



PRACTICAL GUIDE TO THRIVING IN THE 21ST CENTURY

PHYSIOLOGY BEFORE
PHARMACOLOGY



BIOLOGICAL DETOX IN THE 21ST CENTURY Nature's pHarmacy

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BIOLOGICAL DETOXIFICATION IN THE 21ST CENTURY

- **Chronic, autoimmune** illness *is* potentiated by environmental toxins.
- Assess body **toxin burdens** that contribute to treatment failure.
- Practice **safer, functional detoxification** (bio-detox), mitigate adverse effects of toxic minerals & chemicals.
- Use **essential, nutritional** antioxidants & minerals as anti-toxins.
- **Nature's Alkaline Way and Nature's pHarmacy:
Eat, Drink, Think, Do**



TAMING ENVIRONMENTAL RISKS

Goal... being well, resilient & able to handle current toxic load

Avoid > 80% of toxins while increasing essential nutrients to compensate for remaining 21st century anti-nutrients.

Choose *less bad, more good.*



TOXIC METALS (TM) LINKS TO ILL HEALTH...

- **Be paid for value, experience, tests & results**
- **Determine** chronic illness links to TM
- **Link TM to accelerated results of chronic illness**
- **Reduce** chance of treatment failure
- **Assess body burdens accurately**
- **Practice safer** detoxification
- **Mitigate adverse effects** of toxic metals



TOXIC METALS LINKS TO ILL HEALTH

Determine Chronic Illness Links To...

- **Mercury**... annual toll documented by National Academy of Sciences, ATSDR & EPA:
 - >60,000 US newborn' s neurodevelopment impaired
 - Faroe Islands + others confirm; Seychelles not
 - ~20% of population has CNS ± renal damage
 - Bioaccumulation / bio-concentration from 200,000 to 10,000,000 fold
 - At 1 ppm there are 20,000 Hg molecules/cell



MERCURY = 1,513,333 MG / PERSON (US)

- 100 tons (2,000 pounds/ton)
= 200,000 pounds
* 454 gms/pound
= 90,800,000 grams
= 90,800,000,000 milligrams
= 90,800,000,000,000 micrograms
among
- 300,000,000 US citizens
- = **302,666** µgrams/person/year
* 50 years
- 302,666 µgrams/person/year * 50 years
= **1,513,333 µgrams/lifetime**

Synergy in toxic minerals ~100 fold.
1 ppm in blood = 20,000 molecules/cell
Mercury binding constant to active selenium is 10⁴⁰

From coal combustion and medical waste,
= **1,513,333** µgrams per lifetime



EVIDENCE POPS HARM

“These findings suggest, that for girls, **prenatal exposure to POPs may play a role for later development of metabolic diseases by affecting the level of insulin.**”

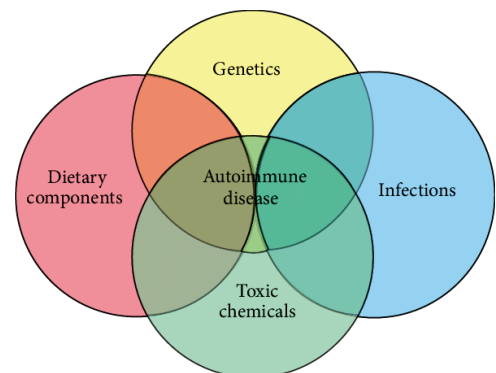
Tang-Péronard JL, Heitmann BL, Jensen TK, Vinggaard AM, Madsbad S, Steuerwald U, Grandjean P, Weihe P, Nielsen F, Andersen HR. Prenatal exposure to persistent organochlorine pollutants is associated with high insulin levels in 5-year-old girls. *Environ Res.* 2015 Jul 29;142:407-413.

“We conclude that **cytoskeletal proteins and their processing, glucose metabolism, and mRNA processing may represent targets affected by exposure to conditions hostile to pancreatic beta cells, including exposure to DDT and DDE.**”

Pavlikova N, Smetana P, Halada P, Kovar J Effect of prolonged exposure to sublethal concentrations of DDT and DDE on protein expression in human pancreatic beta cells. *Environ Res.* 2015; 14(142):257-263.

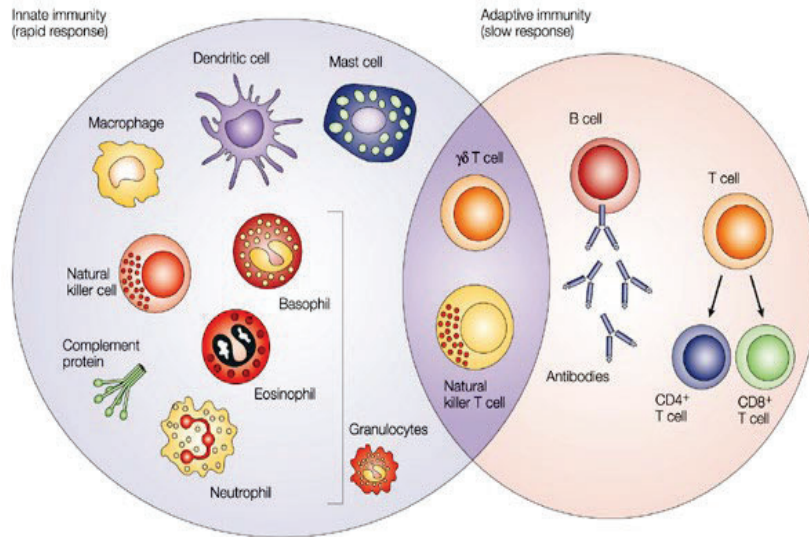
AUTOIMMUNE COMMON CONDITIONS

- Affect 23-50+ million Americans; 80% women
- >100 diseases (ARDA)
- Autoimmunity *different* from autoimmune disease

