medical Center, Miami Beach, USA. Nitric Oxide is released into circulation with wholebody, periodic acceleration 127: 30-39 (2005). Published in Chest. Official medical Journal of the American college of Chest Physicians.



RESEARCH

The following study shows an increase in blood vessel flow and diameter in skin and soft tissue after a 10 minute application of cycloidal vibration. The changes were observed in an invivo microcirculatory model.

Before



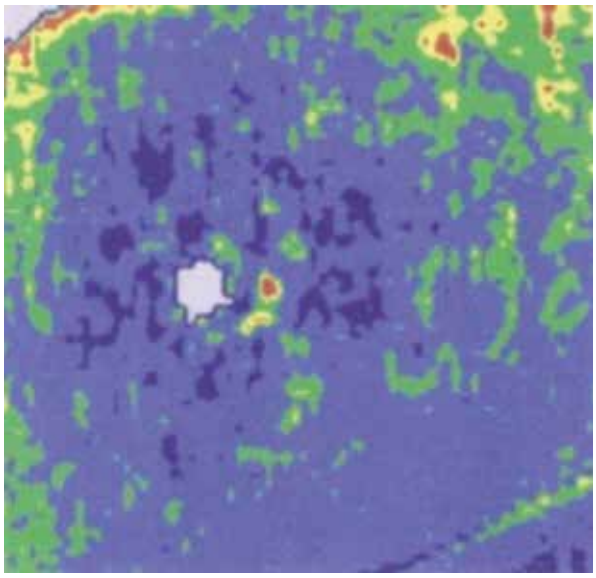
After 10 minutes of cycloidal vibration: Note the enlarged blood vessels due to the dilation caused by NHC Cyclo-Therapy®.

Reference: Professor Pierre Lievens. Head of the department of Medical Rehabilitation Research. Faculty of Medicine, Vrije Universiteit Brussels. Presented at Wounds UK medical conference. Autumn 2011.

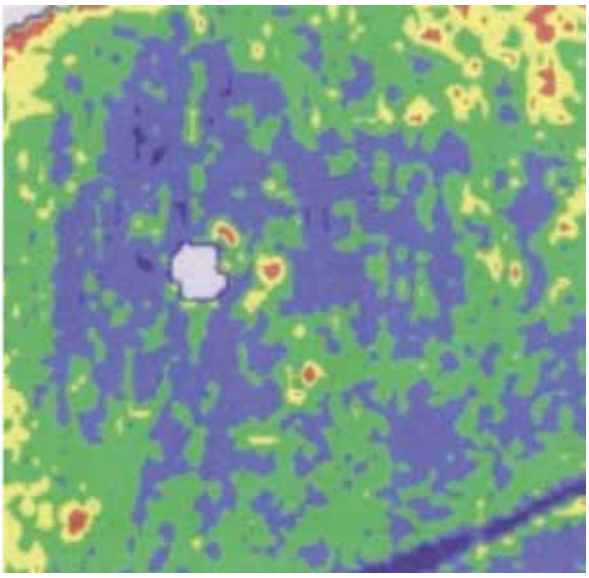
Laser Doppler imaging

Increase in blood flow due to the non-invasive application of cycloidal vibration has been shown in numerous ways including measurement by Laser Doppler imaging and plethysmography.

In 2001 Professor T Ryan and colleagues at the Oxford Wound Healing Institute (Oxford Brookes University and Churchill Hospital) measured blood flow in skin / soft tissue of adults with Laser Doppler Ultrasound before and after NHC Cyclo-Therapy®. "They found that it recorded a consistent increase in blood supply following cycloidal vibration".



Before



After

The blood flow is shown as the green and yellow area by scanning with Laser Doppler imaging before and after cycloidal vibration.

Reference: Ryan et al. The effect of mechanical forces (vibration or external compression) on the dermal water content of the upper dermis and epidermis, assessed by high frequency ultrasound. Journal of tissue viability 2001 Vol 11 NO 3

Research comparing vibration to a placebo (no treatment) on the blood flow of the lower legs found an increase in peripheral blood flow of 14% compared to the placebo. Peak blood flow occurred after 22 minutes of vibration therapy.

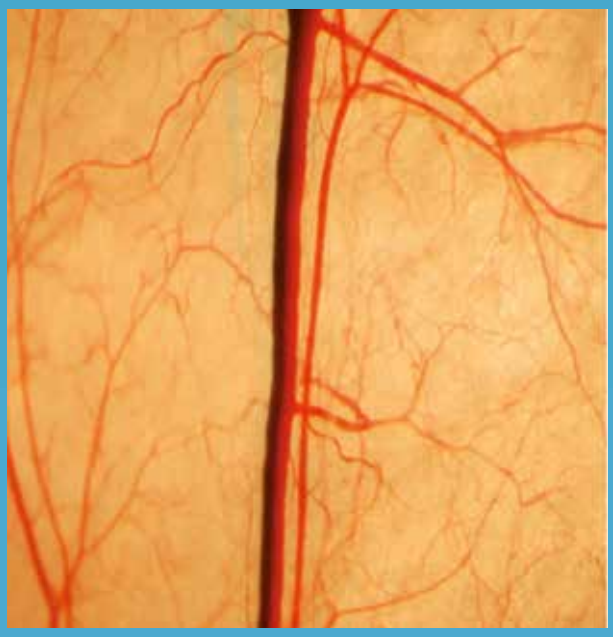
Reference: Button C, Anderson N, Bradford C, et al (2007). The effect of multidirectional mechanical vibration on peripheral circulation of humans. Clin Physiol Funct Imaging, 27, pp211–216.

Research undertaken at the department of physical therapy at Chicago University in 2018 shows that placing your feet on to a low intensity vibration surface as per an NHC Cyclo-Therapy® pad or Hand Unit will produce acute increases in skin blood flow.

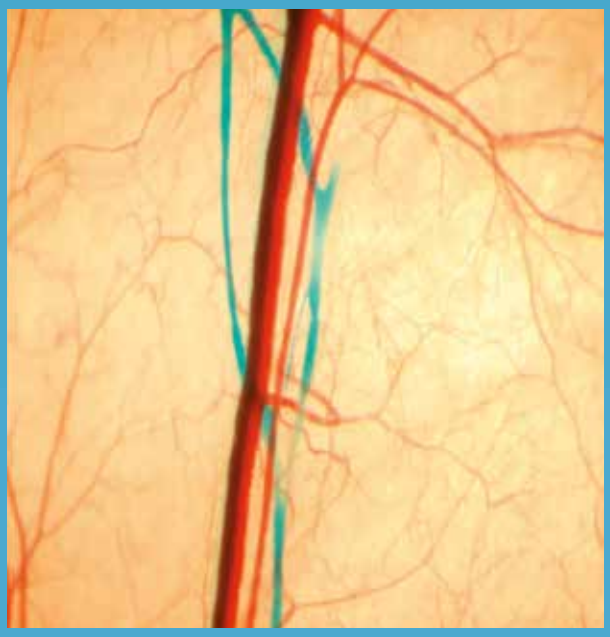
Reference: Yi-Ting Tzen,et al Increased skin blood flow during low intensity vibration in human participants: Analysis of control mechanisms using short-time Fourier transform PLOS ONE https://doi.org/10.1371/journal.pone.0200247 July 12, 2018

Lymphatic system is part of the circulation.

90% of fluid in the body is circulated by blood vessels and 10% by the lymphatic system as the body's overflow system. Lymphatics are vital in removing excess fluid and swelling / oedema, as they remove not only fluid, but also the larger particulate matter such as proteins, microphages and metabolic waste material, which cannot be removed via the blood capillary system.



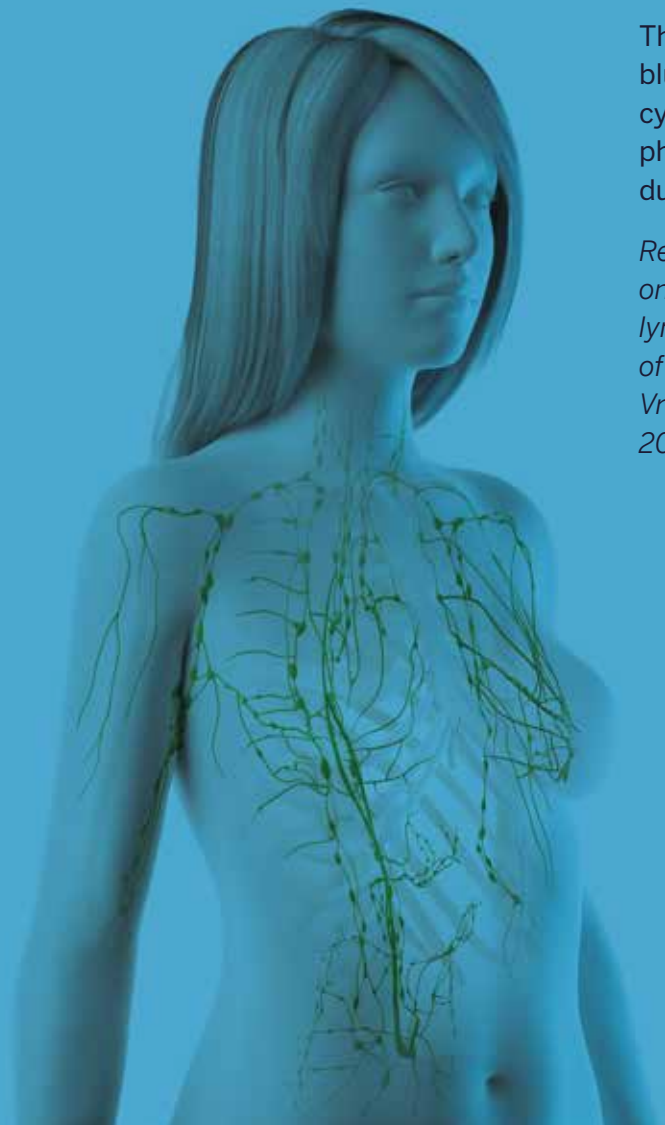
Before



After

The Lymphatic vessel is highlighted with blue dye before and after 10 minutes of cycloidal vibration. Clearly visible in the after photograph is dilation of the lymphatic flow due to NHC Cyclo-Therapy.

Reference: Influence of Cycloidal Vibration on lymphatic flow and changes observed in lymphatic vessels. Professor P Lievens, Head of the department of Lymphoedema Research. Vrije Universiteit Brussel, presented Wounds UK 2008 medical conference.



NHC Cyclo-Therapy®: Reducing Oedema

The combined effects of stimulating blood flow and the lymphatics can help reduce the symptoms of Oedema (lower leg, ankle and foot swelling).

Swollen feet, ankles and Lower Legs: Oedema

Swelling / Oedema is an abnormal accumulation of fluid, this can occur beneath the skin or in deeper tissues. Swelling of the foot, ankle and lower leg can be common results and is often known as water retention. It is often caused by circulatory problems, either directly or as a result of heart problems, varicose veins, venous hypertension, lymphoedema, or a range of health conditions and poor mobility.

