DMSO – Many Uses

http://www.bevanpotter.com/DMSO_bp.html

Description

Dimethyl Sulfoxide is a Sulfuric Compound originally used as an industrial solvent that since the 1960's has been recognized for various therapeutic benefits - its usage has been highly controversial.

Health Benefits of DMSO

Digestive System
DMSO (2,000 mg per day consumed orally as 4 x 500 mg doses) helps to prevent and treat Peptic Ulcers (where the underlying cause of Peptic Ulcer is Helicobacter pylori infection - DMSO helps to kill Helicobacter pylori).
Excretory System
DMSO (50% solution applied topically to the Feet) alleviates Foot Odor (Bromidrosis):
- Clinicians' observations indicate that the longer that the DMSO solution is allowed to remain in contact with the feet, the longer thereafter the Foot Odor subsides.
DMSO has been approved by the FDA in the treatment of Interstitial Cystitis: research
- Double-blind human studies have shown that DMSO markedly improves the condition of 93% of Interstitial Cystitis patients.
- DMSO treatment for IC should be administered by a suitably qualified medical practitioner - the usual treatment protocol involves the administration of a 50% solution of DMSO intravesically (i.e. instilled into the Urinary Tract) every 2 weeks for two sessions of four treatments each.

Immune System
DMSO helps to alleviate Allergies (by "unfolding" Cell Membranes, DMSO permits more Antigens to attach to Cell Membranes, where they are more effectively neutralized by Antibodies).
DMSO (2,000 mg per day consumed orally as 4 x 500 mg doses) helps to kill Helicobacter pylori.
DMSO significantly lessens Inflammation and swelling by reducing inflammatory exudate and enhancing the development of granulation tissue. DMSO facilitates the movement of Macrophages around and through the body's tissues (by increasing the body's production of Migration Inhibitory Factor [MIF]).

Metabolism
DMSO deactivates Hydroxyl Free Radicals (DMSO combines with Hydroxyl Free Radicals to form Methylsufonylmethane (MSM) and Water which are then readily excreted from the body).

Musculoskeletal System
DMSO (either applied topically or consumed orally) minimizes the damage caused by crushing injuries such as Bruises and pulled or wrenched Muscles: research- DMSO is a powerful scavenger of Hydroxyl Free Radicals which are responsible for much of the damage caused in these injuries.- If DMSO is applied quickly to an injury it is possible to eliminate entirely any Bruising.

DMSO (25% gel applied topically) alleviates the Pain associated with Osteoarthritis.
DMSO alleviates Rheumatoid Arthritis (by deactivating Hydroxyl Free Radicals which are one of the principal causes of the Inflammation and Pain associated with Rheumatoid Arthritis).
DMSO (10% gel applied topically) alleviates the Pain and Inflammation associated with Tendonitis and improves the ability to move the affected Tendon in Tendonitis patients.

Nervous System
DMSO (DMSO/Amino Acid Combination) therapy partially reverses some of the abnormalities that occur in Down's Syndrome.
DMSO markedly reduces the formation of the abnormal Antibodies that are characteristic of Myasthenia Gravis (this has only been demonstrated in animals to date):
- As a secondary means of alleviating Myasthenia Gravis, DMSO also inhibits the actions of Cholinesterases (similarly to the Anticholinesterase Pharmaceutical Drugs employed by orthodox medicine in the treatment of Myasthenia Gravis).

DMSO alleviates Pain by impeding the conduction of Nerve Impulses relating to the Pain sensation in the smaller Nerve Fibers.
DMSO (1 gram per kg of body weight administered intravenously in a 40% solution within one hour of the occurrence of quadriplegia) helps to prevent Paralysis following injuries to the Brain or Spinal Cord (by inhibiting the Free Radical damage that causes Paralysis). research

DMSO (1 gram per kg of body weight administered intravenously into the Spinal Cord in a 40% solution within one hour of the occurrence of quadriplegia) helps to prevent Paralysis following injuries to the Spinal Cord that would otherwise cause Quadriplegia:
- Animal and human studies indicate that this treatment often results in total avoidance and reversal of Paralysis/Quadriplegia.

DMSO (administered intravenously within four hours, and preferably within 90 minutes of its occurrence) helps to prevent the after-effects (including Paralysis) following (the Embolic and Hemorrhagic forms of) Stroke.

Respiratory System
DMSO (placed directly into the nostrils) can open the blocked Sinuses that are associated with Sinusitis (relief usually occurs within a matter of minutes).

Sexual System

DMSO (applied topically) helps to soften the abnormally hard tissue that is associated with Peyronie's Disease.

Skin
DMSO (applied topically) alleviates the lesions that occur as a result of Herpes Zoster (Shingles).
DMSO (applied topically) helps to dissolve the (Skin) tissues involved in Scarring: research
- Human studies indicate that a concentration of 50% - 80% DMSO applied topically three times per day flattens raised external Scars after several months - microscopic examination of the Skin usually reveal loosening of Collagen bundles.

