

Whole Body Cryotherapy : The Three Levels of Cure

Historical Overview

The word "Cryotherapy" originates from the Greek words: "cryo" = cold, and "therapeia" = cure. Hence, Cryotherapy is a curative health treatment involving extremely low temperatures (below -130°C/ below -266°F).

Modern "Whole Body Cryo Therapy" (WCT), also referred to as "Air Cryo Therapy" (ACT) and "Cryosauna," is rooted in the practice of Dr. Yamaguchi of Japan who, in 1978, started using freezing treatments of short duration on his rheumatoid arthritis patients' skin surface for pain management purposes. With these cryo-procedures, Dr. Yamaguchi found he could significantly reduce the soreness and pain his patients usually felt during manipulation of their joints, because the rapid decrease of temperature of the outer layer of skin led to the immediate release of endorphines and therefore less sensitivity to pain.

In the 1980s, while continuing his research, now on the effects of Whole Body Cryotherapy, Dr. Yamaguchi and his associates came to this conclusion: that rapid short-term freezing of the skin's surface to a temperature of -1°C/32°F while inside the cryo-chamber has a more beneficial effect on the human body than its gradual cooling while immersed in an ice bath, where the lowest temperature possible is 5°C/41°F.

As a result of thorough and sustained research, Dr. Yamaguchi further formulated that Whole Body Cryotherapy (WCT) affects the body on three different levels:

- The Biochemical level – the circulatory system
- The Energy level – the energy meridians
- The Information level – the nervous system

The Biochemical Level

We start with the Biochemical Level, which is basically the physical level, and the most understandable from the standpoint of modern medicine. Almost all treatments and effects of modern medicine on the human body are on this level.

When inside the cryo-chamber, where ambient temperature is usually around -170 °C/-274°F, the human body is rapidly exposed to extremely low temperatures and the skin's surface is quickly cooled to approximately -1°C / 32° F for a short period of time (2.5 to 3 minutes). When the skin surface temperature reaches freezing for even a few moments, cold sensors in the skin send a very strong signal to the brain that the organism's life might be in danger. In an innate response to protect the body from the critically low temperatures that could lead to hypothermia and death, the brain gives orders to all peripheral parts of the body to constrict the muscles and tissues in order to send blood to the core of the body.

Why does this happen? Because the temperature in the body's core must be constant and equal to 98.6 °F, as even slight changes to this temperature could eventually cause death. So upon receipt of signals from the skin's cold sensors of the freezing temperatures in the cryo-chamber, the brain

center has a clear warning that maintaining the necessary core body temperature will be impossible if blood circulation in the outer layers of the skin is allowed to continue. Therefore, all survival resources are mobilized, and blood is sent into the body's core to begin circulating in an "internal cycle" to protect the vital organs. One immediate effect is that arterial blood pressure increases by about 10 points. For example, if the systolic pressure (upper number) was 130 points (or millimeter of mercury) before the treatment, it may reach 135-140 afterwards for a short time.

But much more is happening as the blood circulates in the "internal cycle." It is also being enriched with oxygen and all the necessary enzymes and nutrients. Several successive treatments will even lead to an increase in hemoglobin count. The blood becomes enriched in accordance with the best capabilities, as all resources and reserves are activated to ensure the functions of life while the body does its best to survive under the perceived critical conditions.

What else is happening at this time? As the internal organs are surrounded and nourished by the enriched blood, all crucial life processes are accelerated. In other words, during WCT, if the performance of any of the organs was low or impaired, these deficiencies are remedied as much as possible with all the required components, so the bolstered organs can begin to recover. And if, in the body's normal, "non-survival" mode of operation, some deficiency was not considered critical, this new, unusual and "perceived-as-dangerous" environment mobilizes the body for self-defense, and it identifies and seeks to address any and *all* deficiencies. Accordingly, all internal organ problems are reduced or eliminated under the strong, rich blood flow effects.

We also know that in a specified period of time the whole range of body cells are replaced with new ones, and the dead cells are eliminated through the lymph system. Extreme cold also contributes to the efficient elimination of the dead cells which would otherwise make sluggish many other workings of the body.

After 2.5 to 3 minutes of WCT, when clients step out of the cryo-chamber into the warmer air, signals to the brain indicate this new temperature change, and all peripheral tissues then expand, including blood vessels, muscles and skin tissues - as opposed to the constriction that occurred in the beginning of the treatment when the skin surface temperature was rapidly cooled to -1°C /32°F.

What is happening at this point? Under the temporary higher blood pressure caused by WCT, blood is now released from the "internal cycle" and flows back out to the peripheral tissues, filling all the remote corners of the body from which it was withheld during the low temperatures. When this enriched blood reaches peripheral tissues, they are enhanced in the same beneficial way as the internal organs were during the treatment. In fact, this beneficial process continues in the body for 6 to 8 hours after the treatment.

