

Silicon Valley Health Institute

Host of the Smart Life Forum

Next Meeting: Thursday, May 21, 2015

Main Presentation: Christopher Shade, PhD
“The Human Detoxification System”

Secondary Presentation: Ann Arens, MD
“Toxins and Toxicology”

Smart Life Forum

Presentation Location

Cubberley Community Center

Room H1

4000 Middlefield Road

Palo Alto, California

Directions on our website:

www.SVHI.com

For those who cannot attend,
you can view livestreaming at

<http://bit.ly/Zpld3o>

See our archived videos at

<http://tinyurl.com/smartlifeforum>



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Announcements & Upcoming Events

Upcoming Speakers:

JUNE 2015

Philip Miller, MD

"What You Need To Know About Heart Disease"

JULY 2015

Raymond Francis, MSc

Upcoming Foundation for Mind Being Research Meeting (FMBR)

Friday, May 22, 2015 @ 7:30pm

**New Humanity Needs New Methods
Introducing the Self-Healing Dalian Method**

Unity Community Church

Y.E.S. Hall

3391 Middlefield Rd, Palo Alto, CA

Please visit www.FMBR.org for more info.

If you have questions please email
susanrdowns@hotmail.com.

Thank you.

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Secondary Presentation Speaker: Ann Arens, MD!



Annie is Board Certified in Emergency Medicine, and is a Medical Toxicology Fellow at the University of California - San Francisco. She completed her Medical School training at the University of Minnesota - Twin Cities School of Medicine and her Emergency Medicine training at Denver Health Residency in Emergency Medicine. Her research interests include drugs of abuse surveillance and the treatment of severe alcohol withdrawal.

(End of Meet Ann Arens!)

Secondary Presentation: Ann Arens, MD

Article written by Susan Downs, MD, ABOIM

“Toxins”

Dr. Arens will discuss detox mechanisms, including chelation.

We live in a polluted world. Toxic chemicals are added to our food, our household products, and body care products. There also are adverse health effects from electronic devices such as cell phones and cordless phones. Each year, approximately 2,000 new chemicals are registered for use in everyday items including: food, personal care products, prescription drugs, household cleaners, and lawn care products.

Personal care products are laden with toxic chemicals. One out of five adults is potentially exposed every day to all the top seven common carcinogenic impurities in cosmetics and personal care products. Hydroquinone is the top most common impurity, potential contaminant in products used by 94 % of women and 69 % of men. Three of these chemicals are systematically absorbed, metabolized and excreted in urine following application on the skin in a cream preparation (Janiua et al. 2008).

Since World War II, over 85,000 synthetic chemicals have been registered with the US Environmental Protection Agency.). The Toxic Substance Control Act of 1976 grandfathered 65,000 chemicals already in use with no further testing required. There is no single regulatory agent that oversees industrial chemicals to insure their safety. All chemicals are presumed safe until proven hazardous

Studies on the health effects of toxins are typically based on short term observations. These studies assume that individuals have similar sensitivities, metabolisms and elimination patterns. Usually these studies do not look at synergistic effects of more than one toxin, do not account for epigenetic effects and cannot address cumulative effects.

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Small amounts of bioaccumulative substances can lead to significant levels of toxins over time (Thorton et al. 2002).

Individuals have varying sensitivities to toxins and varying abilities for the body to clear these toxins from the body.

Differences in sensitivity can be due to increased exposure, nutrient deficiencies (such as Vitamin B6, magnesium, and selenium), a diet high in sugar, heavy metal exposure, stress, intestinal dysbiosis (“leaky gut”) and genetic variations in detoxification enzymes.

The process of removing toxins from the body involves converting the foreign chemicals to a more water-soluble form so that it can be eliminated through the urine. This elimination process can be impaired by high toxic loads, impaired elimination (e.g. constipation), nutrient imbalances, deficiency of detoxifying substances (antioxidants and cofactors) and a dysregulation of detoxifying enzymes. Differences in intestinal microflora may significantly affect xenobiotic (i.e., foreign) induced toxicity by either activating or inactivating these toxins via metabolism (Jeong et al. 2013).