DMSO (applied topically) potently alleviates Scleroderma (where Scleroderma affects the Skin).
DMSO Enhances the Function of these Substances

DMSO enhances the bioavailability of many substances (it has the capability to transport many therapeutic substances across the body's Cell Membranes without altering the integrity of Cell Membranes). By increasing their bioavailability, DMSO permits a lower dosage of some drugs than would otherwise be required.

Enzymes
DMSO inhibits the release of Cholinesterases (i.e. it possesses similar properties to Pharmaceutical Anticholinesterases).

Hormones
When exogenous forms of endogenous Steroids (including Testosterone and the Hydrocortisone form of Cortisone) are dissolved in DMSO prior to topical application, their topical bioavailability increases by 300%.

Immune System Chemicals
DMSO can enter Cells to prime or activate the sub-cellular mechanisms involved in the production and release of Migration Inhibitory Factor (MIF) and in addition, produces a cofactor that enhances MIF or has MIF-like activity.

Neurotransmitters
DMSO facilitates the transport of (supplemental) Gamma Aminobutyric Acid (GABA) across the Blood-Brain Barrier (without DMSO as a carrier-vehicle, GABA poorly crosses the Blood-Brain Barrier).

Pharmaceutical Drugs
DMSO enhances the bioavailability and effectiveness of many Anti-Viral Pharmaceutical Drugs (DMSO facilitates their transport directly across Cell Membranes into Cells where they are most potent against Viruses).
DMSO facilitates the absorption of Penicillins - i.e. Penicillins can be dissolved in DMSO and

applied topically where they are efficiently transported across the Skin.

DMSO Counteracts these Potentially Toxic Substances

Aging Pigments
DMSO (administered intravenously) facilitates the excretion of excessive accumulated Amyloid (amyloidosis).

Electromagnetic Radiation
DMSO (applied topically) protects the body against the toxic effects of X-Rays.

Minerals
DMSO facilitates the removal of Aluminium from the body. peer-reviewed research
These Substances Enhance the Function of DMSO

Antioxidants
Antioxidants counteract DMSO's tendency to convert to Sulfoxide Free Radicals.

Side Effects of DMSO Therapy

Excretory System
DMSO (temporarily) causes Halitosis in the form of a garlic-like odor of the breath (this odor is very unpleasant and appears to be the major practical drawback in the usage of DMSO).

Free Radicals
After chemically reacting with Hydroxyl Free Radicals, DMSO is converted to a Sulfoxide Free Radical.

Skin
Itching is a common side effect of topical DMSO therapy - this side effect can usually be avoided by diluting the concentration of DMSO.
Skin Rashes are a common side effect of topical DMSO therapy - this side effect can usually be avoided by diluting the concentration of DMSO.

Myths Dispelled

Eyes/Eyesight
DMSO is often avoided by orthodox medical practitioners due to UNFOUNDED fears that it can cause Cataracts and other changes within the human Eye:
- This aspect of DMSO toxicology has been extensively tested in both animals and humans: the results clearly show that DMSO does NOT cause Cataracts in humans even at extremely high dosages for periods up to two years. No adverse changes were found in human or monkey eyes

after prolonged, high levels (up to 30 times the usual dosage) of DMSO treatment.
- The myth regarding DMSO's toxicity to human Eyes arises from toxicology studies that show that DMSO DOES cause Cataracts and other changes in the Eyes of both dogs and rabbits, however the toxicity of DMSO to the eyes of these animals definitely differs from that of humans.

Bioavailability
DMSO has the ability to pass through every tissue and Cell Membrane of the body except the Enamel of Teeth, fingernails and Hair without destroying the integrity of these tissues and Cell Membranes (i.e. it is a membrane penetrate). DMSO also permits the passage of a number of compounds across the barriers of Cell Membranes.
DMSO is readily absorbed when administered topically onto human Skin - peak levels occur after 4-8 hours. Topical administered DMSO is slightly less bioavailable than orally ingested DMSO.

Orally ingested DMSO is also rapidly absorbed and reaches a blood serum peak in 4 hours and becomes undetectable after 120 hours.
DMSO readily crosses the Blood-Brain Barrier (this property of DMSO allows its utilization as an effective vehicle for transporting other substances that may not normally cross the Blood-Brain Barrier).

DMSO is excreted from the body partly in an unchanged state and partly as its metabolite - Dimethyl Sulfoxone (DMSO2).

