INTERNATIONAL
IV NUTRITIONAL THERAPY
GLOBAL PHYSICIAN EDUCATION

DMSO / MSM & HCl

Advanced IV Therapy: Chronic Disease and Infections
by
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DMSO and MSM are formed in the atmosphere and return to earth in rainfall, then are taken up by plants and concentrated up to one hundred times. Both compounds are present in small amounts in certain fruits, grains, vegetables and beverages such as milk. All Commercially available DMSO and MSM are manufactured, since the small amounts in plants makes extraction impractical. It remains an indisputable fact that both molecules are found in nature and are therefore natural.

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MSM and DMSO are naturally occurring sulfur compounds. They originate as an end product of the sulfur cycle that begins in the ocean. Algae and phytoplankton produce sulfur compounds know as tertiary dimethysulfonium salts, and these salts are transformed to dimethyl sulfide, DMS, a highly volatile compound. When exposed to ozone and high-energy ultraviolet light, DMS is converted into DMSO and MSM, both of which are water soluble

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DMSO

Dimethyl Sulfoxide

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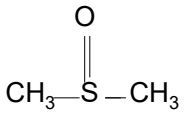
DMSO Molecule



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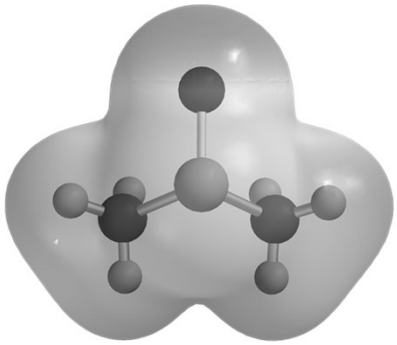

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- DMSO is both water and lipid soluble
- An efficient solvent for water-insoluble compounds
- a hydrogen bond disrupter.
  - a hydrogen bond disrupter decreases inflammation by preventing or decreasing oxygen or hydrogen peroxide reactions with cellular structures

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- Biological properties first introduced to the scientific community by Stanley W. Jacob, MD in 1963
- Potent anitoxidant and free-radical scavenger
- Anti inflammatory
  Prevents the oxidation of lipoproteins

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- Anti- microbial, fungal, bacterial and viral
  Increases sensitivities to pharmaceuticals when used synergistically
  Enhances resistance and decreases susceptibility to infection
- Cholinesterase inhibition
- Cryoprotective

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- Is metabolically converted to MSM within the body

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Indications for DMSO

- Atherosclerosis
- Interstitial Cystitis
- Scleroderma
- Reynauds Disease
- Lupus (SLE)
- Rheumatoid Arthritis

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- Degenerative Arthritis
- Ulcerative Colitis
- Chronic Obstructive Pulmonary Disease
- Reflex Sympathetic dystrophy
- Diabetic Ulcerations
- Burns
- Scar Tissue (increasing circulation)
  - Adjunct in Plastic Surgery

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- Close Head injuries, edema
- Strokes- inhibits platelet aggregation
- Fibromyalgia, polymyalgia used in conjunction with MSM (DMSO2)
- Chronic prostatitis
- Dermatologic diseases
- Schizophrenia
- Alzheimer's disease
- Chemical exposures (i.e. cholorform, bromobenzene)

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DMSO and the Blood Brain Barrier

- DMSO is used in medicine as a BBB solvent to increase transportation of drugs across the BBB.
- It is often used with Chemo as well as HDIVC in brain cancers to increase transport across the BBB.
- DMSO is also potentially of value in reducing edema after CNS radiation.

