

The athletic community has been the quickest to embrace Whole Body Cryotherapy. As the obvious advantages became apparent among the earliest users, teams are realizing that like with any new effective training technology, they need to embrace it to maintain their competitive status.

In athletic training, Whole Body Cryotherapy can help professional and recreational athletes help their bodies be a peak performance, recover more quickly from intense training and break the cycle of nagging chronic injuries. This booklet will address pre event preparation and post exertional recovery. Users can utilize the guidelines in the Pain Management protocols to help their athletes with chronic injuries.

### Post Training and Post Competition Recovery

Athletic training is a method of inducing minor trauma to cause the body to become stronger and more capable. Hard bouts of exertion routinely break a small percent of fibers in the muscle groups utilized. With proper recovery, the body regrows the damaged fibers and grows additional fibers to accommodate for future possible stressors. Over time, these accumulated extra muscle fibers translate into enlargement of the relevant muscle groups, allowing for a greater power output than what was possible prior to training.

Similar beneficial adaptations occur in the cardiovascular system, particularly the density of capillaries that feed oxygen and nutrients to the working muscles. Training allows for an increase rate of blood delivery to the tissues via a greater number of capillaries in the tissues of the well-trained athlete. Within each individual muscle cell, changes also take place in the number of mitochondria present. These organelles allow for the conversion of glucose and fatty acids into energy. Greater numbers of mitochondria allow for a faster generation of energy for longer periods of time.

The main impediment to these beneficial adaptations is the accumulated metabolic inflammation. During exertion, pro-inflammatory tissue chemicals are formed that start the process of tissue repair. In many circumstances, the amount of these chemicals formed is in excess of what is needed. Before repair can begin, these pro-inflammatory chemicals must be neutralized by our immune systems.

Whole Body Cryotherapy has been demonstrated to lower the amount of post-exertional pro-inflammatory tissue chemicals to degrees unobtainable by other methods including ice, massage and stretching. This quick reduction in inflammation allows the athlete to obtain the benefits of training with less mandatory rest time, thereby allowing a

greater frequency and intensity of training.

The benefits of ice cold water to athletes and their rates of recovery from exercise are in proportion to the cooling of thermal receptors which are small nerves that are found just need the skin surface on the body. Normal skin temperature is 90°F. When the skin is exposed ice water the thermal receptors are chilled reaching a maximum decrease in temperature at 59°F after 10–12 minutes of exposure to ice water.

If you have ever spent much time in ice water you know that those 10–12 minutes feel like an eternity. With whole body cryotherapy the skin thermal receptors are chilled down to 32°F in a matter of 30 seconds. Because the chilling is accomplished with dry air rather than cold water, the treatment is much more comfortable. The other large advantage is that the treatment takes so much less time. Typically a client is just starting to get an involuntary shiver response when the treatment is completed.

Whole body cryotherapy is able to accomplish these numerous benefits without any harm to the athlete. The therapy has been extensively studied, and has been shown not to have detrimental effects upon the bone marrow, immune system, cardiovascular system, or stress response

pathways.

Whole body cryotherapy has been shown to measurably reduce numerous chemicals associated with inflammation including IL-10, Pro inflammatory cytokine IL-2, and chemokine IL-8.

The treatment has also been shown not to cause changes which would mimic use of banned performance enhancing substances. No guidelines exist that restrict the use of whole body cryotherapy among athletes.



### Recovery

Whole Body Cryotherapy has been shown to improve strength and endurance when done regularly during the course of training and after especially hard efforts. This allows athletes to increase their prior intensity and frequency of training leading to unprecedented gains in performance.

### Pre Competition

In addition to allowing athletes to train more effectively, Whole Body

Cryotherapy can cause beneficial short term changes to the circulatory system and the inflammatory control systems immediately before competition. This can allow for measurable gains in muscular strength and aerobic endurance independent of the athlete's training load.

The following protocols will enable Whole Body Cryotherapy treatment center to immediately be able to provide their clients with the most effective ways to use the treatments for their client's performance benefits.