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DMSO Could Save Millions from Brain and Spinal Injury

Analysis by A Midwestern Doctor | October 11, 2024

STORY AT-A-GLANCE

- DMSO is a remarkably safe chemical that protects cells from otherwise fatal stressors (e.g., freezing, burning, shockwaves, ischemia)
- Since the heart, brain, and spinal cord are particularly vulnerable to injury, DMSO can produce miraculous results when those injuries happen
- Despite decades of research, many serious shortcomings exist with how we treat strokes (including brain bleeds), heart attacks, and spinal cord injuries
- As I will show here, had the FDA not sabotaged DMSO's adoption, in addition to countless lives being saved, millions could have been protected from a lifetime of disability or paralysis

If I were stranded on a desert island or knew the world was ending and I could only bring a few therapies with me, one of them, without a doubt, would be DMSO. This is because:

- It effectively addresses acute injuries (e.g., sprains) and chronic musculoskeletal disorders (e.g., arthritis).
- It's one of the most effective pain killers in existence.
- It treats severe, often incurable illnesses and prevents long-term disability.
- It's one of the safest medically active substances available.

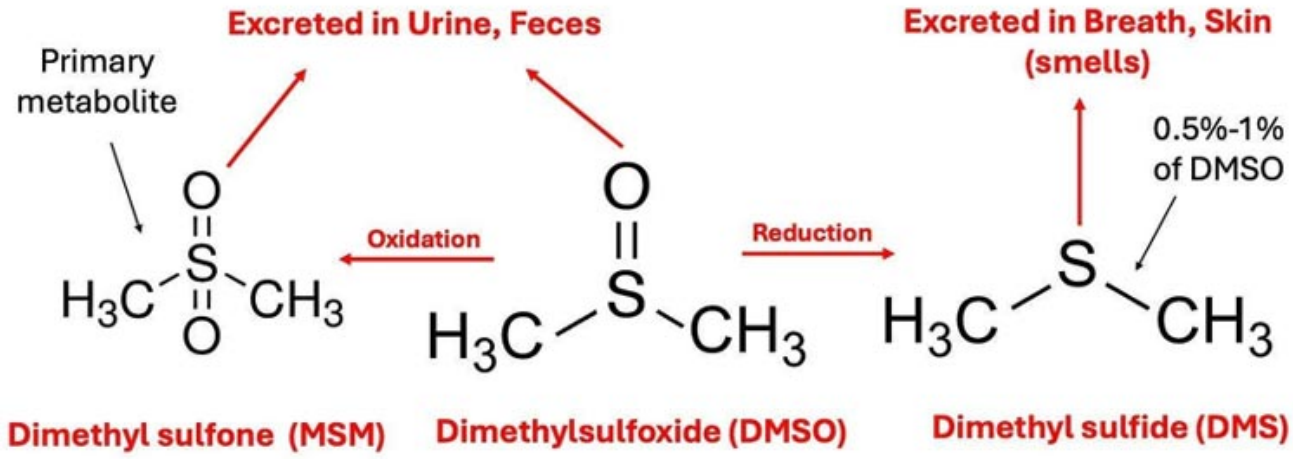
Yet, despite it taking the world by storm in the 1960s and thousands of studies being performed that corroborated its benefits, outside of it being a laboratory chemical or an

alternative therapy some people use for joint pain, few are even aware of DMSO's existence.

This was due to the FDA waging a multi-decade long war against DMSO (despite widespread outcry from Congress and the public).

What Is DMSO?

Dimethyl Sulfoxide (DMSO) exists throughout nature[1] and has two breakdown products within the body.



Most of it is oxidized to methylsulfonylmethane (MSM — a commonly used joint healing supplement), while a small amount is reduced to DMS and gives rise to DMSO's characteristic "side effect" a distinctive garlic or clam-like odor that is excreted through the mouth and skin for a few hours that some individuals have difficulty tolerating.

