

DMSO Transforms the Treatment of Infectious Diseases

Analysis by [A Midwestern Doctor](#)

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STORY AT-A-GLANCE

- › Dimethyl sulfoxide (DMSO) is a safe, naturally occurring substance with properties that make it effective for treating various medical conditions, including pain, injuries, wounds, strokes, spine injuries, autoimmune disorders, cancer, and internal organ diseases
- › DMSO has broad antimicrobial properties, protects against microbial toxins, combats antibiotic resistance, and helps deliver healing deep into the body to treat otherwise inaccessible infections
- › DMSO studies have generated evidence supporting its role in treating cancer and autoimmune disorders through its unique antimicrobial properties
- › DMSO is highly effective against viruses like herpes and shingles, as well as conditions like feline panleukopenia in cats
- › DMSO also proves valuable in treating persistent fungal and parasitic infections

Introduction

DMSO is a remarkably safe and naturally occurring substance (provided you use it correctly¹) that rapidly improves a variety of conditions medicine struggles with — particularly chronic pain. For reference, those conditions included:

Strokes, paralysis, a wide range of neurological disorders (e.g., Down Syndrome and dementia), and many circulatory disorders (e.g., Raynaud's, varicose veins, hemorrhoids), which I discussed [here](#).

A wide range of tissue injuries such as sprains, concussions, burns, surgical incisions, and spinal cord injuries (discussed [here](#)).

Chronic pain (e.g., from a bad disc, bursitis, arthritis, or complex regional pain syndrome), which I discussed [here](#).

A wide range of autoimmune, protein, and contractile disorders such as scleroderma, amyloidosis, and interstitial cystitis (discussed [here](#)).

A variety of head conditions, such as tinnitus, vision loss, dental problems, and sinusitis (discussed [here](#)).

A wide range of internal organ diseases such as pancreatitis, infertility, liver cirrhosis, and endometriosis (discussed [here](#)).

A wide range of skin conditions such as burns, varicose veins, acne, hair loss, ulcers, skin cancer, and many autoimmune dermatologic diseases (discussed [here](#)).

In turn, since I started this series, it struck a cord and I have received over 1400 reports of remarkable responses to DMSO many readers have had (compiled [here](#)).

This begs an obvious question – if a substance capable of doing all of that exists, why does almost no one know about it? Simply put, like many other promising therapies, it fell victim to a pernicious campaign by the FDA which kept it away from America despite decades of scientific research, Congressional protest, and thousands of people pleading for the FDA to reconsider its actions. Consider for example, this 60 Minutes program about DMSO that aired on March 23, 1980:

[Video Link](#)

DMSO and Infectious Diseases

DMSO has a variety of unique therapeutic properties. Some of those make it incredibly well-suited to addressing microbial infections. For example:

- While nontoxic, it has an antiseptic effect that is harmful to microorganisms, especially the smallest ones. This property appears to be the most beneficial for herpes, shingles, and complex conditions with a microbiological component.
- It can remove the antibiotic resistance of bacteria. This is particularly helpful in widespread problematic infections that have gradually developed a resistance to many existing antibiotics (e.g., tuberculosis) and challenging infections that are not responding to antibiotics (e.g., ones that would otherwise require an amputation).
- It can deliver antimicrobial agents to areas that are typically difficult to reach (e.g., deep in a bone) and also directly to regions that would otherwise require a systemic application of the medication.
- It can increase circulation to many parts of the body, something which is often critical for resolving illnesses (as a healthy blood supply allows the immune system to enter and heal diseased areas). Likewise, pretreatment with DMSO has been shown to increase the immune system's ability to resist a subsequent infection.
- Much in the same way DMSO protects cells from a wide variety of lethal stressors,² it can also protect them from the harmful effects of bacterial toxins and can mitigate the toxicity of antimicrobial agents taken for a prolonged period.

In short, DMSO can transform the management of infectious diseases.

Shingles and Herpes

Since many people struggle with Herpes (HSV-1 or HSV-2) and Shingles (Herpes Zoster), especially the pain which follows shingles (known as post-herpetic neuralgia or PHN), DMSO has been extensively studied for these uses. In turn, DMSO was found to

significantly improve those conditions (and canker sores³), particularly when combined with idoxuridine (IDU), an antiviral that has poor penetration into tissues (and hence does not work alone).

