

Neurotoxin Orientation and Getting Started with Your Detox

- What are neurotoxins?
 - Heavy metals, man-made toxic chemicals, Biotoxins from chronic infections, environmental pollutants like mold, additives to food and personal care products; all have exponentially increased in our environment.
- Why are they so ruinous to your health?
- What can be done about it; getting started with your detox, the basic products and strategies.

Neurotoxins

- Neurotoxins are substances attracted to the mammalian nervous system. They are absorbed by nerve endings and travel inside the neuron to the cell body.
- On their way they disrupt vital functions of the nerve cell, such as axonal transport of nutrients, mitochondrial respiration and proper DNA transcription. The body is constantly trying to eliminate neurotoxins via the available exit routes: the liver, kidney, skin and exhaled air.
- Cellular detox mechanisms include acetylation, sulfation, glucuronidation, oxidation and others.
- Often the host is triggered to produce neurotoxins (which are damaging to host tissues) by the invading microbes through molecular trickery.

Neurotoxins: Re-uptake

- The liver is most important in the toxin elimination process. Here most elimination products are expelled with the bile into the small intestine and should leave the body via the feces (digestive tract).
- However, because of the lipophilic/ neurotropic nature of the neurotoxins, most are reabsorbed by the abundant nerve endings of the enteric nervous system (ENS) in the intestinal wall. The ENS has more neurons than the spinal chord.

Sources of Neurotoxins

- Toxic heavy metals: mercury, lead, tin, cadmium, aluminum...
- Toxic chemicals (xenobiotics – man made environmental toxins: phthalates and other plasticizers, solvents, benzene, styrene, formaldehyde, dioxin, insecticides, PCB's, wood preservatives...
- Food preservatives, excitotoxins and cosmetics: aspartame (diet sweeteners), food colorings, fluoride, methyl and propyl paraben...

Sources of Neurotoxins, cont.

- Biotoxins: such as tetanus toxin, botulinum toxin (botox), ascaridin (from intestinal parasites), unspecified toxins from streptococci, staphylococci, Lyme disease (Quin), chlamydia, tuberculosis, mycotoxins (mold and fungus) and toxins produced by viruses.
- Biotoxins are minute molecules (200-1000 kilodaltons) containing nitrogen and sulfur. They belong to a group of chemical messengers which microorganisms use to control the host's immune system, host behavior and the host's eating habits.
- The bowel is a major reservoir of the chronic infections that live and thrive in our body- (leaky gut, bowel biofilm, overgrowth of "bad" bugs...).
- The Bowel is also critical for removing all forms of neurotoxins.

Symptoms of Neurotoxicity

Any illness in any system can be caused by, or contributed to, or exaggerated by neurotoxins.

- See neurotoxin questionnaire
 - Digestive system: all symptoms
 - Ears, eyes, head, mouth and throat, nose, sinus, and skin disorders
 - Energy, weight, endocrine disorders
 - Mental, emotional and nervous and neurodegenerative diseases
 - Heart and lungs
 - Cancer, and immune disorders (autoimmune), allergies
 - Joints and muscular dysfunction and pain
- Blunting of the senses is a common early symptom.
- Neurotoxic life spectrum of diseases: Autism Spectrum (kids) to (neuro) degenerative and cancer diseases (adults), and many chronic diseases in between

Assessment of Neurotoxicity

- History of Exposure: (Did you ever have any amalgam fillings? A tick bite? etc); see mercury exposure questionnaire
- Symptoms: see Neurotoxin questionnaire - (How is your short term memory? Do you have areas of numbness, strange sensations, etc.)
- Laboratory Testing: may or may not confirm assessment initially; toxicity lab testing requires sampling of the toxic metals / chemicals in the bodily fluids or tissues; often need to treat first and confirm later. (Metals: hair, stool, serum, whole blood, urine analysis, xenobiotics: fatty tissue biopsy, urine. Mold: Immunosciences mold panel)
- Autonomic Response Testing: (Dr. Dietrich Klinghardt M.D., Ph.D.)
- BioEnergetic Testing (EAV, kinesiology etc.)
- Response to Therapeutic Trial
- Functional Acuity Contrast Test (measure of Retinal Blood Flow)

