

## *A MIRACLE! OR IS IT A MIRAGE?*

MANY ATHLETES CALL DMSO A WONDER DRUG, SAYING IT HEALS INJURIES FAST, BUT OTHERS—AND THE FDA—HAVE DOUBTS

- J.D. REED



Down in the basement of aging McArthur Court, the University of Oregon gymnasium in Eugene, the air one afternoon last winter was redolent of Eau de Sport, that venerable mixture of aromas—wet wool, steam, liniment, sweat, rubbing alcohol—that defines athletic exertion. It issued even from the wainscoting and the floors of the old structure. In the training room Alberto Salazar, 22, an Oregon senior and one of America's premier distance runners, sat on a table applying to his knee a colorless fluid that may change the smell of sports permanently.

The new odor, a commingling of the vapors of turpentine, rotten eggs and old oysters, comes from dimethyl sulfoxide, better known as DMSO, the controversial and often illegally used drug hailed by a growing legion of amateur and

professional athletes who view it as a panacea for many ills ranging from sprained ankles to tendinitis and ripped muscles.

Having washed his knee carefully, Salazar, winner of last year's New York Marathon and holder of the American indoor record for 5,000 meters, began to roll a cotton swab soaked in DMSO over the area. Around him was the paraphernalia of athletic treatment: ice bags, whirlpool bath, an ultrasound machine, tubes of Ben-Gay, bottles of anti-inflammatory pills. Salazar continued to apply the DMSO for 10 minutes or so, the stink becoming nearly unbearable. Almost as fast as he gently rolled on the stuff, it disappeared, soaking into his skin.

Finally he stopped and encased the knee in Saran Wrap and an elastic bandage. "I used to go the usual route when I got a strain or a sprain," he said, "ice, ultrasound, acupuncture, whirlpool, massage, heat. But I've been using DMSO for about three years now, and it's the answer. A strain like this used to keep me from training for four or five days, but with DMSO I can run full strength again in 24 to 48 hours. That's important when you're peaking for a race." The Millrose Games were just a few weeks away and Salazar would go on to set the record for 5,000 meters there.

"A lot of runners use it," he continued. "Every top competitor I've ever met has used DMSO at one time or another. A lot of guys mix it with cortisone for knee problems, or with liniment. I used to do that, but I find just plain DMSO works fine."

A weightlifter, an Everest of muscle, walks by holding his nose. "Whew! Smells like a bad restaurant in here."

Salazar smiles. "Some weightlifters use DMSO, too," he goes on, "as well as people on the football team. But it is fickle stuff. Sometimes I get immediate relief and other times it doesn't seem to work at all on a similar problem. It's mysterious. All except for the smell. It always gives you a body odor and terrible breath. But I don't notice it too much anymore. I guess other people do."

All over the country athletes say they are getting results with DMSO. Some Dallas Cowboys and some Rams and Raiders use it, but under the guise of what an NFL spokesman calls "experimentation." Dodger Manager Tom Lasorda soaks his fingers in it to relieve the pain of arthritis, as do the Orioles' Jim Palmer and Portland State's prospective high NFL draft choice, Quarterback Neil Lomax. But not all athletes are so certain DMSO is beneficial.

Yankee Outfielder Lou Piniella says, "I used it and it took three days to heal a bruise on my thigh, which is about the same as the whirlpool and other treatment. It's nothing special."

Others are naturally careful about unapproved medication, like the Orioles' Doug DeCinces. "They use it on horses," he says. "Horses only compete for three or four years. I want this body to last a lot longer than that. I've got a bad back. Do they know what it does to the liver?"

Even physicians disagree about the effectiveness of DMSO. Dr. Frank Jobe, orthopedist for the Dodgers and a founder of the National Athletic Health Institute, says, "It's quite spectacular on soft-tissue injuries like sprains, contusions, bursitis and tendinitis. It could revolutionize sports medicine."

Dr. Robert Kerlan, another renowned sports orthopedist and a founder, with Jobe, of the NAHI, says, "DMSO has some medicinal benefits, but curing routine sports injuries isn't one of them. It's almost useless for athletes."

One source of confusion about DMSO is the fact that it acts differently on different individuals, and is even unpredictable when used by the same person, relieving symptoms one week, failing to do so the next. It's a mysterious and complicated drug.

First synthesized more than a century ago, DMSO is a natural by-product of wood-pulp manufacture and has been used for decades as an industrial solvent, paint thinner and additive in a number of chemical products. (Pulp-mill workers have found that it cleans the chrome on their cars.) By the middle of this century, it had

been introduced experimentally into veterinary medicine. Then in 1961 Stanley Jacob, a University of Oregon Health Sciences Center surgeon looking for a way to supercool animal organs for transplant experiments, learned of DMSO from Robert Herschler, a chemist employed by the Crown Zellerbach paper company. (DMSO is still used in cryogenics, because mixed half and half with water, it resists freezing at—270°.) When Jacob applied DMSO to the burned skin of an assistant after a lab accident and noted a remarkable recovery, he became the "father" of DMSO. Since then Jacob has explored, with a host of medical researchers, possible uses for the drug, in ailments ranging from strokes to psychosis, from athlete's foot to baldness.

