



**CRYOTHERAPY
AT
COYNE MEDICAL**

**INFORMATION ABOUT YOUR CRYOTHERAPY SESSIONS
FROM DR HUGH COYNE**

Cryotherapy at Coyne Medical

Widely used by elite athletes, our whole-body cryo chamber allows you to recover like a pro.

Our advanced whole-body cryo chamber tailors your cryotherapy sessions to you and your goals.

Most sessions are around three minutes and our chamber allows you to experience temperatures down to as low as -140°C .

But why would you want to spend any time at such cold temperatures? Scientific studies show that whole-body cryotherapy can:

- Reduce muscle soreness (DOMS after exercise)
- Aid performance recover after exercise
- Increase your overall sense of well being.
- Moderate feelings of fatigue
- Calm the inflammatory response after exercise
- Enhance sleep quality
- Improve cholesterol profile
- Reduce the stress hormone cortisol
- Increase testosterone levels
- Improve chronic low back pain
- Improve pain and function in frozen shoulder
- Reduce depression and anxiety

What is Whole-Body Cryotherapy?

Cold therapies have been used since ancient times to alleviate pain and to invigorate participants. However, it wasn't until 40 years ago that whole body cryotherapy was introduced into clinical practice. Professor Toshiro Yamauchi recognised that the combination of cold and physical exercise had a beneficial effect for his patients who were suffering from rheumatoid arthritis when they came back from winter holidays. Prof. Yamauchi constructed the first cryo chamber and successfully used it to treat patients with

rheumatism.

These days, whole body cryotherapy is performed in special chambers that have strict control over the temperature and humidity. Participants are usually dressed to allow maximum exposure to the cold. Usually, participants must stay in the chamber no longer than three minutes at a temperature from - 85 to - 140 degrees Celsius. Whole-body cryotherapy should only be performed under the supervision of trained personnel. The door of the cryotherapy chamber is closed with a magnet and therefore participants are free to leave the chamber at any time.

How Does Whole-Body Cryotherapy Work?

The first whole-body cryo chambers first appeared in Japan in the 1980s when Yamauchi used them to treat patients with Rheumatism. Nowadays, cryotherapy is widely used by sports teams and is also used in the treatment of a number of medical conditions.

The temperature of whole body cryo chambers is usually between -85°C and -140°C. Participants usually stay in the chamber for between two and four minutes. In the cryo chamber, men will wear a pair of shorts and women shorts and a sports bra. In addition, participants wear gloves, a headband, a facemask, long socks, and clogs or tent-mules.

When you get into the cryo chamber it causes your skin to cool. This activates the sympathetic nervous system initially. As a result, the blood vessels close to the surface of the skin narrow. This causes the blood flow to the peripheries and to injured or inflamed tissues in the body to slow. The decrease in blood flow slows down the metabolic processes in these areas. Hence, inflammation and swelling are reduced.

Cryotherapy reduces cell death after exercise and slows down the speed at which our nerves conduct impulses. This leads to reduced tissue damage and pain sensation.

The narrowing of the blood vessels caused by cryotherapy leads to an increase in blood flow back to the core of the body. This stimulates a process in the body known as the “baroreflex.” The baroreflex is responsible for maintaining our blood pressure. It does this via the autonomic nervous system. There are two branches to the autonomic nervous system. The sympathetic ‘fight or flight’ response or the parasympathetic ‘rest and digest’ response. The stimulation of the baroreflex by whole-body cryotherapy activates the parasympathetic nervous system.

A study of 40 male recreational athletes examined the activation of the parasympathetic

nervous system. Heart rate variability is used in scientific studies as an indicator of parasympathetic nervous system activation. In this study, heart rate variability was found to be increased indicating increased parasympathetic nervous system activity. This has also been found to be the case in a [study of healthy women](#) and in a group of [elite synchronised swimmers](#).

Although cold water immersion, such as in an ice bath, can have similar effects on the parasympathetic nervous system, it is to a lower extent compared to whole-body cryotherapy.