Independent Risk Factors

(which can either cause accumulation of metals in an otherwise healthy body - or slow down - or inhibit the body's own elimination processes)

- Genetics – ability of the person to naturally detox, inherited and acquired (worse early in life)
- Accumulative exposure to toxic metals, chemicals: synergy of neurotoxins; environmental and occupational
- Prior illnesses, surgical operations, medication or “recreational” drug use
- Emotional trauma, especially in early childhood
- High carbohydrate intake combined with protein malnutrition (especially in vegetarians)
- Use of homeopathic mercury
- Food allergies and allergies in general
- The patient's electromagnetic environment (mobile phone use, home close to power lines etc)
- The bowel health: constipation...
- Compromise of head/neck lymphatic drainage (sinusitis, tonsillectomy scars, poor dental occlusion)
- Number of dental amalgam fillings over the patients life-time, number of the patients mothers amalgam fillings

Treatment Strategies – Getting Started with Food - Naturopathic

- Diet: high protein, high mineral, high good fats, water and electrolytes
- Bowel health- one cannot recover without good bowel health: bowel detox is essential
- Binding food: bowel and extra cellular tissues: chlorella
- Mobilizing food: cilantro
- Other bio-protection: garlic, fish oils
- Other strategies: chelation, and other support and detox products will be presented later.

Treatment Strategies

- Understand the neurotoxin nature of detox
- At Home strategies, which focus on foods, super-foods and supplements
- At home strategies that focus on naturopathic detox - bowel, lymph and drainage organs, so to move the neurotoxins out (not around).
- Understanding your symptoms so that you may act (or react) appropriately.

Treatment: High Protein Intake

- Proteins provide the important precursors to the endogenous metal detox and shuttle agents, such as coeruloplasmin, metallothioneine, glutathione and others
- The branched-chain amino acids in cow and goat whey have valuable independent detox effects.
- Amino acids are critical for all immunological, neurotransmitters, enzymatic and detox functions

Treatment: High Mineral Intake/ Electrolytes

- Metals attach themselves only in places that are programmed for attachment of metal ions.
- Mineral deficiency provides the opportunity for toxic metals to attach themselves to vacant binding sites.
- A healthy mineral base is a pre-requisite for all metal detox attempts (selenium, magnesium, zinc, copper, manganese, germanium, molybdenum etc.).
- Substituting minerals can detoxify the body by itself.
- Just as important are electrolytes (sodium, potassium, calcium, magnesium), which help to transport toxic waste across the extra cellular space towards the lymphatic and venous vessels.

Treatment: Water Intake/ Electrolytes

- Water is the #1 detox agent and electrolytes are critical for neurological function. **All symptoms of neurological diseases are minimized if electrolytes are added to the water in copious amounts.**
- Without enough fluid intake the kidneys may become contaminated with metals. The basal membranes swell up and the kidneys can no longer efficiently filtrate toxins. Adding a balanced electrolyte solution in small amounts to water helps to restore intra-and extra cellular fluid balance.
- **The importance of macro minerals or electrolytes during detox cannot be overemphasized (i.e. Calcium, potassium, magnesium, sodium, and phosphorus). Every aspect of detox is enhanced:**
 - Mobilizing Mercury and other heavy metals,
 - Reducing excessive acidosis,
 - Nerve and muscular dynamics,
 - Electrolytes facilitate the voltage to make transport of nutrients and amino acids work
 - Reducing symptoms during detox.

