



## BALENOTHERAPY EMBRACES HORMESIS TO SUPPORT HEALTH DISORDER BY NATURAL HARMONY THROUGH HYDROTHERMAL TREATMENT

Surjya Toran Maiti\*, Dibya Dey and Dr. Dhruvo Jyoti Sen

School of Pharmacy, Techno India University, Salt Lake City, Sector-V, EM-4/1, Kolkata-700091, West Bengal, India.

\*Corresponding Author: Surjya Toran Maiti

School of Pharmacy, Techno India University, Salt Lake City, Sector-V, EM-4/1, Kolkata-700091, West Bengal, India.

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### ABSTRACT

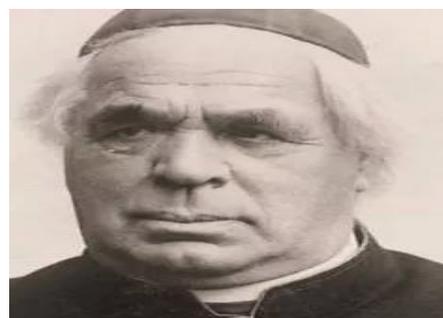
Balneotherapy is a clinically effective complementary approach in the treatment of low-grade inflammation- and stress-related pathologies. The biological mechanisms by which immersion in mineral-medicinal water and the application of mud alleviate symptoms of several pathologies are still not completely understood, but it is known that neuroendocrine and immunological responses—including both humoral and cell-mediated immunity—to balneotherapy are involved in these mechanisms of effectiveness; leading to anti-inflammatory, analgesic, antioxidant, chondroprotective, and anabolic effects together with neuroendocrine-immune regulation in different conditions. Hormesis can play a critical role in all these biological effects and mechanisms of effectiveness. Hormesis is a characteristic of many biological processes, namely a biphasic or triphasic response to exposure to increasing amounts of a substance or condition. Within the hormetic zone, the biological response to low exposures to toxins and other stressors is generally favorable. The term "hormesis" comes from Greek *hórmēsis* "rapid motion, eagerness", itself from ancient Greek *hormáein* "to set in motion, impel, urge on", the same Greek root as the word hormone. The term 'hormetics' has been proposed for the study and science of hormesis. The hormetic effects of balneotherapy can be related to non-specific factors such as heat—which induces the heat shock response, and therefore the synthesis and release of heat shock proteins—and also to specific biochemical components such as hydrogen sulfide (H<sub>2</sub>S) in sulfurous water and radon in radioactive water. Results from several investigations suggest that the beneficial effects of balneotherapy and hydrotherapy are consistent with the concept of hormesis, and thus support a role for hormesis in hydrothermal treatments.

**KEYWORDS:** Spa therapy, Mud therapy, Hydrotherapy, Hormesis, Immune response, Inflammation, Oxidative stress, Heat shock proteins, Pain, Rheumatic diseases.

### INTRODUCTION

**Overview:** Vincent Priessnitz [4 October 1799 – 26 November 1851; Germany] and Sebastian Kneipp [17 May 1821 – 17 June 1897; Germany] may be considered

as the two fathers of the modern balneotherapy (Medicinal use of thermal water) and hydrotherapy (Immersion of the body in thermal water for therapeutic purposes).



**Figure 1: Inventors of Balneotherapy.**

Baleno means flash of lightning & therapy means treatment intended to relieve or heal a disorder. Balneotherapy is the set of methods and practices which,

based on scientific evidence, use medically and legally recognized mineral-medicinal waters, muds, and natural

gases from natural springs for therapeutic purposes inside the facilities of thermal spa centres.<sup>[1]</sup>

Balnotherapy classification:

Bath therapy.

Hot springs immersion.

Hydrotherapy.

Spa therapy.

**Bath therapy:** Contrast bath therapy, is a form of treatment where a limb or the entire body is immersed in hot (but not boiling) water followed by the immediate immersion of the limb or body in cold ice water. This procedure is repeated several times, alternating hot and cold. The only evidence of benefit is anecdotal and no plausible mechanism has been confirmed.<sup>[2]</sup>

**Theory:** The theory behind contrast bath therapy is that the hot water causes vasodilation of the blood flow in the limb or body followed by the cold water which causes vasoconstriction, increasing local blood circulation.

