

Dimethyl Sulfoxide (DMSO)
Kendal & Co. Information Sheet

DMSO has widely been used for years by veterinarians for many types of joint or arthritic like symptoms in both cattle and horses. Discovered as beneficial to humans in the 1960's, DMSO has been used in smaller circles for nearly 50 years by many in the homeopathic community and growing in popularity among essential oil users.

Reported uses for DMSO include:

Amyloidosis, arthritis, back pain and disc problems, burns, bursitis, cancer pain, cardiovascular diseases, cerebral edema, cuts, frostbite, frozen shoulder, gouty arthritis, hemorrhoids, herpes, injuries, interstitial cystitis, joint pain, multiple sclerosis, muscle spasms, including nighttime muscle cramps, neuritis, osteoarthritis, osteomyelitis, peyronies disease, phantom limb pain, phlebitis, post-operative pain, prostatitis, pruritis ani, respiratory disorders, rheumatoid arthritis, sciatica, scleroderma, tendonitis, trauma injuries, urinary tract disorders, varicose veins

How to use DMSO:

DMSO uses for humans require consultation with your medical professional first! The following information is taken from the medical sources listed below.

Clean your hands and the area to be treated

Wash your hands and under your nails thoroughly before using topical DMSO. You should always clean the area for which you plan a DMSO use, just in case there is some harmful substance on your skin with a molecule small enough to go through. Note that only those substances that could penetrate by themselves if left on the skin long enough can be transported through (more quickly) by dimethyl sulfoxide. Bacteria and viruses are too large and thus are not able to pass through, and bacteria cannot grow in dimethyl sulfoxide of 25 percent strength or more.

Test a patch first

DMSO can irritate the skin, so before the first treatment, apply it to a small area on your arm to test your sensitivity. I have sensitive skin and the 90 percent solution burns a bit, but it's no big deal. The burning goes away in a few minutes. If you are super sensitive, then it may not be for you.

DMSO application can involve applying it directly to your skin with your hands. If you prefer not to use your hands, you can use a cotton ball or a paint brush. If you are using liquid dimethyl sulfoxide, allow it to dry for about 20 minutes. Then you can wipe off any excess. If you are using cream or gel, be sure it has soaked in.

Remember, DMSO is a solvent that can dissolve other substances, so make sure your skin is dry before you put on your clothes. So far, the only fabric I've had a problem with is with acetate, which it will quickly melt into a hard glob.

DMSO dosage

In applying the dimethyl sulfoxide for DMSO pain relief, apply it to an area larger than where the pain is. If your knee is painful, it is recommended that you apply it to six inches above and below your knee, all around the circumference of your knee. If your hand hurts, apply it all the way to the middle of your forearm, and so on.

Most of it will penetrate within 15 minutes, and the pores of the skin may be open for another half hour or so. Just to be safe, it is recommended that you avoid contact with all toxic substances for three hours after DMSO use.

There is no need to worry unduly about DMSO's ability to open the pores and penetrate the skin, according to my sources below. Other products on the market also go through the skin, such as patches for nicotine, seasickness medication, and creams/lotions that deliver such things as MSM or capsaicin for arthritis through the skin. With any of these products, you should avoid exposure to toxic substances after you have applied the cream or just after you have removed the patch. Dabbing it onto your skin may reduce irritation from DMSO use. However, rubbing it in may help it to work quicker and make the effects last longer. You might want to experiment with the amount you use to see how it affects your pain. By experimenting, you'll find the minimum amount that eases the pain.

DMSO Treatment

Frequency of DMSO use depends on whether your problem is acute (something that happens, gets fixed, and does not come back, like a sprained ankle) or whether it is chronic (ongoing, long-term pain, as with arthritis).

Although it relieves pain in both acute and chronic arthritis, DMSO for pain relief works best in the acute forms. Dimethyl sulfoxide works for arthritis because it is an anti-inflammatory and because it reduces autoimmune antibodies that damage or destroy tissue. It also prevents free radicals from destroying lubricating fluid in the joints.

Acute conditions: For acute conditions, my sources recommend that you apply it every two hours for six to eight hours immediately after the injury occurs. Following that, for the next five days or more, apply DMSO every four to six hours. Most of the benefit from DMSO uses will come in the first three weeks.

Chronic conditions: For chronic conditions, it takes longer to take effect. Although you may notice some easing of pain right away, it may take six to eight weeks, or even six months to a year in some cases, for the maximum benefit to be achieved. It depends on the person and the condition. One application a day is recommended.

The length of time that DMSO use is necessary to relieve pain will vary. In some cases, injection (by an enlightened doctor) of dimethyl sulfoxide is indicated, along with topical application. To find such a doctor, contact acam.org, "the voice of integrative medicine."