Electrolytes: Matrix Electrolytes (ME), Selectrolytes

- The autonomic nervous system in most toxic patients is dysfunctional. Electric messages in the organism are not received, are misunderstood or misinterpreted. Neither toxins nor nutrients can be shuttled through the matrix (extracellular space). Most effective is a solution pioneered by the American chemist Ketkovsky. He created the formula for the most effective electrolyte replacement, which was further improved to create ME
- The uptake and cellular absorption of herbal remedies is significantly increased
- Five percent of the population is sodium or chloride sensitive – the blood pressure goes up (reversible). In these patients the detox process takes longer and is more difficult. Treatment – Allergy Elimination Therapeutics
- **Dosage:** 1 tbsp in a cup of good water 1-3 times/day During times of greater stress the dosage can be temporarily increased to 2 tbsp 3 times/day. Put the electrolytes in your water and drink throughout the day

Treatment: Good Fats – Rebuild Cellular Membranes

- Lipids (made from fatty acids) make up 60-80 % of the central nervous system and need to be constantly replenished. Deficiency makes the nervous system vulnerable to the fat soluble metals, such as metallic mercury constantly escaping as odorless and invisible vapor evaporating from the amalgam fillings.
- All metabolic processes occur on the membranes, and in toxic metal and chemical conditions the membranes are always damaged. All detoxification occurs on healthy membranes, the liver the primary detox organ is dependent on fatty acid and cellular membrane dynamics.
- Need to eat Essential fatty acids (omega 3 and 6 grain and seed oils) and supplement with fish oils.

Treatment Strategies: Super-foods

Chlorella

- **Toxin binding** (mucopolysaccharide membrane) all known toxic metals, environmental chemical toxins such as dioxin and others, bio-toxins from chronic infections (Lyme), and radiation
 - Sporopollenin is as effective as cholestyramin in binding neurotoxins and more effective in binding toxic metals than any other natural substance found.
 - Effective in bowel detox and extra cellular chelation and mobilization
- Repairs and activates the body's **detoxification functions**:
 - Dramatically increases intra-cellular reduced glutathione,
 - Various peptides restore coeruloplasmin and metallothioneine
 - Lipids (12.4 %) alpha-and gamma-linoleic acid help to balance the increased intake of fish oil during our detox program and are necessary for a multitude of functions, including formation of the peroxisomes.
 - Methyl-cobalamine (B-12) is food for the nervous system, restores damaged neurons and has its own detoxifying effect.

Treatment Strategies: Super-foods

Chlorella cont.

- Chlorella detox factors:
 - Chlorella growth factor helps the body detoxify itself in a yet not understood profound way. It appears that over millions of years chlorella has developed specific detoxifying proteins and peptides for every existing toxic metal.
 - The Porphorins in chlorophyll have their own strong metal binding effect. Chlorophyll also activates the PPAR-receptor on the nucleus of the cell which is responsible for the transcription of DNA and coding the formation of the peroxisomes (see fish oil), opening of the cell wall (unknown mechanism) which is necessary for all detox procedures, normalizes insulin resistance and much more. Medical drugs that activate the PPAR receptor (such as pioglitazone) have been effective in the treatment of breast and prostate cancer.

Treatment Strategies: Super-foods

Chlorella cont.

- Super-food and other beneficial effects
 - **Super nutrient:** 50-60% amino acid content, ideal nutrient for vegetarians, methyl-cobolamin - the most easily absorbed and utilized form of B12, B6, minerals, chlorophyll, beta carotene etc.
 - Good for mineralization -
- **Immune system strengthening**
- **Restores bowel flora**
- **Digestive aid (bulking agent)**
- **Alkalinizing agent (important for patients with malignancies)**
- The use of chlorella is the basis of the mobilizing/chelation cycles that we often advocate.

Chlorella Dosages - Adult

- Start with 1 gram (=4 tablets, 1 teaspoon) 2-4 times/day and build up to the prescribed maintenance dose (3-9 grams/ day) - . This is the standard maintenance dosage for grown ups for the 6-24 months of active detox.
- Chlorella is both a chelator – moving heavy metals out of the body and a mobilizer, moving mercury and other heavy metals from deeper stores to more readily removal areas. We use in it both capacities.
 - There are three strategies to dosing chlorella:
 - Low dose: .25 – 1 gram with meals: this dose will bind mercury and other heavy metals in the food that you eat (i.e. mercury in fish).
 - Mobilizing dose: 3-9 grams per day; the dose could be taken all at once or divided with meals, at night. (See below).
 - Chelating dose: 2-3 times the mobilizing dose - to be used during chelation days

