

SUPPLEMENT RESOURCES AND TIPS

Supplements are an increasingly hot market! Targeted, high-quality supplements are also important tools for you in implementing the wisdom of functional medicine. There are, however, a few common pitfalls that should be avoided.

- **There is no such thing as the “perfect” supplement company**, so don’t waste time looking for it. There are many excellent companies. None of them are the best at everything, despite what claims their marketing reps might make otherwise!
- Don’t lose sight of the different reasons for using supplements.
 - **Rapid Relief**: designed to get immediate support, typically short-term to someone who is suffering. Use until they can change behavior to eliminate the need. A very common mistake is to remain in this phase too long. Upfront, consider a 50/50 focus on Rapid Relief and getting to the Root Cause. After there is some relief in place, focus fully (100%!) on Root Cause resolution.
 - **Therapeutic**: designed to drive a certain healing action in the body over a specific period of time to address a root cause of dis-ease (e.g. eliminating pathogens, eliminating toxic burden in the body, healing the gut lining, eliminating fatty liver, improving thyroid hormone conversion). Typically there will be several, progressive layers of this work (peeling the onion).
 - **Maintenance**: designed to provide ongoing, long-term support to optimize wellness in light of a person’s lifestyle choices, genetics and history (e.g. Vitamin D for one who lives in Canada, Vitamin B12 for one with MTR/MTRR SNPs, zinc for one who eats a vegan diet).
- **Always keep track of how long your practitioner might expect you to need a particular supplement.** Without guidance, people are likely to either stop taking all of them (out of frustration or confusion) or continue to take all of them for many years (out of fear or simple habit). Maintenance supplements should be conscious choices for a specific purpose, and explained in this way. Continuing to take some supplements long-term can have negative consequences and perhaps precipitate other dis-ease e.g. berberine for insulin resistance, promoting downstream gut dysbiosis.
- **Always choose a low’n’slow approach to starting a new supplement**, especially ones that are going to shift hormones/neurotransmitters or increase detoxification. Examples include a B-complex in those with known methylation impairment and elevated homocysteine or histamine intolerance (e.g. begin with half a capsule taken every other day for a week) and alpha lipoic acid in those with suspected high mercury load (e.g. only begin after detox Phases 0,1,2,3 have been well supported for a time; then try 50mg once daily on an empty stomach for first few days to ensure it is well tolerated).
- **Only introduce one supplement at a time.** A good rule of thumb is to space by at least 3 days to ensure the person has ample time to observe their reaction and connect positively to taking it. This spacing also allows easy identification of the culprit if there is an unexpected negative reactions.

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- **Never introduce a supplement until downstream physiology is ready to support it**. For example, address constipation before beginning an antimicrobial herb regimen, improve hydration before upregulating detoxification, and improve fat digestion/absorption before introducing a Vitamin D or omega-3 essential fatty acid supplement.
- **Take care not to take too many supplements at once**. Remember that the body must use its resources to manage and detoxify anything excess including supplements. This could add a burden to already struggling kidneys, liver, and gut lining, among other tissues. Overall, your practitioner should plan a logical order of operations and support the body to achieve improvement in only one or two areas at once. For example, don't try to support gut healing, digestion, detoxification, and hormone balance all at once. It will be ineffective, and the person will be overwhelmed.
- **Prioritize food over supplements**. Certainly in the beginning, a processed/refined food diet that a person seems resistant to changing may require supplements. As individuals improve their diet, however, try to prioritize food sources of nutrients wherever possible and sufficient, especially if digestion and absorption are well-supported. This also helps to reinforce the view that food is a source of nutrition vs. just calories and flavors. For example:
 - Grass-fed liver vs. Vitamin A supplements
 - Whole eggs and dark leafy greens vs. iron supplements
 - Apple cider vinegar or lemon juice vs. HCl supplements (for mild stomach acidity support need)
 - Sunshine vs. Vitamin D supplements (esp. if coming into the warm months)
 - Brazil nuts vs. selenium supplements

SUPPLEMENT ADDITIVES

Many supplements contain not only nutrients, but other inactive ingredients as well, known as excipients. (These may be listed as “other ingredients” on the label.) Excipients have a variety of functions in a supplement product, though may also cause issues for others. Those with allergies or sensitivities to the ingredients, or who maintain certain dietary restrictions (e.g. vegan, Kosher, Halal), may need to be especially careful of additives within their supplements.