- **Herpes simplex**

- A 1965 study⁴ used 1% IDU in 90% DMSO (and 10% distilled water) in 7 patients with severe cutaneous infections and noted significant improvement in all herpes cases, with the only side effect being slight skin irritation from the solution.
- A 1966 RCT⁵ (randomized controlled trial) of 21 patients with recurrent herpes found DMSO halved the durations of outbreaks, and when given with 5% idoxuridine, cut it to a third (with similar results also found in a 1967 study⁶).
- A 1983 study⁷ found that DMSO effectively brought acyclovir (ACV) into the skin, caused a moderate reduction in herpes lesions, and dramatically reduced them when combined with acyclovir.
- A 1990 RCT⁸ gave 80% DMSO mixed with 15% IDU to 301 immunocompetent female patients. The duration of pain was reduced by 2.6 days and the healing time to normal skin by 2.3 days.
- A 2002 cell study⁹ found 0.65% DMSO reduced herpes viral replication by 50%.

Note: *DMSO also helps herpes fever blisters, and DMSO with IDU has been reported to be effective in treating HSV whitlow (herpes on the fingers).*¹⁰



A case of Herpes 48 hours before and after DMSO

- **Shingles and Post Herpetic Neuralgia (PHN)**

- In 1967, a German investigator reported DMSO yielded generally good results in 10 of 11 shingles and PHN cases¹¹ (with similar results being found in another 1967 study¹²).
- Two 1970 RCTs showed that IDU in DMSO was at reducing the duration of pain and healing in shingles.¹³ The patients were delighted, for the pain disappeared within a median of two days.
- In 1971, Dr. William Campbell Douglass conducted a study of 41 patients with shingles and PHN of whom 73.3% had a good response to DMSO and 13.3% had a fair response.
- A 1974 RCT¹⁴ of 118 shingles patients and a 1992 RCT¹⁵ of 171 shingles patients found DMSO and IDU significantly shortened the vesicular phase, healing time, and duration of pain, and it significantly improved post-herpetic neuralgia.

- A 1981 trial of 46 shingles patients also confirmed the benefit of DMSO and IDU.¹⁶

DMSO and Bacterial Infections

DMSO has five key properties that make it effective in treating bacterial infections:

- 1. Increased bacterial membrane permeability** – DMSO enhances bacterial membrane permeability,¹⁷ making bacteria more vulnerable to antibiotics, especially those targeting internal structures (e.g., penicillin). This is crucial for treating infections like tuberculosis, which has a tough outer barrier.
- 2. Direct bacterial breakdown** – DMSO can dissolve bacteria, causing their contents to leak out and effectively neutralizing them.
- 3. Disruption of bacterial function** – DMSO interferes with bacterial metabolism by blocking the production of essential membrane proteins, as shown in studies with *E. coli*.¹⁸
- 4. Improved circulation** – DMSO enhances blood flow,¹⁹ which helps combat chronic infections often caused by impaired circulation.
- 5. Protection against bacterial toxins** – DMSO mitigates the harmful effects of bacterial toxins, protecting cells from stress.

DMSO also enhances the immune response,²⁰ contrary to concerns about immune suppression, and has been shown to increase resistance to infections like typhus.²¹

Common Microbes

DMSO has been extensively tested against common infectious bacteria (e.g., staph, strep, *E. coli*, pseudomonas), both by itself and in combination with antimicrobial therapies.

After a 1964²² study showed DMSO inhibited the growth of bacteria, a 1967 study tested it against various microorganisms, and found at sufficient concentrations that DMSO caused those organisms to dissolve into a sediment.²³

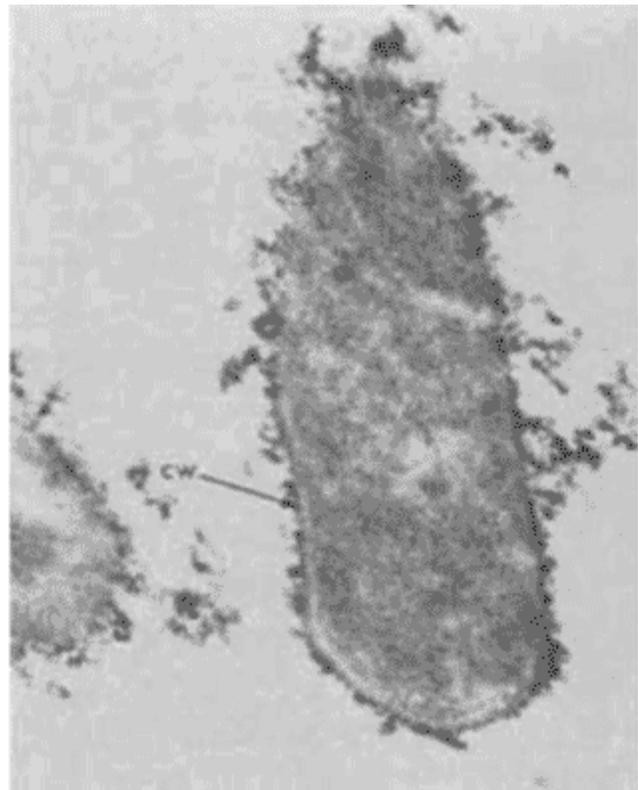
TABLE 2
BACTERIOSTATIC AND BACTERICIDAL EFFECT OF DIMETHYL
SULFOXIDE BY PLATE COUNT METHOD