Chlorella Dosages - Adult

There are two strategies concerning when and how much chlorella to dose

- Take the **entire mobilizing dose (3-9 grams) at one time once or twice a day 1 hour away from food**. This is the best strategy for **gut detox** because it concentrates the chlorella in the gut, scrubbing the heavy metals from the biofilm, gut lining and the pathogens. This strategy is often used earlier in the detox treatment, when bowel functional restoration is important, or when bowel biofilm or other chronic infections are being addressed.
- Once the gut and extra cellular connective tissues have been detoxed for at least 1 month (for some longer), **chlorella and cilantro are used for the most effective detox combination**. The strategy is to take chlorella 30-60 minutes before meals and/ or at night before bed followed by a cilantro dose. This strategy will be most effective in removing neurotoxins out through the feces that are detoxed in the liver and delivered to the bowel from the bile.

Take 30 - 60 minutes before the meal (s) and at bedtime. This way chlorella is exactly in that portion of the small intestine where the bile squirts into the gut at the beginning of the meal, carrying with it toxic metals and other toxic waste. These are bound by the chlorella cell wall and carried out via the digestive tract.

Chlorella Dosages - Adult

- There are 4 phases of chlorella dosages
 - Mobilizing dose 3-9 grams 1-3 times a day AM/ at bed; for 7-10 days
 - Chelating dose: 2-3 times the mobilizing dose; for 2-3 days
 - Post chelating dose: mobilizing dose with meals – 1 gram with meals; for 3-5 days
 - Rest: no chlorella; for 7-14 days
- The cycle can be repeated every 3 weeks at a minimum, usually monthly, or with a number of months between cycles, during maintenance.

Chlorella Strategies

- When amalgam fillings are removed, the higher dose should be given for 2 days before and 2-5 days after the procedure (the more fillings are removed, the longer the higher dose should be given). If you take Vitamin C during your detox program, take it as far away from Chlorella as possible (best after meals). Swish the chlorella in your mouth before swallowing to start removing the mercury in the mouth tissues.
- Side effects: most side effects reflect the toxic effect of the mobilized metals which are shuttled through the organism. This problem is instantly avoided by significantly increasing the chlorella dosage (small chlorella doses mobilize more metals than are bound in the gut, large chlorella doses bind more toxins than are mobilized)
- Some people have problems digesting the cell membrane of chlorella. The enzyme cellulase resolves this problem. Cellulase (Candisol) is also available in many health food stores in digestive enzyme products. Taking chlorella together with food also helps in some cases, even though it is less effective that way
- *C. vulgaris* has a thinner cell wall and is better tolerated by people with digestive problems. Some manufactures have created cell wall free chlorella extracts (Metal matrix, NDF, PCA, HMD) which are very expensive, less effective - but easily absorbed.

Chlorella Growth Factor

- This is a heat extract from chlorella that concentrates certain peptides, proteins and other ingredients.
- The most potent detoxification peptide is sporopollenin only found in CGF.
- The research on CGF shows that children develop no tooth decay and their dentition (maxillary-facial development) is near perfect
- There are less illnesses and children grow earlier to a larger size with higher I.Q. and are socially more skilled.
- There are case reports of patients with dramatic tumor remissions after taking CGF in higher amounts.
- In our experience, CGF makes the detox experience for the patient much easier, shorter and more effective.
- Recommended **dosage**: 1 cap. CGF for each 20 tablets chlorella

Cilantro

(Coriander, Chinese Parsley)

- This kitchen herb is capable of mobilizing mercury, cadmium, lead and aluminum in bones, the central nervous system and connective tissues; but you need a lot of it to be effective (dose= handful).
- The dose of Cilantro is best supplied in tinctures, organically grown under special conditions and in soil that enhances its detox power: Biopure, Morin labs, Dragon River
- It is probably the only effective agent in mobilizing mercury stored on cell wall receptor sites and in the intracellular space (attached to mitochondria, tubulin, liposomes etc) and in the nucleus of the cell (reversing DNA damage of mercury)
- Cilantro is a good mobilizer but a poor chelator, cilantro mobilizes more toxins than it can carry out of the body. It may flood the connective tissue (where the nerves reside) with metals that were previously stored in safer hiding places. This process is called re-toxification. Therefore cilantro must use simultaneously a chelating agent and an intestinal toxin-absorbing agent – chlorella
- Cilantro's action appears to be rapid – 5-20 minutes; dose away from Vitamin C and garlic, so not to inactivate cilantro's action.