Categories of Excipients

FILLERS

Also known as bulking agents, fillers expand the volume of the supplement so that the capsule is full. This is because some supplements are in trace amounts, as micrograms (e.g. iodine, B12, folate, chromium), and so without fillers, the capsule would otherwise appear empty. Addition of fillers renders some of the supplement as inactive. Common fillers include hypoallergenic rice flour, oils, and magnesium stearate. Magnesium stearate has been considered controversial.

BINDERS

These help to keep the ingredients in a tablet together.

FLOW AGENTS

In order to keep ingredients from sticking to capsule-making machinery, flow agents (aka flow enhancers) are added to the supplements. They also help to decrease the cost of supplement production. Other ingredients that may be incorporated in addition to flow agents to maintain manufacturing equipment include glidants, anti-adherents, and lubricants.

ACIDULANTS

In a liquid supplement, particularly with water as an ingredient, an acidulant may be included to keep bacteria from growing. Often derived from fruits and vegetables, e.g. citric acid.

DISINTEGRANTS

An ingredient that helps the tablet to break down quickly in the digestive tract and provide active ingredients for absorption. They disintegrate when in contact with liquids. “Fast-acting” is a clue that a disintegrant is included in the ingredients.

SUPPLEMENT ADDITIVES

GLAZES AND COATINGS

Aside from binders, coatings can prevent tablets from crumbling while also protecting from moisture, as well as facilitate swallowing (e.g. gelatin). Enteric coatings control the rate at which the active ingredients in a supplement release into the digestive tract, while also protecting sensitive ingredients from stomach acid.

FLAVORINGS AND COLORINGS

Often poorer-quality supplements will contain colorings via food dyes or titanium oxide. Artificial flavorings may also be used to improve taste. These should be distinguished from natural flavorings, such as fruit extracts that can be found in higher quality supplements. Sweeteners are another ingredient that may be artificial (e.g. aspartame, saccharin, high fructose corn syrup) or natural (e.g. xylitol, stevia, monk fruit).

PRESERVATIVES

Used to extend shelf life and prevent bacterial growth or quality degradation. Artificial preservatives (e.g. parabens, benzoates, sorbates, sulfites) may be found in poorer quality products, while higher quality products will use ingredients such as cysteine, methionine, citric acid, ascorbic acid, and vitamins A, C, and E (often noted as rosemary).

Commonly Used Excipients

MAGNESIUM STEARATE (FLOW AGENT, LUBRICANT, BINDER)

Lubricating, making supplements cost effective to produce. Considered GRAS (generally recognized as safe) by the FDA. May contain GMOs when derived from hydrogenated cottonseed oil depending on how it is sourced. May impair nutrient absorption though it is used only in trace amounts in supplements. Highly controversial, though highly common and difficult to avoid.

STEARIC ACID (FLOW AGENT, LUBRICANT)

Naturally found in oils, poultry, soybeans, and chocolate, though isolated to be used as a lubricant. Concern that stearic acid may block nutrient absorption at high levels; however, found in much lower quantities as a supplement additive than through any natural food source.

SUPPLEMENT ADDITIVES

CARRAGEENAN (THICKENING AGENT)

Harvested from red seaweed, and thus a vegan alternative to gelatin. Found as a food additive in products such as ice cream, plant-based milks, and vegetarian hotdogs. May contribute to inflammation in the digestive system, and not well tolerated by those with inflammatory bowel disease (IBD). May also contribute to tumors. Since carrageenan is derived from seaweed, some are concerned that it may contain radioactive elements from nuclear disasters, which could increase its cancer risk. Research is mixed on its safety. Carrageenan may also be a cross-reactant with MSG for those with an MSG allergy.