Julian T. Hoff, Richard F. Keep, Guohua Xi and Ya Hua. *Effect of dimethyl sulfoxide on blood-brain barrier integrity following middle cerebral artery occlusion in the rat.* Acta Neurochirurgica Supplementum -Brain Edema XIII 10.1007/3-211-30714-1_55

Walker M. *Profile of the holistic cancer therapist W. Douglas Brodie, MD, HMD.* Townsend Letter for Doctors and Patients 2/1/2002

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Side effects

- Characteristic odor described as sulfur, garlic and described as creamed corn
- Dry skin, itching, occasional burning

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Potential side effects at high doses

Nausea
Vomiting
Diarrhea
Hemolysis
Rashes
Renal failure

- **Hypertension**
- **Bradycardia**
- **pulmonary edema**
- **Bronchospasm**
- **Cardiac arrest**
- **Heart block**
  - rarely
- **Anaphylaxis**
  (flushing and rashes) *

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- Complications
- * due to high concentration and rate of infusion
- Slow infusion rate, or give in a greater volume of NS or D5W at a slower rate

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Treatment protocols

- Courtesy of Stanley Jacob, MD; Oregon Health & Science University (OHSU), Portland, Oregon

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Treatment protocols

- Oral:
- 2%,
- 4% or
- 10% concentrations diluted in water

- Dosage: 1 teaspoon t.i.d. with meals

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Treatment protocols

- Topical:
- Penetrates the cell membrane, causing an increase in osmolality both inside and outside the cell preventing any significant hemolysis due to the formation of an osmotic gradient

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- 50% concentration diluted in water for head area
- 70% concentration diluted in water for all other body and extremity areas

- skin should be clean and dry
- apply 5-15 ml b.i.d. or q.i.d prn

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- addition of urea (10%) reduces skin irritation and odor
- commercially available with a rose scent

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- IV:
- Given in NS or D5W in less than 10% concentration
- Dosage should not exceed 0.3 gm/kg of body weight calibrating on a 70kg (150 lb) person

- *note that if >150lb or 70K the dosage does not exceed this amount

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- 2 grams has been given successfully for closed head injuries or strokes (CVA)

- Administration: 1-5 times weekly over a 30 minute period for extended periods of time (months

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Side effects:

- greater than 10% leads to hemolysis
- nausea due to high concentration and rate of infusion
- Slow infusion rate, or give in a greater volume of NS or D5W with a reduced rate of infusion.

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Hoang BX, et.al. **Dimethyl Sulfoxide–Sodium Bicarbonate Infusion for Palliative Care and Pain Relief in Patients With Metastatic Prostate Cancer.** Journal of Pain & Palliative Care Pharmacotherapy. 2011;25:350–355. DOI: 10.3109/15360288.2011.606294

Prostate cancer (adenocarcinoma of the prostate) is the mostwidespread cancer in men. It causes significant suffering and mortality due to metastatic disease. The main therapy for metastatic prostate cancer (MPC) includes androgen manipulation, chemotherapy, and radiotherapy and/or radioisotopes. However, these therapeutic approaches are considered palliative at this stage, and their significant side effects can cause further decline in patients' quality of life and increase non–cancer-related morbidity/mortality. In this study, the authors have used the infusion of dimethyl sulfoxide–sodium bicarbonate (DMSO-SB) to treat 18 patients with MPC. The 90-day follow-up of the patients having undergone the proposed therapeutic regimen showed significant improvement in clinical symptoms, blood and biochemistry tests, and quality of life.

There were no major side effects from the treatment. In searching for new and better methods for palliative treatment and pain relief, this study strongly suggested therapy with DMSO-SB infusions could provide a rational alternative to conventional treatment for patients with MPC.

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Hoang, et.al. Protocol:

Patients with pain score <3 points (VDS) were treated with infusion of 25 mL of 99.9% DMSO solution mixed with 250 mL of SB 1.4% solution and 10 mL of magnesium sulfate 1.5% (7 patients). Patients with pain score ≥3 points were treated with infusion of 40 mL DMSO mixed with 500 mL of SB 1.4% solution and 10 mL of magnesium sulfate 1.5% (11 patients).