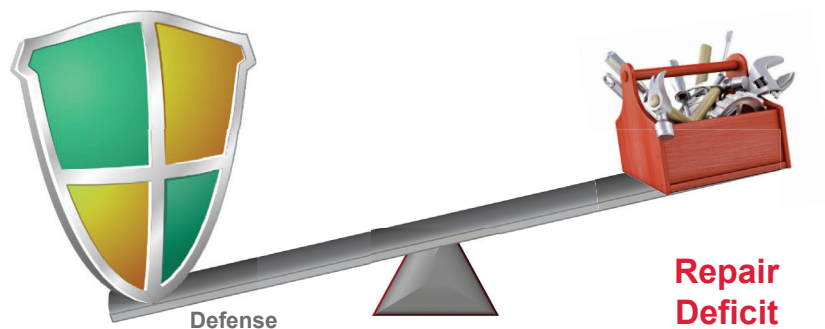


TOLERANCE LOST → SELF-ATTACK → TOLERANCE RESTORED

INNATE AND ADAPTIVE IMMUNITY



OVERBURDENED IMMUNE SYSTEM



Immune dysfunction

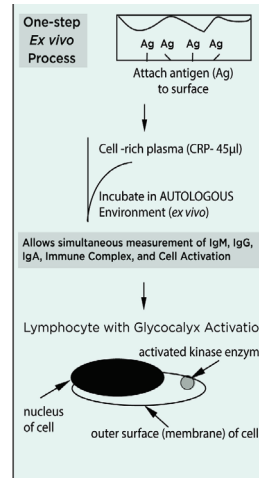
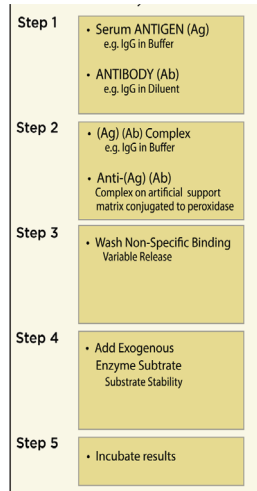
Critical need to tune up immune system now!

STANDARD ELISA vs LRA

Standard ELISA IgG Test

3-4% variance introduced per step

15 – 20 % Variance



ELISA/ACT® LRA

Single Step

<3% Variance on Consecutive Split Samples



LRA SPLIT SAMPLE REPRODUCIBILITY

LRA cell cultures with <3% variance

# items tested	# items matched	# items unmatched	(%) items matched	(%) items unmatched	Time (years)
4138	4050	88	97.60±3.0	2.25±2.75%	2011-14

Consecutive blind split Lymphocyte Response Assay (LRA) samples showing high split sample reproducibility.



AE Lynch and R Jaffe, "Lymphocyte Response Assay: Report on Precision of Novel Cell Culture Test, Experimental Biology," Presented at American Society for Investigative Pathology conference, San Diego, CA, 2016.

AVOID TREATMENT RESISTANCE... CLEAN YOUR CELLULAR SPACE

Functional, provocative tests for divalent cations:

1. Cellular/body burden TMs (Pb, Hg, As, Cd, Ni...)
2. **Nutritional minerals are anti-toxic**
(Ca, Mg, Zn, Mo, Cr, Vn, Mn, Se, I...)
3. Delayed allergy / cell-mediated hypersensitivity
toxic mineral use LRA (lymphocyte response assay)
by **ELISA/ACT[®]** or **MELISA[™]**



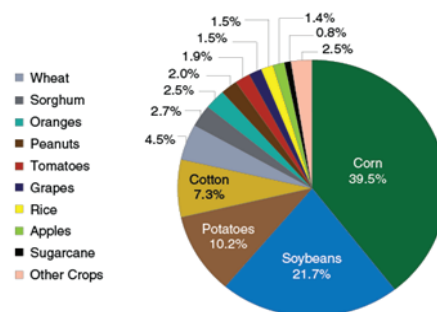
Jaffe R. D- Penicillamine protocol update: Determining toxic and nutritional mineral status by provocation in the urine, Health Studies Collegium. (©1989-2019)
Jaffe R. <http://www.youtube.com/watch?v=SY5h6tDF4iw> (2011)
<http://www.youtube.com/watch?v=D9LkRLE45ik&feature=related> (2011)

ENVIRONMENTAL TOXINS: WAR WITH NATURE

Pesticides are Biocides:

- Glyphosate
- Atrazine
- Chorpyrifos
- Metolachlor
- Metam sodium
- Dioxins
- Vinyl Chloride
- DMF
- Kepone
- Heptachlor
- Dieldrin
- PFAS
- PBA, PBS

Corn, soybeans, potatoes, and cotton accounted for close to 80 percent of pesticide use on 21 crops in 2008



Other crops include: lettuce, pears, sweetcorn, barley, peaches, grapefruit, pecans, and lemons.

Source: USDA, Economic Research Service using USDA, National Agricultural Statistics Service and proprietary data.



PURE WATER IS ESSENCE OF LIFE



Community artisan well,
spring, multi-filtered.

Boiled, Traditional filter?