Additionally, the lymph vessels contract when exposed to cold, and relax in response to heat. The lymph system, unlike the circulatory system, lacks a central pump. By alternating hot and cold, it is believed that lymph vessels dilate and contract to "pump" and move stagnant fluid out of the injured area and that this positively affects the inflammation process, which is the body's primary mechanism for healing damaged tissue. One study showed that fluctuations in intramuscular temperature were lower than those caused by a hot bath alone.



**Figure 2: Bath therapy.**

**Treatment:** Contrast bathing can be used to reduce swelling around injuries or to aid recovery from exercise. It can also significantly improve muscle recovery following exercise by reducing the levels of blood lactate concentration. For any injury presenting with palpable swelling and heat, and visible redness - such as a strain/sprain - contrast baths are contraindicated during the acute inflammation stage. Acute inflammation begins at the time of injury and lasts for approximately 72 hours.

**Effectiveness in athletic recovery:** The current evidence base suggests that contrast water therapy (CWT) is superior to using passive recovery or rest after exercise; the magnitudes of these effects may be most

relevant to an elite sporting population. There seems to be little difference in recovery outcome between CWT and other popular recovery interventions such as cold water immersion and active recovery. In a review on immersion therapy in general, Ian Wilcock, John Cronin, and Wayne Hing suggest that most of the benefits of contrast therapy are from the hydrostatic pressure from the water, not the variations in temperature.

**Hot springs immersion:** There is something SO good about soaking in a spa pool. All your cares seem to float away and you are overwhelmed with a feeling of contentment. What's more, a soak in a spa pool doesn't just feel soothing and healing – it actually is!



**Figure 3: Hot spring immersion with natural harmony.**

Immersing yourself in hot water offers a wealth of proven health benefits, including lower stress levels, enhanced recovery, better circulation and improved sleep. And there's no more luxurious place to enjoy this health and wellness than in the waters of your own backyard spa pool. It's no wonder so many Kiwis are choosing to invest in their self care. There are many benefits to hot water immersion - mental, physical and physiology. Let's explore what they are and why they are so good for you. Hot water immersion is basically the act of immersing yourself in hot water. It's what you do when you sink into your Hot Spring spa at the end of a long and tiring day. You will notice that when you get out of the spa pool you feel completely different from when you got in. That is because the simple act of immersing yourself in water is giving your body the chance to heal and recuperate. When you immerse yourself in water, the process of healing and recuperation are accelerated. That means you are soothing aches and pains, calming a stressed and restless mind and rejuvenating your body at a faster speed than normal.<sup>[3]</sup>

It is no wonder that immersing yourself in water feels so good! But how does having a spa accelerate this healing process? Balneology is the study of the art and science of bathing. Balneotherapy is the use of natural thermal mineral waters, additive baths, peloids, and other natural substances, as well as various atmospheric or environmental elements singly or in combination, for the prevention and treatment of disease. The aim of balneotherapy is to change regulatory and reactive functions, leading to improvement of capacity, adaptation, and self-healing.



**The science behind hot water immersion:** Your body is in a constant state of restoration. It is always working to fight against the biological processes of deterioration. Add an injury or a stressful day into the mix and your body is working overtime to improve itself. To be healthy, we need to eat well and exercise. Mother Nature has also given us another gift that improves health. That is hot water immersion. The healing that immersion provides is difficult to achieve on land without medication.

Our bodies operate with two different components within the central nervous system. The first is the sympathetic component which is also known as the fight or flight mechanism. It is the system responsible for keeping us alive in stressful situations. This system triggers a number of things like increased heart rate, respiratory rate, and blood pressure.

At the other end of the spectrum is the parasympathetic system whose role it is to reduce blood pressure, slow your heart rate, and broaden your sphere of awareness cognitively. These two systems need to act in balance for your body to operate in a 'normal' state.

Living in a heightened situation is not good for your body. It is thought to be the cause of a number of chronic diseases like diabetes, arthritis and depression. There are medications on the market that help to balance the two systems, but they come with side effects. Hot water immersion helps to put the sympathetic system down and puts it in balance with the parasympathetic system. No medication needed.<sup>[4]</sup>



**Figure 4: Contrast Bath and Thermal bath.**

**The key benefits of hot water immersion:** We know that immersing yourself in water does some powerful things to your body. Not only does it help physical recovery, but it also helps to improve your mood, boost your body functions, allows better communication and improves your memory.