DMSO as part of the Global Sulfur Cycle

DMSO is an intermediate product of the methyl-S-methane global Sulfur cycle which distributes bioavailable Sulfur for all animal and plant life. Approximately 85% of Sulfur (for life) is derived from the pathway:
- Sulfonium Salts > Dimethylsulfide > Dimethyl Sulfoxide (DMSO) > Methylsulfonylmethane (MSM)
- Sulfonium Salts (produced by phytoplankton in Water) yield the volatile thioether named Dimethylsulfide which is released into the upper atmosphere.
- Sunlight catalyzes the oxidation of Dimethylsufide to DMSO.
- DMSO is further oxidized in the upper atmosphere (by Sunlight) to form MSM.
- This MSM is then concentrated into raindrops which return to the surface of the earth.
- Plants absorb and accumulate this MSM (and use some of this MSM for bulding Sulfuric compounds).

Forms of DMSO
DMSO is manufactured in liquid and gel forms.

Dosage Recommendations

Long-Term Dosage Reduction

Less DMSO is required to achieve therapeutic results as time passes (i.e. the cumulative effects of DMSO appear to increase with the passage of time).

Topical Therapeutic Dosage Protocol
The liquid form of DMSO is the most effective form of topical DMSO application, although most people prefer the gel form.
Topically applied DMSO is not rubbed onto the Skin but painted or patted on with a thin coating.
The concentration of DMSO used in topical treatments should ideally be individualized on a case by case basis - the optimal concentration varies from 50-80% DMSO.

The Face and Neck are more sensitive to topical DMSO than other parts of the body - the maximum concentration of DMSO for application to the Face or Neck should be no greater than 50%.
Topical applications of DMSO should not exceed 70% in areas of the skin affected by poor circulation.
It is desirable to commence topical DMSO treatment at low concentrations until Skin tolerance builds up.

The Skin must be clean, dry and unbroken before topical application of DMSO.
Aloe Vera gel is an excellent remedy for the temporary Skin irritation that sometimes occurs as a result of topical DMSO therapy.

Oral DMSO Dosage Protocol
The usual oral dosage of DMSO is 1 - 2 teaspoons (5 - 10 ml) per day.
The oral dosage of DMSO used for the treatment of Peptic Ulcers is 2,000 mg per day (taken as four equally divided doses during the day).
Oral DMSO is normally mixed with Tomato juice or Grape juice to mask its "foul" taste.

Intravenous Injections of DMSO Dosage Protocol
Up to 20 cc DMSO that has been diluted to a 25% concentration with sterile water is often administered via intravenous injection by suitably trained physicians for the treatment of the more serious degenerative diseases.
Injected DMSO is not administered by infusion or by the drip technique but is administered by the "slow push" method which involves a slow push into the bloodstream all at once.

Intravenous Drip DMSO Dosage Protocol
The slow intravenous drip method is applied over a 2-3 hour period. It involves the addition of 50-100 cc DMSO to a 500 cc glucose or saline solution, dripped into a vein in the patient's arm. This method should only be administered by a suitably qualified physician.

Commercial Availability of DMSO
Topical Products

DMSO is available from health food stores and mail order supplement suppliers (in the USA) in the form of:
- cream (containing 50% DMSO) for topical application to the Skin

DMSO/Water Combinations
RIMSO-50 is comprised of 50% Water + 50% DMSO, It is a form of pure, pharmaceutical grade DMSO manufactured by Terra Pharmaceuticals and supplied in 50 cc vials.
Domosa is comprised of 90% DMSO + 10% Water. It is a form of pharmaceutical grade DMSO that is suitable for injection or for further dilution with Water for topical or oral ingestion. It is supplied in pint bottles and in gallon bottles for veterinary use.

Dimexide is the brand name of a DMSO product available in Russia.

DMSO/Amino Acid Combinations
Akron (available in Argentina) and Merinex (available in Chile) consist of DMSO combined with Amino Acids (Gamma-Aminobutyric Acid [GABA], Gamma-Amino-Beta-Hydroxybutyric Acid [GABOB] and Acetylglutamine). They are provided in 5 ml ampoules (for intramuscular injection) and capsules (for oral administration). The dosage protocol for DMSO/Amino Acid combinations involves one intramuscular injection every second day and 2 or 3 capsules orally each day. Injections are suspended every 40 days for a rest period of one month during which capsules are still used. This program of treatment normally lasts for one year. Akron and Merinex are not approved by the FDA for use in the USA.

Vasoactive DMSO Combinations
Ipran is the trade name of a vasoactive DMSO product, however this product has not been approved for use in the USA.

Industrial Grade DMSO
Caution: many of the industrial grade DMSO solutions intended for use as solvents have an acid or Acetone contamination of several percent. Acetone contamination can lead to serious medical consequences - because of its small molecular weight, Acetone is readily carried into the blood by Acetone- contaminated DMSO.

Source of Commercial DMSO

In the USA, commercially manufactured DMSO is derived from Lignin.

Chemical Data

The freezing point of DMSO is 68 degrees Fahrenheit.
The molecular weight of DMSO is 78.15.

Molecular Structure

The DMSO molecule is ten-sided with a center occupied by a Sulfur atom. It contains two methyl groups - an oxygen atom and a nonbinding electron pair - located at the points of the tetrahydron.