Test Micro-organism	Plate Count* on Exposure to Varying Concentration of DMSO							
	Control	5%	10%	15%	20%	25%	30%	40%
<i>Pseudomonas aeruginosa</i>	640	640+	380	1	0	0	0	0
<i>Salmonella paratyphoid</i>	1070	1070+	1070+	27	13	10	8	0
<i>Streptococcus (beta - A)</i>	750	640	640	0	0	0	0	0
<i>Staphylococcus aureus</i>	28	32	24	20	5	4	4	0
<i>Canadida albicans</i>	4	4	3	0	0	0	0	0
<i>Streptococcus anginosus F</i>	86	2700	2700	800	70	50	0	0
<i>Streptococcus faecalis</i>	7500	7500	7500	850	240	5	4	0
<i>Escherichia coli</i>	37550	37500	37500	9000	90	0	0	0

*All counts in millions as determined by serial dilution plate count method.

A 1969 study²⁴ found that 75% DMSO was bactericidal (mainly by causing their internal contents to leak out), while 15% was sufficient to stop bacterial growth.

Figure 5—*E. coli* exposed to 75% DMSO for 20 min. 122,500X. Key: CW, cell wall.



DMSO and Head Infections

Since DMSO is effective in eliminating many common microbial infections, it has shown great promise in ENT (ears, nose, and throat) medicine, as many of those diseases result from infections with common bacteria and the inflammatory response to them (particularly since it is often challenging to get antibiotics to the site of the infection).

Much of this was demonstrated in the 1967 publication²⁵ by an ENT doctor who observed that DMSO would often significantly calm inflammation from an infection in the head (including severe ones that were difficult to treat with antibiotics). He compiled all of his cases²⁶ here:

TABLE 2
SUMMARY OF CASES

Diagnosis	Mode of treatment	No. of patients treated	Complete remission of symptoms	Partial remission of symptoms	Unchanged
Furuncular otitis (and infected eczematous otitis)	DMSO	119	2	16	11
	DMSO + ANTIB.		26	53	11
Otitis media (40 acute, 27 chronic)	DMSO	67	1	—	3
	DMSO + ANTIB.		26	26	11
Furunculosis of the nose (and infected nasal eczema)	DMSO	35	4	3	1
	DMSO + ANTIB.		12	12	3
Tonsillitis and Pharyngitis (acute) (acute and chronic)	DMSO	119	4	24	16
	DMSO + ANTIB.		16	48	11
Stomatitis aphthosa	DMSO	34	5	4	2
	DMSO + ANTIB.		8	15	—
Neuralgiform headache	DMSO	109	29	54	26
Temporomandibular arthropathy	DMSO	15	5	8	2
Injuries	DMSO + ANTIB.	13	9	4	—
Various disorders	DMSO	19	2	15	2
90% DMSO		530	149	282	99
Antibiotics were mainly terramycin and erythromycin			28.1%	53.2%	18.7%

- **Eye infections** – DMSO can treat various eye conditions, including macular degeneration and eyelid inflammation. In a 1976 study,²⁷ it was combined with antibiotics to successfully treat eye infections. Additionally, DMSO can resolve pink eye after just a few applications.²⁸
- **Sinusitis** – DMSO helps open blocked nostrils quickly by reducing swelling and promoting tissue healing.²⁹ Studies have shown DMSO significantly alleviates sinusitis symptoms, including one 1967 study³⁰ where most patients had excellent results. It also enhances the effectiveness of antibiotics in treating rhinoscleroma,³¹ a rare nasal infection.
- **Dentistry** – DMSO is used in dentistry as a mouthwash, relieving gum pain³² and preventing bleeding. It can alleviate toothache pain and reduce swelling after dental

procedures.³³ Dentists have found it effective for treating infections and saving loose teeth from periodontitis.³⁴ Many studies³⁵ show DMSO helps improve gum health, treat pulpitis,³⁶ and accelerate healing after tooth extractions.³⁷

Tuberculosis

Despite over a century of work, Tuberculosis remains the world's most deadly microbe (e.g., in 2023, it was estimated³⁸ to have killed 1.25 million people). This is mainly due to this tiny bacteria's unique characteristics and high aptitude for developing antibiotic resistance.

