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Techniques and means of physical therapy for the rehabilitation of athletes

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Abstract

Physiotherapy is a medical profession and an important branch of medicine through which trained professionals evaluate and treat physical dysfunction associated with an injury, disability, disease or health condition. Whereas physiotherapy sessions may be a stand-alone option for treating various diseases, or it may be a kind of auxiliary treatment that is prescribed in addition to other treatments. Age, injuries, disease, movement disorders, or other environmental factors threaten their motor function. Here, this research discusses the concept of physiotherapy, its most important types, techniques, treatment methods, and its most important effects on the rehabilitation of athletes.

Keywords: Natural therapy, techniques, means

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Introduction

The rates of sports injuries and the resulting pathological complications have increased despite the tremendous developments that included most aspects of life, especially in the field of natural treatments and others, and many believe that this may be due to the introduction of modern techniques and means and changing the human lifestyle, and in the sports field, developments in theories and methods of sports training science Where the increase in the use of high tension and for long periods with the absence of the correct rationing of pregnancy in a manner consistent with the functional state, all of this led to an increase in the number of sports injuries on one side, and on the other hand, the modern lifestyle and lifestyle change led to the emergence of the so-called diseases of civilization or (diseases of movement) There is also an increase in the tendency to practice sports activities and physical fitness programs in a way that is not scientifically studied. For these reasons, the need to use modern means and techniques in physical therapy has emerged widely among all segments of society, both old and new. Modern requirements and rehabilitation of the injured faster and better after physiotherapy achieved great success in rehabilitating many of the patient's injuries, diseases, bodily deformities and in other fields.

• natural therapy:

It means the use of "multiple means and techniques from natural outlets developed in proportion to the structural and functional defect that occurs after an injury, disease or disability; Physiotherapy includes various means, and kinetic therapy is one of the most effective means of physical therapy if used in an "organized and precise manner." And in line with the body's dysfunction, where kinetic therapy depends on the histocompatibility of all body systems and relies on the concepts of movement and its laws in building therapeutic systems to restore and renew motor functions and reach the state before injury or disease and determine the complications of disability, and among the advantages of kinetic therapy is that t can be used for all Ages and for different types of injuries, diseases and deformities and for all types of bodily tissues in different stages, so strengthening the muscles and reaching the normal range of movement for the joints is the basis of kinetic treatment and then the use of preventive programs according to the type of injury, disease or disability.

Recent years have witnessed great development and diversity in the means and techniques used in physical therapy because this treatment does not result in any side effects from its use and can be used for all ages and stages and for various types of injuries, diseases and disabilities and for all parts of the body. The same

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principle, but the modification was done in order to increase the therapeutic effect and shorten the time or for the duplication of the effect of more than one factor, all of which aim to reach the maximum level in the rehabilitation of the injured and the return to practising sports activities or for the rehabilitation of non-athletes. The following is a review of the types of natural treatments used in rehabilitation.

First: Cryotherapy: It is one of the "old treatments used by the Chinese 3500 years ago and is widely used in the treatment of sports and non-sports injuries by using ice (shaved or cubes) or cold liquids (with bags or compresses) or shedding cold water directly on areas body, and coldness is used with the aim:

- Pain relief (because it slows down the transmission of sensory nerve impulses that cause pain).
- Stop bleeding and swelling (because the cold causes).
- The constriction of the blood vessels at the site of the injury, limiting their expansion and slowing down local dropsy.
- Reducing inflammation (the cold limits the secretion of chemicals responsible for inflammation).
- Relieves muscle tension and helps relax.

*Cryotherapy techniques and methods:

Cryotherapy techniques and methods have been developed to include many non-traditional methods, as the old methods do not reduce the skin temperature below 15 degrees Celsius, so their effect is limited, so more effective methods are used, including

-Gel spray): which is widely used in sports stadiums.