GELATIN (BINDER, ENCAPSULATION COATING)

Derived from the bones of animals, and used to make hard capsules and softgels (gelcaps).

TITANIUM DIOXIDE (COLORING)

Used solely for its white pigmentation, often in poorer quality supplements. This ingredient is not something one would normally consume, and may be carcinogenic when ingested. Titanium dioxide is fairly easy to avoid.

SILICON DIOXIDE (FLOW AGENT)

Used for its desiccant properties, to keep powders from clumping from moisture. It is derived from sand, though is not absorbed and so passes benignly through the digestive tract.

LANOLIN (DILUENT)

Derived from sheep's wool, this waxy substance is used to dilute the overall product.

GLYCERIN (PRESERVATIVE, SWEETENER, LUBRICANT)

Serving many purposes, this sugar alcohol is commonly found in herbal extract tinctures to disperse the active ingredients throughout the liquid component. It is antimicrobial, inhibits the formation of tannins in plant extracts that could impair digestion, and tastes sweet but with minimal glycemic index.

CALCIUM CARBONATE (FILLER, BINDER, COATING AGENT)

Derived from marine animal shells and eggshells, it can be found in calcium-based antacids, some plant-based milks, and toothpaste as a filler. Excessive amounts of this compound can be detrimental to overall health.

SUPPLEMENT ADDITIVES

POTASSIUM SORBATE (PRESERVATIVE)

Used commonly as an alternative to parabens for its antimicrobial properties and to extend shelf life. Overuse of potassium sorbate can contribute to nausea and indigestion in certain individuals, and some may also be allergic to it.

CELLULOSE (BINDER, FILLER, COATING, THICKENER)

A fiber derived from plants, it is typically used as a filler or binder in supplements.

HYDROXYPROPYL METHYLCELLULOSE (HPMC; LUBRICANT, BINDER, CONTROLLED RELEASE)

A synthetic product often found in eye drops and oral tablets. When used in tablets, it modulates the release of active ingredients to pass through the stomach into the intestines for better absorption.

PALMITATE (LUBRICANT, PRESERVATIVE)

A fatty acid from palm tree oil, it is used to increase the flow of powder being made into tablets. There are several types: ascorbyl palmitate is a fat-soluble form of vitamin C (may also be sold as a supplement on its own), while retinyl palmitate is the ester of vitamin A. Palmitic acid may increase cardiovascular disease risk, though there is disagreement on how it impacts overall cholesterol (and in functional medicine, this topic is quite controversial to begin with), while some scientists classify palmitate as a trans fat.

CITRIC ACID/ASCORBIC ACID (FLAVOR ENHANCER, PRESERVATIVE)

These acidify a supplement to discourage microbial growth. Citric acid is additionally considered a disintegrant that can make the body absorb other minerals, including calcium, more easily, and is also used for its citrus flavor, while ascorbic acid is simply vitamin C. Both may be derived from GMOs.

XYLITOL (SWEETENER)

Derived from birch wood or specific fruits to be used as a sugar replacement. Some use it in oral care products for its oral microbiome-enhancing qualities. Lethal to some pets.

SUPPLEMENT ADDITIVES

Labeling Laws

While supplement manufacturers require all non-medicinal ingredients to be listed on a supplement label, pharmaceutical companies are not required to do the same. Therefore, if you are attempting to avoid some of the aforementioned ingredients or others, you will need to contact the pharmaceutical company to ensure the product is safe for you. For instance, sometimes gluten or corn are used as binders.

Inactive Drug Ingredients (<https://www.drugs.com/inactive/>) - a list of various excipients that are not required to be listed on a pharmaceutical ingredients label

Daily Med - <https://dailymed.nlm.nih.gov/dailymed/> - a searchable database of all licensed pharmaceuticals in the U.S.

SUPPLEMENT BRANDS & CHOICES

Here are some recommendations of who to use and who not to use in this broad market. The scope of this section is limited to supplements typically available in the U.S. market, though many are available around the world. This list is in no way intended to be comprehensive, and many excellent brands are not included. The concepts described can readily be applied to your own investigation and choices from among locally-available brands and formulas.

