

# ALTERNATIVE METHODS OF THERAPY IN ARTICULAR DISORDERS IN DOGS AND CATS

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## **Abstract**

*Alternative medicine has no clear definition, consistent and universally accepted, but most often is defined as all products, practices and healthcare systems that are not part of conventional medical system. Complementary medicine or medicine called unconventional, alternative medicine can help treat various diseases where conventional medicine does not offer solutions. Joint diseases, particularly chronic ones, requires a long therapy with anti-inflammatory drugs, often resulting in the occurrence of secondary reactions, which require cessation of therapy, leaving the patient with pain and physical discomfort. For the most efficient and rapid recovery of locomotor or joint functions, it is recommended to apply alternative methods. In most cases of joint diseases, alternative medicine is not used alone, but together with allopathic medicine, conventional treatments to increase the efficiency and represents the combination of the most effective practices and methods of traditional medicine with conventional medicine.*

**Key words:** *physiotherapy, hydrotherapy, acupuncture, arthritis, alternative therapy*

## **Introduction**

Arthritis in carnivores is a disorder manifested by joint inflammation accompanied by pain, edema, stiffness, labia with avoidance of movement and damage to the general condition. According to statistics, this disease affects one in five dogs and is one of the most common causes of chronic pain (*Moreau et al., 2003*). In most cases of chronic pain syndromes are refractory to conventional therapy (non-steroidal anti-inflammatory drugs), or pain is attenuated for a short period of time, then it relapses and induces discomfort to both patients and owners by having to spend more time and attention on the pet.

The existence of numerous and various alternative treatments, adjuncts, which have increased comfort and improved patient life during the recovery period after various locomotor disorders, and not only, and the shortening of this period, have led us to adopt, to transpose and to make known the effectiveness of these methods.

The question is: why is alternative therapy necessary if the current medicines, obtained through the most modern medical techniques, have contributed and still contribute to the eradication of serious diseases?

Why is it necessary to use alternative therapy since drugs have contributed to a much greater life expectancy than that at the beginning of the 20th century and have become one of the most valuable auxiliaries of modern life? The answer would be that when modern medicine does not yield, there is always a variant of traditional forms of healing, and so increasingly resort to the non-invasive techniques offered by treatments used centuries ago (*Rose Shapiro, 2008*).

Ernst Boris Chain, Nobel laureate of medicine in 1945, said (*Abraham quoted in 1983*): "I could give up radio, television, ultra-fast airplanes even in electric light, but not drugs, which allowed overcoming microbial infections and raising the standard of living". And then, why should we use alternative therapy? Because the drug, as simple as its composition, can ever become a toxic factor that instead heal produce different adverse reactions (*Cortinovic et al., 2015*). These reactions can occur in various ways, from simple indigestion, irregularity and fatigue, skin allergies, to serious organ diseases, many of them serious (*Khan et al., 2012*). In recent years, on the list of causes of death in advanced countries, drug intoxication in humans occupies the fourth place, an alarming place after cardiovascular disease, cancer and traffic accidents. At the same

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time, global drug intoxication cases account for almost 20% of all admissions (*Albert M et al., 2015*). Faced with this unpredictable and dangerous situation manifested worldwide, it was a clear positive trends favorable to the recycling of many traditional therapies such as physiotherapy, acupuncture, herbal medicine, hydrotherapy, also known as alternative therapies.

It advances the question of whether most drugs induce toxic reactions in the body, is there any reason to abandon them permanently and replaced with natural or alternative therapies? No, in any case, the problem arises not so. The drug was, is and will remain one of the most valuable conquests of science, without which life could no longer be conceived, giving up being not only impossible but also unimaginable. However, the medicine should only be used when absolutely necessary and only at the express indication of the doctor (*McGowan Catherine Met et al., 2007*).

It should be noted that a multitude of diseases in humans or animals can benefit from alternative therapies, providing the body with both quicker and more effective mobilization conditions, as well as recovery, to regain health (*Millis DL et al., 2007; Simon Singh, 2008*). Such ways of healing and self-healing have been established since ancient times.

