

DIRTY GENES, by Ben Lynch, N.D., a Book Report, Part II,
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We continue the discussion of genetic variations or single nucleotide polymorphisms (SNP's), their manifestations of symptoms and diseases, and how to clean them up, covering the last 3 of the 7 major SNP's. Dr. Lynch also provides menus and recipes for healthful foods that support cleaner genes. The GST/GPX gene governs glutathione, a key antioxidant and detoxifier. GST links glutathione to toxic chemicals for elimination and helps glutathione to turn hydrogen peroxide, a pro-oxidant, into water. Signs of a dirty GST from not eliminating toxic chemicals are hypersensitivity to chemicals, increased inflammation, hypertension, and obesity. Chemical hypersensitivity can manifest as respiratory symptoms, fatigue, migraines, and rashes. Signs of a dirty GPX from not converting hydrogen peroxide to water, disrupting the methylation cycle are: erratic moods, irritability, chronic fatigue, memory problems, and graying of hair. Infections can make a dirty GPX worse because it uses up glutathione and also the immune system uses hydrogen peroxide to kill microbial invaders.

The author cites 30 conditions related to glutathione dysfunction due to a dirty GST/GPX, including ALS, autoimmune conditions, cancer, heart disease, depression, bipolar disorder, Parkinson's, and vision loss. The sensitivity to chemicals and graying of hair may be the only warning signs that much more severe chronic disease may be on the horizon, if nothing is done.

Things that make GST/GPX more dirty are exposure to chemicals, stress, disrupted methylation cycle, insufficient B-2 (riboflavin), selenium, and cysteine, inflammatory foods such as sugars and unhealthy fats, and just plain overeating.

Some of the many functions of glutathione are antioxidant action, helping the mitochondria burn fuel for energy instead of gaining weight, helping B-12 transport, helping the brain make neurotransmitters, and helping the methylation cycle and a healthy MTHFR.

To support a healthy GST/GPX, eat high fiber foods that support the gut microbiome to detoxify and to assist the glutathione, clean up your personal environment, (Checking for mold is an important part), and detoxifying with hydration, deep breathing, exercise, sweating, etc. Nutritional support for GST/GPX is supplying the amino acid cysteine from onions, broccoli, cabbage, and other high sulfur vegetables, eggs, and meat. Supply B-2 with spinach, almonds, eggs, wild salmon and liver (organic). Supply selenium with brown rice, eggs and meat.

When increasing sulfur to help raise glutathione, some people may not tolerate a lot of sulfur because of an imbalanced gut microbiome. They may smell like rotten eggs. They may have to do a stool exam and correct the imbalances, and temporarily reduce high sulfur supplements such as MSM and NAC. Some people have sulfite sensitivity, with allergic reactions to high sulfite foods such as wine and dried fruits (that have sulfite added). Too high protein and high sulfur supplements can use up molybdenum, which is needed to process sulfites. Correcting the dietary factors and maybe supplementing with some molybdenum (my suggestion) may correct that problem.

The NOS3 gene has prominent issues with the cardiovascular system, but also affects the immune system, nervous system, metabolic, and reproductive systems. Symptoms of a dirty NOS3 can be nasal and sinus congestion, cold hands and feet, mouth-breathing, diabetes, above normal blood pressure, and failure of nitroglycerin to be effective. Many of these symptoms cause a dirty NOS3, and many are the result of it. A dirty NOS3 can cause nasal congestion, which in turn lowers the oxygen level, which

then dirties the NOS3. Pollution, smoking, and stress all can dirty it. The dirty gene during pregnancy increases risk for miscarriage, birth defects, and pre-eclampsia. A healthy functioning NOS3 regulates blood flow, blood clotting, new blood vessel formation, and healthy immune function. If other genes are dirty, such as MTHFR, GST/GPX, PEMT, MAOA, or COMT, each can dirty up the NOS3.

A long list of factors can dirty the NOS3, such as breathing abnormalities, high carbohydrate intake, pollution, smoking, stress, infection, inflammation, sedentary lifestyle, low estrogen and glutathione, microbiome imbalance, overeating, and others.

A host of diseases can result from a dirty NOS3, including breast and prostate cancers, cardiovascular disease, Alzheimer's and ALS, stroke, asthma, obesity, chronic kidney failure, hypertension, diabetes, and many others.

Ways to clean the NOS3 are avoiding toxic chemicals, managing stress, deep breathing, eliminating snoring, consuming foods naturally high in arginine (which makes nitric oxide), such as chickpeas, lentils, pumpkin seeds, goat dairy products, spirulina, chicken, and foods high in calcium such as leafy greens, okra, green beans, broccoli, almonds, goat dairy, and iron from squash, pumpkin, cashews, pine nuts, almonds, leafy greens, almonds, mussels, beef, and B-2 from spinach, wild salmon, mushrooms, eggs, and liver (organic).