Because of this, once the early DMSO researchers realized that DMSO could remove antibiotic resistance, their focus immediately went to tuberculosis. In turn, many lab studies³⁹ have demonstrated DMSO's utility for this challenging infection which has been corroborated in humans:

- A 1969 study⁴⁰ of 32, 14 showed an absence of tuberculosis secretion and most showed improvement (e.g., reduced endobronchitis, perifocal infiltration and lung tissue destruction).
- A 1980 study⁴¹ used DMSO to treat children with pulmonary tuberculosis.
- A 1991 study⁴² found nebulized DMSO mixed with rifampin over 1 to 2 months was an effective treatment for 148 pulmonary tuberculosis and 18 obstructive bronchitis patients (e.g., it healed the destructive cavities caused by tuberculosis).

Bacterial Toxins

One of the primary reasons bacterial infections sicken and kill is because of the toxins they release. DMSO in turn, has been repeatedly shown to mitigate this. For example:

- DMSO has been shown⁴³ to protect the duodenum from H. pylori induced chronic ulcers.

- In rats, DMSO was shown⁴⁴ to create a dose dependent reduction in the fluid secretion and mucosal permeability triggered by C. difficile's toxin (with its maximum inhibition occurring at a 1% concentration). Given how common C. difficile colitis is, this application of DMSO has great promise.
- DMSO was shown to protect cells⁴⁵ from the shigella bacteria's toxin⁴⁶ (which causes severe diarrhea and bloody stools).
- Endotoxaemia occurs in response to bacterial lipopolysaccharide (LPS) entering the bloodstream. A 2008 study of 18 horses⁴⁷ found DMSO reduced the fevers that followed artificially induced endotoxemia, suggesting DMSO's utility in treating sepsis, particularly since, DMSO can protect cells⁴⁸ from the damage LPS causes.

Note: One of the most important characteristics the early adopters of ultraviolet blood irradiation recognized about it was that **UVBI could effectively neutralize toxins in the bloodstream** (a property that saved a significant number of lives).

Challenging Infections

DMSO has shown promise for many other challenging infections:

Sepsis – DMSO has proven effective in treating septic complications, especially in heart attack survivors. A 1982 study⁴⁹ showed its success even against antibiotic-resistant bacteria. In 1984 a Russian study⁵⁰ confirmed DMSO accelerated recovery in critically ill septic patients, with one case of bladder infection improving after using DMSO.

Note: One author cited⁵¹ a case of a septic patient with a severe bladder infection who did not respond to antibiotics but recovered once he began taking one teaspoon of DMSO three times a day.

Lung infections – DMSO has treated chronic lung infections, with a 1975 study⁵² showing rapid recovery in infants with severe respiratory diseases when combined

with antibiotics. A 2020 study⁵³ reported that DMSO, combined with ceftriaxone, helped 31 lung abscess patients fully recover without recurrence.

Note: *DMSO has also been repeatedly shown⁵⁴ to effectively treat acute respiratory distress syndrome, a challenging lung condition that frequently follows severe infections and often requires ventilation.*

Abdominal infections – DMSO, combined with antibiotics, has effectively treated peritonitis⁵⁵ and abdominal abscesses.⁵⁶ It helps concentrate antibiotics in the abdomen,⁵⁷ providing extended treatment duration, especially for peritonitis, a fatal condition.

Meningitis

- A 1978 study⁵⁸ found DMSO was an effective treatment for meningococcal infections.
 - A 1987 study⁵⁹ used DMSO combined with a nuclease to treat meningitis or meningoencephalitis caused by an acute viral respiratory infection.
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Osteomyelitis – DMSO has shown significant results in treating bone infections.⁶⁰ Studies have found that combining DMSO with antibiotics and other therapies like hyperbaric oxygen speeds up recovery and reduces bone damage in both acute and chronic osteomyelitis.^{61,62,63,64,65,66}

Orchitis and epididymitis – In 1986, a Russian physician reported these conditions have an excellent response to DMSO.⁶⁷

Cancer and autoimmunity – DMSO has been observed to eliminate the unusual bacteria **associated with many cancers and autoimmune diseases**, which may in part explain its utility for those conditions.