Note: *Individuals with insufficient oxidation (who are in a state of reductive stress) are more likely to produce DMS. In turn, when this is addressed, their "DMSO odor" often disappears.*

Due to its unique chemistry, DMSO has two remarkable properties:

- It acts as a near-universal solvent (e.g., it interacts with a vast range of biomolecules).[2,3]

- It's able to pass through biological membranes without damaging them (something to my knowledge, nothing else can do).[4]

Because of this, DMSO will rapidly enter the body (including the brain) regardless of its route of administration (e.g., within 5 minutes after going on the skin it can be found in the blood,[5] and within an hour it can be found within the bones[6]), but simultaneously does not accumulate within the body.[7]

DMSO, in turn, has an almost endless number of uses as it can be applied in almost any manner. Almost any drug or substance can be combined with it and administered through the skin (e.g., steroids, NSAIDs, vitamin C, or hydrogen peroxide). In many cases, the effect of those drugs is enhanced, and simultaneously, their toxicity is reduced (although, in some cases, the toxicity increases).

Cellular Protection

DMSO's ability to spread throughout the body (including into the brain) initially seems concerning — however rather than be toxic to cells, DMSO heals them and protects them from damage from many otherwise lethal stressors (e.g., heat, blood loss, radiation, sonic shockwaves).

For example, since DMSO does not expand when it freezes and greatly lowers the freezing point of cells, it was a revolutionary substance for preserving frozen cells,[8] and likewise, **many cases exist** of DMSO saving the fingers or toes that otherwise would have required amputation.

Note: *Due to the intense scrutiny DMSO received, thousands of papers have been published on its biological effects (including numerous animal safety studies and one where humans were exposed to 3 to 30 times the typical dose for 90 days[9]) — all of which did not report any significant side effects from DMSO.*

In turn, those studies found the most common side effect (affecting 50% to 75% of users) is (reversible) irritation at the site when 70% DMSO is applied topically on the skin (which

can be easily mitigated) and the most significant was an allergic reaction in approximately 1 out of every 2000 people (which can easily be screened for).

Circulatory Disorders

DMSO is remarkably effective in managing circulatory disorders, effectively protecting tissues and enhancing blood flow by removing excess fluid, improving circulation, and dissolving clots. Its benefits are particularly evident in conditions like Raynaud's syndrome, where it eliminated symptoms in 50% of patients,[10] and in diabetic circulatory issues, with studies showing over a 94% success[11] rate in treating diabetic ulcers.

DMSO also works wonders for varicose veins, often providing noticeable improvements within minutes by strengthening vessel walls and enhancing capillary circulation. In a study of 67 patients with varicose ulcers,[12] remarkable responses were documented, even in chronic cases. Additionally, DMSO has been shown to help many other circulatory disorders:[13,14]

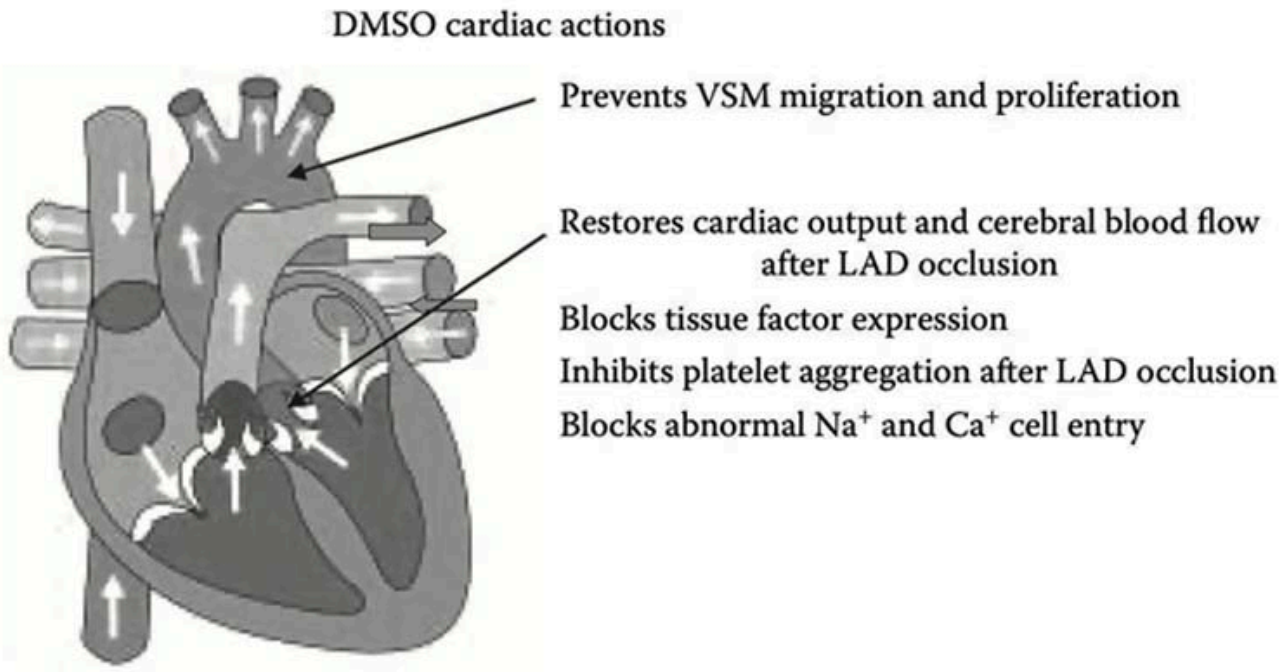
Group	Condition	Results		
		Good	Fair	Poor
1	Spontaneous superficial phlebitis (varicophlebitis, thrombophlebitis)	14	3	4
2	Phlebitis after infusion treatment	16	3	8
3	Subjective complaints due to chronic venous disorders (mostly varicose veins)	29	10	8
4	Postphlebitic leg with dermatosclerosis, indurations, hyperkeratosis, etc., and subjective complaints	17	6	9
5	So-called additive factors in chronic venous insufficiency (tendo-periostitis, myogelosis, arthropathy of the knee joint, static insufficiency)	6	2	4
	Total numbers (overall total 139)	82 (59%)	24 (17%)	33 (24%)