- Cold gas (carbon gas), fired with a gun, has a temperature of 78 degrees below zero. It is worth noting that extreme cold lowers the skin temperature within seconds from 37 to 4 degrees, which causes:

- Reducing the feeling of pain (due to the blocking of sensory receptors), which does not happen when using ice.
- Anesthetize the affected area for half an hour to 3 hours after completing the treatment.

-Inflammation stops due to the slow localization of hydrocephalus and the identification of chemicals responsible for inflammation and constriction of blood vessels.

- Reducing muscle tension that helps relax.

This treatment can be used with ice and cold compresses as an additional treatment, and one of the advantages of using carbonated gas is that (it stops the

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pain as soon as it is felt, and its anti-inflammatory effect appears after 20 minutes of use), and this treatment is used in the following cases: "arthritis, tendinitis, rheumatism, Sciatica".

• Specifications and Dosage: It is used under the supervision of specialists. The duration of exposure to the affected area does not exceed more than a minute. This treatment works on infrared waves to adjust the temperature of the skin in order to avoid damage resulting from the low temperature of the skin to below two degrees because this leads to great damage that is difficult to treat. The carbon gas pistol was developed to become smaller in size and has sterile carbon dioxide gas hoses and was equipped with a ruler to adjust the necessary distance between the skin and the nozzle.

* Cold air therapy: A device is used for this purpose that works to polarize the surrounding air and cool it to minus 30 degrees, then ,it is released on the affected skin. This type of treatment has many caveats, including

- The air used is not sterile, and this device cannot be entered into sterile rooms.
- The device must be regularly defrosted and requires maintenance.

* Cold rooms: It is a "new type of cryotherapy where the whole body is cooled in rooms with a temperature of 110 degrees below zero where the patient enters the bathing suit into the room and continues for a few minutes, followed by a medical massage, a significant drop in temperature causes tingling And paresthesia in the skin, which causes: Immediately stop feeling pain.

- Stimulate blood circulation.
- Remove muscle tension.
- Repeated treatment relieves muscle and bone pain in the long term.
- It improves body functions and thus enhances the abilities of athletes and improves their performance.
- Reduces the amount of medication taken.
- It enhances the abilities of athletes and improves their performance.
- This remedy can be used for chronic diseases.

* Its most important uses: (rheumatism and general pain), as well as used for cases of asthma, depression and psoriasis.

* Cooling in operating rooms: Surgeons use cooling instead of excision or local anaesthesia in cases of cancer, where the tumour is frozen with a cold, sterile gas whose temperature is 180 degrees below zero, and this causes the cells to die in the center of the tumour This technique is developed for use in cases of prostate, breast and uterine cancer. **Second: Magnetic therapy**: Recent studies confirm that the strength of the magnetic field has decreased by 50% due to the use of

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modern technologies and mineral equipment, which led to the absorption of part of the energy emitted to us from the earth. And the power of magnetic energy that we can get. Magnetic energy is used to treat many diseases, as the magnet helps create a balanced environment for the body and speeds up the healing process. The idea of treatment is based on the principles of magnetic energy in nature, as it penetrates the skin in a specific location to be absorbed through the capillaries in the skin and travels in the blood until it reaches the feeding course for the capillaries in the body, as it "absorbs the magnetic energy in the blood to contain hemoglobin molecules." Iron and electric charges, so a magnetic current is generated when absorbed into the bloodstream to carry magnetic energy to different parts of the body.

* The most important effects of magnetic energy:

- It improves blood circulation because it stimulates and expands blood vessels when they are absorbed by the capillaries, which leads to an increase in the amount of food coming into the cells of the body.
- Helps to get rid of toxins more efficiently, and thus equalizes the hydrogen content of the cells and tissues of the body. This balanced environment helps to improve the performance of body functions, which is positively reflected on spontaneous recovery by stimulating biochemistry in the body.
- The effect of magnetic energy remains for several hours on all parts of the body, even after the magnetic field is far from the body.

And the use of (the magnetic field) to "remove pain (by calming the nerves of the pain signals coming to the brain and reducing electrical activity and closing their access channels, so the pain disappears)."