TOXINS AND DISEASES

Environmental toxins have a principle role in causing cancer (Lichtenstien et al. 2000), neurological defects and obesity.

Neurotoxic Effects

Industrial chemicals that injure developing brains and lead to disorders such as autism, ADHD, dyslexia and other cognitive impairments include: lead, methyl mercury, polychlorinated biphenyls (PCBs), arsenic, toluene, manganese, fluoride, (Grandjean, Landrigan 2014). A systematic review of toxicant-related studies in autism found that pesticides, phthalates, PCBs, solvents, toxic waste sites, air pollutants, and heavy metals were implicated in autism, with the strongest evidence found for air pollutants and pesticides (Rossignol et al. 2014). An increase in Parkinson disease has been associated with pesticides (organophosphates, rotenone), herbicides (paraquat), organic solvents, and heavy metals (Manganese, copper, lead plus iron, and solvents (Goldman et al. 2010).

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Obesity

Exposure to toxic chemicals may damage many of the natural weight control mechanisms (Baillie-Hamilton 2002) such as altering homeostatic set points, disrupting appetite controls, perturbing lipid homeostasis and stimulating adipogenic pathways (Grun 2010). Possible obesogens include

- Pesticides and herbicides,
- phthalates (plasticizers),
- bisphenol A (BPA is a plasticizer),
- chemicals in detergents,
- Perfluorooctanoic acid (PFOA): nonstick water repellants
- Polybrominated diphenylethers (PBDEs): flame retardants
- High fructose corn syrup
- Ingredients in detergents

SPECIFIC TOXINS

Persistent Organic Pollutants (POPs): are substances that persist in the environment. They have high lipid solubility and accumulate in the fatty tissues for long periods of time. Hence, they can accumulate in fatty tissues through the food chain. As one moves up the food chain, the accumulation increases (Kelly et al. 2007). Fat stored POPs impair detoxification (acting as CYP450 phase I enzyme inducers). At low levels they are associated with endocrine disruption, mitochondrial dysfunction, insulin resistance, neurotoxicity, immunotoxicity, liver toxicity, and genotoxicity. POPs include dioxin pesticides and materials in flame retardants.

Pesticides

Over one billion pounds of pesticides are produced annually in the US. There are over 350 different pesticide ingredients. Only a small fraction of pesticides reach the intended pests. The scientist who developed DDT won the 1948 Nobel Prize for Medicine, Dr. Paul Mueller of Switzerland. Although DDT was made illegal in the US in 1973, this writer was involved in shipping DDT to India in 1979 as part of the USAID development program. DDT is

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also shipped to Mexico for use on the produce they ship to the US. DDT is associated with an earlier age at menarche and increased risk of experiencing a shortened menstrual cycle (Ouyang et al. 2005).

The produce with the highest amount of pesticides are strawberries, bell peppers, spinach, cherries, peaches, cantaloupe, celery, apples, apricots, green beans, grapes and cucumbers. Strawberries are covered with plastic and repeatedly saturated with fumigants (methyl bromide) to kill weeds and soil microbes. In 2004 over 7 million pounds of methyl bromide were applied to fields.

Side effects of methyl bromide include headaches, myalgia, blurred vision, nausea, disequilibrium, lung damage, kidney damage, and CNS damage.

Atrozone is the most widely used weed killer for corn, grains, citrus fruits and sugar cane. It lowers testosterone and increases aromatase, increasing estrogen. It causes a decrease in fertility and neural damage for embryonic exposure (Environ Health Perspect online, Jan 24, 2006).