If acupuncture is practiced tirelessly for thousands of years, if the physiotherapy and hydrotherapy resort increasingly more doctors include them in the scheme of treatment of articular disorders and not only if herbs are today the parent drug of many peoples, if advanced countries speaking increasingly more alternative therapies are not sufficient evidence that they really speak for themselves about their effectiveness?

The use of these alternative therapies, based on scientific support, along with the use of modern medicine, is nothing but the trend of today's medicine, which aims to leave nothing to be left out of what could be solutions for treating or ameliorating affections. From laser to acupuncture, from nuclear medicine to homeopathy, from genetic engineering to reflexology, from medications to medicinal plants, all of them, products of human genius, harmoniously used, competent, can alleviate or cure diseases.

### **Alternative therapy methods**

Alternative therapies are a set of medical practices that use a wide range of remedies, practices, or systems that serve therapeutic principles and healing mechanisms that are not part of conventional conventional medicine but are almost always used with it.

Joint pain can be defined as an unpleasant sensation in the joints and usually accompanied by inflammation, it is nearly always the result of wear or damage as tissues and structures that form joints. The causes of joint pain are diverse, including inflammation, degenerative processes, deposition of crystals, infections and trauma. The symptoms may be those of inflammation (rubor, tumor, dolor, calor, functiolesa) and of the articular inflammatory disorder may be attached to various (acute or chronic).

The treatment aims to reduce inflammation and joint pain. The most commonly used drugs are analgesic and non-steroidal anti-inflammatory drugs, but if symptoms persist, or if the patient has a contraindication for such treatments, physiotherapeutic treatments will be used.

Alternative medicine uses a very wide range of therapies, some thousands of years old, traditionalist, others a more modern invoice, based on recent discoveries in science (*Cherkin et al, 2015; Millis DL et al., 2007*): *physiotherapy* - is the therapy that uses various therapies such as massage, laser, passive or active movements, electro-stimulation etc; *phytotherapy* - therapy teas, herbs therapy (aromatherapy) oils therapy (oleoterapia), plant shoots therapy (gemoterapia); *natural factors therapy* (balneotherapy, thalassotherapy, heliotherapy, hydrotherapy); *dietotherapy* (oligoterapia, dietary supplements, food macrobiotic, vegetarian diet); *apitherapy, mineraloterapia* (argiloterapia, vegetable ash therapy, treatment with charcoal); *insect therapy* – entomotherapy; *leech therapy* – hirudotherapy; *zootherapy*; *radiation therapy* (radiotherapy, magnetotherapy,

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crystallotherapy); *energy therapy* (acupuncture, moxibustia, auriculotherapy, scalpothrapy, bioenergy therapy, bioresonance therapy, cosmoenergothrapy); *psychotherapy* (hypnothrapy, sacrothrapy, soffrology, biofeedback, visualization, meditation).

Unfortunately, few of these types of alternative thrapies can be used in veterinary practice, but there are plenty of treatment options for treating osteoarthritis in dogs such as physiothrapy, phytothrapy, hydrothrapy and acupuncture (*Bonagura JD et al., 1998*). They can be used to treat mild, moderate and even severe cases of illness, along with non-steroidal anti-inflammatory drugs, oral nutritional supplements that support joint health and weight management. In most cases, all these thrapies used together in the sick patient resulted in a much faster recovery and over 70% without recurrent osteoarticular disease.

### **Alternative thrapy techniques**

Therapeutic methods today, along with conventional specific medication, are one of the most significant forms of treatment in the field of locomotor rehabilitation in small animals. It can also be used as an additional method in a physical condition improvement / maintenance program.

#### ***Physiothrapy***

Physiothrapy is science that studies the mechanisms of action of physical factors such as massage, physical exercise, wrapping, heat, electricity, all of which are used to treat, recover, and prophylactically treat the body's affections. Physiothrapy is one of the most common therapeutic methods used in medical recovery, helping the sick to get to a normal life as quickly as possible (*Allain YM et al., 2007*). Rehabilitation through physiothrapy has occurred relatively recently in veterinary medicine and is the restoration of normal function after accidental or surgical injury, acute or chronic illness (*Clark B et al., 2001*). Rehabilitation usually practiced to reduce pain, to resume mobility and regenerate traumatized muscle, speed up repairing process and decrease the chances of future complications.

