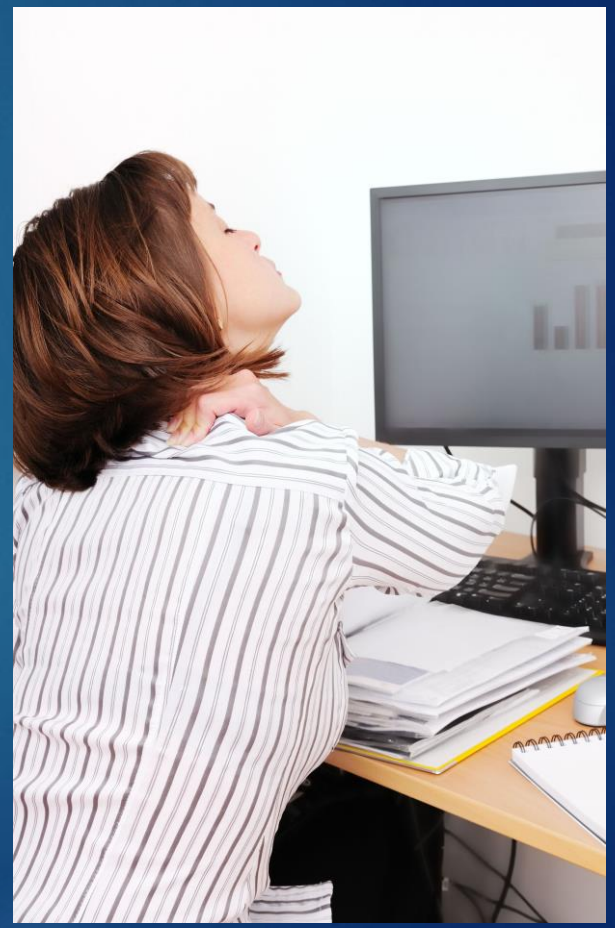
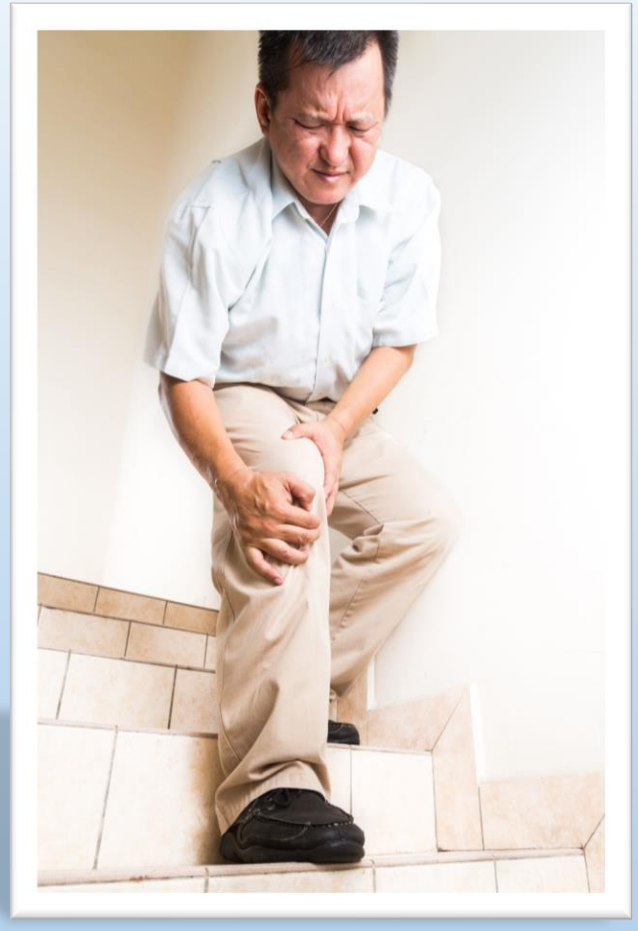
Supplements & Herbs to Reduce Pain & Inflammation

TAL COHEN LAC. DAOM



Why is it so important to talk about **pain** management?



Pain is the leading cause of disability in adults above 45 years old

100 million Americans suffer from chronic pain

Pain is the leading cause of visits to healthcare providers

Which pain is most common?

A. Headaches
B. Neck pain
C. Back pain
D. Nerve pain

INSTITUTE OF MEDICINE

Institute of Medicine (US) Committee on Advancing Pain Research, Care, and Education. pain in America: A blueprint for transforming prevention, care, education, and research. (2011). Washington, D.C: National Academies Press.

Back pain is the leading cause of disability in Americans under 45 years old

- Back pain was the most common (27%)
- Severe headache or migraine pain (15%)
- Neck pain (15%)
- Facial ache or pain (4%)

INSTITUTE OF MEDICINE

Institute of Medicine (US) Committee on Advancing Pain Research, Care, and Education. pain in America: A blueprint for transforming prevention, care, education, and research. (2011). Washington, D.C: National Academies Press.

Pain costs society at least $560-$635 billion annually:

$261 to $300 million in health care costs
$297 to $336 billion due to lost productivity (based on days of work missed, hours of work lost, and lower wages)

The amount equal to about $2,000 for everyone living in the U.S.

INSTITUTE OF MEDICINE

Institute of Medicine (US) Committee on Advancing Pain Research, Care, and Education. pain in America: A blueprint for transforming prevention, care, education, and research. (2011). Washington, D.C: National Academies Press.