RESEARCH

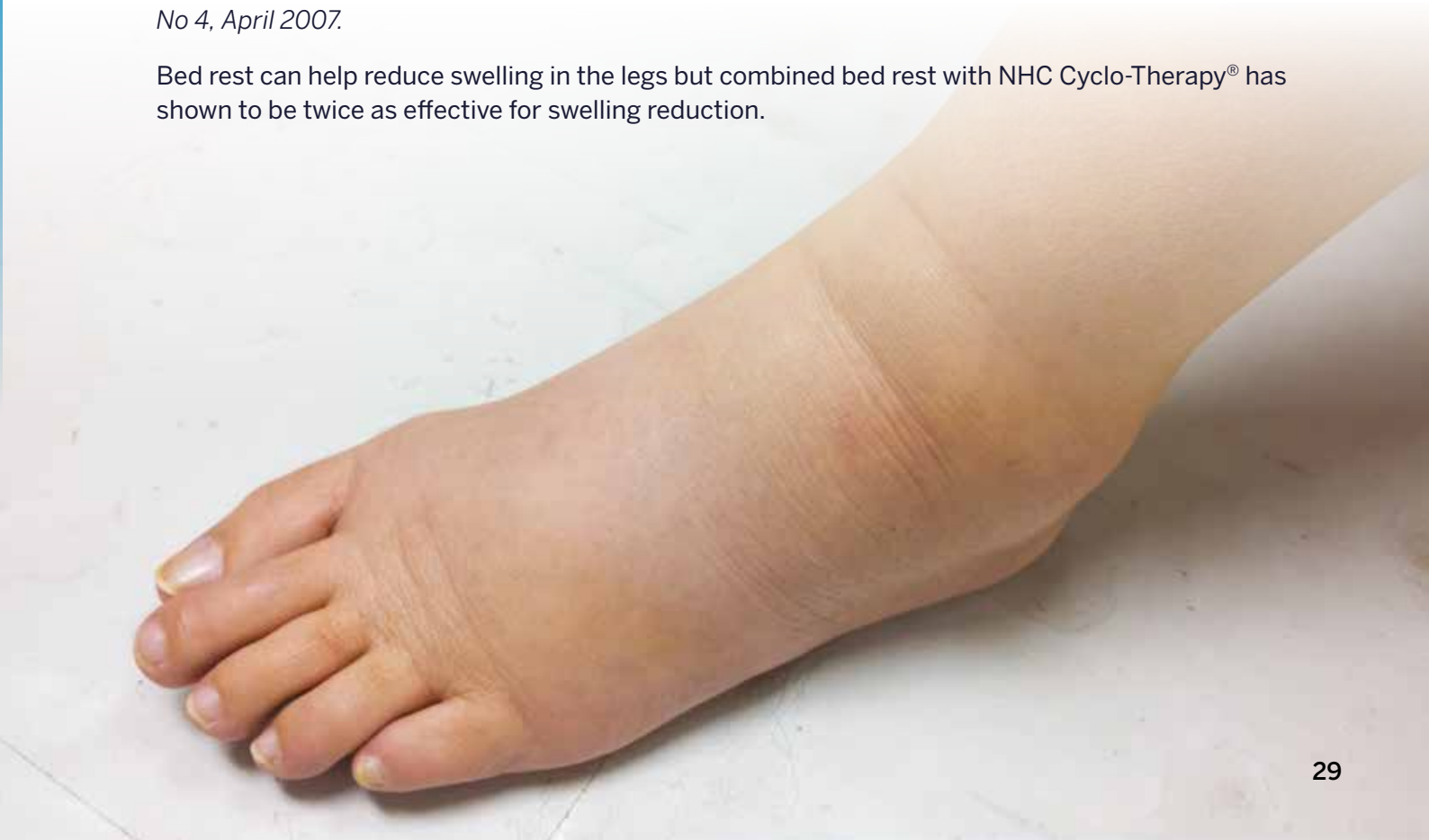
A study by Dr Cherry published in the Journal of Wound Care in 2002 showed that the application of cycloidal vibration showed up to a 15% reduction in leg limb volume or swelling when applied daily.

Reference: Wilson J, Arseculeratne YM, Yang Y and Cherry GW Oxford Wound Healing Institute, Churchill Hospital, Oxford, Journal of Wound Care Vol 11 NO 9 October. 2002

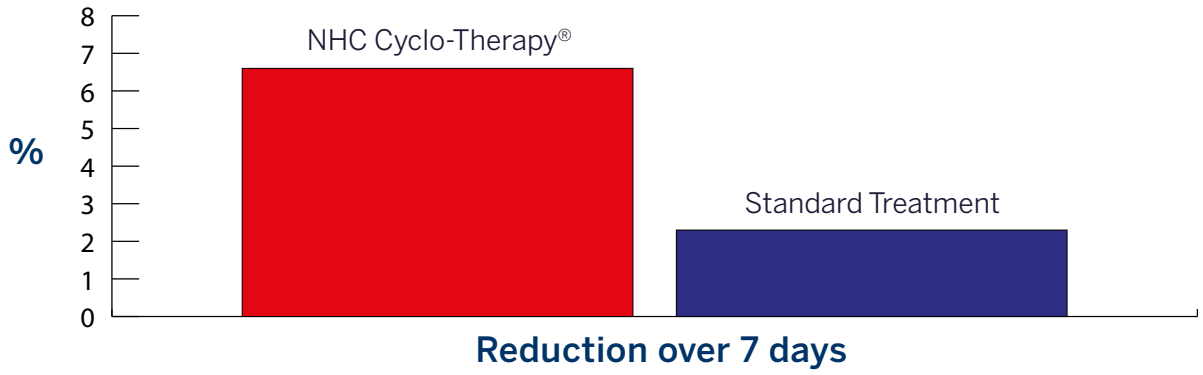
A study by wound care specialists and the vascular department at a UK hospital in 2007 showed that patients with lower leg skin infections and leg swelling, having bed rest alone (for a period of seven days) had an average reduction in lower leg circumference and swelling of 2.3%. This compared to an average reduction of 6.6% for patients having bed rest and cycloidal vibration.

Reference: Johnson S, et al "Can cycloidal vibration plus standard treatment reduce lower limb cellulitis treatment times? Results from a randomised controlled trial. Journal of Wound Care. Vol 16, No 4, April 2007.

Bed rest can help reduce swelling in the legs but combined bed rest with NHC Cyclo-Therapy® has shown to be twice as effective for swelling reduction.



% mean reduction in limb circumference by day 7



NHC Cyclo-Therapy® reducing leg swelling examples

Reduce lower leg swelling - BEFORE and AFTER 7 days of NHC Cyclo-Therapy®

Mrs C had severe leaky ulcerated lower leg oedema with a calf circumference at start of 47cm, after using an NHC Cyclo-Therapy® pad under her leg 3 x times a day for 20 minutes her leg swelling reduced by over 20% and her ulcers started to heal.

A heavily sprained ankle with bruising – had resulted in severe swelling of the ankle, NHC Cyclo-Therapy® was applied with the hand unit to help reduce the swelling. Using NHC Cyclo-Therapy® combined with massage there was an immediate effect.


Before


After 20 mins of Therapy


Before


After 20 mins of Therapy

NHC Cyclo-Therapy® Effects on circulation (Diabetes)

How can it help my leg circulation and health?

If you have diabetes or arterial disease you are at risk of changes that can affect your health and mobility.

Peripheral arterial disease and diabetes can affect blood flow and circulation, particularly to your legs and feet. Blood vessels can narrow or become blocked.

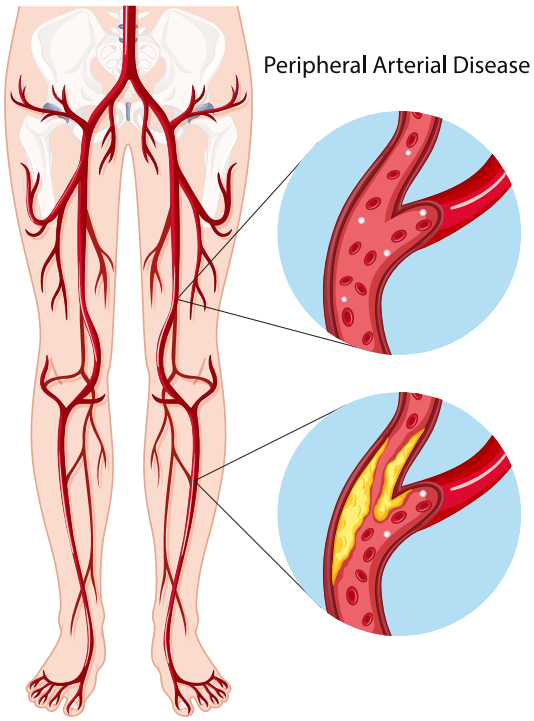
This can cause

- **Muscle cramps and pain when walking called intermittent claudication.**
- **Reduced walking distance due to pain**

If smaller diameter blood vessels become damaged by diabetes, treatment options are limited – Leg and foot wounds can become difficult to heal.

In worst cases poor circulation and non-healing wounds due to arterial disease and diabetes can lead to severe infection and risk of amputations.

HEALTHY Circulation = HEALTHY Legs and better walking and mobility.



NHC Cyclo-Therapy® has been shown to increase blood flow to help improve walking without pain.

NHC Cyclo-Therapy® (CSTP) Pad being used under the legs to increase blood flow.

RESEARCH

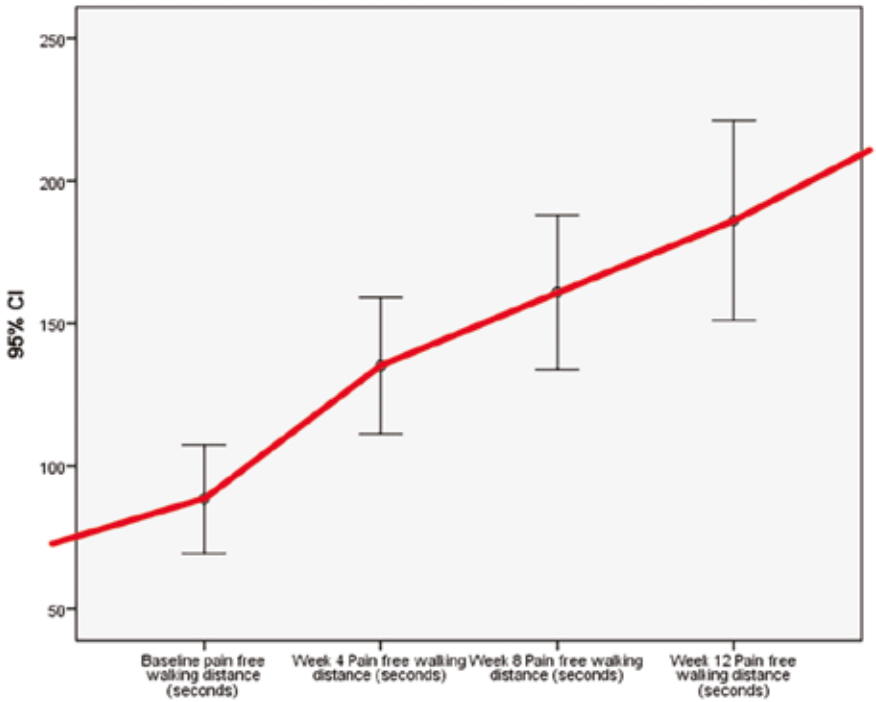
Published research in 2019, applied an NHC Cyclo-Therapy® pad to a group of people with reduced circulation in the legs due to arterial disease and diabetes. As a result of their condition, these patients were unable to walk far before pain.

Applying an NHC Cyclo-Therapy® Pad twice a day for 20 minutes for 12 weeks resulted in:

- **INCREASED Walking distance without pain average of 215%**
- **INCREASED Maximum Walking distance average of 161%.**
- **INCREASED blood pressure in the (poor circulation) arterial diseased leg of 9%.**
- **All these results were determined as clinically significant outcomes.**

Improving circulation to improve walking, improves lives. This was also shown in this study with quality–of–life results showing significant improvement for physical activity and functioning.