Physiothrapy is based on the following principles (*Allain YM et al., 2007*): the principle of *non nocere* - by this principle, a patient must be better biological condition at the end of physiothrapy treatment than before; the Holistic principle - any physical, natural or artificial factor, is addressed to the whole body, which also responds as a whole; the principle of individualisation - any physical therapeutic factor acts nonspecific, from individual to individual, the body being obliged to give "answers", adapt, and changes are evaluated as therapeutic results. Physiothrapy is based on various traditional medicine methods combined with modern medicine that can help with trauma recovery to improve blood circulation and relieve pain (*Ellis DR et al., 1997*).

Postoperative physiothrapy is a commonly used medical technique with satisfactory results that is part of the standard postoperative treatment, with a large share in the ultimate success of surgery. Physiothrapy is an essential part of health care services that provides services to develop, maintain and restore mobility and functional ability to the fullest extent possible throughout life and addresses patients whose mobility/function are and/or may be affected by aging, injuries, diseases, conditions, other pathological conditions or environmental factors (*David P. E., 1998; Downing R., 2011; Duivon V., 1999*).

Through specific means such as movement, physical exercise, manual therapy, electrothrapy, physiothrapists help patients to manage pain, support development and facilitate functional recovery, offering peacemakers the opportunity to be active and independent as long as possible (*Delisa J A, 2002*).

The procedures used by physiothrapists are also very varied and include (*Tangner C. H., 2004*): manual therapy - medical massage, stretching exercises - beneficial to most diseases; therapeutic exercises - also recommended for most affections; traction - especially indicated for

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herniated disc; electrical stimulation (electrotherapy) - especially beneficial for restoring muscle strength; laser therapy - indicated for muscle or conjunctive tissue damage; ultrasound therapy - generally recommended for connective tissue lesions; cold therapy - benificial, especially in case of inflammation, edema; warm therapy - especially indicated for muscle spasms.

The range of currents used is very wide, the choice of one particular depends entirely on the diagnosis and the signs presented by the patient (*Bardet J F, 1991; Bockstahler B et al., 2004; Duivon V., 1999; Ellis DR et al., 1997*):

*Galvanic current* - galvanization has a wide spectrum of application, representing one of the most common procedures in electrotherapy, and is used in the form of simple galvanizing, galvanic bathing or ionization. It follows the widespread use of multiple effects: sedative, analgesic, vasomotor, inflammatory etc. Indications: diseases of the nervous system, locomotor and cardiovascular apparatus, dermatological diseases.

*Trabert currents* - is one of the most analgesic forms of current, having as main therapeutic indications: radiculopathies, painful arthroses.

*TENS* - Transcutaneous electric nervous stimulation (TENS) acts primarily on acute or chronic pain of various causes; is used in various rheumatic disorders, posttraumatic painful states, peripheral neurological disorders.

*Interferential currents* - have excitatory, decontracturant, miorelaxant, vasculotrophic, analgesic effect; are indicated in postconvulsive lesions, sprains, luxations, joint disorders such as arthritis, peri-arthritis, arthrosis, neuralgia, neuritis, etc.

*Short wave* - has caloric action of depth without causing skin lesions, indicated in chronic inflammatory rheumatism, abarticular rheumatism (bursitis, tendinitis, tenosynovitis).

*Diadynamic currents* - are used only for normal innervated muscles; indications: in traumatology, rheumatology, neurology.

*The laser* (light amplification by stimulated emission of radiation) - analgesic and anti-inflammatory effect. Laser therapy is indicated in: arthrosis, tendonitis, stretching and muscle contusion.

*Ultrasound* - is a mechanical vibration by the action of high frequency electric current on a piezoelectric crystal. It has analgesic, miorelaxant, vasodilatory effects, being indicated in: osteoarthritis, spondylosis, spondylitis, myalgia, tendinitis. Ultrasound physiotherapy is a method of treatment that has been used by physiotherapists since the 1940s. The method of applying ultrasound is done by means of a device that is placed directly on the skin and with a special conductive gel. Ultrasound therapy has been shown to accelerate the healing process of tissues, help tissue relaxation and warming tissues, have important roles in improving blood flow, and in healing scars. The effects of ultrasound by improving blood flow can be used to reduce local edema and chronic inflammatory processes, and, according to recent studies (*Bansal PS et al., 1991*), to promote better bone fracture healing. The intensity of the ultrasound can be adjusted depending on the desired effect. Increased intensity is usually used in cases where the purpose is to cure tissue scars. A typical ultrasound treatment will not take more than 3-5 minutes. In cases where it is desired to cure tissue scarring, treatment may take a longer time. During the session, the ultrasonic sample will move continuously, so the patient will not feel any form of discomfort (*Bansal PS et al., 1991*).