* Regulating bodily functions, including:

- Increase the speed of cell renewal (accelerate healing).
- Increase the level of hemoglobin absorption of oxygen, which increases the energy levels in the body.
- Hormones are produced and released according to the body's requirements during treatment.
- Modification of enzyme activities.
- pH balance in body fluids.
- Strengthening inactive body cells, which leads to an increase in the number of cells.
- The dilation of blood vessels, which increases the amount of blood reaching the cells of the body and increases their supply and ability to eliminate toxins more effectively.

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- Reduces the level of cholesterol in the blood and removes it from the blood vessels, which causes low blood pressure.

Third: Hydrotherapy: Hydrotherapy is used for various purposes and in the treatment of many injuries, as it relies on "exposure to cold and lukewarm water to stimulate blood circulation and strengthen the body, and some substances or herbs can be added to increase its therapeutic effect. and usually multiple types are used. One of the herbs after heating to treat pain, because moist heat is highly effective in relieving pain. Hot and cold water bursts are used to revitalize the body. Also, it is possible to work (herbal sauna) where the body is covered with a thick layer of green herbs and a hot cover this leads to rid the body It eliminates toxins and helps strengthen the immune system.

Fourth: Heat treatment: It includes the following:

1- Superficial thermal treatments (treatment with hot water, hot compresses, heat baths, paraffin baths, infrared rays, hot air with cellulose particles, and comparative (opposite) heat treatments).

2- Deep thermal treatments (electrothermal treatments (short waves, microwaves, and ultrasound).

Fifth: Electrotherapy: has an effect (thermal, mechanical, chemical), and includes the following treatments:

A- **Intermittent pressure devices**: They are used in "acute phases of injury in the peripheral parts, where significant swelling occurs in the soft tissues outside the joint, in order to remove the infiltrate and reduce the swelling and fibrosis resulting from it.", and intermittent pressure therapy pumps are less effective in dealing with Intra-articular fluids, due to the continuation of the articular cavity in the formation of the filtrate, this treatment is used daily and with ice and etching currents with electrodes or with magnetic therapy.

b- **TENS electrical stimuli:** that is, transcutaneous electrical stimulation, which is one of the "electrical nerve stimuli" and consists of a small device that emits square waveforms resulting from low frequencies ranging from (0-200 Hz) and the amplitude of the pulse varies between (50 and 250 meters) and narrow pulse amplitudes that have Deeper penetration."):

- The Tens device is of great importance for controlling pain and muscle contraction, and its effectiveness appears with the length of its use.
- It is used in the treatment of acute and chronic pain immediately after injury or when using rehabilitative exercises.

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- It is used in the treatment of sympathetic atrophy, spinal injuries, post-operative pain and in the early stages, and injury to the muscular tendon joints and around the joints.
- It works to restore normal functions because it reduces pain, so an accurate diagnosis must be made before prescribing treatment with Tens because blocking pain allows the performance of activities and thus increases tissue damage and many complications arise, such as (stress fractures).

C- **Electrical muscle stimulators**: These stimuli are used to help in rehabilitation processes and to improve strength in atrophied muscles, as well as in order to gain muscle strength for athletes, and this is done within a specific programming where the following must be noted

1- Strength gains occur due to the improvement of motor neuron output, which leads to adaptive changes in the contractile elements of the muscle.

2- An increase in muscle circumference and strength with a decrease in subcutaneous fat was observed in athletes after long-term treatments.

In general, electrical muscle stimulators are modulated or sinusoidal wave generators with variable pulse amplitude and frequency (50-250 Hz). The electrodes are arranged in a bipolar model along the length of the muscle, or in a unipolar model with one electrode on the origin of the spinal nerve root and another electrode on the motor nerve. Stimulate for 10-15 seconds, followed by 5 seconds of rest for ten repetitions, five days a week.