Bottom line: Mineral rich



<https://holisticprimarycare.net/topics/topics-o-z/prevention-practice-pearls/1932-what-s-in-your-water-and-what-to-do-about-it.html>

MORE OR LESS TOXIC HOME

- **Volatile Organic Compounds (VOCs)**... Carpeting, particleboard
- **Pesticides**... household pest sprays
- **Mold and Other Fungal Toxins**... Contaminated AC & building damp
- **Phthalates and PVC (Polyvinyl Chloride)**... Plastic wrap, storage bottles
- **Dioxins**... Commercial animal fat: dairy, eggs, meat
- **Heavy Metals**... Water, dental amalgams, anti-perspirants
- **PolyBrominated Diphenyl Ethers (PBDEs)**... furniture, carpeting
- **Chloroform, methylene chloride**... air, drinking water



<https://learn.eartheasy.com/guides/how-to-reduce-exposure-to-indoor-toxins/>

AVOID HOME TOXINS

- **'No-Shoes' Policy** in the house: value of walking bare feet
- Outside **clothes**, indoor **attire**
- *Avoid* products with **high VOCs**, let new products off gas and ventilate
- **Natural**, non-toxic weed killers
- Check air filters & dampness source; maintain **humidity** ~40%
- Go **phthalate** free... look for recycling #3 or V for PVC products
- Water filters; avoid chemical treated wood, Teflon
- *Avoid* **flame retardants** (PFAS)



<https://learn.eartheasy.com/guides/how-to-reduce-exposure-to-indoor-toxins/>

HEALTHY CLEANING PRODUCTS

- **Soap:** Removes germs... natural, *no* SLS or chemicals
- **Baking Soda:** Mild abrasive, natural deodorizer
- **Vinegar:** Great for lifting hard water stains
- **Peroxide:** H₂O₂ is a powerful disinfectant (3-6%)
- **Ethanol (Vodka):** Potent deodorizer; other grain alcohols disinfect
- **Heat:** Boiling water kills or inactivates viruses, bacteria, protozoa
- **Light:** UV-C light disinfects
- **Probiotics:** Crowds out pathogens, e.g., acidophilus, bifidus
Bacillus strains on S. Aureus



**Mild soap +
Baking Soda
+ Vinegar**



<https://www.medicalnewstoday.com/articles/323315>

NATURAL CHELATORS: REMOVE TOXIC METALS

- **Ascorbate:**
 - ~10 mcg ToxMin / gm Ascorbate
 - Daily ToxMin exposure = ~2 gm ascorbate/day to safely protect & excrete
- **Mg + Choline Citrate**
 - Magnesium required for adequate glutathione & removal of Hg, Pb, As...
 - Important for phase 1 detox pathway
 - Protects brain from onslaught of toxic minerals like aluminum, cadmium
- **GGOBE**
 - Sulforaphane: IP-6
 - Improves synthesis of glutathione



Fahey JW, Talalay P. Antioxidant functions of sulforaphane: a potent inducer of Phase II detoxication enzymes. *Food Chem Toxicol.* 1999;37(9-10):973-979.

<https://www.holisticprimarycare.net/topics/topics-o-z/prevention-practice-pearls/1806-three-safe-simple-ways-to-detox.html>



BIODETOX SUPER FOODS

Garlic, Ginger, Onions, Broccoli sprouts, Eggs

GGOBE, Sulforaphane, IP6, minerals



... for happier cytochrome p450s



Jaffe, R. Diabetes as an Immune Dysfunction Syndrome. *In: Watson RR, Preedy VR, Eds. Bioactive Food as Dietary Interventions for Diabetes, Academic Press, 2013, 41-52.*

ANTI-TOXIC ESSENTIAL NUTRIENTS

- **Mg plus Choline Citrate** for optimum absorption based on 1st AM Ur pH
- **Buffered, reduced ascorbate** based on C Cleanse
- **Polyphenols:** Quercetin dihydrate, Oligomeric Proanthocyanidin
- **Carnitine fumarate:** micellized
- **Vitamin D3:** to maintain D3 level of 50-80ng/ml
- **Multi nutrient formulation** as foundational support; urine sunshine yellow
 - Vitamins
 - Minerals
 - Cofactors



Schwalfenberg GK, Genuis SJ. Vitamin D, Essential Minerals, and Toxic Elements: Exploring Interactions between Nutrients and Toxicants in Clinical Medicine. *Scientific World Journal*. 2015;2015:318595.

ANTI-TOXIC ESSENTIAL NUTRIENTS: PROBIOTICS

- **Binds toxic metals**, e.g., *Lactobacillus* species
- **Improve essential nutrient absorption**
- **Produce B vitamins**
- **Reduce antibiotic resistant bacterial growth**
- **Influence removal of xenobiotics from body**
- **Soil bacteria...**

Preferably avoided

Not native to human gut

Risk of infection or hypersensitivity



Ibrahim F, Halttunen T, Tahvonen R, Salminen S. Probiotic bacteria as potential detoxification tools: assessing their heavy metal binding isotherms. *Can J Microbiol*. 2006;52(9):877-885

BIO DETOX: PHYSIOLOGY 1ST, BETTER OUTCOMES

- Alkaline Way diet *reduces* toxic minerals
- Mineral rich broths, soups, juices
- **Fluids** (3+ quarts per day) to 'wash toxins out'.
- *Repeat* provocative D-Pen test to ✓ results.



RESTORE METHYLATION, RedOx & pH

Eat, Drink, Think and Do

- Alkaline Way diet (daily Ur pH log to verify)
- Calcium channel blocker: Magnesium & zinc
- Fluids (3+ quarts per day) to 'wash toxins out'
- Therapeutic amounts of antioxidants
 - Flavonoid & Flavanol:
 - Quercetin dihydrate / OPC combo [1-20 g/day]
 - Ascorbate based on individual 'C Cleanse' needs
 - Selenomethionine with Vitamins E
- Bi-weekly D-Penicillamine (a few months)
- Probiotics and Prebiotic high-fiber diet
- Restorative sleep and mindfulness



NATURE, NURTURE & WHOLENESS

- Organic
- Biodynamic
- CSA
- Personal garden
- Farmers' market

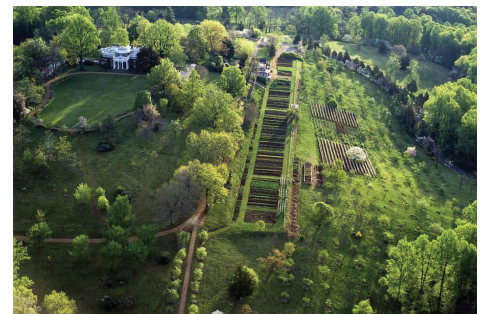
Make peace with nature

Walnut Acres... Paul & Betty Keene



NATURE, NURTURE & WHOLENESS

- Fermented foods
- High fiber staples: herbs, spices and edible flowers
- GGOBE... anti-toxic foods
- Whole food combos
- Organic spices w/o toxic minerals