Note that some higher-end supplement companies in the U.S. are progressively restricting account access to only licensed medical practitioners and limiting access to a narrower group even within that criteria e.g. Designs for Health.

Top Tier - Comprehensive

Using no fillers, binders, or coatings, these broad-based supplement brands are of excellent quality and offer a wide array of hypoallergenic options, all in capsules or loose powders for maximum absorption. All of their products are gluten-free. Unfortunately, they are more difficult to find and will not be available at Whole Foods, Vitamin Shoppe, or similar large-scale outlets (in person or online). Local health food stores and holistic pharmacies may have some options available. Otherwise, online ordering is your best access to these options, especially through dispensaries e.g. Fullscript. They are also typically more expensive which might be a consideration for those with limited resources. The following are good options for those with gastrointestinal absorption issues and/or concerns with allergy/atopy/hypersensitivity. For example...

- **Metabolic Maintenance** www.metabolicmaintenance.com Supplement line without binders, fillers, excipients, or preservatives. Available predominantly online.
- **Pure Encapsulations** www.pureencapsulations.com Consider their Adenosyl/Hydroxy B12, hormonal support formulas (e.g. Thyroid Support Complex, MenoVive, ADR, PhytoADR), and CholestePure (to increase cholesterol binding in the GI tract and reduce reabsorption).
- **Synergy** www.thesynergycompany.com Their products are exclusively made from organic, whole-food-derived ingredients. All are gluten- and dairy-free but be aware of soy and yeast/mushroom ingredients. Not appropriate for those with yeast allergy/sensitivity. Available primarily online.
- **Thorne Research** www.thorne.com Their Basic B complex, Meriva curcumin products, liquid K2 formulas, digestive formulas (especially Dipan-9 and Biogest), medical foods (MediClear and MediBolic), and prenatal multivitamin are commonly recommended products.

SUPPLEMENT BRANDS & CHOICES

Excellent Quality - Comprehensive

These companies produce excellent quality supplements but in a mix of both capsules and tablet forms and also with some use of binders/fillers. These fillers may lessen absorption of nutrients in those with weak digestion or cause some irritation in very sensitive patients. But they are excellent choices for the vast majority of people and do feature high-quality, bioavailable ingredients.

- **Allergy Research** www.allergyresearchgroup.com Vitamin D3 Complete is a rare fat-soluble vitamin blend (D,K,A). Offers ox bile in both low- and high-dose options. Widely available online.
- **Biotics Research** <https://www.bioticsresearch.com/> Excellent resource for glandular extract supplements. IntenZyme Forte is a top recommendation for an excellent systemic, proteolytic enzyme formula. MoZyme/MoZyme Forte is a highly absorbable molybdenum formulation that supports the sulfur pathway in varying potencies. Aqueous Zinc for absorbable zinc, A.D.P. oregano tablets for microbial rebalancing.
- **DaVinci Labs** www.davincilabs.com Offers a particularly good array of supplements for children, plus many liquid formulations in absorbable forms.
- **Designs for Health** catalog.designsforhealth.com/ All products are gluten- and soy-free. For gut healing, G.I. Revive for intestinal permeability and GastroMend-HP for those with ulcers, acid reflux, or H. Pylori overgrowth. The multivitamin Metabolic Synergy is an excellent choice for reversing insulin resistance. Available primarily online or via practitioners.
- **Dr. Mercola** www.mercola.com Fermented chlorella, liposomal CoQ10, and liposomal Vitamin C at some of the lowest prices.
- **Innate** www.innateresponse.com/ A company with whole-food based supplements which are also entirely raw (and thus containing enzymes to aid in absorption and digestion). As with all fermentation-derived supplements, these are not suitable for those with yeast allergies/sensitivities. Excellent probiotic blends and Adrenal Response (adaptogen blend to lower cortisol). Available primarily online.
- **Integrative Therapeutics** www.integrativepro.com/ Panplex 2-Phase offers comprehensive digestive support (HCl/pepsin, pancreatic enzymes, ox bile). Inexpensive magnesium malate. TheraCurmin HP is bioavailable curcumin. Active B Complex offers a higher-potency B formula. Available primarily online.
- **Jarrow** www.jarrow.com This is a great choice for low cost and easy availability, but not always the best forms of nutrients. Their D-limonene is of good quality for hepatic-biliary flow support. Also QH-Absorb (ubiquinol/CoQ10), Methyl-B12 lozenges, Astaxanthin 12mg, Sleep Optimizer, L-theanine, S. boulardii + MOS, BoneUp, Zinc Balance, and MagMind (magnesium threonate). Excellent resource for individual amino acids, especially in loose powders. Widely available at Whole Foods Market, local health foods stores, and many online resources.