The PEMT helps the body to make phosphatidylcholine, a key nutrient for several processes: 1. The primary component of cell membranes, needed to absorb nutrients. 2. Needed in pregnancy and breast feeding, to make many new cells. 3. Helps bile flow smoothly to handle lipids and aid digestion. 4. Moves triglycerides out of the liver, helps avoid *fatty liver*. 5. Needed for brain, nerve, and muscle function. It also provides *choline*, needed to make acetylcholine, a key brain neurotransmitter. Also it provides a backup pathway for the methylation cycle when it lacks methyl B12 or methylfolate. Common signs of a dirty PEMT include fatigue, muscle pain and weakness, malnutrition due to poor absorption from damaged cell membranes, fatty liver, high triglycerides, pregnancy complications, and small bowel bacterial overgrowth (SIBO). Clues as to who has a dirty PEMT are lacking intake of green vegetables, vegan diet, B12 deficient, itchiness, constipation, taking antacids, pains all over, history of gallbladder problems, intolerance to fatty foods, low estrogen levels, pain in right upper abdomen and right shoulder, history of SIBO, fatty liver, and the MTHFR C677T SNP. Chronic conditions that can result are birth defects, breast cancer, fatty liver, gallstones, liver damage, and depression.

Phosphatidylcholine production can be assisted by eating dietary sources of choline. For omnivores, liver, eggs, fish, chicken, and red meat. For vegans, various beans, lentils, mung, pinto, green peas, spinach, flaxseed, broccoli, beets, asparagus, and shitake mushrooms, and possibly supplementing with choline or lecithin. People and situations at most risk for choline deficiency are pregnant and breastfeeding women, children, vegans, low protein diet, post-menopause, low folate level, and deficiency in the methylation cycle from a dirty MTHFR.

So to keep a healthy PEMT, eat some high choline foods daily, eat in moderation, stop after 80% full, control stress, eat leafy green vegetables, get adequate protein, chew foods well, eat in a favorable environment for digestion, reduce refined carbohydrates, reduce exposure to chemicals, preservatives, and alcohol, wash hands with soap after being in public places to reduce infections, and fry foods at very low temperature with no smoke, to reduce fatty acid oxidation. If gallbladder is sluggish, the author recommends visceral manipulation by a professional trained in that.

The author provides more detail on the “Soak and Scrub” process, including food, supplements, detoxification, sleep, and stress relief.

The best foods may differ for a variety of people, and for the same person at different times. He says to *tune into how you feel* to better understand how to choose which foods and to know how much to eat. Learn the difference between *cravings* and *hunger*. Real hunger is that empty feeling in the gut and that you really *need* to eat. Craving is *wanting* a particular thing. When our genes are dirty, we often crave things that we don’t need. When our genes are cleaned, we crave less, and can more easily tell the difference between a want and a need. If you violate your plans and eat dirty food or too much, don’t guilt trip yourself, or that will just dirty up your genes worse. Just enjoy what you ate and get back to your plan. No regrets.

Plan your meals. Check in with your body and choose foods according to mental and physical activity, symptoms, and genes. Heavy physical activity may require more carbohydrates and fats, as well as protein, and mental activity may require emphasis on protein. If you are feeling great, you may not need so much food, but if you fatigue and headache, and haven’t eaten for a while, you may need more food. If we have many symptoms, it may be the consequence of inappropriate choices. Notice which genes need cleaning, to choose foods for that. These are basic methods for choosing foods, but with our commonly eaten junk foods and dirty genes, we often eat according to cravings, and cannot rely on our feelings to help us choose. Animals know how much to eat of what and when. When we clean up, we can begin to trust our natural instincts again to tell us how to eat.

Track your meals, and it may help to keep a food journal, to review your foods and symptoms.

Other recommendations are to eat organically if possible, and if not organic, choose those that are not from the “dirty dozen” vegetables and fruits, posted by the Environmental Working Group. Eat only when hungry. Eat only until 80% full. Fast from 12 to 16 hrs per night by stopping food early in the evening and eating a later breakfast, but if at any time feeling too hungry, foggy thinking, etc., eat something. Chew, chew, chew, enjoy the flavor. Swallow when the solid has turned to mostly liquid. Limit beverages at mealtime, especially cold ones. Limit fruit juices because of naturally high sugar content. Shop for foods at the perimeter of the store. Avoid frozen foods or leftovers if your DAO is dirty. Take time to taste and enjoy 3 meals per day, avoid snacking unless very hungry.