In summarizing, we can say that the enriched blood creates favorable conditions for internal organ regeneration, for expelling of toxins from subcutaneous layers, for the cell renewal process, replacement of damaged cells and elimination of dead cells from peripheral tissues – i.e. rejuvenation of the body at the cellular level.

While these processes are initiated by brief exposure of the skin surface to extremely low temperatures, *it is important to understand that tissue is not actually frozen during the procedure. Only the illusion of a severe cold impact is created when very cold air temporarily touches the skin where our cold sensors are located.* This is one of the essential differences

between the Whole Body Cryotherapy and the Ice Bath. This is very important to understand so let's go in a bit more detail.

Why Cryosauna (WCT) is Better Than the Ice Bath

The Ice Bath has been regularly used in professional sports today for the rehabilitation of athletes with injuries. But the Ice Bath affects the body in a completely different way than does the Cryosauna, which has now been shown to be much more beneficial and with no negative side effects. So what are the different effects of the Ice Bath and Cryosauna?

First, during the 15-20 minutes of ice bathing, tissue freezes quite deep and frozen muscles temporarily lose capacity, as muscle tissue needs time to return to normal - not to mention that after the Ice Bath the body needs rest. So regardless of the time of day when the Ice Bath took place, the athlete cannot get back to practice earlier than the next day. In contrast, Cryosauna does not actually freeze muscle tissue, it only creates a powerful illusion that the body freezes. So a further advantage is that, only 5 or 10 minutes after the Cryo-treatment, an athlete can continue to work out or perform, completely energized and able to make full use of the day.

Next, we need to emphasize that the body's reaction to cryogenic temperatures (temperatures lower than -110°C or -166°F) in the Cryosauna is radically different from its reaction to low temperatures while submerged in the Ice Bath. The big difference lies in the fact that, when gradually cooled in an Ice Bath, the body's response is to try to warm as much blood as possible in its core in order to send it to the peripheral parts to maintain the warm skin surface. In other words, while in the Ice Bath, the body is struggling with actual, unrelenting, penetrating physical cold (not just signals from skin cold sensors). This process continues, trying to make the body capable of generating sufficient heat to maintain warmth in the peripheral body parts. But when the heat is no longer enough, the muscles start to congeal and freeze, beginning at the skin surface and continuing inward to the body's center. For this reason, longer stays in the Ice Bath can cause hypothermia that can lead to death, as it is very difficult to stop this process once begun.

But in the cryo-chamber, the skin surface reaches temperature of $-1^{\circ}\text{C}/32^{\circ}\text{F}$ in just 30-40 seconds while the temperature outside is -170°C (this is impossible in an Ice Bath where skin temperature cannot drop lower than $+5^{\circ}\text{C}/41^{\circ}\text{F}$). This signal sent from skin to the brain about the new critical environment is so powerful that the brain understands immediately – there is no way to keep the peripheral parts of the body warm. Instead, blood vessels and capillaries undergo severe vasoconstriction to keep the body's core temperature from dropping - triggering the processes described before – enrichment of blood and sending it to internal organs under higher blood pressure. This never happens in an Ice Bath.

Lastly, while in the Ice Bath, oxygen supply to the skin surface is interrupted, and it causes skin surface injury that can promote skin disease if the procedure is often repeated.

As we conclude this brief explanation of the Biochemical Level aspects of the Cryo-cure process, we should say that it is presented from a scientific rather than a medical point of view, as although many successful medical studies have been completed in Europe and Asia, the USA has ongoing, but not yet completed, studies for official referral.

The Energy Level

The second level affected by Cryotherapy is the Energy Level of the human body. It's important to note here that modern Western Medicine has traditionally tried to distance itself from even the existence of the Energy Level when referencing organism viability. Only in the last few years has

Acupuncture, which deals with the energy meridians of a human being, become a full medical component and Acupuncturists recognized as effective physicians. This recognition is a major step forward in modern medicine. At the same time, most Eastern Medicine is based, at least in part, on working with the human energy body.

The Energy Level of the human body is made up of a network of energy meridians, similar to the way the circulatory system in the Biochemical Level is a network of blood vessels, and similarly, as we will see in the next section, the Information Level is a network consisting of the nervous system.

The human body consists of 12 main meridians and many lateral meridians, together referred to as the energy network of a human body. The main meridians are located inside the body, while lateral meridians reach the skin surface. When the energy flow in any of the meridians is blocked, some organs do not receive enough energy to function properly. This poses a malfunctioning, and the organ starts to die. Unfortunately, modern Western Medicine can only diagnose organ failures when they are already seriously damaged, and disease symptoms appear at the Biochemical Level. So if we could diagnose or simply restore the energy flow in the human body before it reached this stage, as does WCT, many diseases would be prevented.