Cilantro

- Start cilantro dosing 1-2 months later in the detoxification process, after the bulk of the extra cellular spaces have been cleaned up;
- **Dosage: Start with 2-3 drops 1-2 times a day in hot water and build up to full dose of 10-20 drops; 30 - 60 minutes after chlorella. Cilantro contains a mild toxic compound, which is neutralized in hot water; use at bedtime (during the vagus-dominant sleep phase many detox functions are most active).**
- Cilantro causes the gallbladder to dump bile - containing the excreted neurotoxins - into the small intestine. The bile-release occurs naturally as we are eating and is much enhanced by cilantro. If no chlorella is taken, most neurotoxins are reabsorbed on the way down the small intestine by the abundant nerve endings of the enteric nervous system).
- Gradually increase dose to 10 drops 3 times/day for full benefit. During the initial phase of the detox cilantro should be given 5 days on, 2 days off.
- Works most effectively when combined with Toxaway microcurrent foot bath

Cilantro

- Cilantro can be used topically or orally:
 - Transdermal application will by-pass the gut and brain barriers to uptake the remedy into thin skin and into the ANS nerves and lymphatic system: rub drops of cilantro over any area of pain or dys-function; transdermal application can also be applied over the thin skin of the wrists, ankles or groin. Other ways of taking cilantro:
- rub 5 drops twice/day into ankles for mobilization of metals in all organs, joints and structures below the diaphragm, and into the wrists for organs, joints and structures above the diaphragm. The wrists have dense autonomic in-nervation (axonal uptake of cilantro) and are crossed by the main lymphatic channels (lymphatic uptake)
- Good for headaches and other acute symptoms (joint pains, angina, headache): rub 10 –15 drops into painful area. Often achieves almost instant pain relief
- Take 10-15 drops as a bile stimulant just before meals

Freeze-Dried Garlic

Garlic:

- Protects WBC and RBC blood cells from oxidative damage caused by heavy metals in the blood stream, especially during detox – the way out;
- It a weak detox functions having a high affinity to toxins, but unlike chlorella it has a weak bond to the toxins, which is split off in the GI tract – therefore always use with chlorella to rebind in the gut.
- Garlic oxidizes heavy metals making them water soluble and more easily transportable.
- Metal toxic patients almost always suffer from secondary infections, which are often responsible for part of the symptoms. Garlic contains alliin which is enzymatically transformed into allicin, nature's most potent antimicrobial agent; therefore garlic is an immuno stimulant - anti- viral/ fungal/ parasitic/ microbial; part of the gut maintenance program
- Garlic also contains the most important mineral which protects from mercury toxicity, bio active selenium. Most selenium products are poorly absorbable and do not reach those body compartments in need for it. Garlic selenium is the most beneficial natural bioavailable source. Garlic is also protective for against heart disease and cancer
- Garlic supplies sulfur. Very important in mercury detox

Freeze-Dried Garlic

- Freeze dried – the only type of garlic supplement to consider: Biopure, Bioimmersion, Pharmax
- 1-2 capsules after the meal so the allison is not destroyed is the best timing; in addition – open the capsules into water and let sit for 5 minutes so the allison can become active; use once or twice a day.
- Dose garlic until you reek – then back off so that you are not socially unacceptable.
- Use fresh garlic with meals
- The half life of allicin (after crushing garlic) is less then 14 days. Most commercial garlic products have no allicin releasing potential left. This distinguishes freeze dried garlic from all other products.
- Bear garlic tincture is excellent for use in detox, but less effective as antimicrobial agent
- Note: Garlic and vitamin C will inactivate cilantro, therefore use on consecutive days, or AM and PM or at least 20 minutes apart.