1. **Lowers stress levels:** When the two components of your central nervous system come into alignment, your stress levels drop. A 30 minutes soak in the spa pool gives you an opportunity to take time out from a stressful schedule.

2. **Improved sleep:** Getting the right amount of quality sleep is essential to good health and well-being. Spending time immersed in hot water can relax your body and mind, preparing you for a tension-free sleep.
3. **Faster muscle recovery:** For the most part, recovering from exercise or an injury is a matter of waiting for the body to heal itself. But a spa pool can speed this process up. The heat of a spa pool can relax and sedate muscles to allow for freer movement. Warm water immersion has been proven to speed up muscle recovery following a stroke and

by counteracting gravity with buoyancy, a spa pool can reduce the tenderness, spasms and stress that can occur during the recovery process.

4. **Health and immunity:** Regularly immersing yourself in hot water brings with it a number of general health benefits, from reduced inflammation to the management of chronic pain. If you choose a Hot Spring spa pool, you could even fortify your immune system!
5. **Heart health:** Hot water immersion triggers a number of physiological effects. Cardiac output increases and blood vessels dilate, which means that more oxygen- and nutrient-rich blood makes it to the parts of your body that need it most. This enhanced circulation has a number of effects, from improving blood pressure to helping your vital organs to do their work better.
6. **Reduced toxins:** The warm temperature of the water improves circulation in your body. This allows nutrients and oxygen to flow through your bloodstream more easily, replacing toxins in the traditionally weaker areas of your system. Now, who's ready for a soak in a spa pool? As we've learnt, hot water immersion has many great benefits that naturally improve your health and well-being.

**Hydrotherapy:** Hydrotherapy is the external or internal use of water in any of its forms (water, ice, steam) for health promotion or treatment of various diseases with various temperatures, pressure, duration, and site. Hydrotherapy involves the use of water for soothing



pains and treating certain medical conditions. Hydrotherapy equipment includes pools, whirlpools, whirlpool spas, hot tubs, and physiotherapy tanks. Hydrotherapy is any method that uses water to treat a variety of symptoms throughout your body. You might see it called water therapy, aquatic therapy, pool therapy or balneotherapy. Hydrotherapy can be as simple as taking a warm bath at home, or you might use a special tank or pool.<sup>[5]</sup>

#### Benefits of hydrotherapy

1. Relaxes and rehabilitates injured muscles.
2. Helps boost immunity.
3. Helps boost immunity.
4. Can reduce stress and pain.
5. Can reduce stress and pain.
6. Can reduce stress and pain.
7. Allows those who struggle to exercise on land to stay active.
8. Aquatic physical therapy.
9. Sitz baths (Shallow baths with warm water that covers your genital and rectal areas)
10. Wet saunas (Uses moist heat or steam rather than dry heat)
11. Warm water baths and whirlpool spas.

Hydrotherapy is based on several important bioengineering principles that permit the design and development of aquatic exercise devices, techniques and programs. These principles involve several forces (buoyancy, drag, inertia), hydrostatic pressure and the specific heat of water.



Figure 5: Enzyme Bath & Sauna bath.

**Spa therapy:** Spa therapy can refer to a water treatment, as in a hot tub or spa. Or it can refer to any number of wellness treatments available at a spa. Massage therapy is one of those treatments. There are many types of massage therapy, but all involve rubbing and manipulating the muscles to reduce tension. They sought out hot springs and built baths so they could heal their aching bodies; calling these places 'aquae' and naming the treatment there 'Sanus Per Aquam' (SPA) - meaning 'health by or through water'. Some benefits of spa treatment for your body are: Helps in reducing the back pain due to massage. Helps in removing stiffness in the body. Reduces muscle tension from the workout. One benefit of spa treatment is that it helps you reduce mental

stress. When you visit a spa or have your spa at home, you can have better mental health.<sup>[6]</sup>

#### Benefits of spa

1. Helps you Destress.
2. Help you get better sleep.
3. Clear your mind.
4. Provide relaxation.
5. Reduce distraction.
6. Reduce the frequency of headaches.

