MSM and DMSO
These two remarkable, related substances can ease the pain and inflammation associated with many diseases.

By Jack Challem
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Bill Rich, a retired mechanic in Portland, Ore., flashes back to 1970 when he tells the horrifying story of being trapped inside a burning car. "The doctors spent six months trying to put me back together," he says. With deep burns and a patchwork of keloid scars-from the burns and extensive skin grafts-Rich admits, "I made Frankenstein look handsome."

For years, he also suffered excruciating pain. After a couple of walks from the repair bay to the parts department at a car dealer, where he worked at the time, he'd practically buckle over and cry from how his knees and ankles hurt.

Then, in the early 1980s, a veterinarian suggested he try a supplement routinely used to treat pain in horses and other animals. The compound was methylsulfonylmethane, also known as dimethyl sulfone, or simply MSM.

"In three days, most of my leg pain was gone," Rich says. An inveterate tinkerer, he eventually developed an MSM-containing cream, which he regularly rubbed on his skin. Incredibly, his flat, purple scarring-years old-started to vanish, replaced by round, pink skin.

Origins of DMSO and MSM
If Bill Rich's story seems too incredible to be true, there are legions of other people who claim that MSM has relieved their joint and muscle pain, inflammation, pollen allergies, and even constipation. With relatively little published research on MSM, it's easy to be skeptical. However, MSM does have a scientific basis. It is a normal metabolite, or byproduct, of dimethyl sulfoxide, better known as DMSO. Twenty years ago, DMSO was an alternative "wonder drug," and it still has a strong following.

"It's a tale of two cities," says Stanley W. Jacob, M.D., of Oregon Health Sciences University in Portland. Both substances, in a manner of speaking, have historically been joined at the hip.

In 1961, when Jacob was head of the university's organ-transplant program, he thought DMSO, a common industrial compound, might help in the cryogenic preservation of organs. Curious, he applied a small amount of the chemical to his hand and watched in amazement as it penetrated. Seconds later, he felt the sulfur-like taste of oysters in his mouth. At that time, most physicians and researchers did not think absorption occurred through the skin, but DMSO obviously moved through the skin and quickly entered the bloodstream. At first, Jacob thought that DMSO might be useful in transporting other drugs through the skin.

He teamed up with Robert J. Herschler, a biological chemist and inventor, and together they investigated the properties and medicinal uses of DMSO. It turned out that DMSO was a powerful antioxidant, anti-inflammatory, and pain reliever-and beneficial in a wide range of conditions. Although some major drug companies showed interest in DMSO and funded research on it, the FDA was slow to approve it. It wasn't until 1978-15 years later-that the FDA approved DMSO as a prescription drug for the treatment of severe bladder infections.

By that time, however, DMSO had gained a huge public following, and word of mouth spread knowledge of its benefits. The compound was cheap and easily available over the counter in health food stores. When the television news show 60 Minutes aired a story on DMSO in 1980, Jacob's
university office was swamped with 100,000 phone calls in the week that followed. Health food stores, drug stores, and even gas stations began selling DMSO. It worked and appeared safe. The only negative aspect of DMSO was its characteristically strong sulfur smell and the taste it created, even when it was applied to the skin.

**Growing Interest in MSM**

By 1978, Jacob and Herschler had also become intrigued with MSM. According to Jacob, 15 percent of DMSO (whether taken orally, intravenously, or applied topically) is converted to MSM. MSM appeared to be one of the active forms of DMSO in the body.

Unlike DMSO, MSM is a nutrient found in many foods, and it is normally present in the bodies of people and animals. Unpasteurized milk is a particularly rich dietary source of it, and small amounts of MSM are found in fruits, vegetables, and grains. Food refining and processing removes MSM much the way it reduces vitamin and mineral levels. Although MSM is not off

How does MSM work? Frustrated, Jacob admits that much more research has to be conducted. Only about two dozen scientific papers have been published on MSM, compared with 55,000 on DMSO. However, some people have made a credible argument that, because MSM is the main metabolite of DMSO, many of the DMSO studies are "co-studies" of both substances.

MSM, which is about 34 percent sulfur by weight, may work in large part by donating the mineral to a broad range of normal biochemical processes in the body. Although sulfur is essential for health, it is not officially regarded as that by the U.S. Academy of Sciences (which establishes nutritional recommendations) and by the U.S. Food and Drug Administration.

Ironically, while sulfur is one of the most abundant minerals in the body, it has been one of the least researched. Sulfur is a component of amino acids (methionine, cysteine, taurine), some vitamins (e.g. B1, biotin), hormones (insulin), coenzymes (coenzyme A), and antioxidants (glutathione, N-acetylcysteine, alpha-lipoic acid). Because sulfur is necessary to build "disulfide bonds," which hold together tissue, it forms part of the body's physical structure, including protein, collagen, glucosamine, skin, and nails.