SUPPLEMENT BRANDS & CHOICES

- **Life Extension** www.lifeextension.com Their Super R Lipoic Acid is a way to get a higher dose of R-LA in one capsule when needed. Their Super K blend mixes both MK-4 and MK-7 forms of Vitamin K2, along with K1. ArthroMax Advanced with UC-II collagen for arthritis.
- **Metagenics** www.metagenics.com Their OmegaGenics EPA-DHA 720 (an all-purpose fish oil with great combination of quality/cost), Multigenics multivitamin as a hypoallergenic corn-free high-potency formulation, UltraInflamX Plus 360 medical food for IBD, and UltraFlora Acute Care and Intensive Care probiotics for immune dysregulation. Sugar-free, good tasting children's multivitamin products. Available primarily online or via practitioners.
- **New Chapter** www.newchapter.com and Garden of Life www.gardenoflife.com Excellent options for food-based supplements that are fermentation-derived, with mostly organic ingredients. Diverse multi-vitamins for general use. However, these may not be suitable for those with many food-based allergies or sensitivities as many formulas include soy-, corn-, or yeast-based extracts. All are gluten-free. Widely available at Whole Foods Market, local health foods stores, and a wide array of online sources.
- **Orthomolecular** www.orthomolecularproducts.com/ Paracid Forte for antiparasitic herbal blend in potent doses. Viracid is an excellent acute immune booster. Offers a few, key supplements for children including D-Hist Jr. chewable.
- **Seeking Health** www.seekinghealth.com/ A curated set of supplements from Dr. Ben Lynch, at a reasonable price point, that includes a particularly diverse set of options for methylation support, including formulas that feature specific Vitamin B12 forms. B-Minus and B Complex Plus Methyl-Free do not contain methylated Bs, and Probiota HistaminX and HistaminX work well for those with histamine issues. Optimal Liposomal Glutathione Plus has built-in cofactors for absorption and detox. High potency prenatal vitamin line, including a methyl-free formula and Optimal Prenatal powder for those that prefer shakes to pills.
- **Vital Nutrients** www.vitalnutrients.net/ Formulated by a naturopath, many comprehensive, high-quality formulas. Multi-Minerals Citrate/Malate formulas are available with or without copper/iron and feature bioavailable forms. Fish oil products are molecularly distilled and clean, at strong potency with an affordable price point.
- **Xymogen** www.xymogen.com Several excellent, more unusual formula combinations e.g. Memor-All for mild cognitive impairment/brain fog, OptiMetabolix medical food for insulin resistance, and HistDao for diamine oxidase support of histamine intolerance. Available only from practitioners with an account.

Excellent Quality - Specialty Choices

Unlike the above broad-based, full-service companies, there are several highly recommended specialty supplement companies as well. These companies service only a targeted subset of supplement needs but do so with great quality. For example...