Take some time off regularly from DMSO use

Dimethyl sulfoxide exits the body in about 24 hours. Nevertheless, in both acute and chronic cases, it is recommended that you take some time off on a regular basis, say two days in a row each week. For example, just take Saturday and Sunday off every week. If you are using it daily, long term, take two to four weeks off, in a row, every six months. Or, you could do 30 days on and 30 days off.

According to Medical Doctor (MD) Stanley Jacob, a former head of the organ transplant program at Oregon Health Sciences University in Portland, more than 40,000 articles on its chemistry have appeared in scientific journals, which, in conjunction with thousands of laboratory studies, provide strong evidence of a wide variety of properties. Worldwide, some 11,000 articles have been written on its medical and clinical implications, and in 125 countries throughout the world, including Canada, Great Britain, Germany, and Japan, doctors prescribe it for a variety of ailments.

However, for the pharmaceutical companies was the fact that no company could acquire an exclusive patent for DMSO, a major consideration when the clinical testing required to win FDA approval for a drug routinely runs into millions of dollars. In addition, says Mr. Bristol, DMSO, with its wide range of attributes, would compete with many drugs these companies already have on the market or in development.

DMSO's principal side effect: an odd odor, akin to that of garlic, that emanates from the mouth shortly after use, even if use is through the skin. Certainly, this odor has made double-blinded studies difficult. Such studies are based on the premise that no one, neither doctor nor patient, knows which patient receives the drug and which the placebo, but this drug announces its presence within minutes. Others, such as Terry Bristol, a Ph.D. candidate from the University of London and president of the Institute for Science, Engineering and Public Policy in Portland, Oregon, who assisted Dr. Jacob with his research in the 1960s and 1970s, believe that the smell of DMSO may also have put off the drug companies, that feared it would be hard to market.

DMSO Penetrates Membranes and Eases Pain

The first quality that struck Dr. Jacob about the drug was its ability to pass through membranes, an ability that has been verified by numerous subsequent researchers.¹ DMSO's ability to do this varies proportionally with its strength--up to a 90 percent solution. From 70 percent to 90 percent has been found to be the most effective strength across the skin, and, oddly, performance drops with concentrations higher than 90 percent. Lower concentrations are sufficient to cross other membranes. Thus, 15 percent DMSO will easily penetrate the bladder.²

In addition, DMSO can carry other drugs with it across membranes. It is more successful ferrying some drugs, such as morphine sulfate, penicillin, steroids, and cortisone, than others, such as insulin. What it will carry depends on the molecular weight, shape, and electrochemistry of the molecules. This property would enable DMSO to act as a new drug delivery system that would lower the risk of infection occurring whenever skin is penetrated.

DMSO perhaps has been used most widely as a topical analgesic, in a 70 percent DMSO, 30 percent water solution. Laboratory studies suggest that DMSO cuts pain by blocking peripheral nerve C fibers.³ Several clinical trials have demonstrated its effectiveness,^{4,5} although in one trial, no benefit was found.⁶ Burns, cuts, and sprains have been treated with DMSO. Relief is reported to be almost immediate, lasting up to 6 hours. A number of sports teams and Olympic athletes have used DMSO, although some have since moved on to other treatment modalities. When administration ceases, so do the effects of the drug.

Chronic pain patients often have to apply the substance for 6 weeks before a change occurs, but many report relief to a degree they had not been able to obtain from any other source. DMSO reduces inflammation by several mechanisms. It is an antioxidant, a scavenger of the free radicals that gather at the site of injury. This capability has been observed in experiments with laboratory animals⁷ and in 150 ulcerative colitis patients in a double-blinded

randomized study in Baghdad, Iraq.⁸ DMSO also stabilizes membranes and slows or stops leakage from injured cells.

At the Cleveland Clinic Foundation in Cleveland, Ohio, in 1978, 213 patients with inflammatory genitourinary disorders were studied. Researchers concluded that DMSO brought significant relief to the majority of patients. They recommended the drug for all inflammatory conditions not caused by infection or tumor in which symptoms were severe or patients failed to respond to conventional therapy.⁹

Stephen Edelson, MD, F.A.A.F.P., F.A.A.E.M., who practices medicine at the Environmental and Preventive Health Center of Atlanta, has used DMSO extensively for 4 years. "We use it intravenously as well as locally," he says. "We use it for all sorts of inflammatory conditions, from people with rheumatoid arthritis to people with chronic low back inflammatory-type symptoms, silicon immune toxicity syndromes, any kind of autoimmune process.