Condition	Total Number of Patients	Excellent	Good	No Benefit
Varicose Veins	22	13	8	1
Thrombophlebitis a) Acute b) Chronic	 3 1	 3 0	 0 1	 0 0

Key mechanisms behind DMSO's effectiveness include:

- **Heart function —** It can increase or decrease heart contractions without affecting rhythm, enhancing cardiac output and simultaneously dilates critical blood vessels.[15]
- **Anticlotting properties —** DMSO prevents blood clot formation in the body, reduces clot promoting prostaglandins, and is a powerful platelet deaggregator.[16,17,18] Its ability to safely block platelet bonding, scavenge harmful radicals, and inhibit tissue factor expression makes DMSO a standout in circulatory health.[19]

Heart Attacks



Given all of these protective and circulatory enhancing properties, DMSO is an immensely promising treatment for heart attacks and heart attack recovery,[20] and this benefit has been demonstrated in numerous animal studies.[21,22] Likewise, I and colleagues have had a few situations arise where DMSO was administered to someone having a heart attack and successfully treated it.

Note: *We've also had some success treating heart attacks by rapidly* ***restoring someone's physiologic zeta potential****.*

DMSO and Strokes

Roughly 3.1% of adult Americans have experienced a stroke[23] (a figure we expect to rise from the COVID-19 vaccines). Each year, this translates to about 800,000 people in the United States having a stroke, in 2022, 165,393 dying and between 20% to 40% of survivors experiencing long term disability.[24]

Because of the harm strokes pose to society, and the rate at which brain tissue deteriorates once its blood supply is lost, the medical system prioritizes treating strokes as soon as possible.

Strokes come in two main types: ischemic (caused by clots blocking blood flow) and hemorrhagic (due to ruptured blood vessels). The standard treatment for ischemic strokes is tPA,[25] a clot-busting drug. However, administering tPA can be deadly if the stroke is hemorrhagic, so patients must first wait for a CT scan before receiving it.

Furthermore, tPA is only effective within a limited time frame (up to 3 to 4.5 hours[26]), and only a small percentage of patients (1.8% to 8.5%) actually receive it. Among those who do, only 13%[27] see significant improvement. Additionally, tPA can cause serious bleeding complications[28] (e.g., 6.4% risk[29] of a symptomatic brain bleed) and can't eliminate larger clots.