Research: Feasibility study to evaluate cycloidal vibration therapy for the symptomatic treatment of intermittent claudication. Atkin L, Stephenson J, Ousey K. Pilot Feasibility Stud. 2019 Nov 17;5:133.



NHC Cyclo-Therapy® increasing leg blood flow example

A 55 year old male can only walk 50 meters before getting pain in his left leg. Ultrasound scans show that that blood flow is blocked in a major artery in his lower left leg.

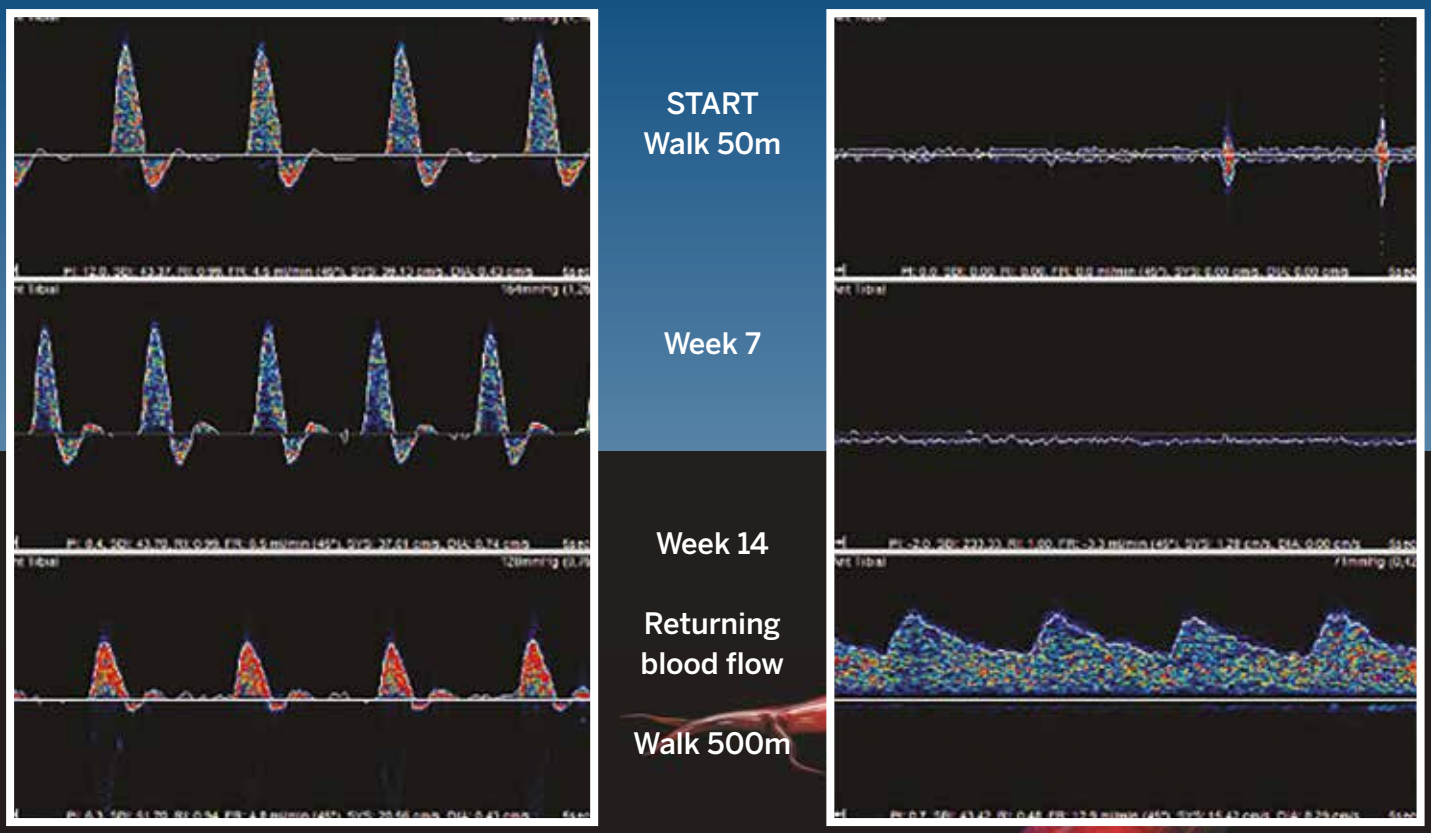
This gentleman started to use the NHC Cyclo-Therapy® pad under his left leg twice a day for 30 minutes.

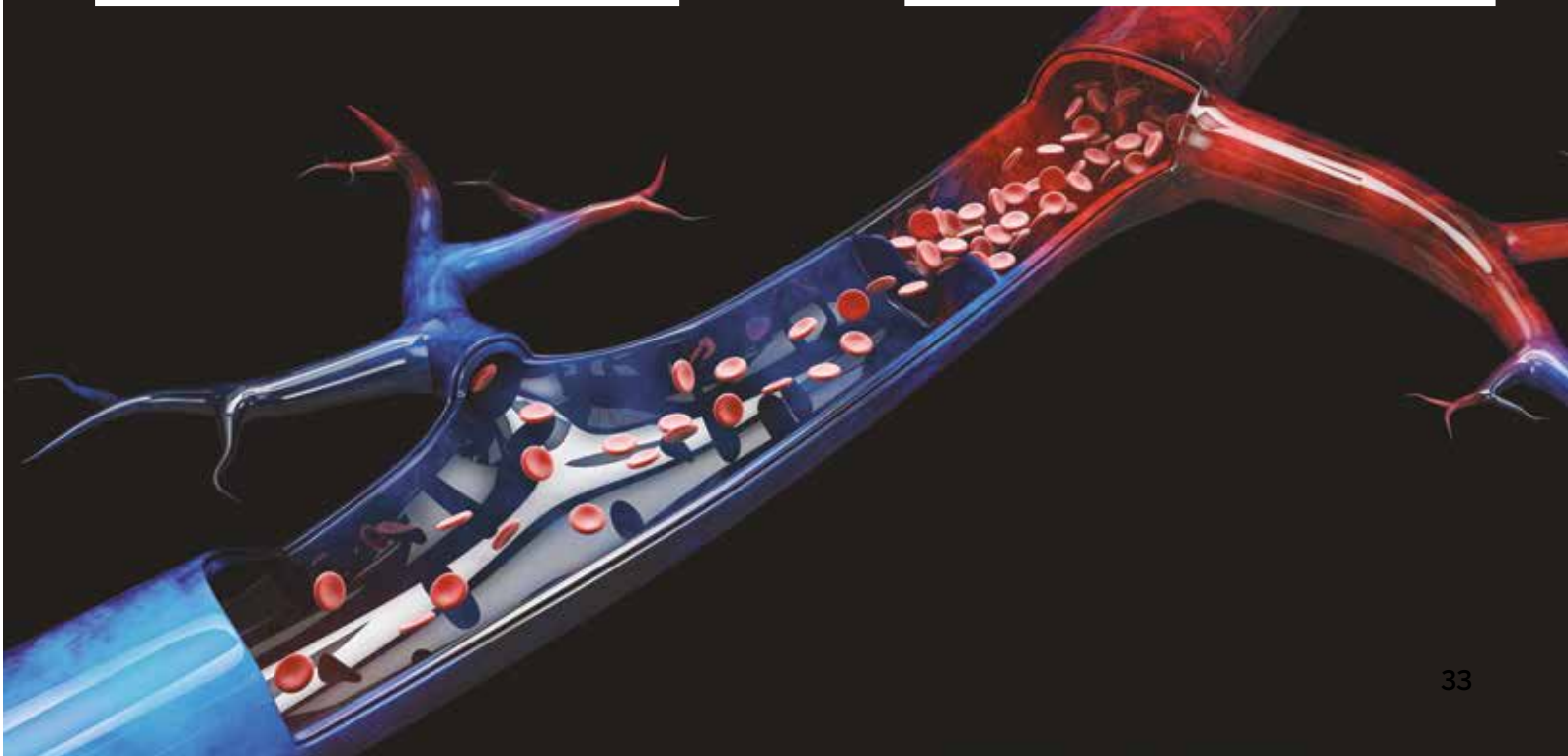
As per WEEK 12 scan, blood flow started to return to his left leg tibial artery.

This meant he could now walk 500 meters before his pain started.

Right Leg artery untreated

Left Leg artery NHC Cyclo-Therapy® treated





NHC Cyclo-Therapy® increasing leg blood flow: Diabetes

With Diabetes it is important to look after your general circulation and your skin blood flow health in particular to your legs and feet. Complications of diabetes contributes to the blocking of arteries and reduced blood flow.

Using NHC Cyclo-Therapy® can help to improve and maintain healthy blood flow in these areas.

RESEARCH

In clinical research published in the medical journal Diabetes Technology in 2009 (carried out at the Department of Physical Therapy, Loma Linda University, California) skin blood flow was measured and compared in age matched healthy older adults to adults with type 2 diabetes when both groups were submitted to vibration therapy. A significant increase in blood flow was seen in both the healthy and diabetic groups. There was an increase in blood flow in the diabetic group, but it was less than in the healthy group. As already described diabetes can result in the thickening of blood vessel walls that can impede dilation of the smooth vascular muscle wall of vessels reducing blood flow. However, the increase in blood flow in the diabetics due to vibration would still have circulatory benefits.

Reference - Maloney-Hinds C, Petrofsky JS, Zimmerman G, Hessinger DA (2009). The role of Nitric Oxide in skin blood flow increases due to vibration in healthy adults and adults with type 2 diabetes. Diabetes Technology and Therapeutics. 11:1; 39-43.

A medical study by Ren in 2019 stated that poor blood flow supply is an important factor that leads to the development and deterioration of diabetic foot ulcers. This study aimed to investigate the acute effects of local vibration on underside of the foot skin blood flow in 11 diabetics compared to 15 healthy people. Results showed that the diabetics had increased blood flow in both vibration and post stage. These findings suggest that local vibration of the feet may effectively improve skin blood flow in the feet of diabetic people.

Reference: Ren W et al. Effects of Local Vibration With Different Intermittent Durations on Skin Blood Flow Responses in Diabetic People. Front Bioeng Biotechnol. 2019 Nov 5;7

Used by Professionals, available for you at home.

Commenting on the use of NHC Cyclo-Therapy®, Katie Ormerod, World cup winner and Olympic snowboarder, said: "As a freestyle snowboarder I have to have the flexibility and control of a gymnast to undertake aerial tricks. A fall on the snow can cause lots of soft tissue injury. NHC Cyclo-Therapy® is really helping me to recover quicker after a hard session of training or injury. I am using the therapy pre-and post-training sessions and competition".

I have found the NHC Cyclo-Therapy® Pad has been effective in relieving the pain I experienced because of a broken elbow and the subsequent aches in my hand. The massage system has encouraged circulation and general mobility. I am really impressed by the difference I have felt through using the Therapy Pad.

— Mrs Jackson, Norfolk

NHC Cyclo-Therapy®: Effects on healing wounds

RESEARCH: Leg Ulcers

Research shows that applying NHC Cyclo-Therapy® to the lower legs can increase blood flow which in turn will stimulate healing and cell regeneration. This can improve the healing of soft tissue injury and wounds like leg and foot ulcers.