Organophosphates increase oxidative stress and inhibit acetylcholinesterase activity (Bayrami et al. 2012). Organophosphate pesticides have been associated with higher rates of ADHD (Chopra et al. 2014), anxiety, insomnia, depression, hyperglycemia (Malekirad et al 2013), and metabolic syndrome (Park S-K et al. 2010). Organophosphate pesticides exposure at levels common in the US may contribute to the prevalence of ADHD. The higher the exposure, the higher the odds of ADHD (Bouchard MF et al. 2010). Dioxin concentration is associated with breast cancer incidence in women (Wamer et al. 2002). Perchlorate, used to produce rocket fuel, is in the US water supply and adversely affects thyroid function in women (Blount et al. 2006).

The United Nations Environment Programme (UNEP) decided that POP regulation needed to be addressed globally. . The US signed a treaty but as of 2014 had not yet ratified it. (Stockholm Convention on Persistent Organic Pollutants, pp 1-43).

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Glyphosate

Glyphosate (sold by Monsanto under the name “Roundup”) accumulates in the genetically modified plants we eat. It may chelate manganese and suppress the enzymes involved in detoxification. This may substantially explain the increase in autism, Alzheimer’s disease, Parkinson’s Disease, anxiety, osteoporosis, thyroid dysfunction and infertility which has increased since the introduction of glyphosate (Samsel, Seneff, 2015).

Glyphosate disrupts gut bacteria and suppresses CYP450 by interfering with the detoxification of toxins. Glyphosate enhances the damaging effects of other food borne chemical residues and environmental toxins. It interferes with the detoxification (CYP) enzymes and synergistically acts with the disruption of the biosynthesis of aromatic amino acids by gut bacteria. It impairs serum sulfate transport. (Samsel, Seneff 2013). Glyphosate and other herbicides have been found to increase incidence of non-Hodgkin lymphoma (Hardell, Eriksson 1999).

Bisphenol A (BPA)

BPA has been used as plasticizer since 1957 despite lack of safety testing. It is used in plastic coatings, can linings (80 % of cans made in US), refrigerator shelving, dental sealants and composites, compact discs and DVDs, electrical insulators, baby bottles, and credit card receipts. It leaches over time and becomes unstable. Urinary BPA concentration is significantly associated with obesity (Trasande 2012). More than 90 % of people in the US have measurable BPA in their bodies. In 2010 Canada’s department of the environment declared BPA a “toxic substance”.

Phthalates

These plasticizers are commonly added to soap, shampoo and hair spray, water bottles, microwave containers, frozen food pouches, cling wrap, flexible plastic products, nail polish products, floor tiles, enteric medication coatings, synthetic leathers, medical devices (IV and ET tubing), and children’s toys, pacifiers, and baby bottle nipples. Phthalates are readily released to the environment, and can enter body through ingestion or inhalation. They have endocrine disrupting effects linked to cancer, obesity, type II diabetes, allergies/ asthma, ADHD and birth defects. They have been linked to asthma in children (Bomehag et al. 2004).

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Perfluoro-Octanoic Acid (PFOA)

PFC (perfluoro chemicals) are used in nonstick cookware, water repellants and stain resistant fabrics. PFOA distributes to serum, liver, and kidneys. It is not stored in adipose tissue and not metabolized in the body, so the body repeatedly recirculates it through enterohepatic recirculation. It is an endocrine disruptor; has immunotoxic and hepatotoxic properties; increases lipid levels and the risk of strokes. Animal studies linked PFOA exposure to cancer of the liver, pancreas, prostate, and testicles. (<http://www.epa.gov/oppt/pfoa/pubs/pfoarisk.html> *Am J Gastroenterol.* 2010 Jun;105(6):1354-63. *Epub* 2009 Dec 15. *Toxicol Sci.* 2007; 98(2):571-81 *Toxicol Sci.* 2006; 92(2):476-489.)

Fluorotelomers (PFOA Precursors) are found in microwaveable popcorn bags, fast food packaging, paper plates, candy wrappers, stain resistant fabrics, leather, dental floss, denture cleaners, shampoo, fire fighting foam, electrical insulation. These are very resistant to biodegradation and will persist long after they are banned. They are found in the blood of 90 % of Americans and 96 % of the blood samples of children.