If you love relaxing and pampering yourself, a spa with aromatherapy will be perfect for you. There are many benefits for both your body and mind. Spending your

time in a spa is fun and also helps you ease muscle pain after exercise or shake off that extra pressure from work. Some of the benefits of spa are described above. You can look at various spa designs that help you destress and unwind from a busy day.

When you think about a spa and the benefits of spa, all you can imagine are people relaxed and enjoying their day with a body massage or facial. That's exactly what a spa is. Spa is a way to take care of your body and mind for a while to provide relaxation and peace of mind. Body spa benefits can help you cope up with stress or healing from body aches. If you are thinking of using a spa, we recommend you to buy a spa for your home rather than waiting for appointments and in long lines for your turn. Some benefits of a spa at home are: Enjoy solidarity. Economical. Adjust your temperature to your needs. No dress code!

While going to a spa, it is important to know what are the benefits of spa treatment. Swim spas also help you relax at home and also provide many health benefits.<sup>[7]</sup>

Get that Radiant skin: One superior benefit of spa massage is that it helps bring back the glow on your skin. Some ways spa is beneficial for your skin are:

Prevent wrinkles.

Hydrates skin.

Stimulate skin cells.

Cleanse your skin.

Removes dead skin cells and toxic elements from the skin.



Makes you happier: Among many other benefits of spa bath, it also improves your mood and makes you happier when you use one. Some spa advantages for your mood are:

Releases serotonin, also known as the happiness hormone.

Improves mood after spa massage.

Makes you feel more peaceful.

Enhancing your bathroom into a healing station will make you happier and more fulfilled. You can look at bathroom designs that can make your bathroom not only functional but also a place for you to unwind.

Relieves aches: Feeling pain in your body after working out in the gym is common. Other pain like sleeping on the wrong side, sitting for long hours at a desk, and bed mattress and sports activities, can also contribute to these factors. Some benefits of spa treatment for your body are:

1. Helps in reducing the back pain due to massage.
2. Helps in removing stiffness in the body.
3. Reduces muscle tension from the workout.
4. Makes your tissues more flexible.
5. Helps in recovering from injuries and arthritis.

Improves blood flow: Another notable benefit of spa is how well it improves your blood flow. Some benefits of spa massage are:

1. Helps in regulating your blood pressure.
2. Improves blood circulation.
3. Improves heart rate to pump more blood to your organs.
4. Improves overall cardiovascular health.



Figure 6: Detox Spa and Mud Spa.

**Spa Etiquette:** How to reap the maximum benefit of a spa. Now that you know the benefits of using a spa, you will be eager to use one. You can either book a spa session nearby your home or save future expenses by buying a spa for your home. Be it at home or outside, there is some vital spa etiquette you should follow to reap the benefits of spa treatment.<sup>[8]</sup>

Do's while using a spa:

Wear slippers or flip-flops.

Shower before using the spa.

Remove makeup and skincare products.

Notify your spa therapist if you have any past or present illness.

Keep your valuables like phone, money or jewellery in the locker.

Wear swimwear or a bathing costume.

Check the spa dress code before visiting.

Adjust the temperature to your needs.

Drink plenty of water or fluids before and after you take a spa.

Dry yourself before entering the spa.

If you are in a public spa, be aware of the surrounding people.

Don'ts while using a spa:  
 Don't wear your outdoor shoes.  
 Avoid applying perfume or deodorant.  
 Avoid talking aloud in the spa area.  
 Avoid being late for your spa appointment.



Avoid eating a heavy meal before taking a spa at home or outside.  
 Avoid spa if you have a fungal infection.  
 Don't be inside the spa for over 15 minutes.  
 Avoid taking your phone inside the spa.



**Figure 7: Steam Bath & Sea Spa.**

Bathing in water (balneotherapy or spa therapy) has been frequently and widely used in classical medicine as a cure for diseases. The benefits of balneotherapy included improved motion and reduced stiffness and pain. These benefits may have a positive impact on RA symptoms, which could improve the quality of life of patients with RA. Systematic reviews have been published on the effectiveness of balneotherapy for patients with RA. Balneotherapy has a very long history, it is said that as early as the 5th century BC scientists were looking at the beneficial properties of sulphurous springs, especially to heal skin diseases and relieve muscular and joint pains.