A study by Dr Cherry published in the Journal of Wound Care in 2002 showed that the application of NHC Cyclo-Therapy® 3 times a day for 30 minutes in conjunction with bandaging can stimulate the healing of 'hard to heal' venous leg ulcers. Patients on the trial had their leg ulcers for an average of 8 months duration. (They can be defined as 'hard to heal')

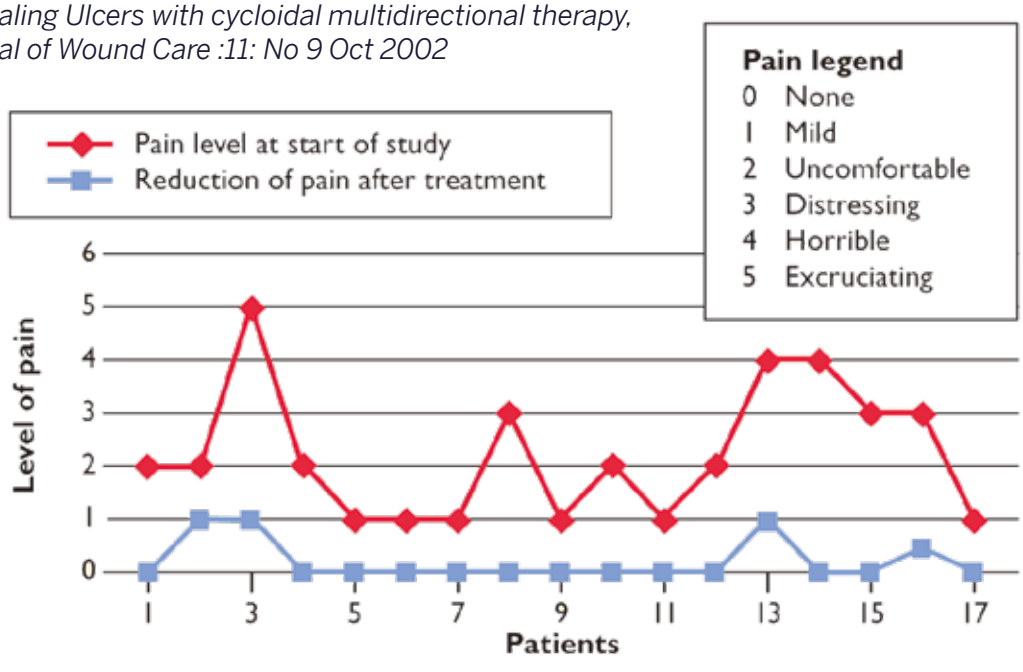
Outcomes included:

- **62% of the patients receiving cycloidal vibration to the lower leg healed within 12 weeks and of the rest all showed a 31-90% improvement in healing**
- **Using cycloidal vibration to stimulate lower leg circulation, in combination with traditional forms of treatment, reduces healing times**
- **It not only improves patient outcomes but also their quality of life by reducing pain**

Examples – Wound Pain (Leg Ulcer)

Reduced lower leg wound pain as a result of NHC Cyclo-Therapy®. Before and After Results, published in the Medical Journal of Wound Care.

Reference: 4.Wilson JM, Arseculeranate YM, Yang, Y, Cherry, W. Healing Ulcers with cycloidal multidirectional therapy, Journal of Wound Care :11: No 9 Oct 2002



Effects on healing wounds and scarring

To stimulate the 4 stages of healing of a wound or tear injury you need the supply of effective blood flow. Without that blood flow healing can take longer and additional risk of complications can occur. Blood vessels need to open to allow fresh nutrients and oxygen into the wound for healing processes to take place.

There are many types of wounds that may benefit in healing from the application of NHC Cyclo-Therapy® and these can include:

- **Leg Ulcer**
- **Pressure wound**
- **Diabetic wound**
- **Tendon or Muscle tear / wound**

Stages of Wound Healing

Bleeding | Inflammatory | Proliferative | Remodelling

Before | After

An 84 year old female with a venous leg ulcer received standard treatment for six weeks showing no improvement. After using cycloidal vibration for four weeks scabs formed and the ulcer was healed during week six.

Reference: Wilson J, Arseculeratne YM, Yang Y and Cherry GW Oxford Wound Healing Institute, Churchill Hospital, Oxford, Journal of Wound Care. Vol 11 No 9 October 2002

RESEARCH: Diabetic Wound

Research by Hesham G in 2013 stated diabetic foot complications are the most frequent reason for hospitalization in patients with diabetes. Together with vascular disease in the legs, neuropathy contributes to the risk of diabetes-related foot problems (such as diabetic foot ulcers) that can be difficult to treat and occasionally require amputation. Early detection and appropriate treatment of these ulcers may prevent up to 85 percent of amputations.

The study set out to detect the effect of low mechanical vibration on healing of diabetic foot ulcer.

29 diabetic patients with type 2 diabetes suffer from diabetic ischemic foot ulcer were divided into 2 groups. 1st group received low mechanical vibration for 15 minutes, 3 x day for up to 4 weeks and a control group received no treatment.

Results showed in the vibration group: there was significant reduction in size of the ulcer after two weeks of treatment, this continued for the 4 weeks. Compared to no significant difference in the un-treated control group.

The study concluded that low mechanical vibration may improve healing of diabetic foot ulcer.

Reference: Hesham G et al. Effect of Mechanical Vibration Therapy on Healing of Foot Ulcer in Diabetic Polyneuropathy Patients. Journal of American Science 2013;9(7)

Example – Prodiatry, Birmingham Community NHS Trust

Start Diabtic ulcer big toe for 9 months

After 30 weeks using the NHC Cyclo-Therapy® Pad ulcer healthy and healed

Male age 63. Diabetic 12 years. Small cut developed into a wound on the first toe subsequent diagnosed as ischemic (a lack of adequate arterial blood flow to the area to help healing). Due to lower limb critical ischemia preventing blood flow, angioplasty took place but was un-successful. The vascular consultant offered consideration of lower limb amputation as their only option as healing was highly unlikely. A diabetes specialist podiatrist had been managing the wound for 9 months prior to commencing NHC Cyclo-Therapy®. This was applied for two weeks, and the wound showed signs of improvement. The lower limb tissues looked healthier with improved blood flow. The decision was made to continue the treatment as the wound was improving and healing. At 30 weeks the wound was virtually healed and as a result of the improvement the patient's mobility, mental health and subsequent general quality of life had improved. The risk of potential amputation had been avoided.

Example – Specialist wound care : Doncaster Royal Infirmary NHS Trust

Chronic wounds are a major burden to both patients and the NHS, these include diabetic foot ulcers that are complex and have a high risk of wound complication. NHC Cyclo-Therapy® has been used as an adjunct to increase tissue blood flow and to heal chronic wounds. This case study record's the experiences of applying the therapy to a non-healing high risk diabetic plantar foot wound of 7 months duration treated with standard methods to date. The patient had below knee arterial disease unsuitable for surgical intervention. The patient self-applied the therapy three times a day in combination with ongoing standard treatment of dressings and offloading resulting in the plantar wound healing by week 6.

Reference: Johnson S,et al . Wound Care Team, Doncaster Royal Infirmary. Cycloidal Vibration (Vibro-Pulse) treatment of post surgical diabetic lower limb wound. Presented at Wounds UK 2012 conference.

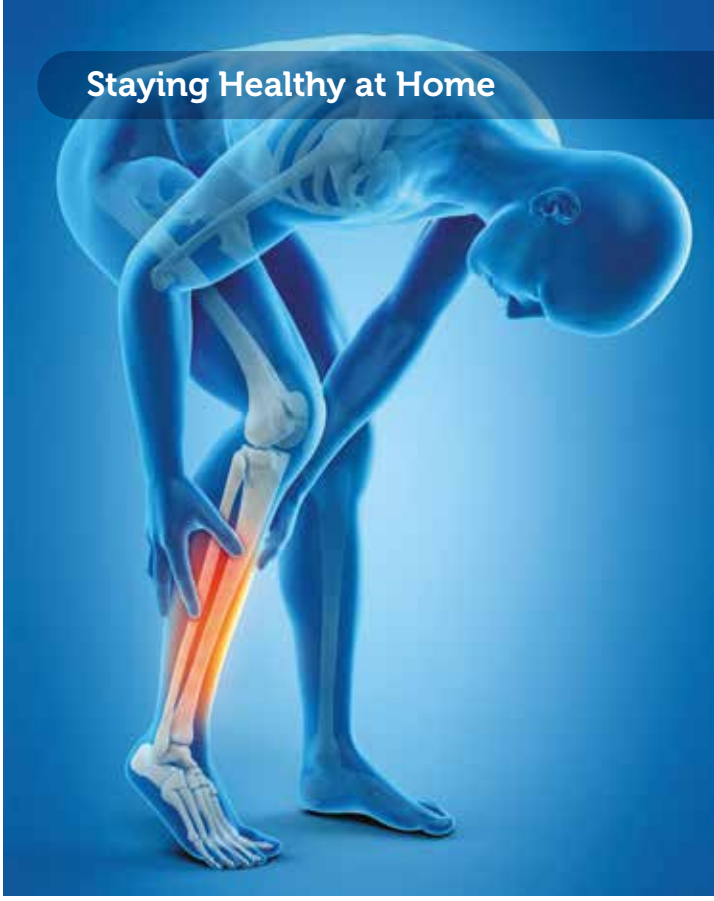
Fig 1

Fig 2

Fig 3

Fig 4

Start: Mr S had a recent post-surgical wound to the top off his left foot as a result of the removal of metatarsal bone (fig 1) and a plantar ulcer of 7 months duration. (fig 2)
By week 6: The plantar ulcer had healed (fig 3). The post–surgical wound top of the foot continued to heal (fig 4) fully healing at week 9.



RESEARCH: Tendon Tear

Published Research in 2019 on a clinical study that set out to evaluate the effects of vibration on Achilles' tendon microcirculation and change in rehabilitation characteristics following surgical repair of Achilles' tendon rupture. 32 patients with an average age of 43 years had vibration application to the ball of the foot, 30Hz, 2mm amplitude, 4kg pressure, and self-administration, this was applied daily. Main outcome measurements: tendon blood microcirculation was measured and tendon stiffness, 3 functional outcome tests, and a questionnaire survey.

Results showed that the acute effects of the vibration were observed immediately after 5-minutes vibration. Lower total haemoglobin and oxygen saturation were respectively observed in the repaired legs 3 and 6 months post-surgery in the vibration group. The vibration group also showed greater tendon stiffness, heel raising height and hopping distance 3 or 6 months post-operation in both the repaired and non-injured legs. The microcirculatory characteristics at 2 months post operation and vibration were correlated with the outcomes at 6 months post operation.

IN CONCLUSION: differences in microcirculatory characteristics and better rehabilitation outcomes were observed in the legs with an Achilles repair that underwent the early vibration intervention.

Reference: Pei-Yun W et al. Acute and Long-Term Effects of Mechanotherapy on the Outcome After an Achilles Repair: A Prospective Cohort Study With Historical Controls. Arch Phys Med Rehabil 2019 Nov;100(11):2046-2052.

RESEARCH: Healing Pressure Wound / Ulcers

Published Research in 2010 investigated whether vibration therapy could facilitate the healing of Stage I pressure ulcers (PrUs) in older adults. The study was on hospital patients in long-term-care facilities with Stage I PrUs. In the experimental group, vibration was applied for 15 minutes 3 times a day for up to 7 days, until Stage I PrUs healed. Apart from the vibration therapy, the vibration and control groups received the same care, which was provided according to PrU care guidelines. The number of healed ulcers was compared between 2 groups.

RESULTS: The vibration group consisted of 16 patients with 20 Stage I PrUs; the control group consisted of 15 patients with 21 Stage I PrUs. In the vibration group, 40.0% healed; compared to 9.5% in the no treatment group.