"I think that the whole DMSO complex-DMSO, dimethyl sulfide, dimethyl sulfone-provide a good portion of the body's need for sulfur," says Jacob. "Sulfur is an important building block."

Alexander Schauss, Ph.D., director of the American Institute for Biosocial Research, Tacoma, Wash., concurs. "Nobody writes about sulfur," he says. "It's taken for granted and neglected. But like any mineral, when it's in short supply, it has a rate-limiting effect that interferes with normal body processes."

**MSM May Benefit Varied Conditions**

Much of the knowledge of MSM gets back to Jacob's clinical findings in treating a wide range of conditions, as well as animal experiments by many different researchers.

DMSO and MSM have very similar effects, says Jacob. DMSO is the more potent pain reliever and an antioxidant. "But MSM is a pain reliever, and it reduces inflammation clinically," he adds. One of the advantages of MSM is that it doesn't possess or create a pungent sulfur odor. That, Jacob says, eases the the problem with bad breath and increases the therapy's "social acceptability."

How does he decide which to use in treating patients? In Jacob's university clinic, he likes to combine the two, giving patients a little DMSO with MSM.

These are some of the conditions that have benefited from MSM:

**Muscle and joint pain.** Like DMSO, MSM (taken orally) can relieve pain and inflammation in muscles and joints. Many of the components of joints are made from collagen and glucosamine, both of which are sulfur dependent. Herschler, in one of his many patents on MSM, describes an 81-year-
old arthritic women who was not helped by conventional drug therapy. After two weeks of taking MSM, she had "almost total" pain relief. In an animal study on rheumatoid arthritis like joint degeneration, DMSO and MSM were about equal in reducing joint inflammation, but MSM completely prevented the breakdown of cartilage. According to Jacobs, MSM can be helpful in most musculoskeletal pain and inflammation, including rheumatoid arthritis, osteoarthritis, tendonitis, and gout.

**Interstitial cystitis.** No infection is associated with this painful and debilitating bladder inflammation, and doctors don't know what causes it. Stacy J. Childs, M.D., of the University of Alabama, Tuscaloosa, recently described six patients with interstitial cystitis who benefited from MSM. Interstitial cystitis is the only condition that DMSO, in prescription form, has been approved for therapeutic use.

**Scleroderma.** The initial symptoms of scleroderma (systemic sclerosis) are swelling and thickening of the fingertips. It evolves into a chronic disease with scarring of the skin, joints, and internal organs. When this scarring effects the esophagus, patients experience difficulty swallowing and chronic heart burn. Jacob, who has served as the medical director for the Scleroderma International Foundation for more than 25 years, says that both MSM and DMSO can ease symptoms. It appears that MSM may normalize collagen formation.

**Allergies.** Symptoms of pollen may be reduced with MSM supplements. Jacob admits that he does not understand why MSM would help relieve allergies, but he suspects that MSM blocks cell receptor sites for histamine, which triggers allergic symptoms. "It's a real phenomenon," Jacob says of MSM's effect on pollen allergies. It's best taken in the evening, a couple of grams a day, maybe more when the pollen count is high." MSM has been shown helpful, clinically, in lupus erythematosus and may be beneficial in other autoimmune (self-allergic) disorders.

**Other conditions.** Although research is limited, MSM may reduce excess stomach acid and hypersensitivity to some drugs. Laboratory studies have found that it can retard the growth of vascular smooth-muscle tissue, which is associated with increased risk of coronary heart disease, and that it may have some anticancer properties.

Despite his clinical successes with MSM, Jacob isn't really sure exactly why it works. There's a need, he says, for much more research and controlled trials with people.

**Taking MSM**

For all practical purposes, MSM has vitamin-like effects that promote normal growth and repair mechanisms in the body. "I wouldn't call it a vitamin, but I would call it an important nutritional supplements," qualifies Jacob. "MSM is useful and safe."

The dosage range is wide, going from one or two grams daily all the way up to 80 grams daily. "A couple grams a day would be a good general dosage," says Jacob. "I would be very careful in the 80-gram (daily) range-that much is best used under the watchful eyes of a health professional.

Jacob, at 73, would like to see more basic research on MSM and greater use of it in preventing and treating diseases. Unfortunately, there seems to be little interest in conducting extensive research.

The lack of scientific research will undoubtedly hinder the recognition and acceptance of MSM as a therapeutic nutrient. However, based on its growing use and the many positive experiences, MSM may develop a strong following as a natural over-the-counter remedy.

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