The use of natural mineral waters, gases and peloids in form of bathing, drinking, inhalation, etc. is now internationally called balneotherapy. The use of water (regardless its chemical/physical characteristics and its geological origin) for therapy is referred to as hydrotherapy.

Balneotherapy may involve hot or cold water, massage through moving water, relaxation, or stimulation. Many mineral waters at spas are rich in particular minerals such as silica, sulfur, selenium, and radium. Medicinal clays are also widely used, a practice known as 'fangotherapy'. Balneotherapy (Latin: balneum "bath") is a method of treating diseases by bathing, a traditional medicine technique usually practiced at spas. Since ancient times, humans have used hot springs, public baths and thermal medicine for therapeutic effects. While it is considered distinct from hydrotherapy, there are some overlaps in practice and in underlying principles. Balneotherapy may involve hot or cold water, massage through moving water, relaxation, or stimulation. Many mineral waters at spas are rich in particular minerals such as silica, sulfur, selenium, and radium. Medicinal clays are also widely used, a practice known as 'fangotherapy'.<sup>[9]</sup>

**Definition and characteristics:** The statue of "A man breaking a walking crutch" in the spa town Piešťany

(Slovakia) - an eloquent symbol of balneotherapy. "Balneotherapy" is the practice of immersing a subject in mineral water or mineral-laden mud; it is part of the traditional medicine of many cultures and originated in hot springs, cold water springs, or other sources of such water, like the Dead Sea. Peloid refers to the pulp of a substance that is applied to the body. It may be in pack form or bath, either local or whole body. The concentration of peloidal solutions can vary, and peloid solutions should be applied to the skin in a specific manner for a specific condition to optimize results. Common peloids are peat pulp, lake or sea muds, and plant substances. For many conditions, balneotherapy works synergistically with peloid therapy, and the percutaneous absorption of their constituents along with the physiological and psychological effects provides an excellent therapy for people who can no longer tolerate oral or injectable pharmaceuticals and have chronic degenerative diseases. Life is stressful, and our society is aging. We would be wise to utilize the positive benefits of balneotherapy in the conventional treatment of pain and illness as well as in health maintenance and prevention of disease. The purpose of this chapter is to describe the general concept of balneotherapy, with an emphasis on the therapeutic application of peat. There certainly is a distinction between the application of peat and the application of other muds, such as lake mud or clay. The characteristics of the specific peat mud constituents being used are vitally important, as is the manner of their application. Recent reviews of spa therapy and balneotherapy (bathing in hot mineral springs) suggest that these treatments are helpful for multiple symptoms and can have long-lasting effects. Patients with access to hot mineral springs and spas can be encouraged to try this modality. Repetitive transcranial magnetic stimulation (rTMS) appears to be promising for improving pain and quality of life for many types of chronic pain, though more research is needed to determine precise protocols for maximum efficacy in treating FM (fibromyalgia). Another area of

potential benefit for patients with FM is emerging from the growing field of energy psychology and energy medicine:

Presumed effect on diseases

Treatment bath at a spa in Hot Springs, Arkansas, United States

Balneotherapy may be recommended for a wide range of illnesses, including arthritis, skin conditions and fibromyalgia. Balneotherapy should be discussed in advance with a physician before beginning treatment, since a number of conditions, like heart disease and pregnancy, can result in a serious adverse effect.

Scientific studies into the effectiveness of balneotherapy do not show that balneotherapy is effective for treating

rheumatoid arthritis. There is also no evidence indicating a more effective type of bath, or to indicate that bathing is more effective than exercise, relaxation therapy, or mudpacks. Most of the studies on balneotherapy have methodological flaws and are not reliable. A 2009 review of all published clinical evidence concluded that existing research is not sufficiently strong to draw firm conclusions about the efficacy of balneotherapy.

"Balneophototherapy" combines salt bathing (balneotherapy) and exposure to ultraviolet B-light (UVB) as a potential treatment for severe, chronic plaque psoriasis. A Cochrane review found low-quality evidence that salt bathing combined with UVB may relieve psoriasis severity compared to UVB treatment only.



Figure 8: Spa therapy.

**Advantages:** Balneotherapy is a set of water-based treatments, typically using natural hot springs, mud, mineral water or sea water to promote relaxation, reduce pain, muscle and joint soreness, improve circulation, stimulate the immune system and revitalise the body.