- In order to achieve the maximum benefit, it is necessary to cause maximum contraction in the muscle, and in order to obtain this, it is useful to position the injured so that the muscle group to be stimulated is against resistance and is close to its ideal length.
- Muscular stimulation can also be performed with high-voltage galvanic (d-c) stimulation.

In general, electrical stimulation is used in the following cases

1- Reducing muscle atrophy and paralysis.

2- Reduce swelling and pain.

3- Activate the affected movements.

4- Introducing drugs into the patient's body (where the drugs are placed on the surface of the electrodes and leak through the skin and are carried away by blood and lymph currents inside the body - the method of electrolyzing drugs) and in this way the effect of the drug lasts for a longer period and with a lower concentration.

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D- **High-voltage galvanic dc catalysts**: These catalysts generate a very high "two-phase frequency" of up to (500 volts), but the amplitude of the oscillation is very short with low current density. The formation of charges under the electrodes is reduced, which reduces the problem of electrical burns even if the electrodes are used The galvanic catalysts use large electrodes connected to one or two effective electrodes, the surface area ranges from (20-30) cm2 and may reach 2 cm2 or less, and the frequency ranges from (1-100 Hz) and the electrodes Reflex, these stimuli are used in the following cases

1- Reducing pain and muscle tension
2- Severe swelling outside the muscle cavity
3- Frozen shoulder (capsulitis)
4- In cases of fibrosis after knee joint operation.
5- It is a non-invasive method for desensitizing scar tissue (chronic irritation).
6- It can be used in acupoints.

E- **Deductive stimulation**: "A low-intensity current that penetrates into tissues by means of medium frequencies producing low vibrations at the site of contact. Two-dimensional devices are used for this purpose using electrodes according to absorption, which makes it a three-dimensional unit that allows the current to be biased to any electrode, which facilitates treatment exclusively with superficial injuries or Deep (i.e. the number of treatment type)"., and the deductive stimulus is used in cases:

1- Pain management, muscle contraction
2- Swelling and circulatory disorders
3- Treatment of arthritis
4- Sub-acute and chronic injuries
5- Thoracic and lumbar vertebrae injuries
6-Treatment of delayed bone fusion cases

The duration of treatment with inductive stimulation takes from (10-20 minutes) to treat soft tissues. In the case of orthopedic injuries, the treatment is carried out daily for a period of (30-40 minutes) where better treatment results are achieved. In cases where it is not permissible to use inductive stimulation in case of infection with: Infectious diseases, deep vein thrombosis, tumors, hemorrhages, uterine region in females.

Sixth: Laser treatment: High-energy lasers are used in the medical-surgical fields. Scientific experiments have shown the effectiveness of low-energy soft lasers in stimulating wound healing as well as in relieving pain. Soft lasers are used with (helium diodes, neon, or calcium arsenide).), which have properties

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according to their wavelengths, and helium-neon units are characterized by a wavelength of (6.32-8) nanometers and can be initially absorbed into the skin to a depth of (30) mm. acupoints in the ear), and "calcium-arsenide units are characterized by emitting continuous light and their wavelength (4-9) nanometers, which is equivalent to infrared radiation, and has a penetration capacity of up to (4) cm. It is used in the following cases (surface injuries). and deep, acupoints), and the laser is used in the following cases (reducing pain and inflammation in superficial and deep injuries, wound healing in superficial and deep injuries), that treatment techniques are different and laser acupoints are stimulated in the areas of injury, treatment time and intensity vary according to the technique used and the area injury. Laser treatment is contraindicated in the following cases: (acute infection, pregnancy, pelvic and abdominal injury, retinal injury, when using photosensitive drugs, cancer, calcium deficiency disease (due to the effect of laser on calcium and sodium), pain of unknown causes, coronary patients and peripheral).