Thomas Jefferson's Vegetable Garden



<https://www.thekitchn.com/23-essential-fermented-foods-for-better-gut-health-229599>

<https://holisticprimarycare.net/topics/topics-o-z/prevention-practice-pearls/1709-the-alkaline-way-ten-tips-for-reversing.html>

FOOD EFFECTS ON BODY CHEMISTRY

Food and Chemical Effects on Acid/Alkaline Body Chemical Balance

MORE ACID
(Consume Less)

Food and Chemical Effects on Acid/Alkaline Body Chemical Balance

MORE ALKALINE
(Consume More)

Food Category	More Acid (Consume Less)	More Alkaline (Consume More)	Food Category
Citrus Fruit Fruit	Cranberry Pomegranate	Orange Banana Blueberry Raisin, Grapes Currant Strawberry	Citrus Fruit Fruit
Bean Vegetable Legume Pulse Root	Soybean Carrot	Brussel Sprout Beet Chive/Scallion Celery/Cilantro Cauliflower Cabbage Artichoke Lettuce Turnip Greens	Bean Vegetable Legume Pulse Root
Grain Cereal Grass	Barley Processed Flour	Quinoa Wild Rice Oat	Grain Cereal Grass
Fowl	Pheasant	Egg, Duck	Fowl
Meat Game Fish/Shell Fish	Beef Shell Fish (Processed) Lobster	Meat Game Fish/Shell Fish	Meat Game Fish/Shell Fish
Egg	Processed Dairy Cow/Human Soy Goat/Sheep	Egg, Chicken	Egg
Oil Seed/Sprout Nut	Cottonseed Oil/Meal Fried Food Hazelnut Walnut Brazil Nut	Ghee Human Breast Milk	Oil Seed/Sprout Nut
Beverage Pseudo-vegetative Sweetener Vinegar	Beer Soda Table Salt Yeast/Hops/Malt Sugar/Cocoa White/Acetic Vinegar	Ginger Tea Suffire Licuamat Umehoshi vinegar	Beverage Pseudo-vegetative Sweetener Vinegar
Spice/Herb	Pudding/Jam/Jelly	White Willow Bark Slippery Elm Artemesia Annuua	Spice/Herb
Therapeutic	Antibiotics	Algae, Blue Green	Therapeutic

Italicized items are NOT recommended



Jaffe R. The Alkaline Way in Digestive Health. *In*: Watson RR, Preedy VR, Eds. Bioactive Food as Dietary Interventions in Liver and Gastrointestinal Disease. *Academic Press*, 2013, 1-21.

HEALTHIER EATING

Spices for life/herbs for interest

- Aloe
- Saffron
- Saba
- Tinctures
- Cold pressed oils
- Broths / Bouillons
- Sea salt
- Peppercorns + grinder
- Avocados
- Fermented vegetables/beers
- Salsa
- Hummus
- Dal, lentils
- Chili
- Nut milks



Eat low on the food chain; high on vitality



HEALTHIER KITCHENS

- Blenders... Vitamix
- Macerating juicers
- Damascus steel knives
- Tea/Coffee makers – French Press
- Mortar & Pestle
- Stock pot
- Strainers/whisks
- Conserve maker
- Thermometers
- Toaster
- Microwave to warm plates



PH PERQUE
INTEGRATIVE
HEALTH
ACADEMY

HEALTHIER KITCHENS

- **Copper...** conducts heat, copper bottoms
- **Iron...** heats evenly and naturally non-stick
- **Stainless steel...** durable, easy to clean, good performance

Cookers...

- **Pressure** (gas / electric): saves energy, time, preserves nutrients
- **Slow/Crock pot:** brings out flavor; tenderizes; soups & stews
- **InstaPot**



PH PERQUE
INTEGRATIVE
HEALTH
ACADEMY

INDOOR AIR QUALITY

- **Measurement:**
 - Use IAQ monitor, test for **radon & CO**
- **Fresh air indoor heat exchangers:**
 - Remove moisture & provide fresh air at home that is pre-heated by outgoing air
- **Ducts integral to the HVAC system:**
 - Supply, return, exhaust and ventilation air
- **Air conditioning:**
 - High EER or SEER is better



Spohn, R, Levin, H, and Jaffe, R: "Introduction," In Spohn, R (Ed.): Clean Your Room! A Compendium on Indoor Pollution. Sacramento, State of California Department of Consumer Affairs, 1982.
https://books.google.com/books/about/Clean_Your_Room.html?id=zE1rAAAAMAAJ