In short, strokes remain a leading cause of death and disability worldwide.[30] This highlights the need for a better treatment that can safely:

Effectively treat ischemic strokes	Has no risk of worsening a hemorrhagic stroke
Could easily be taken at home, and more importantly, be quickly given on ambulances	Protected brain tissue from dying
Prevented reperfusion injuries	Healed damaged brain tissue after a stroke

DMSO has been known for over 50 years to do just that. For example, a 2002 trial with DMSO combined with fructose diphosphate (FDP — a source of cellular energy) indicated that 63% of elderly patients experienced improved neurological status when treated within 12 hours of a stroke, compared to only 20% with standard care.[31]

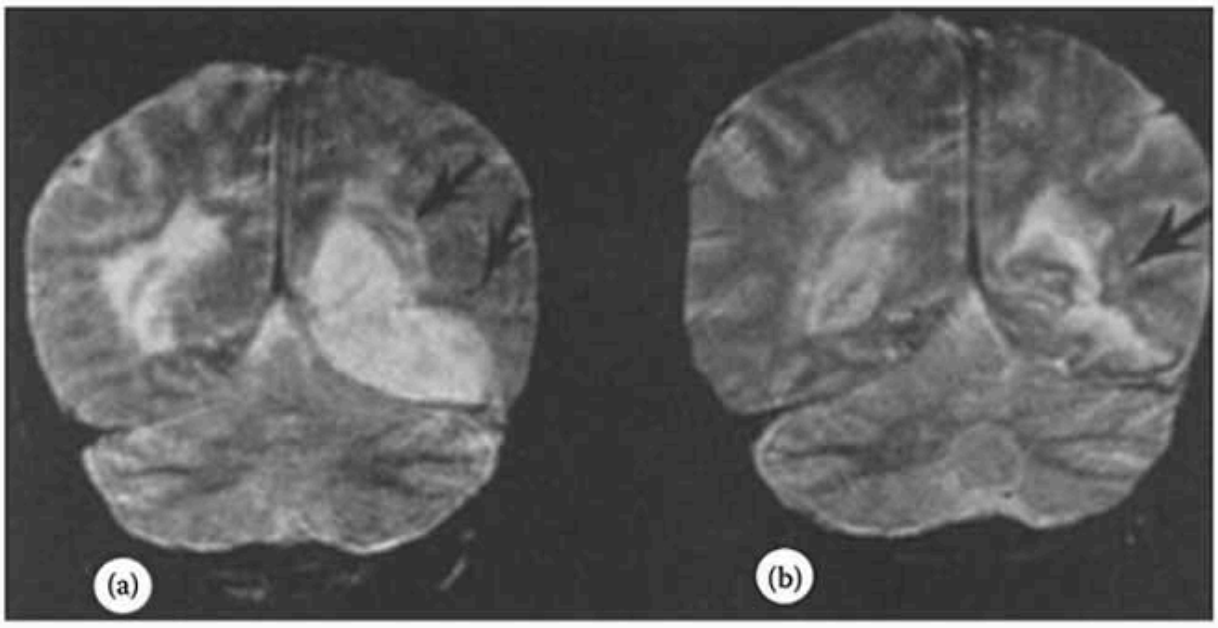
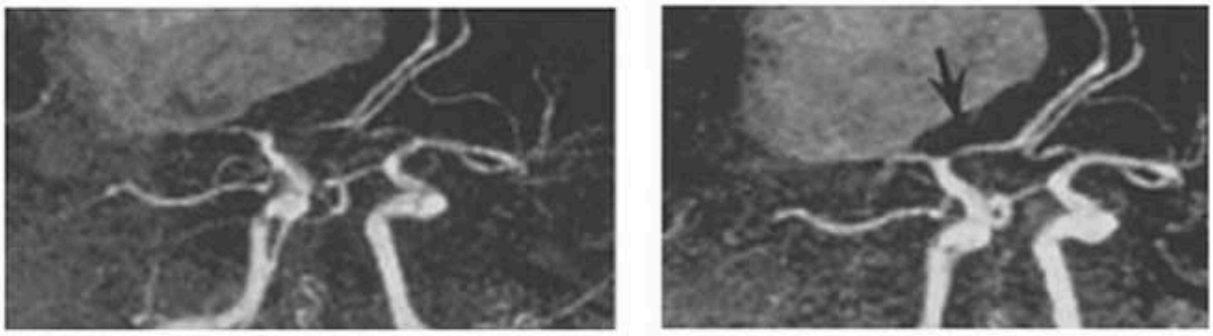


FIGURE 9.6 (a) T2-weighted coronal view MRI of posterior cerebral artery (PCA) territory infarct before treatment. White matter changes are seen with lateral mass effect on lateral ventricle, left thalamus involvement, and widespread edema involving the brainstem (arrows). (b) After 11 days of daily DMSO–FDP IV administration, dramatic reduction of edema and lower signal intensity are seen with an apparent improvement of gray matter and thalamic involvement (arrow). (From Karaça, M. et al., *Neurol. Res.*, 24(1), 73, 2002.)