Elevated parasympathetic activity is associated with greater health and wellbeing. Delayed or incomplete parasympathetic activity is associated with an increased risk of death. Thus, parasympathetic activity is thought to be cardioprotective.

It is thought that cryotherapy also activates the 'endogenous opioid system'. This is the system in the body that influences pain perception, sense of wellbeing, addictive behaviour, and reward. This is thought to be the reason why cryotherapy can have a beneficial effect on depression, anxiety, and an overall sense of wellbeing. Cryotherapy is also known to [have a positive effect on sleep](#).

Who Should Not Get in a Cryo Chamber?

Although whole-body cryotherapy is a fantastic experience for most people, there are some people for whom cryotherapy is not safe. Although in this country, whole body cryotherapy and cryostimulation is available in gyms and medispas, in many countries it is regarded as a medical therapy. Hence, whole-body cryotherapy should follow strict guidelines and indications.

Certain medical conditions prohibit the use of cryotherapy. These include:

Cryoglobinaemia - this is a medical condition whereby patients have a large number of cold-sensitive antibodies. These proteins become insoluble when the body temperature drops and clump together causing restricted blood flow.

Raynaud's syndrome - a condition where blood flow to the extremities is unusually cold sensitive.

Claustrophobia - as although the window of the chamber can be open and the door can be pushed open easily the chamber is still a confined space.

Hypothyroidism - this condition increases sensitivity to cold temperatures. Cardiovascular system disease - people with unstable angina, peripheral vascular disease and cardiac failure would be unsuitable for whole body cryotherapy as it causes constriction of the peripheral blood vessels

Acute respiratory tract disease - these may be worsened by exposure to cold air and relative lack of humidity.

Severe wasting diseases - people with muscle wastage may not be able to tolerate cold temperatures.

Severe anaemia

Pregnancy

Seizure disorders

Wound healing problems

DVT - again, this will have affected the peripheral blood vessels adversely, so people who have had a DVT should not undergo cryotherapy.

Alcohol or drug use - both of these can adversely affect the normal physiological response to cold.

When performed in the appropriate setting with controlled conditions of temperature and humidity whole-body cryotherapy is a safe procedure. It has been shown to have no adverse effect on heart or lung function. However, it has been shown to cause a very slight, and some have suggested clinically irrelevant, increase in blood pressure. So, out of an abundance of caution, we choose to measure clients' blood pressure prior to entering the cryo chamber.

What To Look For In A Cryotherapy Chamber To Make Sure That It Is Safe?

Cryotherapy is now in much more widespread use. There are several different types of cryo chamber that people can use. Some of them are in medical clinics but many are in gyms or medi-spas.

The medical research that has been done in whole body cryotherapy is in just that: whole-body cryotherapy. Treatments that are undertaken in cryo saunas, also called cryo cabins, are not considered in the medical research as the whole body is not inside the cabin. In contrast to a cryo sauna, in a whole-body cryo chamber no exposure to liquid nitrogen. Instead, the chamber is cooled either through electricity or liquid nitrogen is pumped into the pipes inside the walls of the chamber where it is used to supercool the surrounding fresh air; this cooled air is then pumped into the chamber.

Before you get in a cryo chamber the specially trained supervisor should ensure that you are appropriately dressed, have completely dry skin, that your blood pressure is normal, and that there are no contraindications for you to enter the chamber.

What Is The Difference Between A Whole-Body Cryo Chamber And A Cryo Sauna?

Local cold therapy for muscle and joint sprains has been extensively used for many years. However, more recently, whole-body cryotherapy has been widely used in sports medicine. Whole-body cryotherapy involves a brief exposure of up to four minutes at temperatures as low as -140 degrees Celsius.

By rapidly cooling the skin the cold exposure in a cryo chamber causes the blood vessels in the skin and muscles to narrow. This reduces the temperature of the muscles which slows cell metabolism and promotes muscle recovery. It also reduces muscle soreness and is thought to do so through activation of cold receptors that promote pain relief. The effect of the narrowing of blood vessels on the surface of the body is to increase blood flow at the core. This leads to activation of the parasympathetic nervous system, the 'rest and digest' aspect of the nervous system. Elevated parasympathetic activity is associated with greater health and wellbeing.