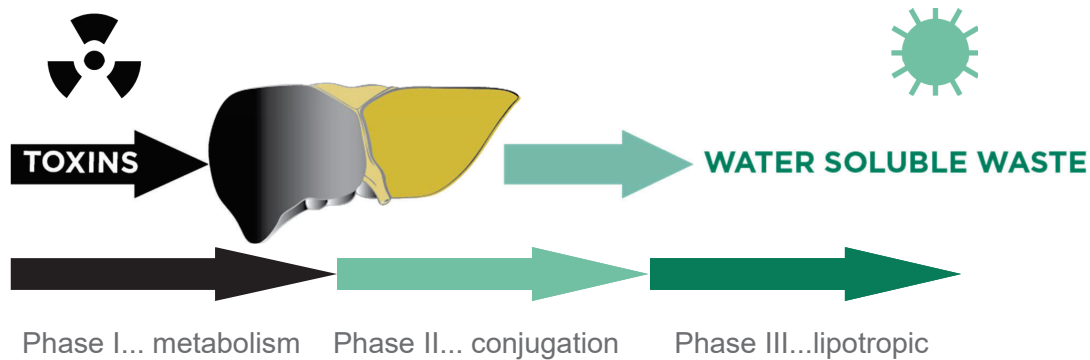
AIR PURIFIERS

- **HEPA: air** fine mesh... traps pollen, pet dander, dust mites, & tobacco smoke.
- **ULPA:** removes smaller particles than above
- **MERV 13...** bacteria, tobacco smoke, sneeze/particles, cooking oil, paint pigments, & fine facial powders
- **Electrostatic...** use static electricity & no filters
- PECO technology, e.g., Molekule... remove particles 1000x HEPA
- **Indoor plants...** absorb home chemicals through leaves and roots e.g., rubber plants, spider plants
- **Humidity (Rh) <40%** to prevent moisture stimulating mold growth



RESTORATIVE DETOXIFICATION

Safer toxin removal (3 phases)



PERSONALIZED DETOX: LIVER, SPLEEN SUPPORT, 30-60 DAY, COMPRISING OF

- Sulfur amino acids + lipotropics + minerals
- Omega 3 good fats: EPA and DHA
- Buffered ascorbates & polyphenolics
- Digestive Herbal Bitters, Prebiotics, Probiotics & Symbiotics

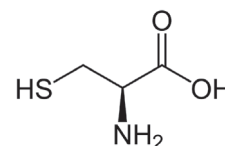


SULFUR AMINO ACIDS + LIPOTROPICS + MINERALS

Detoxify, build glutathione, radioprotective...

Sulfur-containing amino acids

- Cysteine / Cystine
- Methionine / Homocysteine

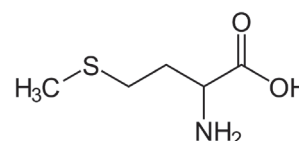


Boost immune function

Neutralize cell acid

Methylate

Transport



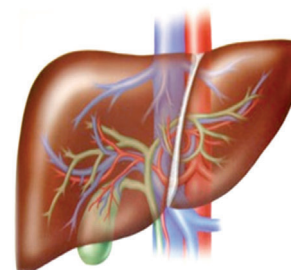
White C C, Viernes H, Krejsa C M, Botta D, Kavanagh, T J. Fluorescence-based microtiter plate assay for glutamate–cysteine ligase activity. *Analytical Biochemistry* 2003; 318 (2): 175–180.

LIVER / ORGAN DETOX SUPPORT

Beat oxidative stress!!

Micellized softgel with Silymarin
+ mixed natural carotenoids
+ tocopherols + CoQ10 + D3

Protects & repairs liver, spleen, kidney



Hajaghmohammadi AA, Ziaee A, Rafiei R, The Efficacy of Silymarin in Decreasing Transaminase Activities in Non-Alcoholic Fatty Liver Disease: A Randomized Controlled Clinical Trial, *Hepatitis Monthly*, 2008; 8(3): 191-195.

Murata N, Murakami K, Ozawa Y, Kinoshita N, Irie K, Shirasawa T, Shimizu T, Silymarin attenuated the amyloid β plaque burden and improved behavioral abnormalities in an Alzheimer's disease mouse model. *Biosci Biotechnol Biochem*. 2010 Nov 23;74(11): 2299-2306.

Galhardi F, Mesquita K, Monserrat JM, Darros DM, Effect of silymarin on biochemical parameters of oxidative stress in aged and young rat brain. *Food Chem Toxicol*. 2009 Oct;47(10):2655-2660.



ACTIVE OMEGA 3: EPA / DHA

- Distilled, Nitrogen protected
- Fat soluble toxins gone
- Restores cell membrane flexibility
- Toxic minerals gone by nitrogen distillation
- Magnesium protects EFAs



UNIVERSAL ANTIOXIDANT

- L-Ascorbate 100% reduced & buffered
- Repairs & renews better
- Universal maternal antioxidant

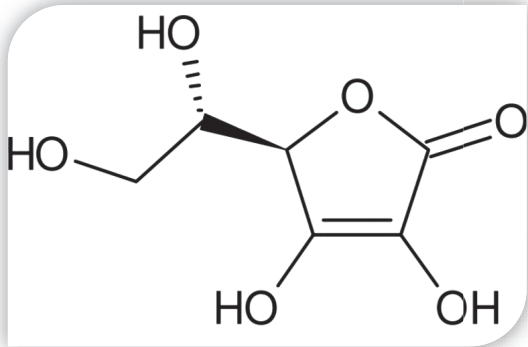


Abdollahzad H, Eghtesadi S, Nourmohammadi I, Khadem-Ansari M, Nejad-Gashti H, Esmailzadeh A. Effect of vitamin C supplementation on oxidative stress and lipid profiles in hemodialysis patients. *Int J Vitam Nutr Res.*2009 Sep;79(5-6):281-7.
Ryan MJ, Dudash HJ, Docherty M, Geronilla KB, Baker BA, Haff GG, Cutlip RG, Alway SE. Vitamin E and C supplementation reduces oxidative stress, improves antioxidant enzymes and positive muscle work in chronically loaded muscles of aged rats. *Exp Gerontol.*2010 Nov; 45(11):882-95.
Englard S, Seifter S. The biochemical functions of ascorbic acid. *Annu Rev Nutr.* 1986;6:365-406
Jaffe R, Brown S. Acid-Alkaline balance and its Effect on Bone Health. *Intl J Integrative Med,* 2000; 2(6): 7-18.



ASCORBATE: TOXIC MINERAL EXCRETION

Pump toxins out more safely...