SUPPLEMENT BRANDS & CHOICES

- **Biocidin** biocidin.com/ GI-Detox is an excellent toxin and metals binder for the gut and Biocidin is a multi-herb antimicrobial formula that can be used carefully with all ages. Available in Fullscript.
- **Gaia Herbs** www.gaiaherbs.com An excellent provider of herbal (largely organic) blends to support specific health concerns from herbs they largely farm locally themselves for maximum potency. Recommendations include their prostate- and adrenal support formulas, Vitex Elixir, astragalus, and ginseng formulas. Mental Alertness for cognitive focus. Sweetish Bitters for digestive stimulation and support.
- **Microbiome Labs** microbiomelabs.com/ An array of spore-based probiotics, prebiotics, gut healing supplements, and immune support available only through their trained practitioner network and FullScript. Popular products include RestorFlora and MegaSporeBiotic, MegalgG2000, MegaPre and MegaMucosa for rebuilding the gut, MegaQuinone as a highly absorbable soy-free K2 MK-7, and WheatRescue digestive enzymes
- **Mountain Rose Herbs** www.mountainroseherbs.com A purveyor of mostly-organic loose herbs, tinctures, teas, spices, and more. High quality bulk herbs, including some that are harder to find.
- **Nordic Naturals** www.nordic.com Their flagship fish oil line comes in a multitude of strengths and DHA/EPA variations, certified free of toxins and contamination by third party testing. Liquid and capsule formations, as well as high potency, vegan (algae), prenatal, and child products available. Available online and in many health food stores.
- **Plant Therapy** www.planttherapy.com Producer of high-quality essential oils including a variety of organic singles and blends. KidSafe line features oils and blends specifically formulated for children. The book "Modern Essentials" (www.aromatools.com) is an excellent guidebook on where to use various oils for specific symptoms, diseases, and personal needs.
- **Quicksilver Scientific** www.quicksilverscientific.com/ Offers a particularly large array of excellent liposomal supplements for enhanced absorption and targeted detoxification e.g. glutathione, CoQ10, fat-soluble vitamins, GABA, and CBD products. Digestive and motility supports include Bitters No. 9 and Liver Sauce while UltraBinder is a multi-faceted toxin GI binder to support Phase 3 clearance. Available in Fullscript.
- **Renew Life** www.renewlife.com One of the best overall brands for easily-accessible, gastrointestinal supportive supplements (e.g. various formulations of probiotics, digestive enzymes, parasite (ParaSmart) and yeast cleanses). All of their products are capsules or powders for maximum absorption. Widely available at Whole Foods Market, local health food stores, many online outlets, and Fullscript.
- **Transformation Enzymes** www.transformationenzymes.com Various formulations of digestive supports including enzymes of varying blends and potencies, with and without herbal additions. Children's enzymes available. Available online.

SUPPLEMENT BRANDS & CHOICES

Whole Food Supplement Choices

There are many whole food extract supplements on the market, and this category can help those who need to increase phytonutrients outside of what they are already willing or able to eat regularly. These specific products are made using high-quality processing (e.g. low temperature) and include organic ingredients where applicable.

- **Amazing Grass** www.amazinggrass.com ~18 superfood ingredients including a digestive enzyme blend and L. Acidophilus. All organic ingredients. Gluten-free and yeast-free. Loose powder.
- **Ancestral Supplements** ancestralsupplements.com Organ capsules made in small batches from grass-fed animals. Their beef liver may be helpful to gently increase iron stores.
- **Perfect Food Super Greens by Garden of Life** www.gardenoflife.com 45 whole-food extracts and superfoods. Available in both caplet and loose powder versions and formulated to be palatable without having to add to another drink/food (includes stevia).
- **Pure Synergy Superfood By Synergy** www.synergy-co.com A blend of 60 organic fruit and vegetable extract and superfoods. Their products are of excellent quality – and are made exclusively from organic, whole-food ingredients. Loose powder designed to be included in a smoothie or juice. Gluten- and dairy-free but be aware of yeast/mushroom ingredients for those who are sensitive.
- **Rosita** www.rositausa.com Cod liver oil derived from cold-pressed, wild-caught fish from Norway. Liquid and capsules available. Also carries a fermented pollen product rich in vitamins, minerals, and omegas.
- **Superfood Plus by Dr. Schulze** www.herbdoc.com/index.php/Our-Products Powdered, whole food supplement to include in smoothies and fresh juices. Includes all organic or wild-harvested ingredients and features both seaweed and algae. Available in both caplet and loose powder versions. Gluten-free.
- **Vital Proteins** www.vitalproteins.com and **Great Lakes Wellness** greatlakeswellness.com Collagen and gelatin supplements made from pastured animals. Vital Proteins also carries a marine collagen. Certified Kosher (ask company for certification papers).