Electromagnetic Fields (EMF)

EMF can cause calcium leakage in the cells by disrupting voltage-gated calcium ion channels and may interfere with vesicle transport of molecules into the cells. Cell phones can alter micro RNA expression in the brain (Dasdag S et al. 2015 .

Further calcium loss makes holes in membranes allowing leakage of damaged DNA which may lead to cancer and infertility.

EMF exposure may have effects on the nervous system, cardiovascular system (Liu X et al. 2013). It can cause damage to the blood brain barrier leading to cognitive impairment (Tang et al. 2015). It affects the fetus' brain when the mother uses a cell phone during pregnancy (Aldad TS et al. 2012). Cell phone and cordless phone use can increase the risk of brain cancer (Hardell, Carlberg 2013; Ostrom QT et al 2015).

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Studies report cellphone use can result in genotoxicity, single- and double-strand DNA damage, chromatin condensation, loss of DNA repair capacity in human stem cells, reduction in free-radical scavengers (particularly melatonin), abnormal gene transcription, neurotoxicity, carcinogenicity, damage to sperm morphology and function, effects on behavior, and effects on brain development in the fetus. Cellphone exposure has been linked to altered fetal brain development and ADHD-like behavior in the offspring of pregnant mice.

Heavy metals

Volatile derivatives from metals such as mercury, arsenic, bismuth (Meyer et al. 2008) and non absorbed heavy metals (Breton et al. 2013) disrupt the gut microflora. Metal toxicity cause direct and indirect damage to mitochondria, depletion of glutathione causing free radical generation and increased mitochondrial damage (Pieczenik, Neustadt 2007).

Lead Toxicity

Lead toxicity was recorded as early as 6500 BC. The Roman Empire used lead in their plumbing, aqueducts, cooking utensils, wine urns, grape juice vessels, makeup, and sweetening agents. Lead is currently found in batteries, car radiators, ceramic cookware with lead glazes, paint, tin cans, and cosmetics including lipstick. In one study blood levels were 20 % higher for women reporting use of Ayurvedic and or traditional Chinese medicine herbs

Ninety five percent of the lead body burden is in the skeleton. Bone lead is considered a biomarker of cumulative exposure. Ninety to ninety five percent of the body burden of lead is in the bone which accumulates over the life time. Lead accumulates in regions undergoing the most active calcification during the time of exposure (Aufderheide, Wittmers, 1992).

Lead levels in post menopausal women have been correlated with lower bone density. When bone loss occurs with osteoporosis, lead is also released from bone. Bone mineral density was significantly inversely related with blood lead level in menopausal women (Lee, Kim 2012).

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Lead can disrupt hemoglobin synthesis, damage the blood brain barrier, lead to structural changes in the brain, damage mitochondrial membrane structure and damage cardiac conduction pathways. At low levels, blood lead was associated with all-cause and cardiovascular mortality (Weisskopf et al. 2009).

Low levels of lead have adverse effects (Needelman 2004). A developing nervous system is adversely affected at levels of less than 10 ug/dL (ATSDR) and is associated with greater impulsivity, irritability, attention difficulties (Miodovnik, Landrigan 2009), loss of intelligence, disruptive behavior, motor deficits, cognitive dysfunction, memory loss and depression. Lead levels less than 10 ug/dL are inversely associated with children's IQ scores at 3 and 5 years of age (Canfield 2003). These findings suggest that more U.S. children may be adversely affected by environmental lead than previously estimated and there may be no threshold for children and developmental effects.

A lead based paint ban was passed by the League of Nations in 1922. The US declined to adopt this measure.

Mercury

Methylmercury inhibits the electron transport activity and impairs mitochondrial function (Mori et al. 2011; Tonazzi A, Indiveri 2002). The Apo-E4 gene (which is associated with a higher risk of Alzheimer's disease) is associated with reduced mercury detoxifying capacity. The Apo-E2 variant greatest mercury detoxifying capacity (Godrey et al. 2003).