**Disadvantages:** Balneotherapy is usually privately-funded, as it is not considered a conventional medical treatment option. Access to out-of-home balneotherapy is dependent on the availability of local treatment centres and natural springs. Balneotherapy can be costly and time-consuming.<sup>[10]</sup>

**Facts:** Another alternative medical practice becoming popular today is *Balneotherapy*, also known as *Hydrotherapy*. *Balneo* is derived from the greek word, 'balneae' which means bath. This is a healing bath, which of course, uses water as the main element. However the water used is not just any faucet or deep well water, but those which have restorative components that can heal and rejuvenate the body. Examples of the kind of water are natural hot and cold spring waters rich in magnesium, sodium, potassium, calcium and iodine. The waters from the sea, like Dead Sea, is also perfect for Balneotherapy because of the natural salt content which is known to have curative properties. Many people try to replicate these 'waters' by adding epsom salt, essential oils, minerals, sea weed, and even enzymes — making their own Balneotherapy bath sessions. Then they soaking their bodies for at least 20 minutes and this should relax sore muscles and bring wellness. As a matter of fact, many spas have already adopted

therapeutic bathing into their list of services. Some would add whirlpools or water jets as this would allow underwater massages for more effective results. Water is the main element of life. Without water, there is no life. Water is not only the source of life but also a catalyst of healing. Apart from drinking for hydration, another is in the form of bathing. According to history, Romans built lavish bath places wherever and whenever they find natural hot springs. They would linger for hours soaking, socializing or even doing business while in their baths because they believed that it is good for them. Today, there are many other water therapy places and they complement Balneotherapy with other treatments to promote better physical health, relaxation, luxury, and recovery from fatigue or training. The following are what you can expect from Balneotherapy:

**Contrast bath:** A contrast bath, or known as hot/cold therapy, can help increase circulation in areas with injury or with poor blood flow. A contrast bath is a type of therapy that involves taking baths in warm and cold water. You alternate the hot and cold baths in sessions. This technique may help to improve blood circulation throughout your body. Contrast bath therapy treats edema, stiff joints, inflammation of soft tissues, muscle spasms, and painful limbs (upper and lower). This treatment method is common with athletes. Athletes use it to treat muscle damage, sore or painful muscles, and to speed up recovery after injuries. However, there is a standard way you can do it: Immerse the resting limb in warm (38°C–40°C) water first for 10 minutes. Follow by immersing the limb in cold (8°C–10°C) water for one

minute. Then, dip the limb in hot water for four minutes alternated with a one-minute bath in the cold water.

Contrast bath therapy may be used on your: Hands, Wrists, Forearms, Elbows, Feet, Knees, Ankle, Lower legs.

Conditions Treated with Contrast Bath: Some of the common conditions managed using contrast bath therapy include:

Foot sprains, Ankle sprains, Rheumatoid arthritis, Carpal tunnel syndrome, Soft tissue trauma

This therapy is more than 2,000 years old, but there is not enough evidence to say how or how well it works. However, diabetes and other conditions that cause circulation problems may cause contrast bath therapy not to work effectively. The process of a contrast bath is a form of hydrotherapy that involves repeatedly dipping a

limb in hot and cold water. This gets done at a specific rate, temperature, and time. The repeated switching between the two temperatures may cause constricting and dilating of blood vessels, leading to a pump effect. This is believed by some to increase circulation into tissues throughout your body. Even though this therapy is widely used, there is no specific protocol for how hot the water should be or how long it should take. Different professionals may use different timing and temperature to produce the best result. Also, the increase in blood flow may lead to oxygenation of blood (improving the healing process). It may also improve the transport of waste products (solving edema). More oxygenation occurs due to the hot water. Hot water is thought by some researchers to cause your hemoglobin (a protein in your blood involved in transporting oxygen) to get oxygen more efficiently into your tissue.