1 gm ascorbate =
 1,000,000 mcg;
 ~0.01% can bind ToxMin =
 1,000 mcg ascorbate binds
 ~0.1 μmol ToxMin =
 ~10 mcg ToxMin / gm Asc

Daily ToxMin exposure =
 ~2 gm ascorbate/day to
 safely protect & excrete



ASSESS INDIVIDUAL ASCORBATE NEED BASED ON OXIDATIVE STRESS

Ascorbate Calibration

± Probiotics, recycled Glutamine, Mg, Polyphenolics

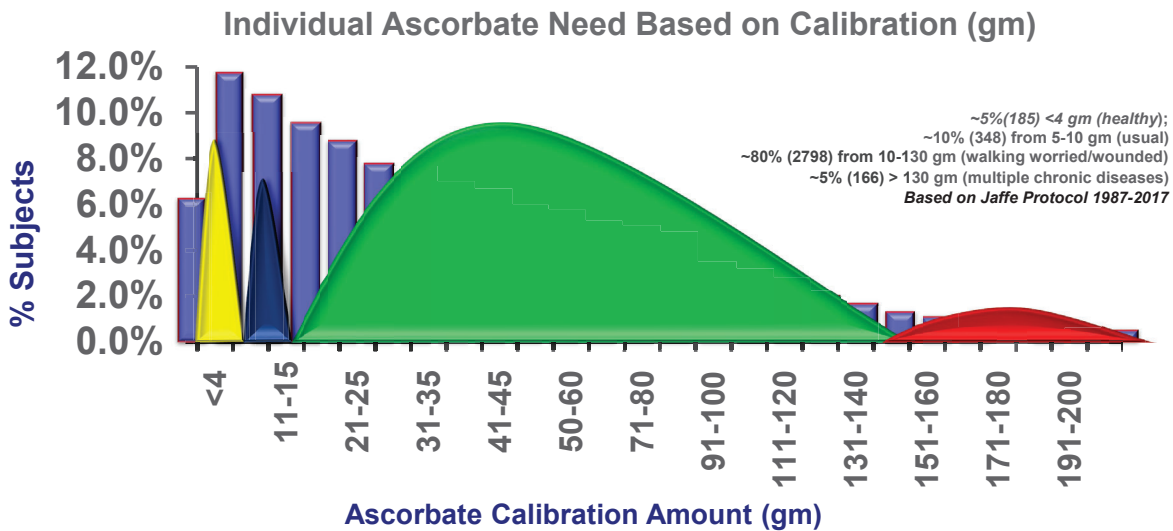
Healthy	Moderate Ills	Chronic Ills
<ul style="list-style-type: none"> • 1.5 grams; ½ tsp • Every 15 min • 6 grams / hour 	<ul style="list-style-type: none"> • 3 grams; 1 tsp • Every 15 min • 12 grams / hour 	<ul style="list-style-type: none"> • 6 grams; 2 tsp • Every 15 min • 24 grams / hour



- Health Studies Collegium, Joy in Living The Alkaline Way, 20th ed. 1990-2015.
- Wintergerst ES, Maggini S, Hornig DH. Immune-enhancing role of vitamin C and zinc and effect on clinical conditions. *Ann Nutr Metab*. 2006;50(2):85-94.
- Level of Evidence III and IV



ASCORBATE NEEDS FROM 4-100+ G/DAY



Jaffe R. Cardioprotective Nutrients. In: Watson RR, Preedy VR, Editors Bioactive Food as Dietary Interventions in Cardiovascular Disease. Academic Press, 2013, 103-119.

1ST AM URINE PH

After six or more hours rest, the urine fluid equilibrates with the GU tract lining cells.

Clinically useful assessment of metabolic acidosis risk and intracellular mineral (K & Mg)



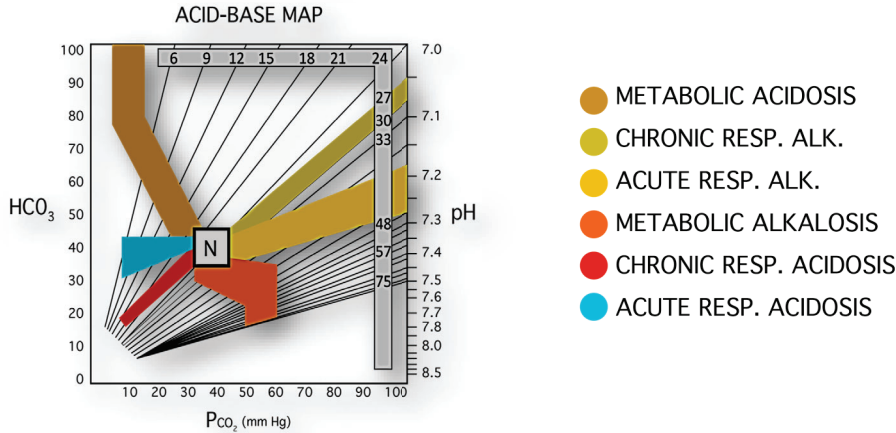
Julian Seifter



- Seifter JL. Integration of acid-base and electrolyte disorders.
- N Engl J Med. 2015 Jan 22;372(4):391-2. Integration of acid-base and electrolyte disorders.

pH: CELLS ELECTIVE PROTECTION OR SURVIVAL

Siggaard-Andersen Acid-base Nomogram



Siggaard-Andersen, O. Therapeutic Aspects of Acid-Base Disorders. Modern Trends in Anaesthesia, Ed. EVANS & GRAY, Butterworths, 1967, Vol. 3, 99p.