Arsenic

Arsenic is associated with an increased risk of diabetes mellitus, hypertension, ischemic heart disease, and cerebral infarction (Wang C-H et al. 2002).

Wang C-H et al. Biological gradient between long-term arsenic exposure and carotid atherosclerosis. *Circulation*. 2002 205:1804-1809.

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PRECAUTIONARY PRINCIPLE

When an activity raises the possibility of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically. The proponent of a proposed chemical should bear the burden of proof of the chemical's safety rather than testing the chemical on the public before the adverse effects of the proposed chemical are known.

In this context the proponent of a toxin, rather than the public, should bear the burden of proof.

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(End of Main Presentation)

Main Presentation Speaker: Christopher Shade, PhD!



Dr. Shade is a globally recognized expert on mercury and liposomal delivery systems. He has lectured and trained doctors in the U.S. and internationally on the subject of mercury, heavy metals and the human detoxification system. Dr. Shade developed the patented liquid chromatographic mercury speciation technology used at Quicksilver Scientific, while conducting his Ph.D. dissertation work with advisor Robert Hudson at the University of Illinois at Urbana-Champaign. This technology was used to create the Mercury Tri-Test.

Dr. Shade's current focus is on the development of cutting-edge, lipid-based delivery systems for nutraceuticals, such as liposomes and micro-emulsion systems to address the growing need of high quality, affordable detoxification solutions.

Dr. Shade has a diverse spectrum of interests and experiences ranging from traditional Scottish stone masonry and geology to open-ocean sailing and marine chemistry. This diversity is the key to harmonizing theoretical development and practical application for true alchemical solutions.

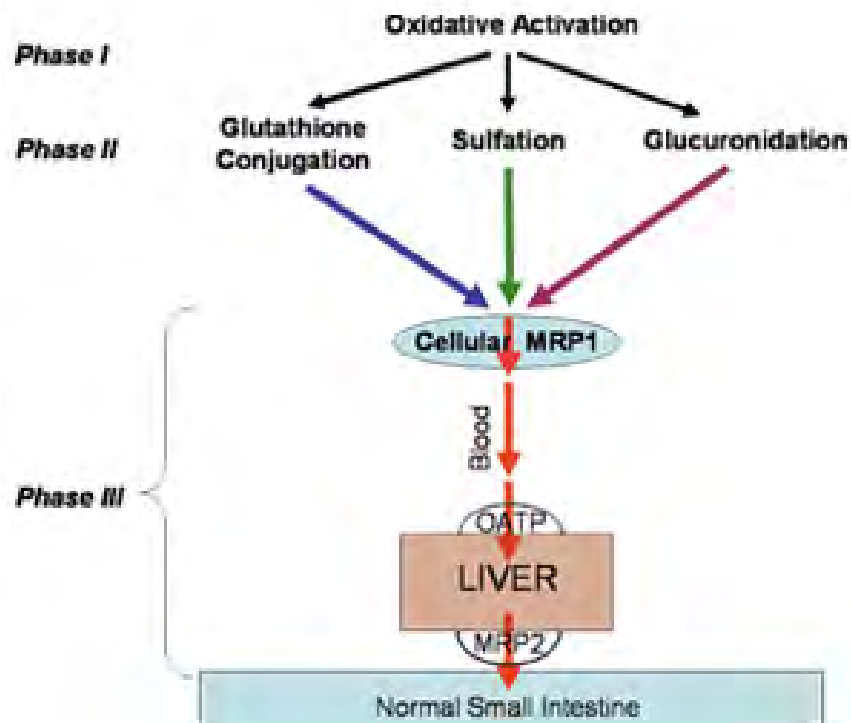
(End of Meet Christopher Shade!)