Sixth: Ozone therapy: Ozone therapy is not a new treatment, and it is "a treatment method that exists in all countries of the world and is considered a traditional treatment in some of them. Despite global results that confirm the effectiveness of ozone therapy for more than 70 years, this science is new to the Arab world.", ozone therapy first originated in Germany more than a century ago. Most scientific sources indicate that ozone therapy began historically in 1870, and some may date the discovery of ozone therapy to the beginning of World War I and due to the lack of medical materials at that time, where the Germans were going wounded soldiers to the tops of the high mountains in order not to cause the infection of others, then they noticed that the rate of recovery of soldiers, especially those who were exposed to serious wounds and gangrene, was very high at the highest mountain peaks, and they did not discover the reasons for this until the German scientist (Relling) discovered in 1928, the existence of a percentage There is a large amount of ozone gas in rainwater, and it may be the first reason for their recovery, and they discovered that the reason is the presence of ozone gas O3 that falls with rain at a high rate, and from there they began their medical research and began using ozone to treat many bacterial and viral diseases, and then the world discovered German Professor Ottofarberg that the cause of colon cancer is a lack of oxygen in the cell, after he proved that the lack of oxygen in the cells of the human body at a high rate leads to an increase in the production of (free radicals): which transform cells O body, to cancer cells, and ozone gas was used to treat this deficiency to prevent cancer and its spread, and from here

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German scientists began to pay attention to ozone at the hands of the German scientist (Lender), where German scientists came to benefit from ozone gas as a safe and painless treatment for many It is a disease and does not conflict with traditional treatments in addition to being relatively inexpensive.

Ozone is a pale blue gas that dissolves in water and has a special smell. It is an oxygen molecule that contains three atoms of activated oxygen, meaning that it is pure oxygen, but it is a three-atomic oxygen that is found in nature and from it the ozone layer was formed in the atmosphere. As for the oxygen that we inhale, it contains two atoms Oxygen is O2, and ozone is O3, and ozone gas is generated from nature from the effect of ultraviolet rays on oxygen in the upper atmosphere, or as a result of the effect of high charges such as lightning on oxygen, as it is generated at sea level from the effect of sea waves on the beach. O3, when it enters the human body, quickly turns into diatomic oxygen O2, and a single oxygen atom capable of precisely calculated oxidation (the ozone splits in 20-30 minutes into two atoms of regular oxygen, leaving an atom of single oxygen), this atom when it reaches a normal cell Its wall contains antioxidant enzymes, which alerts it to an increase in the concentration of these enzymes and increases protection, the development of ozone therapy more than 10 years ago to add to it antitoxins, which are the same ingredients as medicines Without chemicals, the first device to remove ozone was the discovery of the German scientist SIMENS in 1897 AD, where it was used to purify water from bacteria and parasites. Oxygenate to ozone O3 at 2-4°C.

• Methods of use: Ozone is used with oxygen in treatment in different ways according to the requirements of treatment, and in the following ways:

- A quantity of blood (155 cm3) is withdrawn, then ozone gas is added to it and then returned to the body again through a tube of solutions and used for one time only.
- Through the skin, as in the ozone sauna device (the ozone-saturated sauna cabin), the patient enters the cabin with his head outside, where he exposes his body to a mixture of water vapor, oxygen and ozone gas under high temperature.
- Ozone ointment, which is placed on the face as a mask, and leads to the removal of sagging, wrinkles and dark circles in a natural way.
- Compresses of water and olive oil saturated with ozone.
- Ozone bags (where the affected organ is placed inside the bag and then ozone gas is passed over it) in cases of inflamed wounds and ulcers.

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- Subcutaneous ozone injection is done by using fine needles similar to insulin injections to inject medical ozone gas in areas where fat is deposited directly under the skin.
- By sucking tissue through a tube into the ear, anus, vagina, or urethral canal.
- Drinking ozone-saturated water, i.e. drinking water after passing ozone gas in it.

The concentration of medical ozone gas is not more than 5%, and the source of medical oxygen is completely safe, knowing that ozone is 350 times stronger than chlorine in killing bacteria and 3200 times faster than it. And it has a high concentration of up to 30%, and this concentration is not used in the treatment of humans because it may cause his death.