The U.S. is 5% of the world's population and consumes 75% of the world's prescription drugs

United Nations Office on Drugs and Crime report

106,000 people
die every year from correctly prescribed medications (non-error, adverse effects of)

290 people die every day!

JAMA The Journal of the American Medical Association

Starfield B.
Is US Health Really the Best in the World?.
***JAMA*. 2000;284(4):483-485.**
doi:10.1001/jama.284.4.483.

How many American adults are taking supplements?

A. Unknown
B. 25 percent of population
C. 52 percent of population
D. Only seniors, hypochondriacs, and naturopaths take vitamins

52% of US adults report use of supplements in 2011–2012

JAMA The Journal of the American Medical Association

Kantor, E. D., Rehm, C. D., Du, M., White, E., & Giovannucci, E. L. (2016). Trends in Dietary Supplement Use among US Adults From 1999–2012. *JAMA*, *316*(14), 1464–1474. http://doi.org/10.1001/jama.2016.14403

Triggers of Inflammation

Client 70yo female

- Chronic lower back and hip pain for over 10 years
- Tried treatments: Chiropractic, massages, pain medication, and several anti-inflammatory supplements
- Decrease in memory in last few years (“forgetting simple things every day. Gets worse and worse”)
- General sensation of fatigue (“used to be more active”)
- Occasional sensation of mild depression
- Chronic allergies and sinus congestion
- Occasional asthma attacks for over 25 years (“wakes up with difficulty to breath some nights”)

Toxic & Essential Elements; Hair

Heavy Metals Results

TOXIC METALS		RESULT µg/g	REFERENCE INTERVAL	PERCENTILE 68th 95th
Aluminum	(Al)	2.2	< 7.0	
Antimony	(Sb)	0.013	< 0.050	
Arsenic	(As)	0.043	< 0.060	
Barium	(Ba)	0.05	< 2.0	
Beryllium	(Be)	< 0.01	< 0.020	
Bismuth	(Bi)	0.018	< 2.0	
Cadmium	(Cd)	0.012	< 0.050	
Lead	(Pb)	0.16	< 0.60	
Mercury	(Hg)	1.9	< 0.80	
Platinum	(Pt)	< 0.003	< 0.005	
Thallium	(Tl)	< 0.001	< 0.002	
Thorium	(Th)	< 0.001	< 0.002	
Uranium	(U)	0.010	< 0.060	
Nickel	(Ni)	0.04	< 0.30	
Silver	(Ag)	0.17	< 0.15	
Tin	(Sn)	0.12	< 0.30	
Titanium	(Ti)	0.22	< 0.70	
Total Toxic Representation				

High levels of mercury might lead to poor memory, cognitive dysfunction, and neuromuscular disorders.

Heavy Metal Accumulation & Inflammation

- Mercury is capable of inducing a wide range of clinical presentations
- Commons symptoms: fatigue, anxiety, depression, odd paresthesias, weight loss, memory loss, and difficulty concentrating
- **Possibly from years of having dental fillings and high fish consumption**

Bernhoft, R. A. (2012). Mercury Toxicity and Treatment: A Review of the Literature. Journal of Environmental and Public Health, 2012, 460508. http://doi.org/10.1155/2012/460508