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Hoang, et.al. Protocol:

Patients with pain score that did not decrease in 3 days of treatment with infusion of 40 mL DMSO were recommended to receive a dose of 60 mL of DMSO mixed with 500 mL of SB 1.4% solution (2 patients). When the pain was completely under control, the dose of DMSO returned to 40 mL. The patients who were treated with 40 DMSO and achieved complete pain control had their dose of DMSO reduced by 5 mL after each cycle of infusion reaching a maintenance dose of 25 mL DMSO per day for the remaining cycles. The speed of drip was 40 to 60 drops per minute (mean: 50 drops per minute).

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Hoang, et.al. Protocol:

- #1:
  - 42 mL 8.4% Bicarbonate
  - 208 mL Sterile Water
  - 25 mL 99% DMSO
  - 10 mL Magnesium Sulfate
  - 4 mEq Potassium Chloride
- #2:
  - 83 mL 8.4% Bicarbonate
  - 417 mL Sterile Water
  - 40 mL 99% DMSO
  - 10 mL Magnesium Sulfate
  - 6 mEq Potassium Chloride

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Hoang, et.al. Protocol:

All patients received the full 12 cycles of five infusions. The patients with edema were treated with appropriate diuretics. Patients also were instructed to take 1000 mg of potassium orally if there was no evidence of kidney failure. During the treatment period, patients were allowed to take any medication, dietary supplements, vitamins, or herbs for any health disorders they were experiencing.

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Hoang, et.al. Side effects:

- No high grade.
- There were nine episodes of transient mild headache and five episodes of moderate chilling during and after treatment. These side effects subsided and were resolved in 1 to 2 hours and all patients were able to continue with the next set of infusions. For these patients who experienced transient headache and episodes of chilling spell, we recommended slowing the drip rate to 30 drops per minute in the next infusion session.

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Hoang, et.al. Outcomes:

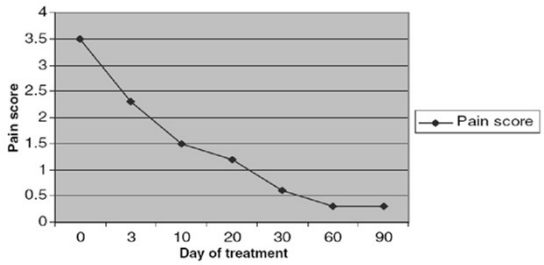

FIGURE 1. Reduction in pain from baseline during the treatment period.

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Hoang, et.al. Conclusions:

"The results of this open-label clinical study suggest that patients with MPC can be treated effectively and safely with DMSO-SB infusion. These agents can be produced inexpensively and used for the patients in and out of the hospital. The patients with MPC who were treated with DMSO-SB infusion had fast relief in two of the key symptoms—pain and urination outflow limitation. More importantly, DMSO-SB treatment substantially improved the patients' quality of life without major negative effects on body and organ functions."

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MSM

Methylsulfonylmethane

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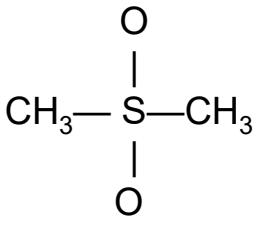
MSM Molecule



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- Pure commercial MSM is produced by reacting H_2O_2 with DMSO and then distilling off the impurities.
- MSM produced by crystallization often contains considerable impurities.

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Toxicity

- The LD50 of MSM is so large that the value is meaningless when applied to this substance
- 18,000 patients have been treated at OHSU Hospital with doses up to 100 grams per day without serious side effects
- Long-term toxicity studies in rodents with oral doses of 8 g/kg/day showed no toxic effects.
  - The equivalent in humans would be 1.2 pounds per/d

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Toxicity

- Acute oral toxicity studies used 20g/kg/d and no animals died
- LD50 study in rats found dose was ≥ 17g/kg body wt, equivalent to 2.6 lbs per day in humans
- Ocular and dermal irritancy was the lowest score that can be achieved by any compound.

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Drug and Nutrient Interactions

- There have been no documented interactions between any pharmaceutical or nutraceutical compound and MSM
- May have an aspirin-like effect on platelet aggregation, but not as strong
  - Nausea reported in high doses (6-20,000mg)
- 6 reports of menorrhagia with MSM supplementation
- No significant interactions with vitamins, minerals, or botanicals have been reported.