URINE >6° REST

Excess acid wears you out



Too Acidic (<6.5)

Healthy Repair / Restore Zone



Healthy pH (6.5-7.5)

Catabolic illness tears you down



Too Alkaline (>7.5)

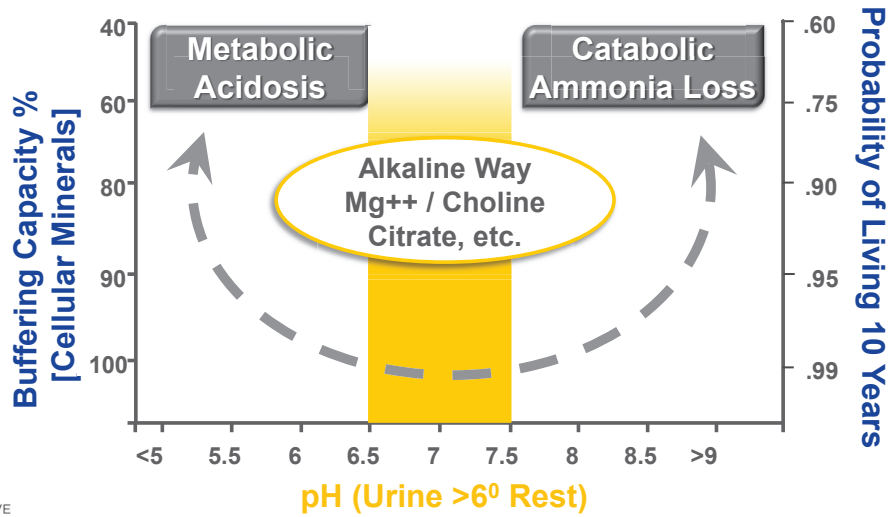
Predictive Goal Value = pH 6.5 – 7.5



Jaffe R, Mani J. Clinical Evidence in Favor of Specific Polyphenolics. In: Watson RR, Preedy VR & Zibadi S, Eds. Polyphenols in Human Health and Disease, Academic Press, 2013: 695-705

METABOLIC ACIDOSIS RISK

Buffering Mineral Need vs Probability of Living 10 Years



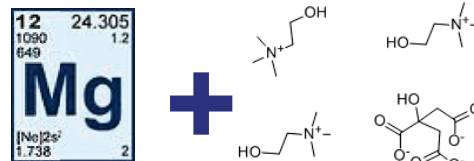
BIOMARKERS SOLUTIONS: MAGNESIUM, MG⁺⁺

Mg uptake enhanced w/ Choline Citrate: 440-880+ mg/d elemental Mg⁺⁺

Mg⁺⁺ displaces toxic minerals, protects fats...

Choline → acetylcholine, cholinergic bile

Citrate → energizes & alkalinizes



THE PERIODIC TABLE
Magnesium (Mg)

1	2	3										4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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- Jaffe R, Uptake of Magnesium with Choline Citrate
- Level of evidence: III & IV



PRO REPAIR / PRO DETOX NUTRIENTS

Personal C Cleanse



Only 100% l-ascorbate, fully reduced & buffered

Dark fruits; super foods



Polyphenolics

B methyl cofactors



Balanced Natural Forms

BioDetox



Whole Greens

High sulfur foods



GGOBE

Omega 3: EPA/DHA



Purer, uncontaminated, micellized = better uptake



- Jaffe R, Mani J. Clinical Evidence in Favor of Specific Polyphenolics. *In: Watson RR, Preedy VR, Zibadi S, Eds. Polyphenols in Human Health and Disease, Academic Press, 2013, 695-705.*
- Jaffe R. Cardioprotective Nutrients. *In: Watson RR, Preedy VR, Eds. Bioactive Food as Dietary Interventions in Cardiovascular Disease. Academic Press, 2013. p 103-119.*

RESTORE METHYLATION, RedOx & pH

Eat, Drink, Think and Do

- Add Chelator like D-Penicillamine *if* needed
 - Enhances antioxidant repair & reduces free radical damage
 - Clinically helps arthritic, CVD, RSD, Fibromyalgia, CFIDS, Macular degeneration & other chronic inflammatory conditions

Side effects from d-pen are rare.
If any issue surfaces, stop penicillamine & re-evaluate clinical situation.



CHELATORS REMOVE TOXIC METALS

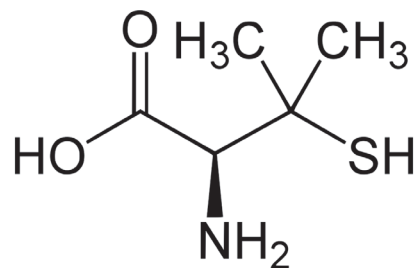
- EDTA: Hg, Pb, Al, Cu; higher affinity for Pb⁺⁺
- EGTA: prefers Calcium
- DMSA: penetrates brain, removes toxic metal via kidney and bile
- DMPS: better at removal from kidney than DMSA
- DMSO: Mainly for Pb
- DFO: Al, Fe
- DTPA: cobalt radionuclide



- Sears ME. Chelation: harnessing and enhancing heavy metal detoxification—a review. *Scientific World Journal*. 2013;2013:219840.
- Smith SW. The role of chelation in the treatment of other metal poisonings. *J Med Toxicol*. 2013;9(4):355-369.

D-PENICILLAMINE PHARMACOLOGY

- Chelates divalent cations
- Stimulates NO (tissue nitric oxide)
- Increases sulfur / phase II detox
- Synergistic w/ phase I + II combo detox



D Pen problems *only* from high-dose, daily, long-term use...
Don't do this!