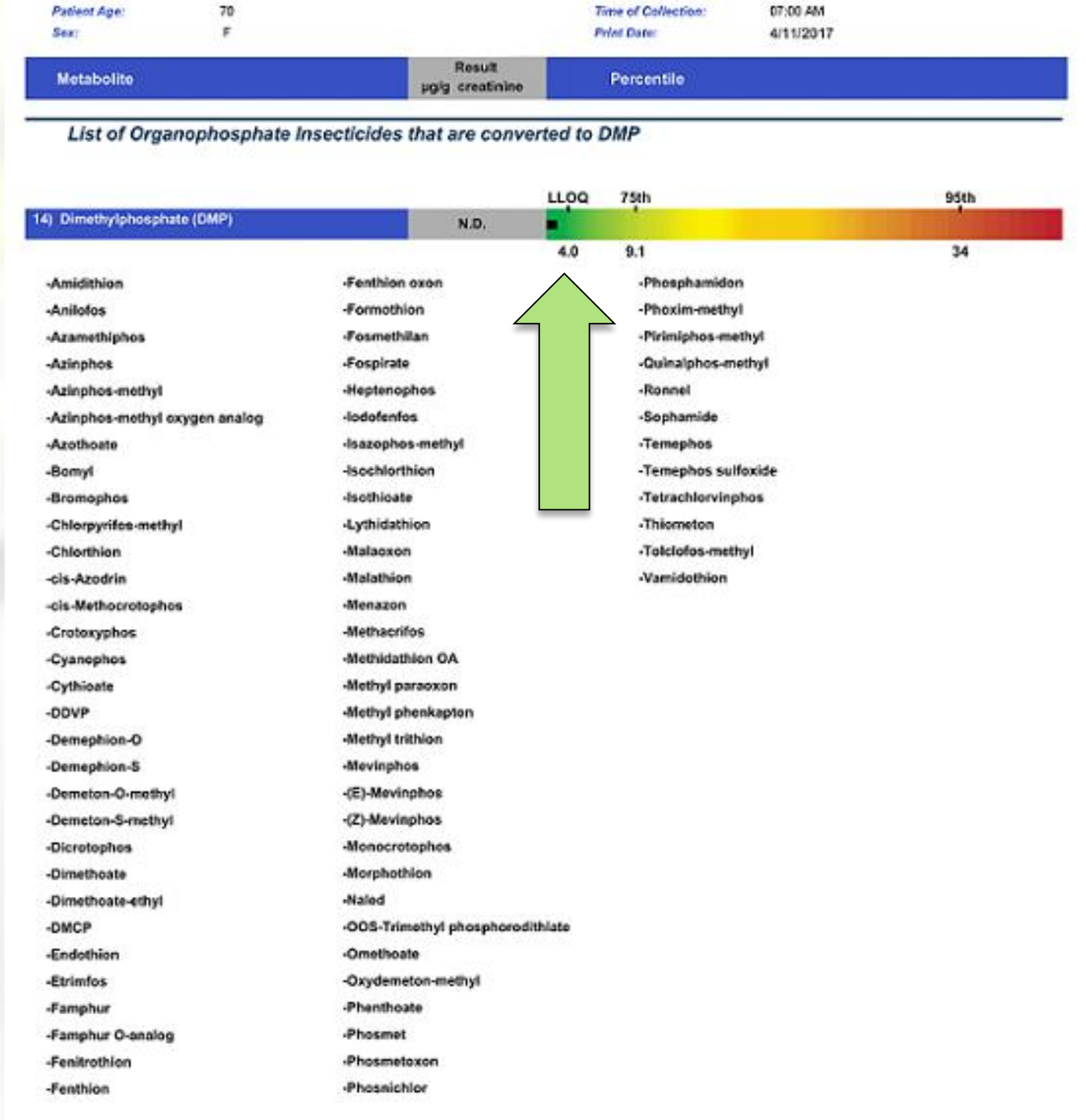
Toxic Accumulation

Although the mechanism of metals' toxicity is not fully known, studies show that accumulation can generate reactive oxygen species (ROS), which cause **damage to lipids, proteins, and DNA.**

Studies suggest that mercury exposure can induce complex autoimmune dysfunction, such as RA or multiple sclerosis.

Motts, J. A., Shirley, D. L., Silbergeld, E. K., & Nyland, J. F. (2014). Novel biomarkers of mercury-induced autoimmune dysfunction: a Cross-sectional study in Amazonian Brazil. Environmental Research, 132, 12–18. http://doi.org/10.1016/j.envres.2014.03.024

Results of measurement of 172 environmental toxins (GPL-TOX)



Patient Age: 70 | Time of Collection: 07:00 AM
Sex: F | Print Date: 4/11/2017

Metabolite	Result μg/g creatinine	Percentile

List of Organophosphate Insecticides that are converted to DMP

LLOQ 75th 95th

14) Dimethylphosphate (DMP)	N.D.	4.0	9.1 / 34

-Amidithion
-Anilofos
-Azamethiphos
-Azinphos
-Azinphos-methyl
-Azinphos-methyl oxygen analog
-Azothoate
-Bomyl
-Bromophos
-Chlorpyrifos-methyl
-Chlorthion
-cis-Azodrin
-cis-Methocrotophos
-Crotoxyphos
-Cyanophos
-Cythioate
-DDVP
-Demephion-O
-Demephion-S
-Demeton-O-methyl
-Demeton-S-methyl
-Dicrotophos
-Dimethoate
-Dimethoate-ethyl
-DMCP
-Endothion
-Etrimfos
-Famphur
-Famphur O-analog
-Fenitrothion
-Fenthion
-Fenthion oxon
-Formothion
-Fosmethilan
-Fospirate
-Heptenophos
-Iodofenfos
-Isazophos-methyl
-Isochlorthion
-Isothioate
-Lythidathion
-Malaoxon
-Malathion
-Menazon
-Methacrifos
-Methidathion OA
-Methyl paraoxon
-Methyl phenkapton
-Methyl trithion
-Mevinphos
-(E)-Mevinphos
-(Z)-Mevinphos
-Monocrotophos
-Morphothion
-Naled
-OOS-Trimethyl phosphorodithiate
-Omethoate
-Oxydemeton-methyl
-Phenthoate
-Phosmet
-Phosmetoxon
-Phosnichlor
-Phosphamidon
-Phoxim-methyl
-Pirimiphos-methyl
-Quinalphos-methyl
-Ronnel
-Sophamide
-Temephos
-Temephos sulfoxide
-Tetrachlorvinphos
-Thiometon
-Tolclofos-methyl
-Vamidothion

Patient Age:	70	*Time of Collection:*	07:00 AM
Sex:	F	*Print Date:*	4/11/2017

Toxic Compounds

Metabolite	Result µg/g creatinine	Percentile
9) 2-hydroxyethyl mercapturic (HEMA)	12	LLOQ 0.80 · 75th 1.7 · 95th 4.8

Parent: Ethylene oxide, Vinyl chloride, Halopropane

High HEMA may be due to exposure to ethylene oxide, which is used in many different industries including agrochemicals detergents, pharmaceuticals, and personal care products. Ethylene oxide is also used as a sterilant on rubber, plastics, and electronics. Chronic exposure to ethylene oxide has been determined to be mutagenic to humans. Multiple agencies have reported it as a carcinogen. Studies of people exposed to ethylene oxide show an increased incidence of breast cancer and leukemia. Ethylene oxide may be difficult to detect since it is odorless at toxic levels.