Omega 3 Fatty Acids- Fish Oils

- Other researchers have focused on the mitochondria and other cell organelles, which in our experience are damaged much later. The cell is constantly trying to make new **peroxisomes** to replace the damaged ones– for that task it needs an abundance of fatty acids, especially EPA and DHA. Until recently it was believed, that the body can manufacture its own EPA/DHA from other Omega 3 fatty acids such as flax seeds. Today we know, that this process is slow and cannot keep up with the enormous demand for EPA/DHA our systems have in today's toxic environment. Fish oil is now considered an essential nutrient, even for vegetarians. Recent research also revealed, that the transformation humans underwent when apes became intelligent and turned into humans happened only in coastal regions, where the apes started to consume large amounts of fish.
- The fatty acids in fish oil are very sensitive to exposure to **electromagnetic fields**, temperature, light and various aspects of handling and processing. Trans fatty acids, long chain fatty acids, renegade fats and other oxidation products and contaminants are frequently found in most commercial products. Ideally, fish oil should be kept in an uninterrupted cooling chain until it ends up in the patient's fridge. The fish-source should be mercury and contaminant free, which is becoming harder and harder. Fish oil should taste slightly fishy but not too much. If there is no fish taste, too much processing and manipulation has destroyed the vitality of the oil. If it tastes too fishy, oxidation products are present..

Fish Oils

- **Dosage:** 1 capsule Omega 3 taken 4 times/day during the active phase of treatment, 1 caps. twice/day for maintenance. Best if taken together with chlorella
- When Krill oil is used, only 1 cap bid is recommended. In Krill oil EPA and DHA are bound to phospholipids, which gives it special properties. May be superior to fish oil
- The VegiPearls contain half the amount of EPA/DHA. The vegetarian capsules eliminate even the most remote possibility of containing prions and make the idea of taking fish oil more easily acceptable for vegetarians. Recently a fatty acid receptor has been discovered on the tongue, joining the other more known taste receptors. If the capsules are chewed, the stomach and pancreas start to prepare the digestive tract in exactly the right way to prepare for maximum absorption. Children love chewing the VegiPearls
- To treat bipolar depression, post partum depression and other forms of mental disease, 2000 mg of EPA are needed/day (David Horrobin). For the modulation of malignancies, 120 mg of EPA 4 times/day are needed. The calculations can easily be done with the information given on the label

Neuro-toxin Detox: Summary

- What are neurotoxins? Heavy metals, toxic chemicals, chronic infections – Lyme, mold...; Neurotoxin disease = symptoms, over the threshold of the bodies ability to detox; all are synergistic, therefore all must be detoxed to regain health.
- Everyone accumulates neurotoxins through dental, foods, the air we breath, the chemicals we put on our bodies...; its unavoidable in our modern living even if we try to be as clean as possible
- How are neurotoxins detoxed: liver, bowel; with the primary use of chlorella to bind the toxins and carry them out – note neurotoxin re-uptake.
- What is the most effective natural method of detoxing mercury and other heavy metals: chlorella and cilantro (note the techniques)
- What are other critical foods, food-supplements for neurotoxin detox: fish oils, proteins, minerals, electrolytes, and freezed dried garlic

Neuro-toxin Detox:Summary

- Detox for Life – principle for health
- Handouts that accompany this seminar downloadable on the net, www.nihadc.com/ library : Neurotoxin questionnaire, Dosing with Chlorella and Cilantro for Neurotoxin Elimination and-
- Principles and strategies to detox can be reviewed in the Heavy Metal Detox E-book (150 pages); Please have these references to help make this easy.
- These principles will be the subject of the other “web-in-air”. Much more to come, this is just the start!

Neuro-toxin Detox: Summary

- The purpose of this initial seminar on Detox for Live is to give you ready to use strategies to get started; change the focus from heavy metals to synergistic neurotoxins; Emphasize the importance of the bowel in detoxification – its health and ability to efficiently remove the neurotoxins, without re-absorption; and the major focus to health and detox for life is food and super-foods.
- The past seminars and handouts are available on the web; this series is intended to be additive.
- Diet and life-styles are critical for success, your food is your medicine. Please take advantage of our "Healthy Living Nutrition and Lifestyle Programs: Eve, Lisa and Kathy.