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MSM Protocols

Courtesy of Stanley Jacob, MD; Oregon Health & Science University (OHSU) Portland, OR

- **IV**
- 15% in deionized water, sterile for parenteral use, 100 ml
- 100 ml 15% MSM is admixed with 100 ml of D5W
- Administered over 12-15 min.
- Drip Rate: 15ml/min
  - To achieve this rate consider a 22-20g needle/catheter as this rate is not attainable with a 24g angiocath

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- When adding MSM to other nutrients (Vits/Min), a rate suitable for the infusion of the other nutrients should be utilized, and this depends on their concentration within the IV and the resultant osmolarity

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Protocols

- **Oral** MSM
- Liquid oral MSM is absorbed better than MSM in capsules
  - 15% in deionized water, 8 ozs.
- Dose: 1/5 tsps with breakfast and lunch
- Can be mixed with water, juice, milk and coffee.
- Do NOT mix with alcohol
- MSM increases GI motility, resulting in increased stool frequency, this decreases over time
  - Increase dose gradually
- > 100gms have been administered orally

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Protocols

- **Topical** MSM gel
- 15% MSM
- 6-8 drops over painful areas bid
- Can be used hourly
- May leave a white residue on the skin
  - Remove with water
- Absorbed well topically
- Not a carrier/synergist like DMSO

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Protocols

- **Urological**
- 15%, sterile, 50 ml
- Effective: intersitial cystitis, prosatitis, irritable bladder syndrome
- Instill with #10 french cath. With a 60 ml catheter tip syringe (trained professional)
- Pts can be self taught to perform this using a new sterile catheter each time
- Instilled MSM is retained in the bladder until the patient feels the urge to void
- Often retained over night if instilled at bedtime

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Protocol

- **Trigger point injections**
- 5 ml IV MSM mixed with 5 ml 0.5% lidocaine
- Can be given s.c. or i.m.
- Inject trigger point or areas of pain 3 days per week

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Indications for MSM

- **Scleroderma**
- If the patient has esophageal and internal organ involvement they should be started with five IV txs weekly for 6 weeks
- After 6 wks a noticeable improvement in swallowing solid foods is noted.
- Topical MSM gel several times weekly, oral as tolerated
- At 6 weeks, reduce to 2x/wk for several months increasing oral dose to tolerance

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Indications for MSM

- **Rheumatoid arthritis**
- IV's 1-2x/wk quicker and better results
- Oral 1/5 tsps with breakfast and lunch
- Topical apply on affected area
- 2 months tx, reassess, may notice need to reduce pharm. txs

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Indications for MSM

- Fibromyalgia
- Note: tx x 2 mos before benefit noticed
- IV treatments 5x week for 2 wks
  - Decrease to 2x wk for several months
- After 2 wks start oral and topical MSM
- Trigger pts as described

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Indications for MSM

- Back Pain including Disogenic
- IV txs 5x week x 2 wks
  - Decrease to 2x wk for months as required
- Follow with oral and topical MSM
- Increase Oral as tolerated
- Trigger pts as indicated

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Indications for MSM

- Interstitial Cystitis
  - 90% improvement with MSM when pt compliant with protocol
  - IV tx 5x week for 2 wks
    - Decrease to 2x wk for 2 monts
  - Oral tx concurrent with IV
    - 11/2 tsp 2 x/day increase as tolerated
  - Topical gel apply over pernieum/bladder

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Indications for MSM

Interstitial Cystitis

- Bladder Instillation Protocol
  - 50mls of 15% MSM 5x/wk x 1 month
  - 50mls of 15% MSM 4x/wk x 1 month
  - 50mls of 15% MSM 3x/wk x 1 month
  - 50mls of 15% MSM 2x/wk x 1 month
  - 50mls of 15% MSM 1x/wk x 1 month
  - 50mls of 15% MSM weekly thereafter
  - Do NOT stop irrigations until reasonable comfort level is obtained
    - Weekly tx prn/indefinitely