* Purposes of its use: Ozone therapy plays a successful medical role in helping to cure many diseases and has multiple uses for patients and non-patients.
- It is used in the areas of sterilization, especially for wounds, and in the treatment of wounds, clinical ulcers and inflamed ulcers.
- Treatment of bacterial internal and skin diseases and addresses the viruses that cause chronic hepatitis and the resulting complications such as cirrhosis of the liver, especially hepatitis C diseases known as the C virus, as it works to break down and destroy the outer thorns of the virus through oxidation, and thus prevents the virus from multiplying because it cannot In this way, the invasion of the liver cell with its thorns and sending DNA into the liver cell for reproduction, and is considered as a therapeutic method that helps in treating viral hepatitis in addition to drugs and does not cancel them, as it contains higher energy than normal oxygen that kills bacteria and viruses.

It has been scientifically proven that ozone increases the secretion of natural interferon in the body by 4-9 times, which is able to destroy viruses that have been paralyzed and controlled, in addition to this, immune substances such as interleukin increase, and the ability of white blood cells to devour the virus increases, all of this leads To treat viral hepatitis, at higher rates than any other treatment and without side effects. It is also used in other viral diseases, including AIDS.
- Treating bacterial and fungal infections and resisting cancer cells, and based on that, ozone can treat electrolytes by stimulating antioxidants, and this is essential for treating cancer, but it does not eliminate them, but rather regulates them, as it helps delay cancer activity, stop the growth of cancer cells and eliminate them, and increases the arrival of interferon that It fights cancer cells, increases the efficiency of antioxidant enzymes, activates blood cells, secretes enzymes,

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activates the immune system, and strengthens the immune system by secreting interferon enzymes, cytokinins and leukins, and ozone helps treat tumors.

An effective treatment that goes hand in hand with traditional medical treatment in cases of arterial disease (atherosclerosis), high blood pressure and narrowing of the vessels, as it works to expand them, treat heart and cerebral thrombosis, get rid of fats, and reduce cholesterol and uric acid in the blood.

It is used in the treatment of diabetes and its complications, as it (accelerates the healing of diabetic foot wounds) and cases of gangrene.

- Treatment of skin fungi such as foot fungi and fungi of the digestive, urinary and genital tracts, and in the treatment of parasites of the digestive system and blood such as ascaris, malaria and worms, and in the treatment of chronic constipation and diarrhea, and the elimination of stray bacteria, and the elimination of wastes attached to the intestinal wall and the secretion of toxins accumulated in the intestinal wall over the years and responsible for diseases The body by washing the intestines with warm water, certain temperature and oxygen, and eliminating bloating, gas, feeling of fullness in the digestive system, intestinal colic, and mouth odor resulting from digestive disorders.

It is useful in treating some allergic diseases such as asthma and eczema.

It is used when general weakness, fatigue and symptoms of aging and treats poor memory and works to stop the acceleration of aging and reduce its damage by strengthening the outer wall of the cell, which is surrounded by double enzymes and cell weakness or atrophy leads to a defect in these pairs of enzymes, and here comes the role of ozone in cleaning It strengthens the immune system and protects the cell from any element that can destroy it.

It has multiple uses in the field of cosmetics and weight loss, where ozone helps in treating obesity and wrinkles by tightening the skin (wrinkle removal and face lifting), and slimming the buttocks, which is done by injecting ozone directly under the skin and adding an amount of oxygen that helps to stretch and tighten the skin, and burn excess fat by Through the regularity of blood circulation, as it has proven successful in removing cellulite in women.

Ozone strengthens the sexual ability of men and women, but it does not treat infertility, but rather activates ovulation in women. Also, ozone is able to treat ovulation problems in women, but it cannot create eggs.

It is an effective treatment in cases of radiation and chemical burns.