"DMSO is not a cure," he continues. "It is a symptomatic approach used while you try to figure out why the individual has the process going on. When patients come in with rheumatoid arthritis, we put them on IV DMSO, maybe three times a week, while we are evaluating the causes of the disease, and it is amazing how free they get. It really is a dramatic treatment."

As for side effects, Dr. Edelson says: "Occasionally, a patient will develop a headache from it, when used intravenously--and it is dose related." He continues: "If you give a large dose, [the patient] will get a headache. And we use large doses. I have used as much as 30 ml IV over a couple of hours. The odor is a problem. Some men have to move out of the room [shared] with their wives and into separate bedrooms. That is basically the only problem."

Does DMSO Help Arthritis?

It was inevitable that DMSO, with its pain-relieving, collagen-softening, and anti-inflammatory characteristics, would be employed against arthritis, and its use has been linked to arthritis as much as to any condition. Yet the FDA has never given approval for this indication and has, in fact, turned down three Investigational New Drug (IND) applications to conduct extensive clinical trials.

Moreover, its use for arthritis remains controversial. Robert Bennett, MD, F.R.C.P., F.A.C.R., F.A.C.P., professor of medicine and chief, division of arthritis and rheumatic disease at Oregon Health Sciences University (Dr. Jacob's university), says other drugs work better. Dava Sobel and Arthur Klein conducted their own informal study of 47 arthritis patients using DMSO in preparation for writing their book, *Arthritis: What Works*, and came to the same conclusion.¹²

Yet laboratory studies have indicated that DMSO's capacity as a free-radical scavenger suggests an important role for it in arthritis.¹³ The Committee of Clinical Drug Trials of the Japanese Rheumatism Association conducted a trial with 318 patients at several clinics using 90 percent DMSO and concluded that DMSO relieved joint pain and increased range of joint motion and grip strength, although performing better in more recent cases of the disease.¹⁴ It is employed widely in the former Soviet Union for all the different types of arthritis, as it is in other countries around the world.

Dr. Jacob remains convinced that it can play a significant role in the treatment of arthritis. "You talk to veterinarians associated with any race track, and you'll find there's hardly an animal there that hasn't been treated with DMSO. No veterinarian is going to give his patient something that does not work. There's no placebo effect on a horse."

DMSO and Central Nervous System Trauma

Since 1971, Dr. de la Torre, then at the University of Chicago, has experimented using DMSO with injury to the central nervous system. Working with laboratory animals, he discovered that DMSO lowered intracranial pressure faster and more effectively than any other drug. DMSO also stabilized blood pressure, improved respiration, and increased urine output by five times and increased blood flow through the spinal cord to areas of injury.¹⁵⁻¹⁷ Since then, DMSO has been employed with human patients suffering severe head trauma, initially those whose intracranial pressure remained high despite the administration of mannitol, steroids, and barbiturates. In humans, as well as

animals, it has proven the first drug to significantly lower intracranial pressure, the number one problem with severe head trauma.

"We believe that DMSO may be a very good product for stroke," says Dr. de la Torre, "and that is a devastating illness which affects many more people than head injury. We have done some preliminary clinical trials, and there's a lot of animal data showing that it is a very good agent in dissolving clots."

Other Possible Applications for DMSO

Many other uses for DMSO have been hypothesized from its known qualities and have been tested in the laboratory or in small clinical trials. Mr. Bristol speaks with frustration about important findings that have never been followed up on because of the difficulty in finding funding and because "to have on your resume these days that you've worked on DMSO is the kiss of death." It is simply too controversial. A sampling of some other possible applications for this drug follows.

DMSO has long been used to promote healing. People who have it on hand often use it for minor cuts and burns and report that recovery is speedy. Several studies have documented DMSO use with soft tissue damage, local tissue death, skin ulcers, and burns.

In relation to cancer, several properties of DMSO have gained attention. In one study with rats, DMSO was found to delay the spread of one cancer and prolong survival rates with another. In other studies, it has been found to protect noncancer cells while potentiating the chemotherapeutic agent.

Much has been written recently about the worldwide crisis in antibiotic resistance among bacteria (see *Alternative & Complementary Therapies*, Volume 2, Number 3, 1996, pages 140-144) Here, too, DMSO may be able to play a role. Researcher as early as 1975 discovered that it could break down the resistance certain bacteria have developed. With its great antioxidant powers, DMSO could be used to mitigate some of the effects of aging, but little work has been done to investigate this possibility. Toxic shock, radiation sickness, and septicemia have all been postulated as responsive to DMSO, as have other conditions too numerous to mention here.

Sources:

Alternative & Complementary Therapies, July/August 1996, pages 230-235.