**Figure 9: Balneotherapy.**

**Thermal and Mineral bath:** Naturally dissolved minerals in hot springs will be absorbed by the skin by immersion for a few minutes. It treats painful and tender areas caused by arthritis and fibromyalgia. This type of bath can also clean and treat other skin conditions like psoriasis, eczema, and cellulite. Mineral water comes out of the earth at 50°C, and is then combined with hot fresh water to bring the temperature to around 97-100°C, the perfect bathing temperature. Mineral bath can improve mobility and relieve pain on the lower back.<sup>[11]</sup>

**Enzyme bath:** This bath is great for cleaning pores resulting to fresh and glowing skin. Hence, an optimum temperature is required for the enzymes to function, and the temperature range of 37°C or 98°F provides the best temperature for enzyme activity.

**Sauna bath:** A sauna bath is a hot room that utilizes dry heat produced by either hot rocks or electrical stoves. What is steam bath? A steam bath is a hot room that utilizes wet/moist heat produced by steam boilers. Sauna room temperature requirements. Saunas are small rooms that are heated to temperatures between 150°F and 195°F (65°C to 90°C).

**Steam bath:** A steam bath is a steam-filled room for the purpose of relaxation and cleansing. It has a long history,

going back to Greek and Roman times. Today, natural steam baths still exist, and often still use similar systems that the Romans used, which contain pipes and pumps that bring water up and into the large pool areas, wherever the natural springs exist. Heaters are also now used to maintain warm temperatures in the baths. There are many types of steam baths, which are different from saunas. (Both are hot, but the steam in a sauna is created by throwing water on a stove.)

Hammams, steam rooms and steam showers are types of steam bath. A steam bath is a room where relative humidity is kept at 100%, with a fine mist produced due to stratified temperature, from 20-25°C at floor level, up to 40-50°C at head level.

**Detox bath with essential oils:** This is the idea of a relaxing bath, taking time to remove all outside stress. After the bath, the body will be relieved from all the negativity and you will feel energized. The majority of hot tub users prefer a water temperature in the range of 100°F-102°F. 104°F is the standard maximum temperature, which some users also prefer.

**Sulfur baths and FMS:** Israeli research was conducted to evaluate the effectiveness of balneotherapy on patients with FMS in the Dead Sea. Forty-eight patients with

FMS were randomly assigned to either a treatment group receiving sulfur baths or a control group. All participants stayed for 10 days at a Dead Sea spa. Physical functioning, FMS-related symptoms and tenderness measurements were assessed prior to arrival at the Dead Sea, after 10 days of treatment, and 1 and 3 months after leaving the spa. Physical functioning and tenderness moderately improved in both groups. With the exception of tenderness threshold, the improvement was especially notable in the treatment group and it persisted even 3 months after leaving the spa. Relief in the severity of FMS-related symptoms (pain, fatigue, stiffness and anxiety) and reduced frequency of symptoms (headache, sleep problems and subjective joint swelling) were reported in both groups, but lasted longer in the treatment group. The conclusion was that balneotherapy treatment of FMS is effective and safe. Soaking in hot springs can be a great way to naturally detox your skin. Thanks to the high amount of silica in the water, it can also soften rough or dry skin. The water temperature of a sulphur bath is between 37 and 39°C and should last about 10 to 20 minutes. After a sulphur bath, a hot shower is taken to open the skin pores and remove the

unpleasant sulphur odors. Plus, the mineral content of sulfur springs has been shown to help persisting skin conditions like psoriasis, acne and eczema.<sup>[12]</sup>

**Mud Spa:** Mud baths may contain minerals like sulfur, zinc, magnesium, and bromine that are said to: Draw out impurities from the skin. Exfoliate dead skin cells. Relax sore muscles and joints. Improve skin conditions, like eczema and psoriasis. One benefit of mud baths is their anti-inflammatory properties -- soaking in mud and its minerals can help alleviate aches and muscle pains. Another mud bath advantage is the soothing effect mud and its minerals -- including sodium, magnesium and potassium -- can have on the skin. A mud bath is performed by covering an individual's skin with a thin layer of rich, dark mud, or by the individual immersing themselves in a pool of liquid mud. The mud bath can smooth and exfoliate skin, in addition to relieving pain caused by arthritis and relaxing muscles and joints. Mud baths are heated to 100-102°F (37-38°C), which helps to invigorate circulation. Most mud baths contain a mixture of hot spring water and volcanic ash.