What is a Cryo Sauna?

Unlike in a cryo chamber, in cryo saunas - also called cryo cabins - the whole body is not inside the cabin (the head is outside). These cabins are open-ended metal tubes. In the cryo saunas the head is outside the cabin. The cooling in a cryo sauna is delivered through direct exposure to liquid nitrogen. This allows free nitrogen vapour into the cryosauna, which could potentially be very hazardous, causing asphyxia.

What is a Cryo Chamber?

In contrast to a cryo sauna, in a whole-body cryo chamber, there is no exposure to liquid nitrogen. Instead, the chamber is cooled either through electricity or indirectly by liquid nitrogen. Generally, liquid nitrogen chambers can achieve colder temperatures. Most of the medical studies into whole-body cryo chambers have been done at -110°C. Only a few electric cryo chambers can get down to this temperature. In the liquid nitrogen chambers, the liquid nitrogen is pumped into pipes inside the walls of the chamber. This supercools the surrounding fresh air which is then pumped into the chamber.

Because the head is inside the whole-body cryo chamber it is more effective at cooling the skin than a cryo sauna. Whole-body cryotherapy [has also been found to be more effective at activating the parasympathetic nervous system than cryo saunas](#).

If you are nervous about having your head inside the chamber, our safe liquid nitrogen cooled whole-body cryo chamber has an adjustable window so you can chat with your trained operator. The door is closed but not locked so you always feel in control when you are in the chamber.

Can Whole-Body Cryotherapy Improve Your Mood?

Whole-body cryotherapy has been used since the 1980s to improve pain and function in various forms of arthritis. More recently, it has become a popular method amongst athletes to improve their recovery from exercise, reduce muscle soreness, and increase their general sense of wellbeing.

If you have ever jumped into the sea in winter or braved an ice bath, you will know that afterwards you will feel fantastic. As the endorphins released by your body course through your blood vessels following the cold exposure, you feel alive. You will be bristling with energy.

Many people struggle with low mood or anxiety. The complexity and relentlessness of modern life exacerbate this. There is an understandable reluctance for many people with mental health issues to take medication. Scientific interest in the benefits of strategies other than medication to treat depression and anxiety has been growing. This includes the use of cold therapy to treat mental health issues. A [case report published in the BMJ](#) received considerable [press coverage](#). The case report described how a 24-year-old woman who had been on antidepressant medication since the age of 17 took up weekly open water swimming and was eventually able to give up her medication.

Open water swimming is not readily available to everyone, and having ice baths involves the purchase of a considerable amount of ice. For some people, whole-body cryotherapy for three minutes at a time provides a more convenient solution. Scientists have examined whether this might be effective in depression.

It is thought that cryotherapy and cold water immersion activate the 'endogenous opioid system'. This is the system in the body that influences pain perception, sense of wellbeing, addictive behaviour and reward. Cryotherapy is also known to [have a positive effect on sleep](#).

Scientists in Poland sought to discover whether cryotherapy using a whole-body cryo chamber could be beneficial for people with depression or mixed depression and anxiety. The [study involved people aged 18-65](#). The control group received standard medication for depression and anxiety. The study group, in addition to medication, had 15 sessions of cryotherapy daily, each one lasting 2-3 minutes. In the study group, over a third of participants had a 50% improvement in depression symptoms and almost half had a 50% improvement in anxiety symptoms. In the medication-only group, only 3% had a 50% improvement in depression symptoms and none had a 50% improvement in anxiety. Now, it should be noted that medication takes at least three weeks to have any beneficial effect in depression and anxiety. However, this study does show that there may be a significant benefit to be gained by people with depression and anxiety at the onset of their treatment.

Even if you do not have depression or anxiety, cryotherapy may be useful for your mood. In [a randomised controlled trial of runners](#), cryotherapy improved general sense of well being after vigorous exercise to a significant degree compared to far infra-red therapy and passive recovery.

Anecdotally, many people - including me - [report a sense of euphoria](#) for several hours after being in the chamber. So, by taking three minutes out of your day, whole-body cryotherapy could potentially change your mood for far longer.