The healing rate during the study period was significantly higher in the vibration group than in the control group. The mean relative changes per day in wound area and intensity of redness were significantly greater in the vibration group than in the control group.

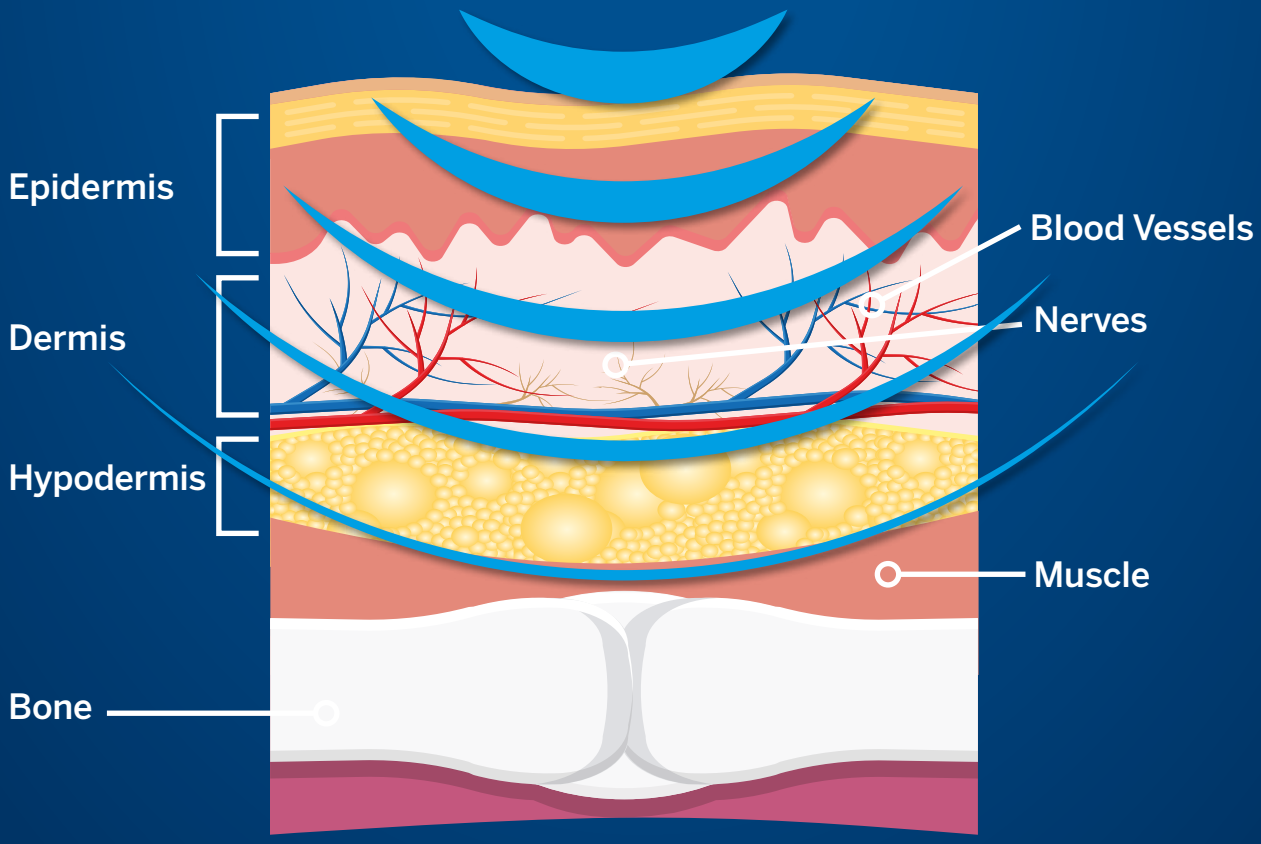
IN CONCLUSION: Based on these results, the use of the vibration may facilitate the healing of Stage I PrUs.

Reference: Arashi M et al. Vibration therapy accelerates healing of Stage I pressure ulcers in older adult patients. Adv Skin Wound Care. 2010 Jul;23(7):321-7.

NHC Cyclo-Therapy®: Helping to relax muscles for stroke patients

We use the NHC Cycloidal Vibration Therapy (CVT) hand unit with stroke patients that suffer with increased tone and muscle spasticity (muscle stiffness). We have tried other sensory vibration products before with little effect. The CVT hand unit really helps to free up the muscles in these patients to improve joint proprioception and improved flexion and extension after only 5 minutes use. The treatment has given enormous physical, functional and mental gains to stroke patients. *Physiotherapist Kelly Aelberry, Hospital Stroke Team.*

Physiotherapists at Leicester General Hospital

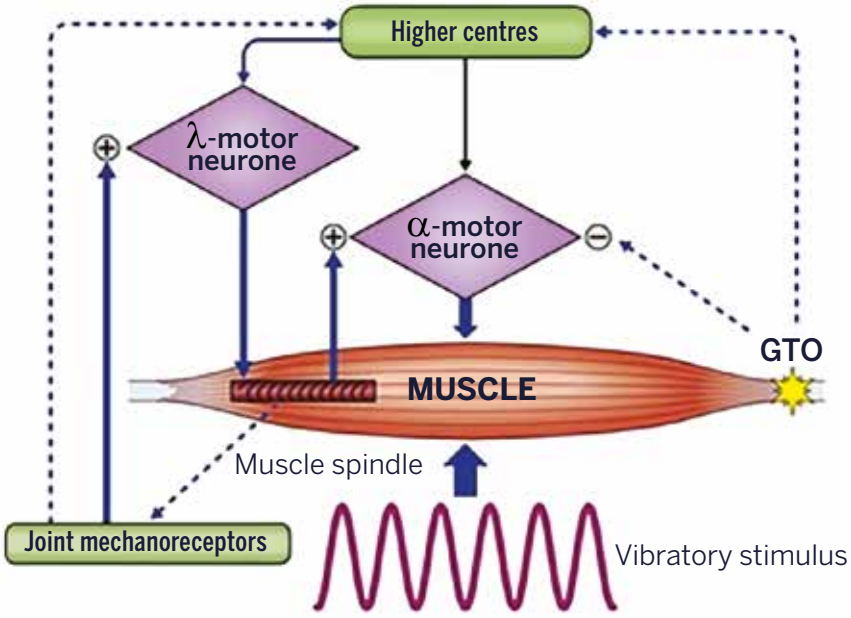


Staying Healthy at Home: Muscle relaxation and stimulation

When applied, directly to or surrounding an area of tight or sore muscles, NHC Cyclo-Therapy® is a non-pharmacological aid to generate muscle relaxation and stimulation. This can help increase joint movement and rotation if tight muscles prevent movement.

The cycloidal vibration generates a relaxation effect on the muscle. HOW?

Tonic Vibration Reflex



In what circumstance will NHC Cyclo-Therapy® help relax or stimulate my muscles

a) **If you over work your muscles with strenuous activity, such as too much gardening, exercise or walking. – The next day muscles can be tight and sore reducing movement. (DOMS Delayed Onset Muscle Soreness)**

b) **If you suffer with a medical condition or trauma that results in tight muscles otherwise known as high tone or spasticity such as a stroke, spinal cord injury, cerebral palsy, multiple sclerosis and Parkinson's disease.**

RESEARCH – Extracts

Muscle Stimulation - effecting joint mobility in knee osteoarthritis: published research by Lievens P describes a study conducted on an NHC Cyclo-Therapy® and non-therapy group to show the influence of cycloidal vibrations on the knee and joint mobility of osteoarthritis patients. Although the results did not show that one treatment of NHC Cyclo-Therapy® had an effect on mobility, a significant increase in mobility was shown after ten days of Therapy.

Reference: Lievens P,Van De Voorde J. The influence of Cycloidal Vibrations on the Knee joint mobility of Osteoarthritic Patients. Physiotherapy, June 1984, vol 70, no 6

Muscle relaxation / stimulation of muscles change in balance in the elderly: published research by Attansio G. 2018 reported a study set to demonstrate the effects of focal (direct to muscle) vibration on the elderly. Imbalance in elderly is a common problem strictly related to fall. This study investigates the possibility that focal (direct) mechanical muscle vibration may improve balance and stability. Patients referring with poor balance were treated with focal muscle vibration applied to quadriceps muscles and evaluated before and immediately after therapy and after 1 week and after 1 month with postural stability examination and with an inertial measurement unit during the 'time up and go' test. Stability analysis showed statistically significant differences in both the area and sway of the center of pressure during the 'closed eye' tests. The time of the 'time up and go test' was reduced and the rotation velocity was increased.

IN CONCLUSION: The findings confirm the beneficial role of focal muscle vibration in elderly patients improve postural stability and mobility.

Reference: Attanasio G et al Does focal mechanical stimulation of the lower limb muscles improve postural control and sit to stand movement in elderly? Aging Clin Exp Res. 2018 Oct;30(10):1161-1166.

Muscle stimulation & relaxation treatment for after effects of Stroke.

Published research by Annino G in 2019 studied the upper extremity functional impairments which are a common consequence of a stroke. Focal (direct) muscle vibration is one of the interventions that incorporate sensory stimulation to improve motor cortical excitability. The aim of this study was to investigate the influence of 5-minute muscle vibration along with supervised physical therapy on improving activities of daily living and motor recovery on the hemiparetic upper extremity in patients with stroke. A sample of 37 patients poststroke (29 males) was randomly allocated to either physical therapy control group or physical therapy and muscle vibration experimental group. All patients received 3 sessions per week for 8 weeks. Outcome measures used were Barthel index (BI), modified Ashworth scale, manual muscle testing, and goniometry for range of motion (ROM) assessment.

RESULTS: 34 patients completed the study. Patients in both groups improved significantly after treatment in BI, elbow ROM, and elbow muscles strength. However, muscle tone in elbow joint of the hemiplegic upper extremity improved significantly after muscle vibration only in the experimental group.

IN CONCLUSION: Muscle vibration can improve functional outcomes of upper extremity in people after stroke. However, it may have superior effect on improving muscle tone after stroke.

Reference: Annino G et al. Effect of segmental muscle vibration on upper extremity functional ability poststroke: A randomized controlled trial. Medicine (Baltimore). 2019 Feb;98(7)

Muscle stimulation & relaxation treatment after exercise induced muscle damage. Published research by Stebbings G in 2021 stated that previous research on vibration therapy reports modulation in muscle blood flow, oxygenation and strength. The aim of this study was to observe if local vibration therapy alleviates the impairments and haemodynamic changes associated with Exercise Induced Muscle Damage (EIMD). Ten healthy participants were randomized into experimental vibration therapy and control no therapy groups. Both groups perform 10 sets of 10 eccentric wrist flexions at 70% of 1-repetition maximum to induce muscle damage. Subsequent assessment of wrist flexor strength and flexor carpus ulnaris (FCU) muscle

oxygen saturation (SmO2) occurred at 1-, 24- and 48 hrs-post exercise. The vibration therapy group underwent 10 min of local therapy (at 45 Hz) starting 1 hr-post exercise and applied twice daily (separated by 8 hrs) for 48 hrs during habitual waking hours. Main measurements were grip strength, resting muscle oxygen (SmO2), muscle oxygen de-saturation and re-saturation rate.

Results: No difference in grip strength observed pre EIMD, but the vibration therapy group demonstrated greater strength at 1 hr, 24 hr and 48 hr post EIMD compared to no therapy. No difference in SmO2 re-saturation over time, but the vibration therapy group had a greater re-saturation rate compared to controls at 1 hr, 24 hr. post EIMD. Conclusions Local vibration therapy successfully attenuated the effects of EIMD and increased SmO2 re-saturation in muscles. Including this as part of a recovery protocol post-EIMD could be beneficial for rehabilitation and athletic training purposes.