Alarmed by DMSO's sudden popularity and worried about misuse of it, the U.S. Food and Drug Administration banned the substance for medical use in 1965, citing a study that suggested it caused eye damage in laboratory rats. Since then the FDA has cleared DMSO for treatment of one condition, a bladder inflammation called interstitial cystitis. One reason the FDA has moved so cautiously is that researchers have detected cataracts in the eyes of monkeys, dogs and rats that were treated with DMSO, and there seems to be evidence that its use has damaged fetuses in hamsters. All potential users of the drug should bear in mind that the Federal Government's testers still doubt that DMSO's effects have been adequately studied.

But, so far, such adverse findings have not dampened sales. There are mail-order houses with toll-free numbers where credit cards are accepted for the purchase of industrial-grade DMSO. Sufferers from arthritis are treated with DMSO injections in Mexican clinics, and athletes who want the drug have thought up ingenious ways to obtain it. Says one Oregon runner, "A guy in our neighborhood has a dog with arthritis. Vets prescribe DMSO for it, and we all borrow the dog. He's been to more vets than any dog in America."

One of the first sports figures to use DMSO was Sam Bell, currently the track coach at Indiana University. "Back in 1962 I was the coach at Oregon State," he says. "Jacob and DMSO hadn't hit the national media yet, but I'd read about the doctor in the Oregonian. I had two pretty good runners. One had a chronic Achilles

tendon problem and the other a hamstring injury. I took them to Jacob and he gave us DMSO. I can't say they would've lost otherwise, but they were both NCAA champions that year. But without the training that DMSO let them get in by relieving the pain of their injuries so fast, they wouldn't have even competed in the NCAAs."

In 1965 Pierre Pilotè of the Chicago Black Hawks treated a dislocated shoulder with DMSO and was able to resume skating immediately. Also in 1965 when Sandy Koufax recovered quickly from a nagging elbow problem to pitch brilliantly in the World Series, many insiders were convinced that DMSO had done it. Koufax always denied it, and recently the Dodgers' trainer, Bill Buhler, said, "I tried it on Koufax. The only thing we got was a dry, chapped elbow."

Satchel Paige's Magic Snake Oil, which was rubbed onto his geriatric arm in the 1950s, was thought to contain DMSO, but the old Cards' trainer, Doc Bauman, says, "It was just chloroform liniment with cologne in it to cut the smell."

By 1968 DMSO was stinking up NFL locker rooms. Former Raider Quarterback Daryle Lamonica, who testified about DMSO at a Senate subcommittee hearing on medical research last summer, says, "One day I jammed my right thumb in practice and it hurt so much I couldn't make a fist. The trainer put DMSO on it and in 15 minutes the swelling and pain were gone; in 24 hours I was throwing again. It didn't work on a torn ligament, but without it I wouldn't have won the passing title in '69.

"A lot of us used it—Pete Banaszak, Jim Otto, Ben Davidson, other guys. And the only side effect we ever noticed was body odor and incredibly bad breath. It's a smell you don't forget. I got on an elevator in Washington after testifying and I smelled it. I was so excited I yelled. 'Who's using DMSO around here?' and a guy raised his hand."

The 49ers' outstanding guard, Randy Cross, a confirmed DMSO user, says, "The breath thing is awful. It's death breath. It makes for a lot wider huddle."

Seattle Mariner Pitcher Dave Heaverlo says, "They should get the wives to make guys use it on the road. They wouldn't have a groupie problem."

Within a minute of applying DMSO, most users get what they describe as the taste of raw oysters in their mouths. The oyster flavor and the rapidity with which it appears are indicative of why DMSO may work so quickly on some injuries. Dimethyl sulfoxide has a complex molecular structure that allows it to combine with a wide spectrum of other molecules. Few substances penetrate the skin as rapidly as DMSO, which can carry hundreds of other molecules through the skin as well. Those other ingredients can be anything from medications like cortisone to potentially lethal substances, including dye from clothing and pesticides in the atmosphere.

Within moments of application on the skin, DMSO is in the bloodstream, mixing with water from surrounding tissue. When it reaches the lungs, it releases dimethyl sulfide in the gas exchange. Hence, death breath.

DMSO's thirst for water is the key to its relief of pain. Veterinarian Joe Burch, who, with his son George, treats 700 horses during the racing season at Miami's Gulfstream Park, says, "Swelling is the cause of soft-tissue pain. Nature allows blood, lymph fluid and pus to collect to protect injuries. When DMSO moves fluid into the blood, the swelling and pressure are gone, and so is the pain. We don't know all about its workings yet, but that one's for sure. DMSO doesn't heal tissue. The body does that for itself. DMSO just makes it easier, quicker and pain-free."