Whole-Body Cryotherapy for Recovery From Exercise

Since the 1980s, whole-body cryotherapy has been used to improve pain and function in various forms of arthritis. More recently, it has been used to help people with a variety of other conditions such as depression, anxiety, fibromyalgia, psoriasis, eczema, and multiple sclerosis. However, for many people, the effect of whole-body cryotherapy on recovery after exercise is its most important use.

I really enjoy cycling. However, after being out on the bike for several hours, when I get home to my family I am often in pain, tired, and irritable.

A randomised controlled trial was undertaken to establish the effects of [whole body cryotherapy on recovery from exercise](#). It compared the use of whole-body cryotherapy with far infrared therapy and passive recovery in endurance runners immediately after exercise. Each different type of recovery was then repeated at 24 and 48 hours post-exercise. In three different weeks, the runners performed a run on a treadmill designed to induce muscle damage. The participants were asked to report their feelings of pain, tiredness, and wellbeing using a standardised questionnaire. The scientists also measured the participants' muscle strength at different stages following the run.

The study found that after whole-body cryotherapy muscle strength was restored one hour after whole-body cryotherapy and 24 hours after far infrared. Muscle strength did not recover at all with passive recovery (sitting in a chair for 30 minutes). The study also found that pain and tiredness were reduced by one session of whole-body cryotherapy. Far infrared only reduced pain and tiredness after 48 hours and passive recovery did not help at all. At 24 hours following exercise, the runners reported that their wellbeing was better than it had been prior to exercise. However, following far-infrared and passive recovery, wellbeing did not recover to pre-exercise levels.

Another study asked participants to [perform a workout of 30 minutes of step-up/ down](#). The group consisted of physically active males of college age. They were then randomly assigned to either cryotherapy sessions or a control group. The cryotherapy group had significantly less muscle pain (and also improved cholesterol profile).

In a group of elite level synchronised swimmers, daily whole-body cryotherapy improved the athletes' tolerance of training load. It was also found to improve sleep duration.

So, whole-body cryotherapy has a variety of beneficial effects after exercise. It can reduce muscle pain, help restore muscle strength, enhance sleep, and promote a sense of wellbeing. Why not see if cryotherapy can do the same for you?

Can Cryotherapy Help With Sleep?

Whole-body cryotherapy has become a very popular method to enhance recovery after exercise. It has been found to increase wellbeing after vigorous exercise, quickly restore muscle strength and reduce muscle soreness. In addition, whole body-cryotherapy has been used to treat a variety of medical conditions as varied as depression and psoriasis.

But can cryotherapy help you sleep?

Over a sustained period of time, chronic partial sleep loss has been shown to reduce mood, increase the likelihood of picking up infections, impair mental performance, and reduce physical performance. In addition, it can have unhelpful effects on metabolism. Quality of sleep is also key to recovery from exercise.

Recently, two studies have demonstrated the beneficial effects of whole-body cryotherapy on sleep. The [first study involved a group of elite swimmers](#) during an intensive training period prior to the Olympic games. To measure sleep at night, the swimmers wore actigraphs. These are devices used in scientific studies to measure sleep parameters. The study investigated the effects of 14 consecutive days of whole-body cryotherapy at a temperature of -110°C . The researchers found that cryotherapy improved sleep quality, duration, and time to get to sleep compared to control. Interestingly, the cryotherapy also helped preserve the athletes' swimming speed.

The second study [involved the men and women of the French National Basketball Teams](#). It was performed during an intense one-week training camp followed by three international matches. The training and the matches were part of preparation for the European Basketball Championships. After training, or after a match, the athletes underwent a three minute cryotherapy session at temperatures between -110°C and -150°C . Sleep quality was found to be improved following the cryotherapy sessions when compared to nights without cryotherapy.

So, cryotherapy has been demonstrated to improve the speed of onset of sleep, the quality of sleep, and the duration of sleep. We also know that cryotherapy activates the parasympathetic nervous system. This is the part of the nervous system associated with recovery. Try it for yourself to see if your sleep and recovery improves.