High HEMA [illegible] industrial chemicals, including polyvinyl chloride, and used in the past as an aerosol propellant. Exposure to vinyl chloride has been associated with increased incidence of autism. High [illegible] damage and liver cancer, degenerative bone changes, thrombocytopenia, enlargement of the spleen and even death. To reduce exposure to vinyl chloride, eli[illegible] or drinking (especially warm or hot) food or beverages. Replace these containers with glass, paper, or stainless steel whenever possible. Elimination of vinyl chloride can also be accelerated by sauna treatment, the Hubbard detoxification protocol employing niacin supplementation, vitamin B-12 therapy, by glutathione (reduced) supplementation (oral, intravenous, transdermal, or precursors such as N-acetyl cysteine [NAC]).

The chemical Ethylene can be found in agrochemicals, detergents, pharmaceuticals, and personal care products.

10) N-acetyl(propyl)cysteine (NAPR)	88	LLOQ 4.0 · 75th 11 · 95th 46

Parent: 1-bromopropane

1-bromopropane is an organic solvent used for metal cleaning, foam gluing, and dry cleaning. Studies have shown that 1-BP is a neurotoxin as well as a reproductive toxin. Research indicates that exposure to 1-BP can cause sensory and motor deficits. Chronic exposure can lead to decreased cognitive function and impairment of the central nervous system. Acute exposure can lead to headaches.

11) N-acetyl(2-hydroxypropyl)cysteine (NAHP)	40	LLOQ 4.0 · 75th 101 · 95th 403

Parent: Propylene oxide

This chemical is used in the production of plastics and is used as a fumigant. Propylene oxide is used to make polyester resins for textile and construction industries. It is also used in the preparation of lubricants, surfactants, and oil demulsifiers. It has also been used as a food additive, an herbicide, a microbicide, an insecticide, a fungicide, and a miticide. Propylene oxide is a probable human carcinogen.

Results 172 toxins

Ethylene oxide causes damage to the central nervous system, (decline memory?), liver (reduced toxic elimination?), and hormonal system (reduce thyroid or adrenal function?)

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High HEMA may also due to exposure to vinyl chloride, an intermediate in the synthesis of several major commercial chemicals, including polyvinyl chloride, and used in the past as an aerosol propellant. Exposure to vinyl chloride has been associated with increased incidence of autism. High concentrations of vinyl chloride may cause central nervous system depression, nausea, headache, dizziness, liver damage and liver cancer, degenerative bone changes, thrombocytopenia, enlargement of the spleen and even death. To reduce exposure to vinyl chloride, eliminate use of plastic containers for cooking, reheating, eating or drinking (especially warm or hot) food or beverages. Replace these containers with glass, paper, or stainless steel whenever possible. Elimination of vinyl chloride can also be accelerated by sauna treatment, the Hubbard detoxification protocol employing niacin supplementation, vitamin B-12 therapy, by glutathione (reduced) supplementation (oral, intravenous, transdermal, or precursors such as N-acetyl cysteine [NAC]).

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Found in metal cleaning, foam gluing, and dry cleaning

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Results 172 toxins

Chronic exposure to 1-bromopropane can lead to decreased cognitive function and impairment of the central nervous system.

Treatment protocol (detox):

1. Microgreen powder (Superfood by Amazing Grass): Organic fruits and vegetables powder with vitamins (e.g. vit B complex), minerals, fiber, and digestion enzymes to facilitate bowel movement and increase levels of nutrients
2. Replace plastic containers with glass or stainless steel whenever possible
3. Herbs: 2g twice a day of *Curcumin and Dan shen (Salvia Miltiorrhiza)* to support liver function to get rid of toxins
4. Acupuncture to stimulate liver function (LI-11, GB-40)
5. Selenium 200mcg
6. Acetyl L-Cysteine 600 to 1200mg TD (every 12 hours)
7. Vitamin C 500mg TD (every 12 hours)

Results:

After three months, the client reported:

- ✓ Hip pain and lower back reduced
- ✓ No asthma attacks (from 3 weeks after treatment started)
- ✓ Congestion and allergies reduced significantly
- ✓ Memory improved significantly
- ✓ Energy improved and she started taking painting classes and working a few hours a week as substitute teacher
- ✓ No abdominal bloating
- ✓ Not taking any medication