A magnetic resonance angiogram is shown in Figure 9.7 of an 80-year-old patient who was diagnosed with a right MCA infarct that resulted in a mild mass effect and large hematoma affecting the basal ganglia territory. This patient was treated with DMSO–FDP twice daily after 48 h poststroke and showed improved perfusion in the MCA territory and reduced basal ganglia involvement.



One of the most important aspects of this trial was that while DMSO is the most helpful when given immediately after a stroke, the trial showed DMSO could save the neurons long after the stroke had happened.[32]

How long after stroke DMSO was initiated

Patient		Treatment	After 1 month	After 3 months	Tx time (h)
ES	(90/♀)	PHA-56	Markedly improved	Markedly improved	6–12
FG	(62/♀)	PHA-56	Slightly improved	Slightly improved	>48
IU	(80/♂)	PHA-56	Unchanged	Unchanged	>48
NT	(41/♂)	PHA-56 DMSO+FDP	Improved	Markedly improved	>48
NC	(61/♀)	PHA-56	Slightly improved	Improved	>48
HD	(59/♂)	PHA-56	Unchanged	Unchanged	>48
GK	(80/♀)	PHA-56	Markedly improved	Markedly improved	>48
FO	(75/♀)	PHA-56	Markedly improved	Markedly improved	13–48
EF	(60/♀)	PHA-56	Unchanged	Unchanged	>48
AE	(62/♂)	PHA-56	Improved	Markedly improved	6–12
IC	(63/♂)	PHA-56	Improved	Markedly improved	6–12
HH	(74/♂)	Standard tx	Unchanged	Slightly improved	6–12
RK	(59/♂)	Standard tx	Unchanged	Slightly improved	6–12
NA	(64/♀)	Standard tx	Slightly improved	Improved	6–12
MA	(61/♀)	Standard tx	Unchanged	Slightly improved	13–48
HK	(48/♂)	Standard tx	Unchanged	Unchanged	6–12

Given the existing options for strokes, a trial like this should have been immediately replicated by premier institutions around the world — but instead almost no one even knows it happened.

Note: *Numerous animal studies (listed **here**) have also demonstrated DMSO's effectiveness in treating ischemic strokes. Sadly this revolutionary medical treatment remains a forgotten side of medicine.*

After I learned how unconscionable the FDA's prohibition against DMSO was, I made a point to begin telling people I felt were at risk of a stroke to stock DMSO at home, and since then, I've had instances where someone (or their caretaker) called me up, described a stroke, I gave them instructions on what to do (since they already had DMSO at home), and by the time they got to the ER, the stroke was "resolved."

Note: *In my opinion, IV DMSO would have been ideal (and more effective) in those situations, but in each case, it was not feasible to implement.*

Likewise, many compelling cases have been recorded[33] of individuals who treated their strokes with DMSO:

> *"A Los Angeles school teacher suffered a major stroke just after Christmas, found unconscious at home. Immediately, she was treated with DMSO: first applied topically to her head and then given by intramuscular injection — all without ever going to the hospital, thanks to a family friend's advice.*
>
> *Remarkably, she regained consciousness later that day and continued daily DMSO treatments. By the time school resumed in January, she was back teaching, fully recovered and without any mention of her ordeal. She continued her teaching career until retirement, healthy and free of disability."*

In another case, a woman in a coma for three months after a stroke showed no signs of life. Daily topical DMSO treatment was started, and within a month, her brain began to respond. After four months, she returned home and began a regimen of daily DMSO in water alongside topical applications. Three years later, she was living a normal life with only a slight speech defect, claiming her memory was sharper than her husband's.