*Massage* is a technique adapted to the patient's problems, a non-invasive approach based on the natural capacity of the body to cure and has multiple benefits: intensifies circulation, and the body provides more oxygen and nutrients in vital tissues and organs; stimulates lymph flow and intensifies blood circulation in the circulatory system; relieves affected muscles and overstress; reduces spasms and cramps and increases flexibility of joints; shortens recovery period of locomotory disorders (*Hourdebaigt J P et al., 2000; Valpenaire K., 1999*).

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Physiotherapy through electrotherapy procedures has important antialgic effects (pain relief), anti-inflammatory (elimination of joint and muscle inflammation), decontractants (removal of contractions), myorelaxant (muscle relaxation), anti-edematous (elimination of edema resulting from infiltration of a serous fluid in a tissue subcutaneous cellular cell), using diadinamic, interferential and ultrasonic currents, polarized light, generated by modern NEMECTRON, NEMECTROSON, BTL-5816 SLM and BTL-20 devices (Baxter GD et al., 2007).

These methods of physiotherapy to get recovery, improving and maintaining mobility lost due to disease, reintegration into normal daily activities to extinction reducing muscle and joint pain and improve strength and muscle tonicity.

### Hydrotherapy

Hydrotherapy is another alternative therapeutic method that uses a remedy considered the first cure, namely water. About water it can be said to be the universal medicine, in the therapeutic arsenals of all peoples. Still to the water, the animals, instinctively, go not only to quench their thirst but also to treat some suffering, some of them remaining there until healing.

In antiquity, water was first used for hygienic and then curative purposes in the romans, and hydrotherapy was highly appreciated, building special and imposing buildings to relax and treat certain conditions (Guigardet V., 2009). In Europe, the scientific foundations of hydrotherapy were made by German medical W. Winternitz, from the Faculty of Medicine in Vienna in 1877 when he published the first paper entitled *Die hydrotherapie auf physiologischer* (quoted by Lebauelle D., 1998).

Water acts on the body through the following factors: thermal (high or low temperature), mechanics (pushing the body upwards according to Archimedes principle, pressure on the body, its movement) and chemical (through chemicals and gases contains them) (Downer A., 2009).

Hydrotherapy is becoming more and more accessible in the veterinary field, and its need is increasingly evident. The water therapy is done in specially arranged pools under the careful guidance of the doctor, being a safe, painless and non-invasive procedure in which the water level, treadmill speed, temperature can be adjusted as needed (Figures 1 and 2).



Fig.1 Hydrotherapy in the cat in pools with underwater treadmill  
([www.animalhydrotherapyatblossoms.co.uk](http://www.animalhydrotherapyatblossoms.co.uk))



Fig. 2 Hydrotherapy in the dog in pools with underwater treadmill  
([www.scotveterinaryclinic.co.uk](http://www.scotveterinaryclinic.co.uk))

Hydrotherapy is indicated in dogs and cats who have suffered traumatic conditions, locomotor diseases, in dogs of marrow in growth periods, and for sporting purposes in those participating in competitions. Water therapy complements the treatment of articular and

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periarticular disorders, neurological disorders, muscle atrophy, tendon and ligament disorders (Lebauelle D., 1998).

This process is based on the principles and properties of water such as: superficial tension that provides resistance to certain muscle groups, improves the balance of the weakened organism; hydrostatic pressure helps to increase the rate of metabolism and heat burn, reduce heart rate and arterial pressure; buoyancy, reduces body weight and improves flexibility (Downer A., 2009).