Treatment of some rheumatic diseases, where it treats joint pain, knees and autoimmune disorders such as rheumatoid, arthritis, and chronic nerve infections that affect joints, muscles and tendons, and is considered as an aid in relieving

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pain as it is a positive stimulus to the activity of the immune system, that the use of ozone therapy led to improved processes Immunological and preventing inflammatory reactions, and had a role against germs, viruses and fungi in the case of a weak immunity against microbes.

Treatment of spinal diseases, spine pain and (particularly herniated disc cases in which surgical intervention is not allowed), and herniated discs are treated by direct ozone injections into the vertebrae of the spine to prevent congestion that nourishes the back vertebrae due to the lack of oxygen in the cells that causes pressure On the nerve, and thus to the emergence of acute pain, and the injection of the back is difficult and requires long experience because the error may lead to paralysis of the patient.

Treatment of osteoporosis and multiple sclerosis.

Cases of knee stiffness, migraine headaches and psychological depression.

It has an effective role in treating cases of tension, stress and exhaustion associated with modern life with exposure to many environmental pollutants, decreased vitality, self-poisoning of the body, lack of mental focus, loss of appetite, nervous tension, shoulder and muscle pain.

Medical ozone significantly improves the performance of athletes.

* Conditions for using ozone: Ozone does not have side effects on humans when the proportion of doses used is correct, but if the dose is increased, it poses a danger, so the following conditions must be met when using it:

- Ozone therapy should be under the supervision of a specialized doctor who has experience in this field.
- The amount of ozone that should reach the body according to the situation.
- It is necessary that ozone be given in special doses determined by the doctor, and it is wrong to inject it directly into the vein, because injecting it into the vein is similar to injecting the body with an air injection, where oxygen in this case interferes with ozone to cause a clot, and therefore ozone is only taken under water, so if taking Ozone through the so-called (ozone jacuzzi) is correct, and ozone gas should not be inhaled directly because it causes irritation in the airways and may lead to suffocation of the patient, and this may lead to clots, and treatment is carried out in this case with ozone in order to help the body And the immune system, on the production of the substance (cytoquine), because when the liver malfunctions, it is offset by a significant defect in the exit of this substance that defends the body.

* Benefits of ozone:

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- It forms a layer in the upper atmosphere that protects us from the high concentration of ultraviolet rays of the sun.
It protects us from the lower layers of the atmosphere, as it combines with harmful substances (hydrocarbons) and turns them into harmless substances (carbon dioxide and water), and because ozone is heavier than oxygen, it descends to the lower layers of the atmosphere, and because it is an unstable compound, it is divided to give a free oxygen atom It can stick to the pollutant particles and oxidize them.
Oxygen remains the most useful gas that surrounds the globe, so the ozone layer purifies the air and water, and ozone is one of the most powerful factors that destroy germs and viruses in nature.
- Ozone and sports injuries: Ozone therapy has developed very rapidly in the field of global sports medicine in European countries, and ozone has been used in sports medicine for more than 10 years and the purposes of its use in the sports field are the following:
Treatment of acute sports injuries and chronic sports injuries that do not respond to medical treatment and medications.
It is used to stimulate the body because the entry of ozone into the body stimulates the immune system and increases its activity, and thus works on:
Increase muscle energy.
Protecting the body from infections.
- Raising the efficiency and vitality of the cells and organs of the body and activating the cells of the body by increasing the percentage of oxygen available to them through the oxidation of foodstuffs.
Reduces pain and calms nerves
It helps to secrete many important enzymes for the body in a natural way
It interacts with viral and bacterial cells by penetrating them because their walls contain special enzymes found in normal cells, oxidizing them and stopping their effectiveness.
Ozone baths are widely used in the sports field.
* Ozone baths: It is one of the very modern methods of ozone activation. It treats cases of stress associated with exercise and muscular effort in all kinds of sports activities and events and works on:
Increasing muscle efficiency in the body.
Reducing the risk of infection to a very high degree.
- Increasing the effectiveness of performance in athletes.

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