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References

- MSM: the definitve guide. A Comprehensive Review of the Science and Therapeutics of methylsulfonylmethane. Stanley Jacob, MD and Jeremy Appleton, ND. Freedom Press, Topanga, CA, 2003
- Protocols on the Proper Administration of MSM. Stanley Jacob, MD. Oregon Health & Science University (OHSU), Portland, Oregon. 2003

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Hydrochloric Acid

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Hydrochloric Acid

- Dilute form used
  - 1:500 – 1:1000 concentration
  - In medical literature in the 1920's-1940's as an antibiotic
- IV of 10 cc SLOW push given
  - Stimulates WBC's
    - Used in Viral and some aggressive Bacterial conditions
      - Chemotherapy compromised
    - **Contraindicated in any infection that cannot drain!**
      - Skull, Jaw or Brain abscess…

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Hydrochloric Acid

- Know your dilution form
- When to high:
- **IF PUSHED TOO QUICKLY WILL SCLEROSE THE VEIN!**

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Hydrochloric Acid

- Dose and Administration:
  - Typical dose is 10 cc daily for 3 to 12 days for acute infection
    - Given as a slow push – or -
  - Used as an adjunct to Immune formulae **(given through side port of the IV line)**
  - **If diluted in a high volume IV it is only going to act as a pH adjuvant.**

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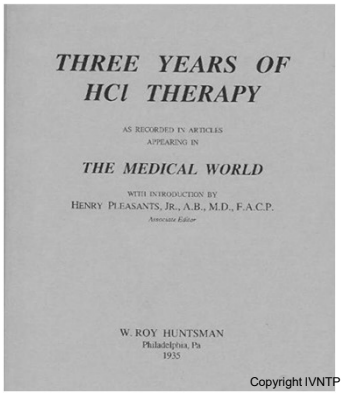
The only source for the original HCl data. Very interesting and informative.


THREE YEARS OF HCl THERAPY

AS RECORDED IN ARTICLES APPEARING IN

THE MEDICAL WORLD

WITH INTRODUCTION BY

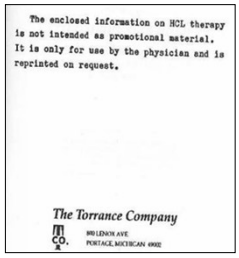
HENRY PLEASANTS, JR., A.B., M.D., F.A.C.P.

Associate Editor

W. ROY HUNTSMAN

Philadelphia, Pa

1935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Claimed Success of Uses of IV HCL

- Iritis
- Sinusitis
- Wound infection
- Bronchial infection
- Staph & Strep
- Hepatitis with jaundice
- Tuberculosis
- Kidney infection
- Malaria
- Elephantiasis
- Leprosy
- Cerebrospinal meningitis

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Contraindications

- Tooth abscess
- Infected Appendix

Caution

- Sinus infection
- Middle ear infection
- Myelogenous leukemia (raises WBC)
- Can cause temporary fever

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How does it work?

- Transitory extracellular acidosis.
  - Known to activate variety of immune cells

- Arch Surg.1986 Oct;121(10):1195---8 PMID:3767651
- J Leukoc Biol. 2001 Apr;69(4):522---30. PMID:11310837 J Immunol 2006;176;1163---1171 PMID:16394005 And many more citations

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Clinical Research

Case 1:

24 hours

32% Increase Neutrophils

14% Increase Lymphocytes

12% Increase in B-cells

53% Increase in NK Cells

- Cells continued to remain elevated well into 72 hours after infusion.

Thanks to Dr. Davis Lamson, ND

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Clinical Research

Case 2:

24 hours

14% Increase Neutrophils

68% Increase Lymphocytes

68% Increase in NK Cells

- Cells continued to remain elevated well into 72 hours after infusion.

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Clinical Research

Case 3:

6 hours

Increase in all cell types 26-71% except NK Cells

24 hours: Cells returned to baseline

Thanks to Dr. Davis Lamson, ND

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