Recovery therapy should be done with great care to identify painful areas and select solutions to improve it. It is a very important aspect because animals easily and for a long time memorize the pain and circumstances in which it appears. Once the animal experiences the pain, it is very difficult to convince him to do the therapy once he has suffered a painful procedure.

The establishment of the physiotherapy program with water is based on the diagnosis of certainty, the chosen surgical intervention, the weight of the animal, its age, the degree of the disease, the posttraumatic lesions and their location, their evolution, sometimes complex procedures of long duration.

The access to the physiotherapy pool must be easy, have an adherent surface, and the level difference is as small as possible (Downer A., 2009). It is always necessary to accommodate the animal with the physiotherapy room, the equipment, the medical staff and the owners of the animals together to give the feeling of safety to the treated animal and the sessions to be carried out with maximum efficiency.

Underwater treadmill became quickly one of the most popular equipment for the rehabilitation of locomotory disorders in dogs and cats. It is necessary that, depending on the patient undergoing therapy, the pools should be respectable and be spacious for the animal and the therapist. Underwater treadmill can be used for most orthopedic and neural diseases (Downer A., 2009). Lately, more emphasis is placed on underwater drift than swimming, since there is no effort to bear a weight, the muscles and the bone system are not required to support part of the body weight, as is the case with the underwater treadmill.

A means of controlling and potentiating hydrotherapy is the water temperature that can be adjusted as desired. Adjustable water temperature allows for maximum metabolic stimulation, optimal muscle relaxation, pain reduction, and increased soft tissue elasticity (Downer A., 2009). An important method in hydrotherapy is the water level in the massage basin, a level that offers the possibility of adjusting the weight sustained by the affected area, by removing the affected joints and affected areas. The speed of the treadmill is another way to achieve and physiotherapy to improve the final results. This can be adjusted from a very low speed to a moderate speed, usually used in the latest physiotherapy sessions.

Throughout the period of hydrotherapy, the evolution of the case should be recorded and recorded, followed by a careful observation of progress and adjustment of the drug therapy according to these advances.

### **Acupuncture**

Acupuncture is a curative technique which became very popular worldwide. Although the name of acupuncture includes several techniques, it generally refers to the use of very thin needles that are introduced into certain areas of the body to obtain a therapeutic response. Research over the past decades suggests that acupuncture may be effective in some cases because it leads to the release of neurotransmitters, which can help alleviate pain and the disappearance of inflammation (Roustan C., 1989).

Acupuncture consists of pinching certain points on the skin, maintaining a health or, in the conception of traditional Chinese medicine, for balancing body energies. The oldest traditional medicine treaty, Nei King, written about 3000 years before our era, contains many information

about practicing acupuncture (*Ming Wong et al., 1987*). From China, acupuncture spread throughout Asia. In the European space, the first country in which he practiced was France, where he entered through the delegation sent to China by Louis XIV, also here being translated the first acupuncture treaty into a European language. From France, acupuncture spread throughout the centuries that followed throughout Europe, then in America and Australia, where it is still practiced by tens of thousands of doctors.

Traditional Chinese medicine claims that the body passes without interruption many kinds of energies that support the activity of all organs (*Ming Wong et al., 1987*). These energies are transmitted through channels called meridians, each meridian having direct links to a particular organ. On the route of the meridians, whose headquarters are on the skin, there are the acupuncture points, which the specialists stimulate by means such as acupuncture or acupressure. Of the approximately 800 acupuncture points found on the 12 pairs of meridians, about 100 are commonly used. Dogs and cats use up to 20 acupuncture points.



**Fig. 3** Acupoints in joint diseases in cats  
([www.beechwoodvets.com](http://www.beechwoodvets.com))



**Fig.** Acupoints in joint diseases in dogs  
([www.budgetpetworld.com](http://www.budgetpetworld.com))

The skin on which the acupuncture point is applied has some electrical properties, which is why the points can be located with great precision by means of specially built electronic devices. Researchers have discovered that around the acupuncture points there is an electron wrinkle that disappears immediately after stimulation (*Roustan C., 1989*). Also, beneath the tissues under the acupuncture point, there is a network of nerve fibers and blood vessels, and by stimulating points, the level of endorphin and endomorphine secretion increases, which relieves pain.