Reference: S Percival, D T Sims, G K Stebbings. J Athl Train 2021 Aug 17. Local vibration therapy increases oxygen re-saturation rate and maintains muscle strength following exercise-induced muscle damage.

NHC Cyclo-Therapy®: Helping to Relax Muscles for Athletes

Rebecca Campsall was a 26 year old sprinter training at the English Institute of sport, a Yorkshire champion and twice medalled at Northern Championships, as well as making the final of the England Championships. Rebecca slashed her 100 metres personal best and by doing so is knocking on the door of the Great Britain athletics team. Rebecca has recieved treatment with the NHC Cyclo-Therapy® Hand Unit massage. This would release the deeper scar tissue and fascia without causing bruising trauma or excessive soreness, Rebecca stated: "my soft tissue and muscle recovery has really improved since starting to use the therapy, I am now starting to use it to help recovery after racing.

NHC Cyclo-Therapy®: Helping former Olympians Recover

Irish Olympic event rider Jonty Evans is making remarkable progress after a fall from his horse in competition at Tattersalls in 2018 that left him with a serious brain injury and in a coma for 6 weeks.

As part of his rehabilitation therapy Jonty is now benefiting from using the NHC Cyclo-Therapy® hand unit and Pad. It helps relax his high tone, stiff and sore muscles due to his injury.

> "When I applied the NHC Cyclo-Therapy® pad behind my back and under my legs I could feel a real difference in the relaxation and stretch in my muscles enabling me to move my hip and joints with greater movement, I was really surprised". *Jonty Evans, Irish Olympian*

Staying Healthy at Home: Restless Legs Syndrome (nervous system)

Restless Legs Syndrome (RLS) is characterised by unpleasant sensations that occur mostly in the legs. Severity of RLS can vary widely from mild to extreme it includes an urge to move the legs. These sensations are often described as "itching under the skin," or a "tingling, creeping, crawling feeling." RLS is also known as Willis-Ekbom Disease (WED), a neurological disorder RLS is a common disorder that affects people of all ages; however, its prevalence increases with age. These sensations tend to begin or worsen during periods of rest or inactivity, such as lying or sitting, and can be partially or totally relieved by movement, such as walking or stretching, at least as long as the movement continues.

Most people experience symptoms in the evening while they are in bed trying to fall asleep. Many individuals with moderate to severe primary RLS experience disruptive sleep that can cause poor sleep quality. This can lead to disrupted work and family life, moodiness, and feelings of tiredness or drowsiness during the day.

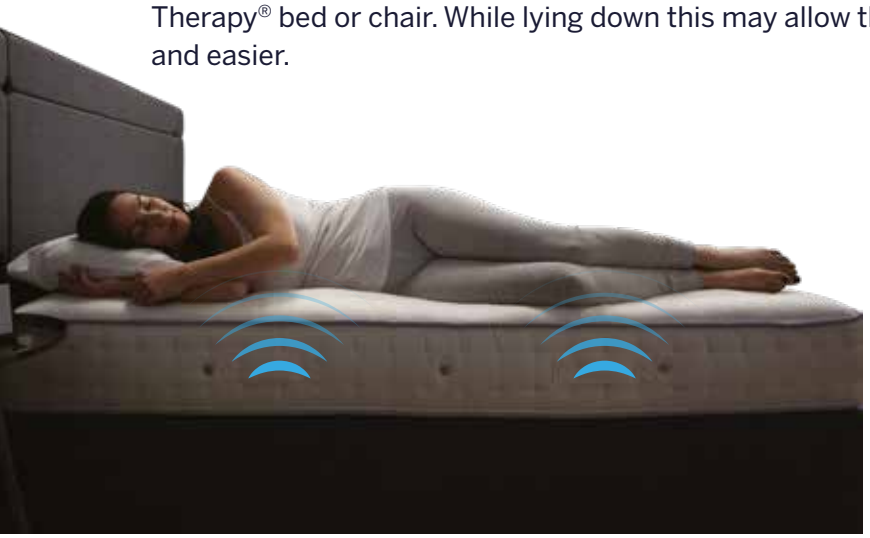
References: Hening W, Allen R, et al. The treatment of restless legs syndrome and periodic limb movement disorder. An American Academy of Sleep Medicine Review. Sleep 22:970-999. 1999. Yoakum RH: Restless legs syndrome: Relief and hope for sleepless victims of a hidden epidemic. New York: Fireside, 2006.

NHC Cyclo-Therapy® reducing the unpleasant feelings of RLS and helping sleep

Applying NHC Cyclo-Therapy® to the lower legs generates a counter stimulation applying a specific range of vibrations to overwhelm the sensations that are felt in the legs during an RLS attack. When placed at or near the site of discomfort, commonly the calf or thigh, vibratory counter stimulation can interrupt an RLS attack and distract from the uncomfortable RLS sensory experience and relieving the symptoms.

The leg has a range of somatic sensory receptors, highly specialised cells associated with neurons that convert various forms of energy from a physical stimulation into nerve impulses.

This can be achieved with a CSTP therapy pad or ideally within the foot section of an NHC Cyclo-Therapy® bed or chair. While lying down this may allow the user to relax and fall to sleep quicker and easier.



RESEARCH – Extracts

Using the NHC Cyclo-Therapy® pad to Reduce symptoms of Restless Legs syndrome (RLS): Research presented by Rayner J. 2017 at the Respiratory Support and Sleep Centre (RSSC), Papworth Hospital, Cambridge stated that patients with moderate to severe RLS may not tolerate or respond to first line pharmaceuticals. An evaluation to investigate the role and efficacy of NHC Cyclo-Therapy® in the management of treatment-refractory RLS was carried out. Method - All patients had a clinical diagnosis of RLS and had failed to respond to, or tolerate standard conservative treatment.

Patients attending outpatient clinic were provided with a NHC Cyclo-Therapy® pad for a four week trial period. Effectiveness was assessed before and after using Epworth Sleepiness Score (ESS) International Restless Legs Syndrome Rating Scale (IRLSRS) Self-reported Sleep Latency (SL) Self-reported Total Sleep Time (TST) Clinical Global Impression – Severity (CGI-S) (0-10, 10=worst symptoms).

45 patients (20 male: 25 female), average age of 63.8 years completed the trial.

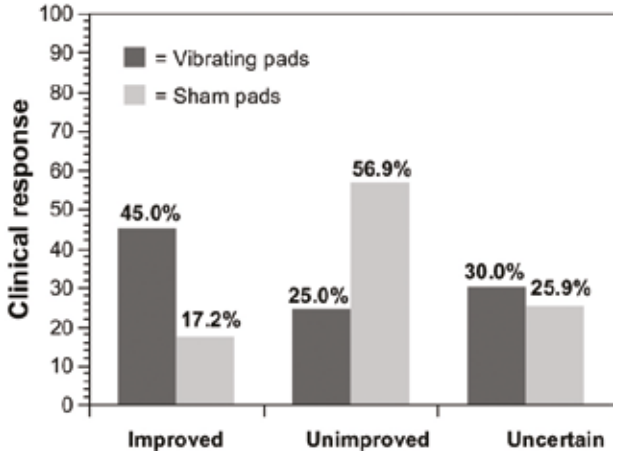
The therapy caused a statistically significant: reduction in IRLSRS: an increase in TST: stabilisation in CGI-S score.

IN CONCLUSION: 42% of patients completing a four-week trial of NHC Cyclo-Therapy® treatment reported a noticeable improvement in their symptoms. NHC Cyclo-Therapy® can offer an alternative and effective non-pharmacological treatment for patients with refractory RLS.

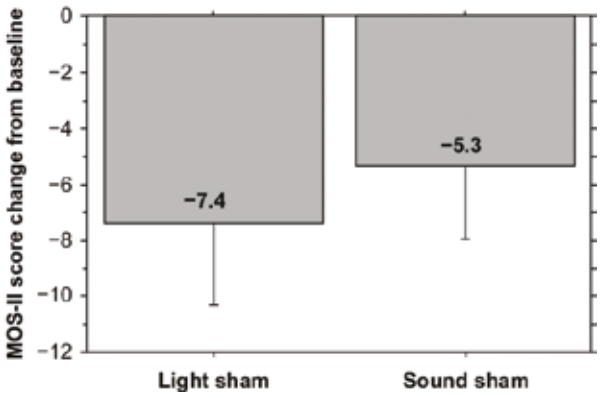
Reference: Rayner J et al. The use of Vibrating Therapy Pads in treatment resistant Restless Legs Syndrome. Respiratory Support and Sleep Centre, Papworth Hospital NHS Foundation Trust, Papworth Everard, Cambridgeshire CB23 3RE. Presented at the British Society of Sleep Biennial Scientific Meeting 2017.

Using a vibration therapy pad to Reduce symptoms of Restless Legs syndrome (RLS) to improve sleep. A study published in 2013 on 158 patients with at least moderately severe primary restless legs syndrome (a score of 15 or greater on the International Restless Legs Syndrome Study Group rating scale).

Patients were randomly assigned to treatment with a vibrating pad or control no therapy sham pad. Efficacy was measured as a change in score from baseline to week 4, on the Medical Outcomes Study Sleep Problems Index II, the Johns Hopkins Restless Legs Syndrome Quality of Life summary scale, and the International Restless Legs Syndrome Study Group rating scale.



Bar graph showing greater clinical improvement for patients assigned vibrating pads.



Bar graph showing greater sleep improvement in MOS-ii scores from baseline for patients assigned a vibrating pad (±1 SeM bars). Abbreviations: MOS-ii, Medical Outcomes Study Sleep Problems index ii; SeM, standard error of the mean.

The Medical Outcomes Study Sleep Problems Index II scores improved significantly more for patients receiving a vibrating pad over those receiving a sham pad.

IN CONCLUSION: Four weeks of treatment with vibrating pads safely improved sleep in patients with restless legs syndrome compared to a sham therapy.

Reference: Burbank F et al. Sleep improvement for restless legs syndrome patients. Part 1: pooled analysis of two prospective, double-blind, sham-controlled, multi-center, randomized clinical studies of the effects of vibrating pads on RLS symptoms. Journal of Parkinsonism and Restless Legs Syndrome 2013:3 1–10.

How to use NHC Cyclo-Therapy® to reduce the symptoms of Restless Legs Syndrome

Where to apply the NHC Cyclo-Therapy®? Apply directly or adjacent to the area of the legs where you get the RLS feelings.

NHC Cyclo-Therapy® Used by Professionals

CVT products are used at specialist spinal injury centres across the country. Occupational and physiotherapy use CVT to relax tight muscles, soften tissues reducing swelling and pain management.

> "We use it daily for reducing high tone to get muscle relaxation" *Emma Lindley – Clinical Lead Occupational Therapist, London Spinal Cord Injury Centre*

Staying Healthy at Home: Chest clearance to help breathe easier

There are numerous conditions wherein the airways become inflamed and the air sacs in the lungs are damaged. This causes airflow obstruction resulting in narrower airways, making it difficult to breathe in and out comfortably.

A number of chronic lung diseases which NHC Cyclo-Therapy® addresses are:

- COPD
- Bronchiectasis
- Asthma
- Cystic Fibrosis

Plus, additional common problems such as infection from a cold or flu virus, allergies or acid reflux can lead too:

- Chest Congestion - the accumulation of mucus in the lungs and lower breathing tubes (bronchi). It is usually accompanied by a wet, productive cough that brings up thick mucus. Chest congestion may cause you to hear or feel wheezing or crackling sounds when you breathe in and out.
- Chest tightness – this can be both medical and muscular in severe cases accompanied by dyspnoea, often described as an intense tightening in the chest, difficulty breathing, or breathlessness.