Main Presentation: Christopher Shade, PhD

“The Human Detoxification System”

Detoxification is a natural process inherent to the human body. Our bodies, over time, accumulate a variety of toxins from our environment, food sources and toxic emotions and become less effective at this process. Efficient detoxification depends on a series of seamless reactions that bind toxins to shuttle molecules and “escort” them out through a series of doors. The glutathione system is the most important of the detoxification systems and includes glutathione and the enzymes that work with it. The process of detoxification proceeds in three parts or “phases”, Phase I, II, and III. Dysfunction of the human detoxification system is the most common and insidious root cause of toxic element and compound accumulation in the body. True health requires that all phases are functioning and balanced or the whole system can not work properly.

The Human Detoxification System



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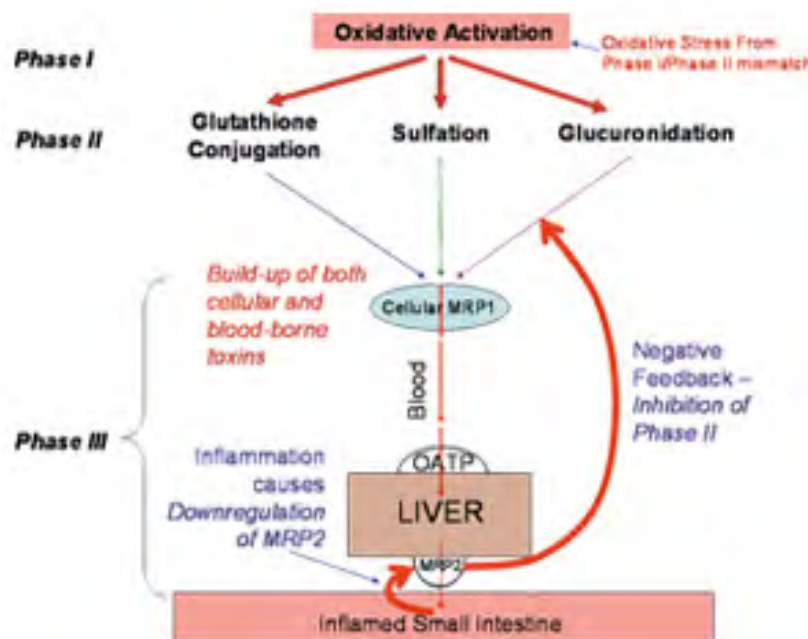
Successful Detoxification

Successful Detoxification of Mercury and other Heavy Metals (e.g. lead, cadmium, arsenic) requires three Fundamental Conditions:

1. Fully-functioning Phase III detoxification transport system (MRP1&2, OATP)
2. Fully-functioning Phase II enzyme, Glutathione S-transferase (GST)
3. Adequate intracellular glutathione levels

Quicksilver Scientific's Therapeutic Detoxification System is the ONLY detox system that specifically targets all three detoxification requirements!

Disruptions in Natural Body-wide Detoxification



Intestinal inflammation inhibits elimination of toxins by causing a strong down-regulation of the body's natural detoxification pathways. Unfortunately, exposure to pesticides, chemicals and certain toxins, such as the corrosion by-products of dental mercury amalgam ("silver" fillings) contributes to intestinal inflammation. In addition to inflammation, it has been demonstrated that a build up of metals alone slows the transport proteins. The data suggests that continuous removal of metals from the intestines is essential for the proper daily functioning of natural detoxification processes. The continuous removal of metals is also critical for any successful practitioner-directed detoxification program.

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Consequences of Impaired Detoxification

- Downregulation of toxin transporters
- Downregulation of Phase II detoxification enzymes
- Underexpression of cellular antioxidants

(End of Main Presentation)

About Smart Life Forum

Smart Life Forum, Inc. is a 501(c)(3) California nonprofit corporation whose primary mission is to provide credible health education to the public with an emphasis on optimal wellness, anti-aging medicine, and longevity.

Annual memberships in Smart Life Forum, Inc. and charitable donations are tax deductible to the extent allowed by law. For information on how to join or make a donation, please visit our website: www.SVHI.com.

For questions, please contact Susan Downs at susanrdowns@hotmail.com.

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