Acupuncture has been used for many years to treat the symptoms of arthritis in dogs and cats, and has recently become accessible to Western European countries as well as to our country. Many veterinarians now offer or can recommend acupuncture therapies, which can increase the mobility of the joints. Needle insertion improves blood flow in tense muscles, and improving muscle tension allows the joints to have better mobility (*Ming Wong et al., 1987*).

Acupuncture also works as a method of controlling pain by blocking the transmission of the painful signal from the receiver to the brain, and also allows for a reduction in the dose of analgesic drugs or nutritional supplements. Acupuncture also stimulates the production of white blood cells and red blood cells, as well as gastric juice secretion, reduces blood pressure, regulates heart rate and helps blood circulation throughout the body. The number of treatments required depends on the severity of the illness, so light cases can be treated with one or two sessions per week, while severe cases may require treatment every two or three days.

Spinal joint aches and pains are those in which the best results have been achieved, but the list is much longer (*Roustan C., 1989*): hip dysplasia; traumatic spinal cord trauma; arthritis;

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epilepsy; allergies; chronic digestive disorders; paralysis; endocrine disorders; cardiac affections; liver disorders; pulmonary affections; kidney problems.

Acupuncture results in animals may be miraculous, or may be absent. According to a study in 25% of cases, a long-term symptom improvement was obtained, in 50% of cases remarkable results were obtained in the short term, and in the remaining 25% of cases no improvement in health status was observed in animals subject to acupuncture (*Johnson M., 2006*).

Acupuncture in veterinary medicine is becoming increasingly implemented for different disease processes with an increasing number of veterinarians undergoing advanced training to respond to growing demand for this relatively new intervention. Learning the locations of the acupuncture point and the nomenclature is easy because each point is assigned either to one of the 12 pair channels (named after an organ) or to the additional dorsal and ventral medium linear channels. Each channel is marked with a two-letter code (LU, LI, ST, SP, HT, AND, BL, KI, PC, TH, GB, LR, GV, and CV) (*Ming Wong et al., 1987*).

The specific mechanism of acupuncture is uncertain. Theories include stimulating the release of natural chemical substances in the body, or stimulating neuromanian mechanisms that reduce pain and promote healing.

### **Phytotherapy**

From the earliest times man noticed that among the plants that provided him with food there existed some who relieved the pain or had the property of healing some diseases. Observing the therapeutic properties of plants, discovering and identifying good grasslands from the harmful ones began to lay the foundation of what today is called the phytotherapy. Hence, the beginnings of phytotherapy are lost in the mists of old times, the ancient Chinese have been unrivaled specialists in the use of medicinal plants, and they have the great merit of having written the first pharmacopoeia called Pen-Ts-Ao-King, which depicts many plants and their mode of use (*Lindley S. et al., 2010*).

Over the past few years, we have witnessed a real return to natural remedies, first being herbs, as a result of the increasingly serious and multiple side effects produced by drugs when used randomly or without the doctor's advice. In fact, herbs have always been a raw material for more than half of the pharmaceutical remedies.

The therapeutic effects of plants are due to the chemicals they contain, known as alkaloids, glycosides, tannins, vitamins, essential oils, trace elements (mint, chamomile, etc.) (*Lindley S. et al., 2010*). These substances, true drugs of nature, are found in the whole plant or concentrated in flowers, leaves, seeds, stems or roots. Any medicinal plant can become poisonous and vice versa, any poisonous plant can become a remedy. It depends on which part of the plant is used, how it is prepared and how it is administered.

Modern phytotherapy uses products with herbal extracts, incorporated in solutions, tablets, ointments, suppositories, making them easier to store and manage.

For the correct treatment of arthritis, it is necessary to use herbs and supplements to: reduce inflammation, remove joint pain, detoxify the body, repair and maintain joint health.

As part of a comprehensive approach to pet care, natural remedies will greatly contribute to the promotion of joint health and mobility, as well as to the active maintenance of pets as they should.

### **Weight management**

Weight management is also an important component of non-surgical arthritis treatment in dogs and cats. Overweight animals suffer more consequences of arthritis than those with normal weight.



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Weight gain may have several causes. It may occur due to inappropriate feeding, lack of movement, but also due to aging or due to a condition. Keeping a dog or cat at its ideal weight will help reduce the severity of arthritis signs and slow the progression of the disease.