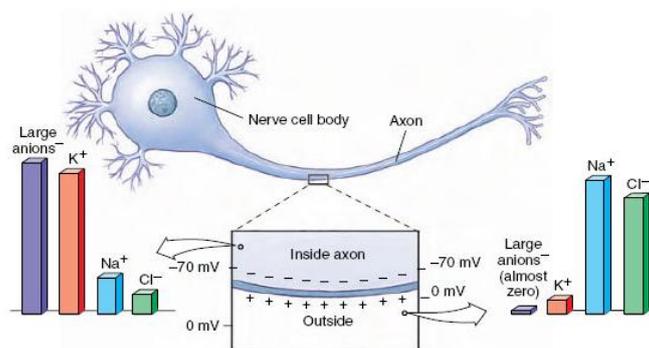


Figure 10: Balneotherapy: A natural harmony for sound health.

**Dead Sea balneotherapy and FMS:** A further study was conducted to assess the effectiveness of balneotherapy in the Dead Sea area in the treatment of patients suffering from both fibromyalgia and psoriatic arthritis. Twenty-eight patients with both psoriatic arthritis and fibromyalgia were treated with various methods of balneotherapy in the Dead Sea area. Clinical indices were assessed and the results showed that the number of active joints was reduced as were the number of tender points. A significant improvement was found in dolorimetric threshold readings after the treatment period in women. The Dead Sea region is the major spa area in Israel for patients with various types of arthritis. The unique climatic conditions in this area, and the balneologic therapy-which is based primarily on mud packs and bathing in sulfur baths and in Dead Sea water-combine to alleviate the symptoms of arthritis. Controlled studies conducted over the last 10 years have demonstrated that treatments provided at the Dead Sea have a positive effect on patients with inflammatory arthritides such as rheumatoid and psoriatic arthritis, and on non-inflammatory arthritides such as osteoarthritis. In

addition, the use of mud packs and Dead Sea salts dissolved in regular bath water outside the Dead Sea region are also effective, although to a lesser degree than when applied at the Dead Sea area itself. The conclusion was that balneotherapy appears to produce a statistically significant, substantial improvement in the number of active joints and tender points in both male and female patients.<sup>[13]</sup>

**Pool exercise and FMS:** The treatment group was advised to 'match the pool exercise to their threshold of pain and fatigue'. The educational component comprised discussion of coping strategies and encouragement to physical activity. The outcome was that significant differences were observed and noted on the Fibromyalgia Impact Questionnaire and the 6-minute walk test. There were also improvements in the treatment group, to a significant degree, in physical function, grip strength, pain severity, social functioning, psychological distress and quality of life.

Spa therapy can also improve circulation, reduce inflammation in the body, and enhance the body's autoimmune response. Additionally, going to a spa to relax and be pampered can improve your self-esteem and improve mental clarity. In India if you want to good spa and massage than it will minimum costs you 1000/- per session, depend upon where you took massage. But in 1000/- you will get good massage service at spa and massage center.

## CONCLUSIONS

Balneotherapy is an effective complementary approach in the management of several low-grade inflammation- and stress-related pathologies, especially rheumatic and metabolic conditions. However, despite the demonstrated clinical and symptomatic benefits of these therapies, their role in modern medicine is still controversial, mainly because the biological mechanisms underlying these benefits have not yet been completely elucidated. In the context of these pathologies, further studies are clearly necessary in order to clarify the mechanisms of effectiveness involving the stress response and, consequently, its interaction with the inflammatory response.

In this review, we proposed that neuroendocrine and immune effects are very important biological mechanisms of effectiveness of this therapy, and that several hormetic pathways can be involved in these effects. Due to the variety and heterogeneity of balneotherapy modalities, water and mud compositions, and application protocols, it is difficult to determine the exact intervention for obtaining optimal biological and clinical outcomes in different pathologies. Furthermore, the regulation of altered inflammatory and stress status by this strategy could be conditioned by each specific disease's basal set-point, so whether the benefits of balneotherapy could be extended to other conditions or even healthy subjects remains unknown.

In the context of hormesis, it is necessary to ascertain the ideal temperature and concentration of different bioactive chemical elements (as well as the number and duration of sessions, and intervals between each session) in order to elicit hormetic responses without causing damaging or toxic effects. Further studies looking deeper into the hormetic mechanisms of effectiveness are clearly needed, so balneotherapy can be practiced by health professionals based on scientific evidence that supports its use.

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