“

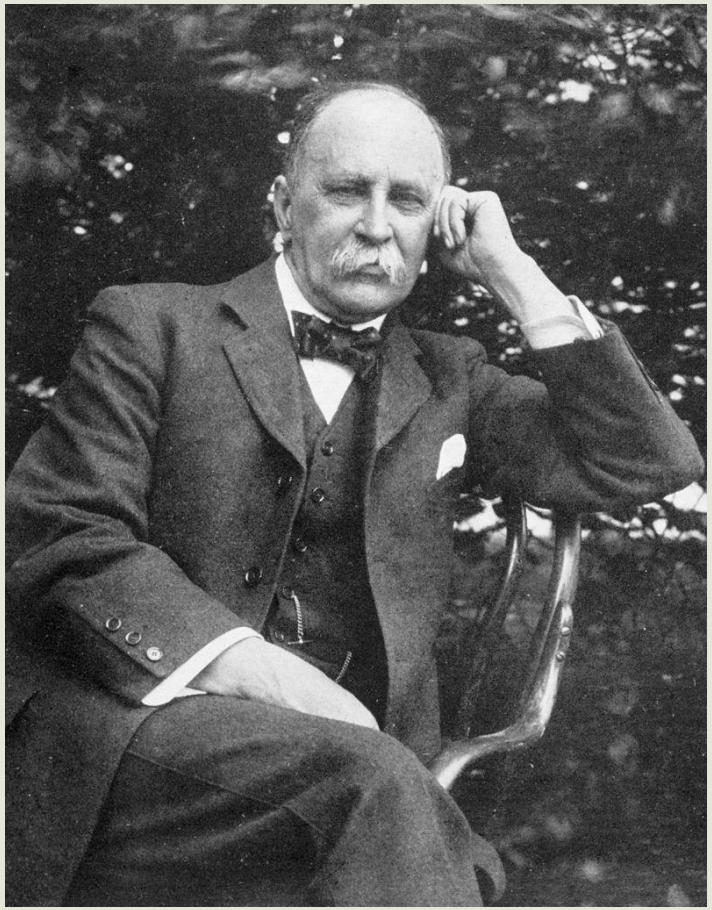
The good physician treats **the disease;**

The **great** physician treats **the patient**

who has the disease.”

William Osler, MD.

A physician, educator, author, public speaker, and innovator in medicine



Dr. Osler 1849-1919

Nutritional Supplements & Herbs to reduce inflammation and pain.

Cruciferous Vegetables & Inflammation

Indole-3-Carbinol (I3C)enzyme, found in Cruciferous vegetables, inhibits expression of proinflammatory cytokines, such as interleukin-6 (IL-6).

Cruciferous vegetables, including broccoli, cauliflower, cabbage, brussels sprouts, rutabaga/swede, turnip, and watercress.

Chang, H.-P., Wang, M.-L., Hsu, C.-Y., Liu, M.-E., Chan, M.-H., & Chen, Y.-H. (2011). Suppression of inflammation-associated factors by indole-3-carbinol in mice fed high-fat diets and in isolated, co-cultured macrophages and adipocytes. International Journal of Obesity (2005), 35(12), 1530–1538. http://doi.org/10.1038/ijo.2011.12

Cruciferous Vegetables & Detoxification

Indole-3-carbinol (I3C) increases **phase II enzyme glutathione S-transferase**

Iwona B, Monika O, Jolanta C. Effect Of Indole-3-carbino on Detoxification Enzymes and Lipid Metabolism. Medicina Veterinaria 1(2) 2002, 5-11

Cruciferous Vegetables & Cancer

Indole-3-Carbinol (I3C)
I3C shows efficacy for the prevention of breast, endometrial, and cervical cancers.

1. Shertzer HG, Senft AP. The micronutrient indole-3-carbinol: implications for disease and chemoprevention. Drug Metabol Drug Interact. 2000; 17(1-4):159-88.
2. Rogan EG. The natural chemopreventive compound indole-3-carbinol: state of the science. In Vivo. 2006 Mar-Apr; 20(2):221-8.

Curcumin is derived from the rhizomes (underground stems) of the plant Curcuma longa.

Curcumin has powerful antioxidant and anti-inflammatory properties, and is the most active constituent of turmeric.

Curcumin: Clinical Dosage

Meta-analysis of randomized clinical trials (RCTs) provides evidence that supports the efficacy of turmeric extract (about 1000 mg/day of curcumin) in the treatment of arthritis

Daily, J. W., Yang, M., & Park, S. (2016). Efficacy of Turmeric Extracts and Curcumin for Alleviating the Symptoms of Joint Arthritis: A Systematic Review and Meta-Analysis of Randomized Clinical Trials. Journal of Medicinal Food, 19(8), 717–729. http://doi.org/10.1089/jmf.2016.3705

367 primary knee osteoarthritis patients with a pain score of 5 or higher were randomized to receive **ibuprofen 1,200** mg/day or **Curcumin extract 1,500** mg/day for 4 weeks

The capsules were identical in appearance and the patients were asked to take only these pills in three dosages

Clinical Interventions in Aging

Kuptniratsaikul, V., Dajpratham, P., Taechaarpornkul, W., Buntragulpoontawee, M., Lukkanapichonchut, P., Chootip, C., … Laongpech, S. (2014). Efficacy and safety of Curcuma domestica extracts compared with ibuprofen in patients with knee osteoarthritis: a multicenter study. Clinical Interventions in Aging, 9, 451–458. http://doi.org/10.2147/CIA.S58535

After 4 weeks the study concluded that:

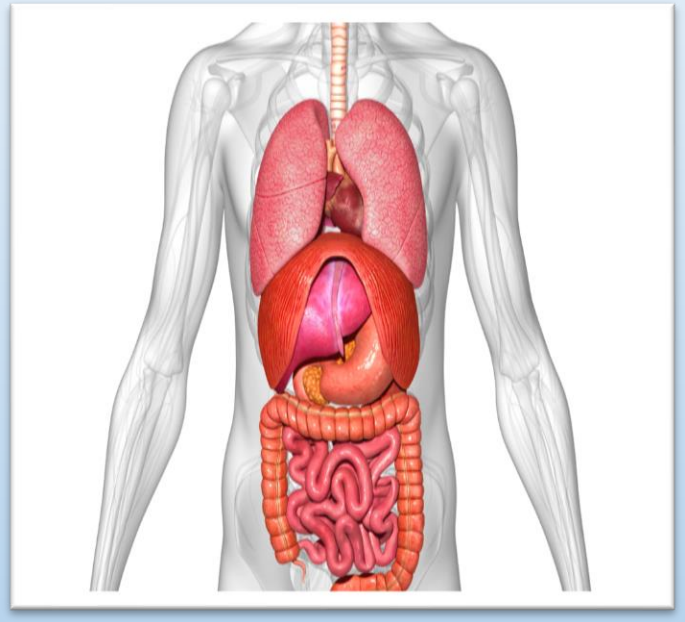
Curcumin extracts are as effective as ibuprofen for the treatment of knee osteoarthritis.

Number of events of abdominal pain/discomfort was significantly higher in the ibuprofen group

Clinical Interventions in Aging

Kuptniratsaikul, V., Dajpratham, P., Taechaarpornkul, W., Buntragulpoontawee, M., Lukkanapichonchut, P., Chootip, C., … Laongpech, S. (2014). Efficacy and safety of Curcuma domestica extracts compared with ibuprofen in patients with knee osteoarthritis: a multicenter study. Clinical Interventions in Aging, 9, 451–458. http://doi.org/10.2147/CIA.S58535

Curcumin Bioavailability



- Low bioavailability for local GI inflammatory diseases
- Higher bioavailability for systemic inflammation (e.g. joints)
- Adding piperine, the major active component of black pepper, to curcumin has been shown to increase bioavailability by 2000%

Hewlings, S. J., & Kalman, D. S. (2017). Curcumin: A Review of Its' Effects on Human Health. Foods, 6(10), 92. http://doi.org/10.3390/foods6100092

Curcumin & Dose Dependent

Several nutritional supplements appear to act as both inducers and inhibitors. The effect might be **dose dependent or altered** by the isolation of bioactive compounds derived from food.

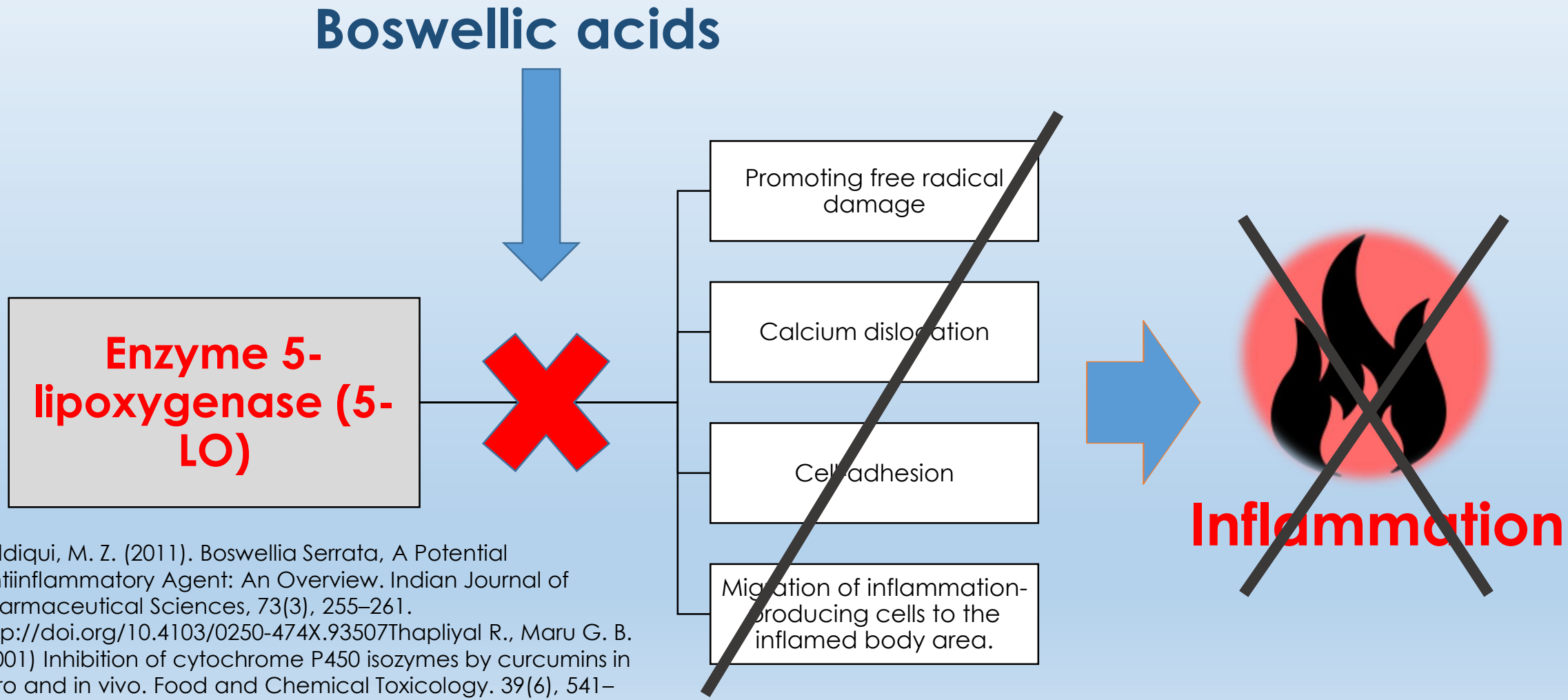
Curcumin at 0.1% of the diet has been shown, in animals, to induce levels of cytochrome P4501A1 (CYP1A1),(1) while a diet of 1% turmeric was inhibitory.(2)