As a result of overweight, you may experience: osteoarticular disorders that are irreversible; the animal can no longer move; cardiovascular, respiratory problems, urinary problems (urolithiasis and incontinence), especially in the case of sterilized cats and cats; diabetes (both for dogs and cats, insulin resistance is favored). To eliminate these situations, the first step is always education. The veterinarian has a moral obligation to specify to the owner of animals the risk factors for obesity. Thus, it is necessary to provide pets with a healthy lifestyle, balanced nutrition and physical and mental stimulation.

Nutrition is the key to ensuring healthy joints and muscles, as well as maintaining the integrity of the entire musculoskeletal system (*Allain YM et al., 2007*).

### **Nutritional supplements**

The articular cartilage, under normal conditions, wears the ends of the bones. Although equipped with pressure resistance and traction forces, due to the continuous stresses to which the joints are subjected, they wear out in time. A consequence is inflammation of the tissues and the appearance of joint pain.

Nutritional supplements, administered as such or added by diet, are commonly used to help restore or stop degeneration of the articular cartilage (*Bennet JS et al., 2005*). Among the existing supplements in the pharmaceutical market are: glucosamine, chondroitin and hyaluronic acid. These three nutrients are known for the effect of helping to lubricate joints and even repair damaged cartilage. An important role in cartilage formation as well as in tendon, ligament, and joint structure is glucosamine.

Glucosamine, along with chondroitin, is a chemical found in the body, more precisely in all connective tissues: tendons, ligaments, epidermis, bones, cartilage. It is in the form of naturally synthesized sugar and one of the main cartilage compounds. The substance is available in various forms: glucosamine sulfate, glucosamine chloride, N-acetylglucosamine (NAG). Commercial products usually contain the first two variants. Although the most commonly used is glucosamine sulfate, there is no significant difference in efficacy or contraindications between it and glucosamine chloride. The only difference to be taken into consideration is the absorption of the active principle, namely in the assimilation of glucose (*Gupta RC et al., 2012*).

All tissues affected by osteoarticular pathologies or various painful symptoms share the same glucosamine deficiency. In order to compensate for the deficit, scientists mobilized to find the best glucosamine-based formula as close as possible to the natural variant so that they had as little collateral effects as possible (*Laverty S et al., 2005*). Scientific research has mainly concerned with glucosamine sulphate, which, in the form of dietary supplements, is mainly used to treat arthritis (*Redford C et al., 2012*).

In fact, glucosamine does not act directly on inflammatory processes in the joints and therefore does not have an anti-inflammatory effect in the true sense of the word (*Streppa C et al., 2005*) Instead, due to analgesic action, the substance is used to treat joint pain. In fact, glucosamine does not act directly on inflammatory processes in the joints and therefore does not have an anti-inflammatory effect in the true sense of the word. Instead, due to analgesic action, the substance is used to treat joint pain (*Redford C et al., 2012*). Long-term action is the reconstruction and protection of cartilage.

The administration of nutritional supplements in dogs and cats takes long periods of time (3 to 6 months) and has as basic objectives: regeneration of bone cartilage and synovial fluid (fluid which by its lubricating action protects the articular cartilage); combined action due to association

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with other compounds; in combination with hyaluronic acid, it helps fluidize synovial fluid (the deficiency of these compounds is specific to arthritis); in combination with omega 3, it has an immediate anti-inflammatory effect (the mechanism is due to its ability to inhibit inflammatory processes); in combination with chondroitin (the water-retaining substance useful for joint lubrication), the glucose effect for the treatment of osteoarthritis is amplified.

Omega 3, an essential fatty acid, has proven to be very beneficial for arthritis pets, effectively helping to reduce inflammation and pain.

Nutritional supplements combined therapy with non-steroidal anti-inflammatory drugs (NSAIDs) and accompanied by alternative therapies will lead to visible results quickly and efficiently.

### Conclusions

Alternative therapies are working tools for the treatment of many diseases and which have gradually increased in veterinary medicine, being used especially in dogs and cats.

Over time, there have been developed several types of therapies that support patients, therapies designed to contribute alongside conventional therapies to a better life for pets.

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