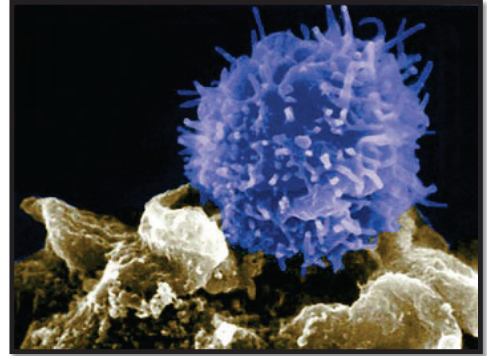
- <https://en.wikipedia.org/wiki/Penicillamine>
- Jaffe R. D- Penicillamine protocol update: Determining toxic and nutritional mineral status by provocation in the urine, Health Studies Collegium. (©1989-2019)

TOXIC MINERAL QUANTITATION & IMMUNE BURDEN

d-penicillamine (d-pen) for amount

and

LRA tests for hypersensitivity



INTEGRATIVE DETOX ASSESSMENTS

Personal Detox Measures:

1. d-glucaric acid [Ur]
2. Mercapturic acid [Ur]
3. Hippurate
4. d-penicillamine provocation
Urine essential & toxic minerals

Stephen B. Edelson. Autism: Xenobiotic Influences. *Toxicol Ind Health*, September 1998 vol. 14 no. 4, 553-563.
Inhibition of mercapturic acid pathway-mediated disposal of 4-hydroxynonenal causes complete and sustained remission of human cancer xenografts in nude mice. *Indian Journal of Experimental Biology* Vol. 49, November 2011, pp. 817-825.

Jaffe R. *HSC d-penicillamine Protocol*, 87-05.

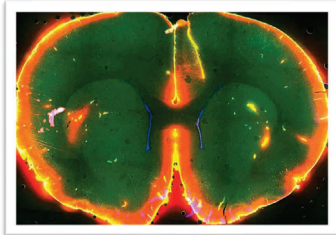
Esteller M. *Lancet Oncol*, 2003; 4: 365-372.

Jaffe R. *Int Clin Nut Rev*, 1990; 10: 265-266.



DETOXIFICATION AND SLEEP: INTERRELATED

Sleep cleanses the brain



*A good night's rest
literally clears the mind*

Hormone disrupters affect the
normal hormonal cycle
necessary
for sleep

Green light meditation:

<https://www.youtube.com/watch?v=hLMezM4YCp0>



Xie et al "Sleep initiated fluid flux drives metabolite clearance from the adult brain." *Science*, October 18, 2013. DOI: 10.1126/science.1241224

RESTORATIVE SLEEP: EMF/RF

- ↑ oxidative stress on sperm function, brain & nervous system, immune dysfunction
- Power down
 - Turn off Wi-Fi at night
 - No phone near head
 - Reduce EMF
- Power off alarms
- Dichromatic lights; no bright lights



Ben Carter, Philippa Rees, Lauren Hale. Association Between Portable Screen-Based Media Device Access or Use and Sleep Outcomes. A Systematic Review and Meta-analysis. *JAMA Pediatr.* 2016;170(12):1202-1208.

Klotsche C, Color Medicine: The secrets of color/vibrational healing, Light Tech Pub, 1993
<https://ehtrust.org/science/research-on-wireless-health-effects/>

Lai H. Genetic effects of non-ionizing electromagnetic fields. *Electromagn Biol Med.* 2021 Apr 3;40(2):264-273.



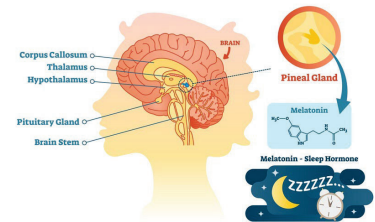
NEUROCHEMICAL HARMONY

Green Dichroic Lights

- Harmonizes, calms & supports pineal gland
 - Promotes restorative sleep
 - Improves digestion, bio-detox & stress
 - Better sleep, concentration, perception
- **Green** = forest like
- May be used *ad libitum*



PINEAL GLAND



- <https://holisticprimarycare.net/topics/topics-o-z/prevention-practice-pearls/1921-giving-the-green-light-to-stress-reduction.html>

RESTORATIVE SLEEP IS A CHOICE



- Salt/soda bath for 20 min
 - ½ cup each Epsom salts + baking soda
- Abdominal breathing for 5 min
 - Diaphragmatic breathing
 - Meditation
- No PM caffeine/heavy meals- causes glucose /insulin imbalance
- Tryptophan, Mg, Vitamin B6, Adrenal support

- Ong JC, Manber R, Segal Z, Xia Y, Shapiro S, Wyatt JK. A randomized controlled trial of mindfulness meditation for chronic insomnia. *Sleep*. 2014;37(9):1553–1563
- Andrew W McHill, Andrew JK Phillips, Charles A Czeisler, Leigh Keating, Karen Yee, Laura K Barger, Marta Garaulet, Frank AJL Scheer, Elizabeth B Klerman, Later circadian timing of food intake is associated with increased body fat, *The American Journal of Clinical Nutrition*, Volume 106, Issue 5, November 2017, Pages 1213–1219



BIOLOGICAL DETOXIFICATION IN THE 21ST CENTURY

- Evidence of chronic, autoimmune illness potentiated by environmental toxins.
- Assess body **toxin burdens** that contribute to treatment failure.
- Practice **safer, functional detoxification** (bio-detox), mitigate adverse effects of toxic minerals & chemicals.
- Using **essential, nutritional** minerals as anti-toxins.
- **Nature's pHarmacy- Eat, Drink, Think, Do**



CLINICIANS NEED TO KNOW

Go from No to Know

- Early information: Anticipates symptoms
- Accurate: Specific, sensitive, validated
- Widest variety of foods, chemicals, toxins
- Reliable B cell, T Cell, Immune Complexes
- Tolerance or intolerance is a choice



LRA TESTS & PLANS IN SUMMARY

- Healthy immune system is tolerant – No Delayed LRA Allergies
- Food and chemical sensitivities (delayed allergies) over-burden the immune system leading to intolerance and chronic illness
- LRA lymphocyte reactions identifies all 3 types of delayed allergies concurrently that contribute to failed clinical trials.
- LRA delivers <3% variance and 30+ years of clinical evidence: Gold standard immune cell culture tests / plans
- Other Predictive Biomarkers available



BIOLOGICAL DETOX
IN THE 21ST CENTURY
Nature's pHarmacy

DR. RUSSELL JAFFE