Note: *There are also many reported cases of individuals who took DMSO for musculoskeletal or pain disorders (by far the most common use of DMSO) who then*

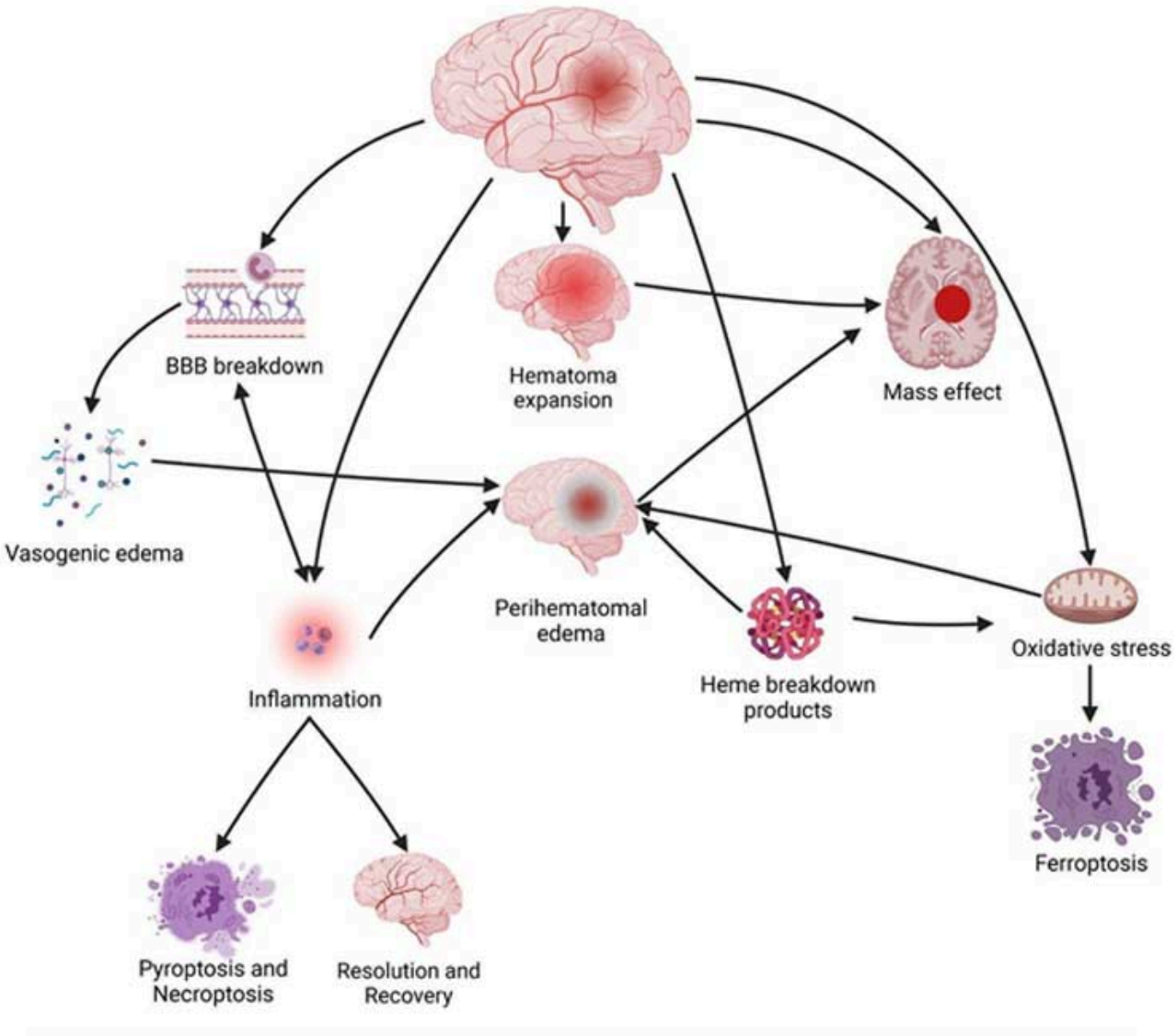
experienced a permanent improvement of stroke symptoms.