How does WCT stimulate this energy flow in the body? We know from any physics curriculum that if we take a sufficiently long wire (1 m or more), and warm one end of it while cooling the other, the temperature difference leads to an electric current in the wire. Exactly the same thing happens to the human energetic system while using WCT. When the temperature on the skin surface drops to -1°C / 30°F while body core temperature is 98.6°F , there is a 68.6°F difference that is sufficient to cause a strong flow of energy in the meridians, thereby restoring energy flow where disruptions may have been present. In this case, WCT is used as a preventive and corrective method, and by stimulating the energy flow in the human body, it allows people to stay healthy longer.

Today, we cannot say that any method, including Acupuncture, can accurately diagnose potential discrepancies in energy flow, as relatively little research has been documented about it. However, energy flow restoration will be very beneficial even without knowing the exact site of disruption in the body. As a result of today's lifestyle characterized by stress, immobility, bad eating habits, chemical and biological contamination, as well as physical injuries and surgeries, the energy systems of human beings are seriously damaged. Even scars inside and outside the body are barriers to the energy flow through the body. If our energy system does not function properly, and the body has the internal malfunctions and damages described above, then there is not enough energy, even at a very early stage, for prevention of an aging process, much less rejuvenation. Aging is the immediate result of insufficient energy supply inside the body. Restoration of the energy flow helps to restore the body physically, and can at least prevent its premature aging.

So, in summarizing WCT's effects on the first two levels of the body, we can say that: WCT helps enrich the blood and supply it to all internal organs and peripheral parts of the body by making sure that the organs have all necessary "building materials" for cell renewal. WCT also helps to supply the organs with the necessary energy to make full use of these materials - as without energy, no beneficial processes can occur. And in addition, remember that the organism is not exposed to real danger during the treatment, and there is no threat of damaging the tissues - only illusion of a survival threat is created.

The Information Level

Now we proceed to the third level - the Information Level, which consists of the intricate network of the body's nervous system, through which electronic signals, self-analyzing questions and answers, and other detailed information are sent to and from all parts of the body. (Remember, on this level, the nervous system can be seen as similar to the circulatory system at the Biochemical Level, and the energy meridian system at the Energy Level.) This incredible communication system assesses the organism's specific conditions, deficiencies, and immediate needs in order to know how to restore itself and remain viable.

For example, if cell division does not follow the pattern determined in the Information Level of the body, the cell begins to mutate. Cell mutation, of course, disturbs proper functioning of the body. One of the most prominent examples of this is the cell mutation in cancer, caused by incorrect cell regeneration. Furthermore, we have to acknowledge that even modern medicine does not know how the human immune system works, and there are actually two schools of thought about whether auto-immune diseases, where normal cells have mutated somehow and do not perform their needed function, are 'real' diseases. An auto-immune system disease is one in which the body cannot distinguish its own tissues and substances from a foreign element and attacks itself, thinking it's defending itself against intruders that threaten the health of the organism. Another typical example of immune disease is Psoriasis. WCT has proved to be an effective method fighting Psoriasis, and significant results have been achieved in Russian clinics, confirming previous assertions.

How can WCT affect the immune system and rejuvenescence of the body's information system? Similar to the brain signals in the biochemical system that are sent to the peripheral tissues causing vaso-constriction during WCT due to the significant drop in temperature - In the Information Level, the brain sends signals to *all* parts of the body through the nervous system in order to determine the extent to which each part of the body is compromised. This is done to allocate adequate resources that will ensure the viability of the organism, as this function of the brain does not distinguish between the important (critical for survival) organs and less important tissues and functions. The human brain will try to perpetuate *all* the organs and body parts, unlike this same survival process in a lizard, for example, which sacrifices its tail in order to save the rest of the body.

What exactly is happening here in the body during WCT? When the brain, in response to perceived critical conditions, surveys all body parts and analyzes the returned signals, it creates a complete up-to-date picture of the body's state of health - which the brain requires to properly allocate resources to ensure the viability of the body.

Currently, there is no other known method in the world able to provide this kind of information-updating procedure that the body's immune system and information system need to correct itself in early stages of malfunction. And currently, there is no medical research that even refers to the effects of WCT on the human Information Level. And because modern medicine does not know exactly how the immune system works; it does not know how to restore the immune function.

Conclusion

But the processes we have described here as a result of WCT have very impressive, if at present mostly empirical, evidence from people suffering particular biochemical malfunctions, auto-immune system diseases or energetic body impairment having reported considerable and lasting improvements after taking a sufficient number of WCT treatments. References to such cases can be found in various reputable sources, including well-known medical journals.