1. Bansal, S. S., kausar, H., Vadhanam, M. V., Ravoori, S., Pan, J., Rai, S. N., & Gupta, R. C. (2014). Curcumin Implants, not Curcumin Diet Inhibits Estrogen-Induced Mammary Carcinogenesis in ACI Rats. Cancer Prevention Research (Philadelphia, Pa.), 7(4), 456–465. http://doi.org/10.1158/1940-6207.CAPR-13-0248
2. Thapliyal R., Maru G. B. (2001) Inhibition of cytochrome P450 isozymes by curcumins in vitro and in vivo. Food and Chemical Toxicology. 39(6), 541–547, doi: 10.1016/S0278-6915(00)00165-4.

Boswellia Serrata

A natural and affordable agent that can reduce the inflammatory process

Boswellia Serrata



Siddiqui, M. Z. (2011). Boswellia Serrata, A Potential Antiinflammatory Agent: An Overview. Indian Journal of Pharmaceutical Sciences, 73(3), 255–261. http://doi.org/10.4103/0250-474X.93507Thapliyal R., Maru G. B. (2001) Inhibition of cytochrome P450 isozymes by curcumins in vitro and in vivo. Food and Chemical Toxicology. 39(6), 541–547, doi: 10.1016/S0278-6915(00)00165-4.

Boswellia Serrata

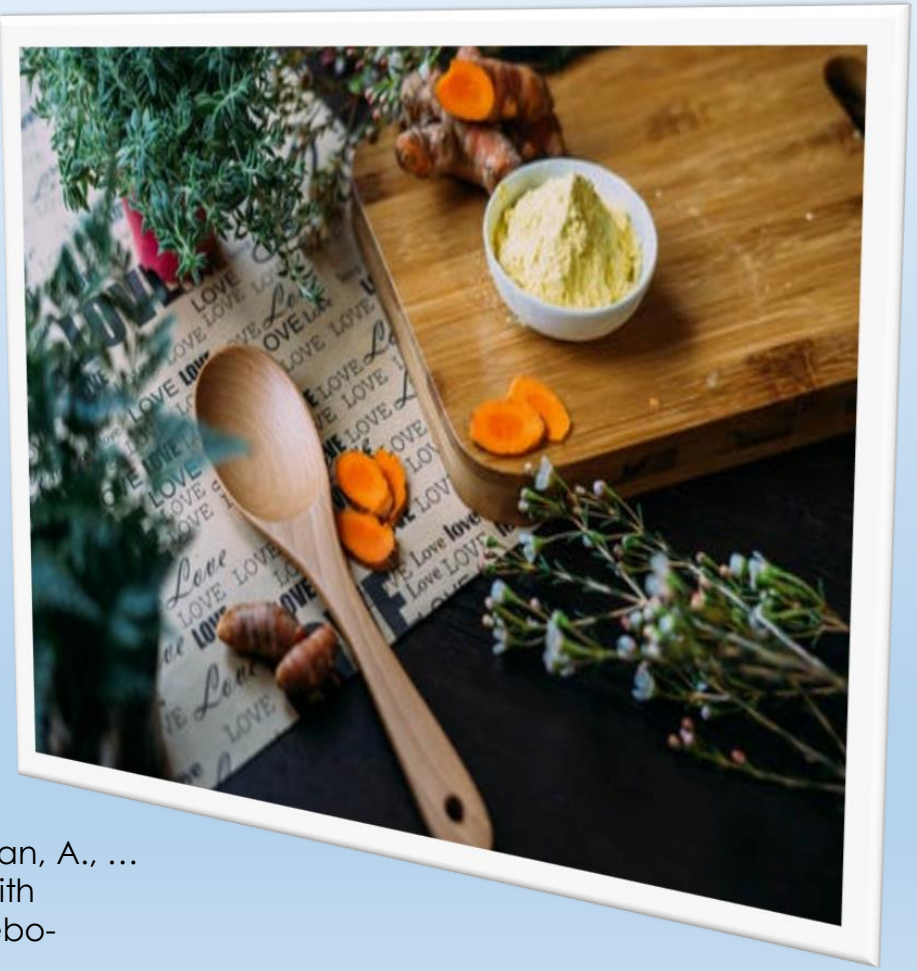
Curcumin combined with boswellic acid extract led to improvement in physical performance and reduction in joint pain and morning stiffness. The use of Boswellia and curcumin supplements was well tolerated and safe. (1)

1. Haroyan, A., Mukuchyan, V., Mkrtchyan, N., Minasyan, N., Gasparyan, S., Sargsyan, A., … Hovhannisyan, A. (2018). Efficacy and safety of curcumin and its combination with boswellic acid in osteoarthritis: a comparative, randomized, double-blind, placebo-controlled study. BMC Complementary and Alternative Medicine, 18, 7. http://doi.org/10.1186/s12906-017-2062-z

Boswellia Serrata

Recommended dosage of Boswellia is 500 to 1,000mg twice a day.