Hemorrhagic Strokes and Traumatic Brain Injuries

While ischemic strokes are difficult to treat, hemorrhagic ones (and other traumatic brain injuries) are even more challenging, and after decades, there has been surprisingly little progress in neurologic intensive care, particularly in preventing long-term paralysis and disability.[34]

> *"It was, as if the hand of God had somehow touched the [experimental] animal's forehead. 'I don't believe it,' I stammered. But it was true. I felt a tingling in my spine because this reawakening of a virtually dead animal had all the markings of a medical breakthrough.*
>
> *Instead, the discovery, the potential for saving lives and the continued research that should have uncovered other uses for dimethyl sulfoxide and similar agents was quietly laid to rest in the coffers of forgotten medicine."*

***Note:** Dr. Jack de la Torre's observations were partly based on the fact he saw numerous animals with flatlined EEGs (which typically precede brain death and then actual death) have the EEGs come back within 10 minutes of receiving DMSO.*



In cases of severe brain bleeds, key challenges like increased intracranial pressure (ICP) and inflammation can severely damage brain tissue. Common treatments often fail, leading to further complications (e.g., the most commonly used ICP lowering agents like mannitol can create a "rebound ICP" which is higher than it was at the start).

Remarkably, DMSO[35] effectively lowers ICP[36] without the rebound effect seen with other agents, while enhancing cerebral blood flow and reducing inflammation.

Research shows DMSO can significantly improve outcomes in traumatic brain injuries. In several studies, patients with elevated ICP experienced rapid decreases in pressure and improved neurological function after DMSO treatment. For instance, one study demonstrated a drop in ICP within 30 minutes for patients with closed head trauma, leading to long-term neurological improvement.[37]

Additionally, DMSO also **addresses many other critical aspects of traumatic brain injuries** and brain bleeds (which under conventional care requires many different drugs):

Pathologic Event	DMSO's Effect
Intracranial pressure increase	Reduces
Cerebral edema	Reduces
Free radical formation	Scavenges
Cerebral ischemia	Increases flow
Inflammation	Suppresses
Calcium influx	Attenuates
Na* channel activation	Blocks
NMDA-AMPA channel activation	Suppresses
Arterial thrombosis	Suppresses
Glutamate excitotoxic death	Antagonism
Tissue factor expression	Suppresses
Vascular smooth muscle cells	Prevents proliferation & migration
Neurologic disability	Reduces
JAK2/Stat pathway	Lowers
Iron induced lipid peroxidation	Prevents
Cell membranes	Protects
Neurotoxic NMDA-AMPA induced ion currents	Suppresses

Animal studies further support these findings, showing DMSO's ability to reduce brain swelling and **improve survival rates** in models of brain injury. Its unique properties make it a standout option in neurocritical care, addressing multiple challenges associated with brain injuries.[38] To put all of this into context:

> *"A January 11, 1981, **a news report**[39] in the Ocala Star Banner [page 6], carried the headline: 'DOCTOR CLAIMS DMSO SAVED 11.' The story read:*
>
> *SAN DIEGO (AP) — A doctor at the University of San Diego credits the controversial drug DMSO with saving the lives of 11 people who suffered severe head injuries. Dr. Perry E. Camp, a UCSD Medical School neurosurgeon, said*

> *Friday that dimethyl sulfoxide was effective for 11 of 30 people judged near death and for which other lifesaving methods have proved useless.*
>
> *'To take patients like that and have even one out of 10 survive is phenomenal,' Camp said. 'The fact that we have any survivorship at all ... doesn't sound like much, but it is extremely encouraging,' Camp said."*

Sadly, however, despite the immense amount of research conducted and these results being dramatically better than what the standard of care can offer, this remains an almost completely forgotten side of medicine.

Note: *Many of the same principles hold true for concussions, and the pioneers of DMSO felt it was an essential treatment for athletes after they experienced one — particularly since unhealed concussions can predispose the athlete to long-term cognitive issues (e.g., both boxers and professional football players have a threefold risk of dementia).*[40,41]

Spinal Cord Injuries

> *"We used to think that the damage caused at the moment of injury in a severe head or spinal cord injury was irreversible. But now there are animal studies and a handful of clinical cases that tell us something different. There is still a little bit of time before the injured cells die.*
>
> *Based on what we've seen in animal studies and a handful of human situations, we think that if you can treat a head injury victim within a few hours of the injury, or a spinal cord victim within one hour, there is a good chance of preventing death or the paralysis that would otherwise occur." — Dr. Jack de la Torre*

As much of the same pathology that causes permanent damage in the brain also occurs in the spinal cord (the loss of blood flow and compressive post-traumatic swelling), DMSO can produce miraculous results.[42] Despite decades of research, steroids remain the standard treatment, even though they're **largely ineffective and come with significant side effects**.[43] In fact, spinal surgeons often use steroids simply to avoid lawsuits.[44]

The greatest success comes when DMSO is administered intravenously within 90 minutes of injury.[45] For example, dogs that were expected to be paralyzed after spinal cord trauma regained nearly normal function after DMSO treatment.