RESEARCH – Extracts

Using NHC Cyclo-Therapy® to help chest clearance for ventilated patients in hospital.

A research study published by Chen YC in 2009 stated that almost 80% of patients in the intensive care unit are intubated and on mechanical ventilation. Thus, their ability to clear their chest and airways is compromised and their risk of lung collapse increased. A number of interventions are used to enhance airway clearance with the goal of preventing atelectasis and infection. The purpose of this study was to evaluate the effect of a chest vibration nursing intervention on the expectoration of airway secretions and in preventing lung collapse among ventilated critically ill patients.

METHODS: A randomized, single-blind experimental study. A total of 95 patients were enrolled from 2 intensive care units and randomly assigned into either the NHC Cyclo-Therapy® group (50) or control group receiving standard care (45) of routine positioning care, which consisted of a change in body position every 2 hours. Patients in the NHC Cyclo-Therapy® group received routine positioning care plus the use of a NHC Cyclo-Therapy® pad for 72 hours. This consisted of placing the therapy pad on the patients back for 60 minutes when the patient was in a lying / supine position. NHC Cyclo-Therapy® was applied 6 times a day. Outcome variables were cough dry sputum weight (DSW) per 24 hours and lung collapse index (LCI); these were measured at 24, 48 and 72 hours. RESULTS: Patients who received the NHC Cyclo-Therapy® had greater DSW and lower LCI after 24 hours. Pre-test DSW and group could explain 48.2% of the variance in DSW at 24 hours. The LCI at 24, 48 and 72 hours were all significantly improved in the therapy group compared to the control group. A significant difference was found between the control and experimental groups in their 24-, 48- and 72-hour DSW and LCI after NHC Cyclo-Therapy®.

IN CONCLUSION: The results suggest that chest vibration with NHC Cyclo-Therapy® may contribute to expectoration and thus improve lung collapse among ventilated patients in an ICU. Chest vibration nursing intervention is a safe and effective alternative pulmonary clearance method and can be used on patients who are on ventilators in ICUs.

Ref: Chen YC et al. Using chest vibration nursing intervention to improve expectoration of airway secretions and prevent lung collapse in ventilated ICU patients: a randomized controlled trial. J Chin Med Assoc. 2009 Jun;72(6):316-22.

In what circumstance will NHC Cyclo-Therapy® help chest clearance?

Applying NHC Cyclo-Therapy® to the back or chest may stimulate the smooth muscles of the trachea bronchial tubes. These muscles are controlled by the automatic nervous system but we have seen how muscles respond favourably to NHC Cyclo-Therapy®. This can help release mucus to encourage effective coughing and improve chest clearance to improve breathing.

Breathlessness may be eased by the soothing and rhythmic muscle vibration to enable muscle relaxation and to help the general feeling of breathlessness anxiety.

Using NHC Cyclo-Therapy® to help chest relaxation

A Study by Binks AP published in 2001. Stated that Vibration of the chest has been shown to modify the drive to breathe and the sensation of dyspnoea (breathlessness). It has been suggested that respiratory muscle afferents (nerves within the muscle) generate these effects. The possibility that the consequences of chest-wall vibration also involve intra-pulmonary afferents led us to investigate whether such vibration reaches the airways. Two vibratory stimulations were independently applied to four chest-wall sites and two control sites on eight healthy subjects. During separate breath holds, the vibrator was held on each site while subjects periodically opened and closed the pharynx (throat). Airway pressure (P(AW)) was measured at the mouth. Spectral analysis of P(AW) showed pressure oscillations occurred at the same frequency as that of the vibrators when the pharynx was open; oscillation amplitude was vastly reduced when the pharynx was closed. Oscillation amplitude was also significantly larger during vibration at greater amplitude. These data demonstrate that vibration over the chest-wall vibrates the lung and could potentially excite intrapulmonary receptors.

Ref: Binks AP et al Oscillation of the lung by chest-wall vibration Respir Physiol. 2001 Jul;126(3):245-9

Effects of Vibrating pad on chest clearance

The effect of vibration (41.0 +/- 5.4 Hz; 2 mm amplitude) on the clearance of lung secretions was ascertained in 10 patients with chronic bronchitis who complained of difficulty in raising sputum. Vibration was applied to the back for one hour by an electrically driven pad while the patients reclined on a couch with the trunk at 45 degrees to the vertical. Each patient had randomized control and experimental runs of 5 hours duration that were identical in all respects except for vibration. The rate of clearance of secretions from the lung was assessed by serial whole lung counts after inhaling mono-dispersed tracer particles tagged with a gamma-emitting radioisotope (technetium-99m) and by sputum production. The mean rates of clearance and of sputum production were slightly higher during the vibration runs than the control runs but the differences were not significant.

Ref - Thomson ML, Phillipakos D. A preliminary study of the effect of a vibrating pad on bronchial clearance. Am Rev Respir Dis. 1976 Jan;113(1):92-6.

"Chest vibration nursing intervention is a safe and effective alternative pulmonary clearance method and can be used on patients who are on ventilators in ICUs." A preliminary study of the effect of a vibrating pad on bronchial clearance. Am Rev Respir Dis. 1976 Jan;113(1):92-6.

How to use NHC Cyclo-Therapy® for Chest Clearance

Where to apply the NHC Cyclo-Therapy®?

Apply directly to the back or chest, applying the CSTP pad to the back in a seated position, or the Hand Unit to the Chest. Using a NHC Cyclo-Therapy® bed or chair use the therapy in the back section

What speed of therapy should I apply?

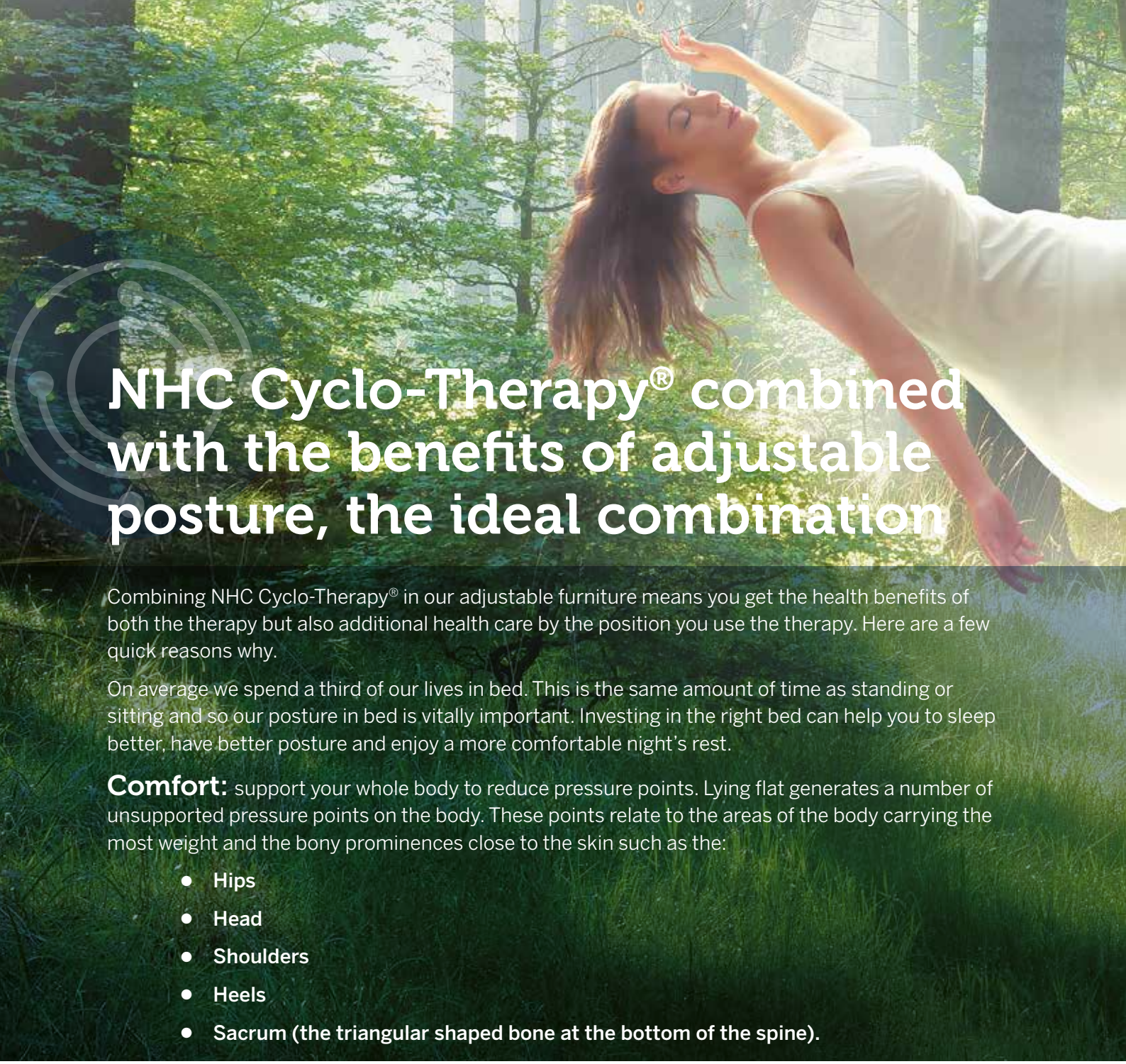
Test speed settings while speaking. At the speed where your voice starts to oscillate can indicate that this is oscillating your airways and chest to help release mucus

Why is it making my cough more?

When releasing mucus this may cause some irritation that results in coughing more frequently, coughing is required to remove the released mucus from the lungs.

How often should I use the NHC Cyclo-Therapy® per day?

On average people use the NHC Cyclo-Therapy® 2 to 3 times a day.



NHC Cyclo-Therapy® combined with the benefits of adjustable posture, the ideal combination

Combining NHC Cyclo-Therapy® in our adjustable furniture means you get the health benefits of both the therapy but also additional health care by the position you use the therapy. Here are a few quick reasons why.

On average we spend a third of our lives in bed. This is the same amount of time as standing or sitting and so our posture in bed is vitally important. Investing in the right bed can help you to sleep better, have better posture and enjoy a more comfortable night's rest.

Comfort: support your whole body to reduce pressure points. Lying flat generates a number of unsupported pressure points on the body. These points relate to the areas of the body carrying the most weight and the bony prominences close to the skin such as the:

- **Hips**
- **Head**
- **Shoulders**
- **Heels**
- **Sacrum (the triangular shaped bone at the bottom of the spine).**

The ideal and most comfortable position therefore in principle is a zero gravity position to eliminate these pressure points. The smooth, accurate and contouring control of an Adjustamatic bed allows you to position and contour the bed to support and reduce tension of these pressure points. Reducing pressure points can improve your general health by relieving the pressure of your joints and weight bearing areas. This also improves skin and soft tissue blood flow to any areas subject to pressure. Medical research based on 10 different lying positions with 62 healthy volunteers shows that using an adjustable bed to raise the legs and head of your bed slightly by 20 to 30 degrees, generates a soft contour position that will reduce the amount of pressure between you and the mattress surface. This soft contour position will support the body to take the strain off the spine and pivot point joints giving you as relaxed position as possible to zero gravity

References: Defloor, T., 2000. The effect of position and mattress on interface pressure. Appl Nurs Res 13, 2–11. & Call, E., Baker, L., 2007. How does bed frame design influence tissue interface pressure? A comparison of four different technologies designed for long-term or home care. Journal of Tissue Viability 17, 22e29.