The use of Boswellia and curcumin supplements was well tolerated and safe. (1)



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Omega-3 fatty acids are long-chain polyunsaturated essential fatty acids (PUFAs)

If you increase consumption of omega-6 and reduce the consumption of omega-3, you increase the risk of chronic diseases and inflammation

Simopoulos AP. Omega-3 fatty acids in inflammation and autoimmune diseases. J Am Coll Nutr. 2002 Dec;21(6):495-505.

Omega-3 fatty acids

A randomized, double blind trial, of 12 weeks of treatment with six n-3 PUFA capsules (**3.6 g per day**)

Significant improvement of morning stiffness and joint tenderness with consumption of omega-3 supplement

Nielsen GL, Faarvang KL, Thomsen BS, Teglbjaerg KL, Jensen LT, Hansen TM, Lervang HH, Schmidt EB, Dyerberg J, Ernst E. (1992) The effects of dietary supplementation with n-3 polyunsaturated fatty acids in patients with rheumatoid arthritis: a randomized, double blind trial. Eur J Clin Invest, 22(10), 687-91.

Resveratrol

Resveratrol is a natural polyphenol that is found in the skin of red grapes, cranberries, peanuts and root extracts of the weed Polygonum Cuspidatum

Camins, A., Junyent, F., Verdaguer, E., Beas-Zarate, C., Rojas-Mayorquín, A. E., Ortuño-Sahagún, D., & Pallàs, M. (2009). Resveratrol: An Antiaging Drug with Potential Therapeutic Applications in Treating Diseases. Pharmaceuticals (Basel, Switzerland), 2(3), 194-205.

Resveratrol

Resveratrol showed **antioxidant and immunomodulatory** effects for some autoimmune diseases, such as **rheumatoid arthritis, systemic lupus** erythematosus, **psoriasis**, **inflammatory bowel diseases**, and **type 1 diabetes** mellitus.

JBC JOURNAL OF BIOLOGICAL CHEMISTRY

nutrients

Resveratrol reduces the inflammatory process by inhibiting proinflammatory cytokines and T-cell differentiation.

1. Oliveira, A. L. de B., Monteiro, V. V. S., Navegantes-Lima, K. C., Reis, J. F., Gomes, R. de S., Rodrigues, D. V. S., … Monteiro, M. C. (2017). Resveratrol Role in Autoimmune Disease—A Mini-Review. Nutrients, 9(12), 1306. http://doi.org/10.3390/nu9121306
2. Mobasheri, A., Shayan, P., Lueders, C., Stahlmann, R., & Shakibaei, M. (2012). Resveratrol Modulates Interleukin-1β-induced Phosphatidylinositol 3-Kinase and Nuclear Factor κB Signaling Pathways in Human Tenocytes. Journal of Biological Chemistry, 287(45), 38050-38063. doi:10.1074/jbc.m112.377028 Retrieved from http://www.jbc.org/content/287/45/38050.full.html

Resveratrol Dosage

No standard dosage was found

My recommendation:
500mg Japanese Knotweed (Polygonum cuspidatum) Root Extract (standardized for 50% Trans-Resveratrol, **yielding 250 mg**) TD

Considerations in treatment of patients with supplements

Herbs & Supplements: Interaction with Medication

- St. John's Wort with SSRI, digoxin, Warfarin
- Curcumin (in high dosages) and blood thinners (e.g. Coumadin)
- Fish oil is safe to consume (my experience: 3 to 5g daily)
- Ginkgo no interaction with warfarin or aspirin directly
- Ginkgo demonstrated antiplatelet activity when combined with NSAID drugs, especially aspirin, might cause severe bleeding, including intracranial bleeding

AMERICAN ACADEMY OF FAMILY PHYSICIANS

American Academy of Family Physicians. (2018) Herbal and Dietary Supplement–Drug Interactions in Patients with Chronic Illnesses. Retrieved from https://pdfs.semanticscholar.org/0685/6ae00b3ca62eb770e4a7684d3a6299656fc2.pdf

1. **Evaluate for ‘triggers’ of chronic inflammation (treat the patient, not just the disease), such as:**
    - Heavy metals
    - Environmental toxins
    - Subclinical or chronic infection
    - Food allergies or sensitivities

2. **Is the patient interested in clinical use of supplements or herbs?**

3. **What supplements might be a good fit?**
    - Complex patient or on blood thinners: Using Boswellia and/or resveratrol, avoid curcumin
    - General population: Curcumin in high dosages is safe and effective
    - Patient with high consumption of animal protein and/or processed food: Using high amounts of omega 3

4. **Adjustment of dosage and duration of use:**
    - Effective dosage should be reached slowly (e.g. increase every two weeks)
    - Duration of use is minimum 3 months
    - Reduction in pain should be noticed within 4 to 6 weeks

Supplements & Herbs to Reduce Pain & Inflammation

Thank you!

Tal Cohen, DAOM, Lac.

www.ANewWay.Clinic