While researchers explore—20 to 30 Investigational New Drug Exemptions have been approved by the FDA for DMSO experiments involving herpes, malignancies, spinal-cord injuries, eye problems, arthritis and scleroderma among other ailments—many athletes aren't waiting for official findings. But DMSO's unsettled status is the reason the NFL claims it limits the drug's use to an experimental role.

NFL trainers are reluctant to discuss the drug. One says, "Maybe the stuff would help, but if I give it to a player, he can sue me in 10 years if he has trouble. Players are winning those suits."

The 49ers' Cross started using DMSO on his own—for a wrist injury—after his mother told him it relieved her arthritis. "I applied it once a day during the season," he says. "In football things keep hurting. About half of our team uses it. When we played New Orleans, a Saints player wanted some, so we gave it to him. The guy complained that the bottle read 'For horses and dogs.' I told him most people think we're horses, anyway."

The Raiders' orthopedic consultant, Dr. Robert Albo, says, "Every NFL player has tried it. They'd be crazy not to. Athletes are looking for the panacea that will get them back a game earlier, allow them to play one more season. But you have to be careful with it. I always ask, "What DMSO? From where?" "

Says Indiana's Bell, "Applying the stuff is the tricky part. If you rub it in hard, you'll burn hell out of your skin." That's what happened to the Orioles' Palmer, who says, "I use DMSO a lot, but one time I got too strong a dose and it left a burned circle on my arm. People asked if I had ringworm." Other users have had painful results because they found out—too late—that they were allergic to the drug.

Ex-Dodger Pitcher Don Stanhouse warns, "Don't buy the solvent, industrial grade. You can't tell how it's been repackaged, and contaminants will go into your body. Get at least veterinary grade DMSO and dilute it to a 60% to 65% solution with distilled water in a clean container."

Some sufferers are simply left with bad breath and the old aches and pains after using DMSO. The Golden State Warriors' trainer, Dick D'Oliva, a jolly man who stands half as high as his NBA charges, knows some of the reasons. In his Oakland Arena training room, which has so much therapy equipment it resembles a Battlestar Galactica set, D'Oliva says, "We've used DMSO on only one guy, Purvis Short. The results are inconclusive. Purvis had shin splints. He got better in three

days, which is what we would get with conventional modalities. Once it burned his skin badly, and he complained about the smell. Another time we tried it on his knees and got nothing. But in pro sports trainers don't have time for controlled studies. Our job is to get the player back on the court as quickly and safely as his health will allow. So when a trainer uses DMSO, he uses ice, ultrasound, acupuncture, anything—all at the same time. He doesn't have the time to sort his treatments.

"And who knows how much is in an athlete's head? So much of rehabilitation is psychological. When grandma gave you sulphur and molasses, it worked because medicine was supposed to be awful. Maybe DMSO works the same way on some guys."

In the field of athletic injuries, the most extensive studies on DMSO's effectiveness are being carried out with FDA approval by Work Research Productions of Salt Lake City. Brigham Young University trainer Marv Robertson has been associated with that testing, specializing in strains and sprains. "After almost three years of work I have concluded that DMSO is effective on soft-tissue injuries," says Robertson. "It's erratic, but it has no side effects except an occasional rash and bad breath. It reduces recovery time by 50% on the average. It's amazing stuff. I think it should be legalized as a controlled substance.

"If aspirin were submitted to the FDA today for approval, considering the wide range of claims it makes, it would take 10 years for approval and it would be a prescription drug. And, unlike aspirin, DMSO hasn't been proven responsible for one death yet."

When all the hue and cry is set aside, when the claims that DMSO will cure quadriplegia and psychosis are laid to rest, most experts agree that it is effective in reducing pain and swelling. It may be quite useless in treating arthritis, but for athletes it appears to be a harmless, often effective anti-inflammatory agent and analgesic, what one physician calls "muscle-bound aspirin."



Oregon Orthopedist Stan James, the "runner's doctor" who treats most of America's top track and field competitors, has perhaps the most reasonable view of DMSO.

"DMSO is no miracle," he says. "It's effective, yes. But when you withhold something from the public, whether it's laetrile, marijuana, liquor or Playboy, an artificial madness is created. DMSO is not dangerous. Legalize it, and it will take its place in the pharmacology of sports medicine. People won't believe it, but miracles are few and far between. Penicillin was the last one, and DMSO is not penicillin."

The FDA is trying to speed up the creaky bureaucratic process for approving the stuff. Agency spokesmen believe the go-ahead to use DMSO as a prescription treatment for injuries could come in a year or two.

In the meantime, if you see your favorite local athlete at the horse track with a limping dog on a leash, he's not there to bet the trifecta, he's looking for the vet. And if you go up to get his autograph, better hold your nose.

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Even physicians can't agree on the effectiveness of DMSO.

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The best way to obtain DMSO for yourself is to have a dog that has arthritis.

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"The breath thing is awful," says 49er Randy Cross. "It's death breath."

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