Advice on supplements include choosing the best forms. Liquid, powders, lozenges, and liposomal are better absorbed than tablets and capsules. Start with one supplement at a time and start slow. He recommends the “pulse” method, see how you feel on the supplement as you increase the dose. If you are feeling better, after a while decrease the dose to see if you need more and go back up on the dose. If feeling worse on it, stop it. After a “vacation” from it, if you start feeling worse on it, you can go back on it as before. This way you get a chance to see how it is working for you. A multivitamin with folate but no folic acid may be helpful, 1/3rd dose 3x/day. If you feel good without it, don’t take it. Herbal adaptogens can be helpful once a day. They help with long term resilience. Check with your health care provider about tapering off prescription drugs, and about stopping non-prescription drugs you may be taking.

Details on detoxification include avoiding foods in contact with plastic, avoid non-stick cookware, avoid air fresheners, scented products, and household cleaners. (Make use of vinegar and baking soda.) Avoid using pesticides and herbicides, and check your home environment for sources of toxins, especially mildew, damp areas, water spots, and get them cleaned up by certified remediator. Get a water filter, a HEPA filter vacuum, replace furnace air filters, and clean air ducts. Sweat frequently

with exercise, Epsom salts baths, and/or saunas. Wash off after sauna, and don't stay in any longer than feels right, and start with short sessions, and gradually lengthen later.

For better sleep, no bedtime later than 10:30. Stop eating 3 hours before bed, unless you have a fast MAOA, then have a light snack before sleep. No caffeine after 2 PM. Stop all electronic activity at least 1 hour before bed, install blue light filters on those devices, turn off night lights, and block illumination from street lights or neighbors. Sleep cycle can be tracked with the Sleep Cycle app or the OURA ring. Get sunlight early morning. Many things can be done to manage stress. He recommends stretching exercises, deep breathing practices, getting outside, enjoying nature, playing sports, etc. Meditate for at least 3 minutes, before going to bed. Go on a "news fast." Read only what you need to and ignore the rest, especially news on TV. Reduce time on social media. Keep a balance between work and play. Take vacations that you have coming to you.

Take a multivitamin if you feel a need for it. Then add liposomal glutathione as you feel the need, and use the "pulse method" described previously for supplements. Take molybdenum if breath, armpits, or gas smells like sulfur, or if you know you are sensitive to sulfites. Start with 75mcg and use the pulse method. You may have to temporarily reduce sulfur containing foods and glutathione until the smell goes away. If you have gas and bloating after meals, try digestive enzymes and betaine hydrochloride with meals, if no stomach ulcer.

Dr. Lynch provides several pages of recipes that help clean the genes, following the principles of food choices previously discussed.

After 2 weeks of scrub and soak, then spot clean specific genes. Do the review of symptoms for each gene, as before, and if showing signs of problems, zero in on that one, and if multiple genes are still dirty, he recommends the following order: start with the DAO, then PEMT, GST, COMT, MAOA, MTHFR, and NOS3.

He gives a more comprehensive list of symptoms for each gene in preparation for spot clean. For MTHFR, short of breath, red face, or wheezing after exercising, moods fluctuating, intolerance for alcohol, feeling tired or "toxic," difficulty falling asleep, some time to calm down after irritated. For DAO, irritable, hot, or itchy after eating, can't tolerate fermented foods, chocolate, citrus, or probiotics, and many food sensitivities, ringing in ears after eating, random joint pains off and on, hives, eczema, or psoriasis, headaches often, runny nose, nosebleeds, exercise induced asthma, can't fall asleep for several hours after eating. For slow COMT, more irritable after eating high protein diet, taking a long time to calm down, PMS, uterine fibroids, acne, heavy menses, enthusiastic, but easily irritated, able to focus for long hours, trouble falling asleep, cautious, irritated by coffee. For fast COMT, difficulty paying attention, depressed, can calm down after stressed out, calm most of the time, but don't always like to be, risk taker, feel great after pulling stunts, class clown, fidgeting, hard to get going in AM, easy to get addicted to games, social media, shopping, gambling, drugs, smoking, not interested in sex, falling asleep easily, and focus helped by caffeine. For slow MAOA, can focus for a long time, self confident, sometimes aggressive, irritable when eating cheese, chocolate, or wine, angry drunk, takes time to slow down or to fall asleep, but sleep well through the night. Caffeine, melatonin, inositol, 5-HTP, and SSRI's all cause irritation, and lithium helps the mood. For fast MAOA, difficulty focusing, depressed and anxious, obsessive, fall asleep easily, but awake during the night, need snack, feel better after cheese, chocolate, wine, and carbohydrates, seasonal affective disorder, chronically inflamed, Fibromyalgia, IBS, autoimmune conditions, melatonin, inositol, and 5-HTP help mood, but lithium makes depressed. For GST/GPX, generally feel tired and "toxic," easy to get infections, chronically stressed out, high blood pressure, chronic inflammation and autoimmune conditions, sensitive to

chemicals and smells, very easy to gain weight, early graying of hair, feel better after sauna or sweating, and cancer runs in family. For NOS3, cold hands and feet, atherosclerosis, heart disease, diabetes, asthma, sleep apnea, memory failing, autoimmune conditions and inflammation. For PEMT, general pain everywhere, gallstones, don't tolerate fatty foods, fatty liver, SIBO, low estrogen levels, worn out from breast feeding.