Note: *A wealth of evidence also supports DMSO's use in a variety of challenging veterinary infections.*⁶⁸

Surgery

Three of the major issues encountered in surgery are:

- Surgical wounds (or burns) become infected before they seal and heal.
- Infections deep within the body need to be cut open so the infection can be drained or removed (or have antibiotics directly applied to it).
- Infected tissues must be removed (e.g., amputated) because the infection within them can't be reached or addressed.

Fortunately, DMSO's is uniquely suited to address each of these. For example, in [this article](#), I discussed how many studies and reader testimonials show DMSO is a remarkable therapy for burns and wound healing, and [here](#) I reviewed the wealth of evidence that DMSO is a highly effective therapy for surgical scar healing.

Likewise, DMSO makes reaching a deep infection within the body possible without surgery. Numerous studies, in turn, demonstrate that DMSO can prevent and treat those infections:

A 1969 case report⁶⁹ highlighted a patient with a chronic fungal infection (that has high resistance to antifungals) who declined amputation in favor of antifungals dissolved in DMSO which saved his foot.

Note: *There are many other cases of DMSO curing a chronic infection that had required amputation.*⁷⁰

A 1978 surgical study⁷¹ used DMSO in combination with antibiotics to treat inflammatory infiltrates.

A 1984 study⁷² used DMSO to treat surgical wound infections.

A 1985 study⁷³ found that injecting DMSO after severe mechanical trauma reduces the risks of a subsequent infection, while a 1984 study⁷⁴ found that DMSO plus antibiotics prevent open wounds in the hands from developing purulent infections.

A 1990 study⁷⁵ of 33 patients with phlegmons (inflamed areas under the skin) throughout the body found that a dressing with DMSO and silver nitrate, when compared to those receiving standard treatments, reduced the time required to begin a surgical repair by 2 to 2.5 times.

In 1998, Russian physicians reported that they routinely apply DMSO to surgical wounds as it accelerates healing and provides general infection control.⁷⁶

Fungal Infections

A 2013 study⁷⁷ used DMSO and antifungal agents on six different *Candida* species. It found 0.5% to 1% DMSO had an antifungal effect, but the inhibitory effect (with or without concurrent antifungals) varied significantly.

DMSO can also effectively bring antifungals to many parts of the body. DMSO for instance was shown⁷⁸ to significantly increase the amount of ketoconazole that enters the brain and can transport griseofulvin⁷⁹ through the skin (which in a 1974 study⁸⁰ was used to successfully treat ringworm). Additionally:

- A 1965 study⁸¹ found DMSO was an effective treatment for ringworm and athlete's foot, especially when combined with an antifungal.
- A 1977 study⁸² found DMSO (in combination with lidase) was a highly effective treatment for actinomycosis of the face and neck.
- A 1997 study⁸³ found DMSO mixed with itraconazole treated fungal infections in horse corneas.

Parasites

There is also some data on how DMSO can treat parasites (e.g., 3% DMSO has been shown to significantly inhibit the growth of *Trypanosoma cruzi*,⁸⁴ which causes Chagas

disease). However, its primary value is bringing an antiparasitic medication to the region of infection (as parasites can often burrow quite deep into the tissues).

For example, two different 1966 studies (this study⁸⁵ and this 25 person RCT⁸⁶) found that DMSO plus an antiparasitic (e.g., 2% topical thiabendazole in 90% DMSO) was an effective treatment for hookworm infections in the skin. DMSO can also be combined with antiparasitic medications to reach challenging parasitic infections deep within the body. For example, a 1984 case report⁸⁷ discussed DMSO treating a complex amoeba infection of the liver.

Conclusion

Many who've worked with DMSO believe it should be routinely utilized for severe infections, particularly those not responding to antibiotic therapy. Fortunately, we are in a unique moment where these forgotten sides of medicine finally have a chance to see the light of day.

Thus, I sincerely hope articles like these can begin to shift the medical system towards adopting a more sophisticated approach to infectious diseases that can help patients struggling with challenging infections.

***Author's Note:** This is an abridged version of [a longer article](#) that goes into greater detail on the points discussed here and provides guidance for personal DMSO use (e.g., dosing, therapeutic precautions and where to obtain it) along with other natural approaches we've also found help many of those conditions (e.g., herpes and shingles). That article can be read [here](#).*

A Note from Dr. Mercola About the Author

A Midwestern Doctor (AMD) is a board-certified physician from the Midwest and a longtime reader of Mercola.com. I appreciate AMD's exceptional insight on a wide range of topics and am grateful to share it. I also respect AMD's desire to remain anonymous

since AMD is still on the front lines treating patients. To find more of AMD's work, be sure to check out [The Forgotten Side of Medicine](#) on Substack.

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