Numerous other animal studies have also shown[46] DMSO prevents spinal cord injuries from causing paralysis, and **in humans numerous miraculous stories exist**, such as a 16-year-old quadriplegic girl gradually regained organ function and eventually walked after a year of DMSO therapy. Even older injuries see results — one man, paralyzed for 12 years, regained some feeling and movement after using a DMSO lotion.

Cognitive Impairment and Dementia

Since many neurological disorders are linked to poor blood flow to the brain, previous traumas (e.g., concussions or microstrokes), the accumulation of misfolded proteins or an autoimmune process (all things **DMSO is also remarkably effective at treating**), it stands to reason that many cognitive disorders would respond to DMSO.

In turn, we find that much in the same way DMSO reverses many other complications of aging (e.g., skin issue, hair loss, poor organ function) IV DMSO is one of the most effective antiaging therapies for the brain (along with **ultraviolet blood irradiation** or **improving the physiologic zeta potential**).

Likewise, IV DMSO is one of the only therapies I know of which can help challenging neurological diseases like Multiple Sclerosis, Parkinson's and ALS. Likewise, I periodically come across anecdotes of DMSO consuming centenarians who have no cognitive impairment despite their age. **Numerous animal and human studies demonstrate this**. For example:

- 18 patients with probable Alzheimer's disease[47] were treated with DMSO and tested regularly for nine months, with great improvements being noted after only three months of treatment, and becoming especially noticeable after six months of treatment. Areas of improvement included memory, concentration, and

communication alongside a significant decrease of disorientation in time and space.

- 100 patients with cerebrovascular diseases[48] (e.g., a previous stroke, cerebral embolism, or a hardening of the arteries of the brain), many of whom were senile received DMSO orally and through intramuscular injections over the course of 50 days. In addition to their coronary heart disease (i.e., atherosclerosis) and high blood pressure improving in 96.12% of them, the observing neurologist noted that their cognition, mood and behavior improved.

- A study of[49] 104 elderly adults with a disease process causing impaired cognition found DMSO was highly favorable for both their cognitive and psychiatric function.

Note: *Since many psychiatric conditions are neurological in nature, DMSO has also been shown to be remarkably effectively here (e.g., a study[50] found it had a 100% success rate in treating acute schizophrenia, and an excellent effect on psychosis from manic-depression or alcoholism, chronic schizophrenia, anxiety and obsessive compulsive disorder).*

Conclusion

DMSO was discovered during a time when the scientific community was open to exploring unconventional ideas, as science had not yet been handcuffed by a grant system designed to thwart unconventional ideas. In turn, thousands of studies were published on its potential, thanks to dedicated researchers with strong institutional support.

However, despite this promising research, the FDA suppressed its development, consigning years of scientific effort and countless animal sacrifices to the dustbin of history.

This is particularly tragic given the immense suffering caused by conditions that DMSO could potentially alleviate. Decades of research and billions of dollars later, conventional

medicine still struggles to treat many of these disorders effectively. Dr. Pierre Kory, after reviewing this article, shared my sentiments:

> *"In over 15 years of running ICUs and treating brain injuries, strokes, and bleeds, it saddens and infuriates me to know an intervention like DMSO could've helped so many. The treatments I relied on were often limited or came with major risks."*

My goal in presenting this work is to give DMSO another chance to flourish and help those in need. I sincerely thank you for your attention and allowing me to do this!

Author's note: *This is an abridged version of* ***a longer article*** *about the remarkable utility of DMSO which goes into greater detail on the points mentioned here (e.g., stroke recovery and spinal cord paralysis or how DMSO protects tissues from a variety of stressors), others not covered (e.g., the wealth of evidence DMSO can treat immensely challenging conditions like amyloidosis and Down Syndrome), and the protocols for internal DMSO use.*

That article and its additional references can be read ***here*** *(along with* ***a companion article*** *discussing DMSO's remarkable utility for a variety of musculoskeletal injuries and chronic pain conditions).*

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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