To spot clean DAO, select foods that support DAO, find health professional that does visceral manipulation, and someone to help with leaky gut and overgrowth of pathogenic bacteria, use natural antimicrobials, and L-glutamine, zinc carnosine (with additional copper to balance the zinc), aloe vera, and marshmallow root to heal leaky gut. Probiotics to restore beneficial bacteria that break down antihistamine, and temporarily avoiding foods high in histamine, such as citrus and juices, red wine, cocoa drinks, and fermented foods. Be aware that metformin slows the DAO enzyme, and aspirin and other NSAIDs can release histamine. Copper is needed for the enzyme to work, so in case you are taking extra zinc, you could become deficient in copper. Stinging nettle, bromelain, luteolin, and quercetin block histamine, and Vitamin C and fish oil stabilize mast cells. Support cell membranes to keep histamine inside cells, by keeping a clean PEMT. Sodium bicarbonate and potassium bicarbonate can relieve symptoms quickly by alkalizing the body fluids, especially if they are acidic.

For spot cleaning the PEMT, consider visceral manipulation of the liver, gallbladder, and diaphragm. Recognize the additional support needed during pregnancy, breastfeeding, and post menopause. Eat foods high in choline, as mentioned before. If estrogen is low, help from a health professional may be needed. Supplement with phosphatidyl choline or lecithin, and creatine to conserve SAME needed to make phosphatidyl choline.

For GST/GPX, eat foods high in cysteine, riboflavin, and selenium, listed previously, limit exposure to chemicals, do sweating with sauna, hot baths, exercise, massage, and use fiber supplements. Supplement with liposomal glutathione, riboflavin, selenium, and detox powders.

For slow COMT, remember to rest, do relaxing activities, and take vacations, do stimulating activities early in the day, limit your stressors, support sleep quality, as detailed previously, limit caffeine intake, eat sulfur containing vegetables, support liver with dandelion and radishes, limit protein intake (contains tyrosine) and keep most of it early in the day, don't take tyrosine supplements late in the day, beware of methyl folate supplements that can slow the COMT. Also estrogens can slow the COMT. Supplements to help are herbal adaptogens, magnesium, taurine, SAME, Phosphatidyl serine, phosphatidyl choline, and indole 3 carbinol or dindolylmethane.

To clean fast COMT, do activities that stimulate the brain, physical exercise, beware of addicting activities, devote enough time to each activity to accomplish something, to keep from bouncing frequently from one to another. Be sure you are getting enough protein. Be careful with supplements like SAME, phosphatidyl choline, creatine, and estrogen containing prescriptions, as some of these may slow your COMT too much. Supplements that may help are NADH and CoQ10, that can charge the mitochondria for energy in the morning, and tyrosine in the AM can build neurotransmitters needed for energy.

For slow MAOA, the things that benefit slow COMT can help here also. Supplements that may help are riboflavin and lithium. Be careful about the following supplements, as they may make the slow MAOA worse: Tryptophan, 5-HTP, melatonin, tyrosine, inositol, and prescriptions of testosterone, SSRI's, and thyroid replacement.

For the fast MAOA, reduce causes of inflammation such as stress, poor sleep, over-training, food sensitivities, mold, and infections. Supplements that may help are NADH and CoQ10 in the AM, as with the COMT, 5-HTP, inositol, nighttime melatonin, and liposomal curcumin.

For MTHFR, be sure thyroid function is up to par, supplement with riboflavin, and L-5-methyl folate. With the latter, start at a low dose and build up, and if you have anxiety, insomnia, joint pains, you may be taking too much.

For spot cleaning the NOS3, keep all the other genes clean, and NOS3 will probably take care of itself. Be sure to get exercise, deep breathing, and maybe sauna. Supplements: beet root powder, citrulline, ornithine, liposomal Vitamin C, liposomal glutathione, and PQQ (pyrroloquinoline quinone).

This topic is an extremely complex issue, and it may seem laborious wading through the details. The book is somewhat repetitive, but much of this bears repetition to understand it, first introducing each topic, then covering it in detail. The book has resources in the back for testing many of the nutrients, metabolites, and other compounds, as well as genetic testing. For someone with a major issue with several of these SNP's, it would well be worth studying the book, for the many details and complexities not covered here, and for the recipes for planning to get the foods that clean the genes.

Dr. Lynch is to be complimented heartily for tackling such a complex topic and making it readable for the general public.