SUPPLEMENT BRANDS & CHOICES

Bottom of the Barrel

These companies generally offer inexpensive but often subpar supplements, largely including versions of nutrients with low bioavailability, chemical and/or allergenic additives, flavorings, artificial colors, stripped versions of nutrients, and/or trans fats. While generally easy for people to obtain at grocery and other mainstream stores and online, they are often ineffective and can even cause harm depending on the ingredients. Some are certainly of lower-quality than others within this list, but generally, they are not recommended for use in your patient recommendations. (See above section on Supplement Additives for additional support in determining high vs. low quality supplements on brands not listed here.)

- One-A-Day
- Centrum
- Kirkland (Costco brand; unfortunately a *very* mixed bag of some excellent and some very poor quality)
- Spring Valley (Walmart brand; usually cheap, poorly absorbed forms of nutrients)
- Nature Made (don't confuse with Nature's Way, an excellent, long-time herbal supplement brand)
- Equate
- Berkley & Jensen (BJ's Stores brand)
- Viactiv
- Adora

SOME PHARMACEUTICAL-SUPPLEMENT CONSIDERATIONS

A resource from which you may learn more about medication-mediated nutrient depletion is www.mytavin.com. The book *Drug Muggers* by Suzy Cohen (and her website/blog) can additionally be helpful. Also, a useful tool in determining possible drug-supplement interactions can be found on the Integrative Therapeutics website. www.integrativepro.com/drug-nutrient-interaction-checker

For those using **thyroid hormone medication**, be aware that high-dose biotin supplements interfere with the accuracy of thyroid labwork. Biotin does not negatively affect hormone levels themselves, just the testing methodology (and thus the results). Stop biotin for 2 full days before testing.

STATIN MEDICATIONS

(e.g. Lipitor, Crestor) deplete CoQ10 (unfortunately one of the most important nutrients for overall muscle strength and endurance – including that of the heart in particular). So do beta-blockers (e.g. Metoprolol, Atenolol).

METFORMIN MEDICATIONS

(e.g. Glucophage) for diabetes very readily depletes Vitamin B12 (low levels of which can exacerbate diabetic neuropathy). Low-dose calcium supplementation along with the B12 may help to reduce this dynamic.

GLYBURIDE MEDICATIONS

(e.g. DiaBeta) are also for diabetes and can deplete CoQ10.

DIURETIC HYPERTENSION MEDICATIONS

(e.g. hydrochlorothiazide aka HCTZ) can deplete magnesium and potassium (unfortunately particularly these are two electrolytes required for healthy blood pressure). Use caution in giving any potassium supplement to a patient taking potassium-sparing diuretics (e.g. Aldactone); use only a minimum as is typically found in a multivitamin (e.g. 400mg) and check to confirm typical levels.

CALCIUM CHANNEL BLOCKERS

(e.g. Norvasc, Sular), also prescribed for hypertension, can deplete potassium.

SOME PHARMACEUTICAL-SUPPLEMENT CONSIDERATIONS

ACE INHIBITORS

(e.g. Tensoril) are also prescribed for hypertension, increase potassium and potentially deplete zinc (to which it binds directly).

PROTON PUMP INHIBITORS

(e.g. Nexium, Prilosec) medications may deplete magnesium, Vitamin B12, and also minerals such as zinc and iron. With ongoing use, they will also deplete many other minerals (possibly leading to bone density issues and/or anemia or neuropathy) and also protein and specific amino acids (often leading to neurological issues e.g. anxiety, depression, mood swings).

ALL NSAID MEDICATIONS

(e.g. Aleve, Motrin, Advil, Tylenol) can deplete the body of folate, as well as cause major damage to the gastrointestinal lining (potentially impairing absorption of many nutrients).