Reducing back pain with adjustable posture and a Therapy bed or chair

Sleeping in the wrong position can exacerbate back pain or cause back pain in those who don't typically have it. Your spine is an 'S'-shaped curve. So, when you lie on your back, you put pressure on the areas that are not supported such as the lower back, where the arc is at its peak. If you were to lie down on the floor flat on your back, you should be able to put your hand under the arc of your spine. This proves that it is not fully supported and in return causes the vertebrae to squeeze the discs in the back which can lead to severe back problems. Back pain and problems can develop over time if the body is not in a natural position while you sleep.

An Adjustamatic bed is capable of closely matching the contours of the body, and that reduces the pressure on the spine. Some back-pain sufferers will pile pillows up. However, that can lead to awkward positions for the neck – leading to stiffness and muscle strains. Adjustamatic beds, however, provide this elevated position without putting extra pressure on the neck. Sleeping on your back puts approximately 50 pounds (20kg) of pressure on your spine, so raising your knees while lying on your back cuts pressure on your spine roughly by 50%.

Ref: The American Chiropractic Association, 2015. Smith, M.T., Edwards, R.R., McCann, U.D., Haythornthwaite, J.A., 2007. The effects of sleep deprivation on pain inhibition and spontaneous pain in women. Sleep 30, 494–505.

Reducing ankle and leg swelling with adjustable posture and a Therapy bed or chair

Adjusting your sleep or sit posture with an NHC Cyclo-Therapy® bed or chair by raising the lower legs above the level of the heart by 3 to 6 inches will help to reduce lower leg, ankle and feet swelling, improve microcirculation and oxygen delivery.

In medical trials, leg elevation acting against gravity increased blood flow within veins by 45% and reduced lower leg swelling

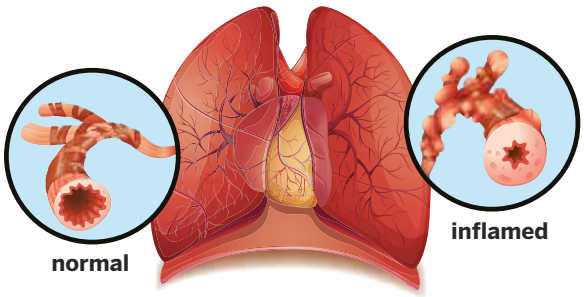
With leg elevation, you'll notice it feels good immediately. It takes the pressure off your leg veins first and foremost, encouraging the blood to flow out of your leg veins emptying them, and undoes the pressure of the day by giving your veins a break for a few hours as blood flow moves away from the legs and courses through the rest of your body. The raising of limbs and joints on an adjustable bed overnight can help the speeding up of the healing process. It allows blood to flow more quickly, which leads to the healing of bruises and reduction of swelling.

Reference: Abu-Own, A., Scurr, J.H., Coleridge Smith, P.D., 1994. Effect of leg elevation on the skin microcirculation in chronic venous insufficiency. J. Vasc. Surg. 20, 705–710.

Improve Breathing with adjustable posture and an NHC Cyclo-Therapy® bed or chair.

A range of medical conditions that can cause disturbed sleep are associated with breathing or respiratory problems in bed at night. These include but are not limited to:

- **Snoring and sleep apnoea**
- **Chronic Obstructive Pulmonary Disease (COPD)**
- **Emphysema**
- **General chest congestion**



Applying the benefits of changing posture in bed has shown to improve respiratory breathing rates. Using the head elevated position in patients in hospital on ventilation has shown that reducing the effects of gravity on the diaphragm with a raised head position improves breathing compared to the patient lying on their side.

Reference: Shah, D.S., Desai, A.R., Gohil, N., 2013. A comparison of effect of semi Fowler's vs side lying position on tidal volume & pulse oximetry in ICU patients. Innovative Journal of Medical and Health Science 2.

How can improved posture in bed help relieve the symptoms of snoring and sleep apnoea in conjunction with other treatments?

The worst position for snoring and sleep apnoea is lying flat on your back as the tongue falls back more readily against the pharyngeal wall due to gravity. Harper and Sauerland (1975-25) identified that changing position of the head can prevent this. Lifting the head up and sleeping at a slight incline can change the effect that gravity has on the neck – drastically reducing snoring and the instances of sleep apnoea.

Medical research has shown that sleeping in a more upright position like this improves the

airflow in the airways which thus improves oxygen in the blood. One study demonstrated that for approximately half of people studied; "obstructive sleep apnoea was essentially abolished by the postural intervention and arousal from sleep was less frequent" in a more upright posture.

Ref: McEvoy, R.D., Sharp, D.J., Thornton, A.T., 1986. The effects of posture on obstructive sleep apnoea. Am Rev Respir Dis. Apr;133(4):662-6.

Lying on your side with your head raised will also help reduce airways collapsing and improve airflow and breathing for individuals with snoring and sleep apnoea problems.

Ref: Ravesloot, M.J.L., van Maanen, J.P., Dun, L., de Vries, N., 2013. The undervalued potential of positional therapy in position-dependent snoring and obstructive sleep apnea-a review of the literature. Sleep Breath 17, 39–49.

Chronic Obstructive Pulmonary Disease

Chronic Obstructive Pulmonary Disease (COPD) is the name for a collection of lung diseases including chronic bronchitis, emphysema and chronic obstructive airways disease.

COPD is one of the most common respiratory diseases in the UK. It usually starts to affect people over the age of 35, although most are not diagnosed until they are in their 50s. It is thought there are over 3 million people living with the disease in the UK, of which only about 900,000 have been diagnosed.

Symptoms of COPD include breathlessness a persistent cough with poor chest clearance and frequent chest infections. Due to breathlessness and gravity on the chest and diaphragm, sleeping in a flat position can exacerbate breathlessness, so using an Adjustamatic bed for appropriate posture positioning may help relieve the symptoms of COPD. For example, elevating the head of the bed by 45 degrees allows the diaphragm to expand to improve respiratory function and reduce pulmonary venous congestion. One clinical study based on 38 stable COPD patients supports that head elevation, particularly the semi-fowler position in bed improves breathing.

Reference: Ichiba, T., Miyagawa, T., Kera, T., Tsuda, T., Kokubu, F., 2011. Late-breaking abstract: Efficacy of relaxation posture in patients with chronic obstructive pulmonary disease (COPD). Eur Respir J 38, p3641.

Improve digestion with adjustable posture and a Therapy bed or chair

Using your Adjustamatic bed to improve posture will help with digestion at night and while sleeping. Many studies have tied eating before sleep to weight gain digestion, which can be helped by allowing gravity to work normally. If a person is lying completely flat, the effects of gravity are seriously impeding digestion. However, sleeping at an incline can help the body to better digest food that is still in the stomach. If your head is elevated, your stomach will be below your oesophagus, so acid or food will stay in your digestive system.

Reduce heart burn/acid reflux with an Adjustamatic bed

A common problem for many people at night is acid reflux affecting up to 40% of the population. This involves stomach acid travelling up through the oesophagus and causing a painful burning sensation. In some instances prolonged reflux can generate healthcare concerns. On a flat bed, acid moves to the oesophagus leading to episodes of acid reflex or heartburn. Applying an inclined position offered by an Adjustamatic bed allows gravity to work against acid reflux helping the stomach to retain the acids – improving the chances of a full night's sleep.

Medical research has shown that applying an inclined position at night will reduce acid reflux. In one of many clinical trials a study with 24 reflux-sufferers lying flat on a bed was compared to lying in the head inclined position. The study showed that bed head elevation reduced oesophageal acid exposure and acid clearance time (acid reflux) in nocturnal refluxes and led to relief from heartburn and sleep disturbance.

References: Khan, B.A., Sodhi, J.S., Zargar, S.A., et al. 2012. Effect of bed head elevation during sleep in symptomatic patients of nocturnal gastroesophageal reflux. J Gastroenterol Hepatol. Jun;27(6):1078-82

Johnson, L.F., DeMeester, T.R., 1981. Evaluation of elevation of the head of the bed, bethanechol, and antacid form tablets on gastroesophageal reflux. Dig Dis Sci. Aug;26(8):673-80.

Datta, K., Rahalkar, K., Dubey, D.K., 2011. Prasad BA. The effect of posture on esophageal pH in endoscopy normal reflux disease (ENRD) cases. Indian J Physiol Pharmacol. Oct- Dec;55(4): 315-21.

CONTRAINDICATIONS

There are certain conditions in which our NHC Cyclo-Therapy® should not be used with. Please take note of the following such conditions listed below:

- **Active Deep vein thrombosis / Pulmonary embolism / Active thrombophlebitis / Osteomyelitis**
- **Severe Osteoporosis / Active cancer / Pregnancy / Uncontrolled epilepsy / Severe wound infection not receiving antibiotic therapy for / Active Aneurism / Severe tissue necrosis / Charcot's foot**

DEFINITIONS

- **"Active" relates to a specified condition or diagnosis that you are aware of having or suffering from at the time of using the therapy.**
- **Active cancer is defined as: a cancer diagnoses or are in remission at the time of using the therapy.**
- **Severe Osteoporosis is defined as: a health condition that weakens bones, making them fragile and more likely to break (fracture). Symptoms can include a fracture from a fall or even from a strong sneeze or cough, back, neck pain or loss of height.**

CAUTIONARY

Although we do not have any evidence of an adverse reaction, we recommend that you consult with your doctor with regards to using the NHC Cyclo-Therapy® in the following areas of the body or in any of the circumstances listed below:

- **If you have a pacemaker fitted, we do not advise usage of the therapy against the chest or upper back area as a precaution. The therapy is able to be used against the lower back and upper and lower legs.**
- **If you have an active infection and you are not receiving antibiotic treatment.**
- **If you have active unstable bone structures or fragments.**
- **Over an area of a recent joint replacement as a temporary precaution (recent is defined as within six weeks).**
- **Over a wound with active bleeding or difficult haemostasis**
- **Directly over area of pain caused by recent trauma or injury that remains undiagnosed or untreated medically (Recent defined as within 3 months of the date of trauma or injury.)**
- **Directly to exposed unbroken skin or a wound that is not dressed.**
- **If you experience any localised swelling or pain during or after use, please stop use on affected area.**

DISCLAIMER – Important. *The content in this document is provided as a general guidance on the conditions described and is not intended to be acted upon or substituted for medical advice, or from seeking medical advice from your GP or other healthcare professional. In the event of a diagnosis or a coincidental diagnosis received relating to any of the above-mentioned conditions, Niagara Healthcare Limited and its associated companies is not responsible or liable for any such diagnosis that may arise out of any potential misuse of their products, NHC Cyclo-Therapy® or misinterpretation of the information which is provided as general guidance only. You should always consult with your GP in the first instance with regards to any health concerns.*

The Company may from time to time amend, modify, or update this guidance and/or issue supplemental guidance to coincide with any advancements to our design and technology specifications, in accordance with our continued research and development programme.

Please note that the alternative NHC Cyclo-Therapy® speed and durations used during medical trials were carried out by professionals and should not be replicated at home. Users must use the NHC Cyclo-Therapy® as per the instructions for use.

NHC Holdings Ltd

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NHC Holdings Limited is a limited company registered in England and Wales.
Registered number: 4682455 VAT number: 401476580

Registered office: Colomendy Industrial Estate, Rhyl Road, Denbigh, North Wales LL16 5TS

Authorised and regulated by the Financial Conduct Authority

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