WARFARIN MEDICATION

(e.g. Coumadin) is prescribed as a blood thinner and depletes the body of Vitamin K which is vital for healthy clotting and retaining bone density. If needed, Vitamin K2 may still be added as a supplement (or even K1 increased via food) with testing validation that PT/INR remains at an acceptable level with a specific daily dose/intake (you will likely need to educate the primary care provider about this). Exercise caution in using other blood-thinning supplements (e.g. marine oils like fish oil or herbs like curcumin) for a patient already taking Warfarin; this is not common, but be prudent and look for any evidence of easy bleeding (e.g. bruising, bloody nose, poor wound healing).

SSRI ANTIDEPRESSANTS

(serotonin reuptake inhibitor medications) will over time deplete the body of both serotonin and dopamine due to enhanced MAO activation. This may be more marked in those with insulin resistance. Note: supplementing with precursors to these neurotransmitters (e.g. 5HTP) has to be done with extreme care while the person is taking the medication, or toxic overload of a neurotransmitter can occur; the patient should be on progressively lower dose and in process of weaning off and ramping up precursors over time.

ORAL BIRTH CONTROL PILLS

(aka "OCP" or other oral sex hormones containing estrogen) can especially deplete Vitamin B6. But also Vitamin B12, minerals such as zinc and magnesium, and tyrosine. Ongoing use can also deplete both serotonin and dopamine.

SUPPLEMENT RESOURCES FOR MORE LEARNING

Some recommendations for ongoing, regular education about supplements include:

- **Fullscript, Wellevate, and Microbiome Labs** online dispensaries offer excellent articles and webinars regarding appropriate supplement usage through the functional medicine lens. Consider subscribing to their updates as a practitioner. fullscript.com/for/integrative-practitioners-us wellevate.me microbiomelabs.com/home
- **Life Extension Magazine** is an excellent resource for supplement research. You may sign up for a free account with them in order to receive their magazine. Archives are available online for free but are not easy to search. www.lifeextension.com/magazine Their website also offers many detailed monographs on specific disease processes and protocols.
- **The Foundational Medicine Review**, housing the Alternative Medicine Review, is an archive of previously written, high-quality articles including nutrient monographs. Includes a strong search tool. www.foundationalmedicinereview.com/resources
- **The Natural Standards Database** is an excellent online tool to learn more about specific nutrients, herbs, and supplement ingredients. This non-profit research initiative also attempts to summarize the status (and credibility) of research to date into the efficacy of certain ingredients toward aiding certain illnesses or symptoms. It does require a \$182/year subscription as of the date of this document. This may be more research access than you really need depending on your practice/role. naturalmedicines.therapeuticresearch.com
- There are also **many individual functional/integrative medicine practitioners** that regularly publish high quality articles. Explore their various works and see who resonates with you, and subscribe to their blogs, podcasts, and/or newsletters. You can also search their websites when you need specific information and find a wealth of helpful details along with research references to explore further. Some examples include Chris Kresser, Dr. Mark Hyman, Dr. Joseph Mercola, Dr. Axe, Dr. Jill Carnahan, Dr. Amy Myers, Dr. Ben Lynch, Dr. Kara Fitzgerald, Deanna Minich PhD, Dr. Datis Kharrazian, Dr. Tom O'Bryan, Chris Masterjohn PhD, and Joe Cohen's site. www.SelfHacked.com
- **Examine.com** www.examine.com has a rich database of specific nutrients which gives easy summary and access to published research for further exploration. While their research "summaries" are not always optimally aligned with the research findings (there seems to be a focus on looking for only one-size-fits-all substantiation of the value of supplements, which as we know, often isn't applicable re: n=1 for the unique individuals we serve), be on the lookout for that and this resource can be quite helpful.
- **ConsumerLab.com** www.consumerlab.com a helpful database of articles and reviews of various supplements and companies. Paid subscription.

SUPPLEMENT RESOURCES FOR MORE LEARNING

- **The Linus Pauling Institute's Micronutrient Information Center** provides a summary on many individual vitamins and minerals. While parts of this resource have not been updated in several years, it provides a good launching point for the basics of these nutrients, including recommended amounts by age, toxicity amounts, food sources, and information about connections between lack of specific nutrients and dis-ease states. lpi.oregonstate.edu/mic