The Mitochondrial Toxin Reference Guide

A Companion Resource to *The Mitochondrial Decline* Series *By Dr. Barry Dublin, MD* | *neuralift.co*

> This guide pulls together, in one place, every toxin category covered in the five-part Mitochondrial Decline series — the specific products where each exposure shows up in daily life, practical alternatives, and a structured action guide. Use it as a reference alongside the full series at neuralift.co/blog.

Table 1 — Mitochondrial Toxins: Where They Show Up and

What to Use Instead

Category	Common Product Sources	Practical Alternatives
PM2.5 and combustion air pollution	Traffic exhaust, diesel trucks, attached garages, wildfire smoke, tobacco smoke, wood-burning stoves, poorly ventilated gas-stove kitchens	HEPA filtration at home, kitchen range-hood use, no indoor smoking, avoid heavy outdoor exertion next to busy roads at rush hour
Polycyclic aromatic hydrocarbons (PAHs)	Smoke, exhaust, soot, charred grilled foods, indoor combustion	Reduce charring of food, ventilate when cooking, avoid wood smoke and tobacco smoke, HEPA indoors
PFAS / “forever chemicals”	Non-stick cookware (especially older or scratched), grease-resistant food packaging, microwave-popcorn bags, fast-food wrappers, stain-resistant carpets and upholstery, waterproof outdoor gear, some cosmetics, contaminated drinking water	Stainless steel, cast iron, carbon steel, glass, or ceramic cookware; less fast food and grease-resistant packaging; PFAS-free clothing and furniture when available; certified water filtration (reverse osmosis or appropriate activated carbon)
Bisphenols (BPA, BPS, BPF)	Polycarbonate plastics, epoxy-lined food and beverage cans, thermal-paper receipts, some hard plastic bottles	Glass and stainless steel for food and drink; avoid handling receipts when possible; reduce canned food in favor of fresh, frozen, or jarred
Phthalates	Vinyl flooring, vinyl shower curtains, vinyl wallpaper, synthetic leather, soft plastic toys, food wrap, many fragranced personal-care products (lotions, shampoos, perfumes, hair sprays)	Fragrance-free personal care, natural-fiber shower curtains, real wood or linoleum flooring instead of vinyl when renovating, glass food storage

Category	Common Product Sources	Practical Alternatives
Microplastics	Bottled water, plastic-packaged food, synthetic textile fibers (polyester, nylon, acrylic, fleece), degraded plastics in indoor dust	Filtered tap water in glass or stainless steel; natural-fiber clothing and bedding when possible; HEPA filtration; damp dusting and damp mopping
PET-bottle antimony	Single-use plastic water bottles, especially when stored warm	Stainless steel or glass refillable bottles with filtered water
Organophosphate and other pesticide residues	Conventionally grown produce (especially high-residue items), agricultural drift, home pest sprays, treated lawns	Buy organic for high-residue produce (see Dirty Dozen list below); wash and peel where appropriate; use integrated pest management at home rather than routine chemical fogging
Lead	Old paint in pre-1978 homes, renovation dust, old plumbing/solder, contaminated soil, some imported spices, some imported cosmetics, some imported pottery, some imported jewelry	Lead-safe renovation practices; soil testing in older urban areas; certified water filtration; vet imported foods, cosmetics, and pottery; do not let children chew on painted older surfaces
Mercury	Certain large predatory fish (shark, swordfish, king mackerel, tilefish), broken thermometers, certain fluorescent bulbs	Lower-mercury fish (salmon, sardines, anchovies, trout); proper disposal of broken thermometers and bulbs
Cadmium and arsenic	Cigarette smoke, contaminated water, rice grown in contaminated soil, batteries, industrial fallout	Do not smoke and minimize secondhand smoke; vary grains rather than relying on rice every meal; certified water filtration when at-risk

Category	Common Product Sources	Practical Alternatives
Mixed metals (Ni, Mn, Sb, etc.)	General urban/industrial mixed exposure, occupational settings, indoor dust	HEPA filtration, damp dust and mop, shoes off indoors, workplace protection where applicable
Flame retardants (PBDEs, organophosphate flame retardants)	Foam furniture, mattresses, some baby products, electronics, carpet padding	Furniture marketed as “made without added flame retardants,” snug-fitting cotton children’s sleepwear, HEPA and damp dusting to reduce treated dust
High-fructose corn syrup, refined sugar, ultra-processed foods	Soda, fruit drinks, sports/energy drinks, sweetened yogurts, candy, sweetened breakfast cereals, packaged desserts, many sauces, many “kid foods”	Water and unsweetened beverages, whole foods, real fruit instead of fruit drinks, plain yogurt with whole fruit
Acetaminophen overuse	Tylenol and acetaminophen alone, plus hidden in cold/flu combinations, prescription pain combinations, some sleep aids	Use the lowest effective dose for the shortest time; do not stack acetaminophen-containing products; address sleep and pain root causes when possible
NSAIDs in chronic use	Ibuprofen, naproxen, and related drugs used daily or near-daily	Use short courses for true indications; protect kidneys with hydration; address chronic inflammation with diet, movement, and sleep rather than chronic NSAIDs alone
Antibiotics used unnecessarily	Antibiotics prescribed for clearly viral illnesses or as patient-demand prescribing	Reserve for true bacterial indications; for selected classes (fluoroquinolones, aminoglycosides, others), weigh mitochondrial risk against benefit

Table 2 — The Dirty Dozen: Highest-Priority Organic Produce

These items consistently carry the highest pesticide residue levels per serving in annual testing. Prioritize buying these organic when budget allows.

Priority	Produce Item	Why It Matters
1	Strawberries	Highest pesticide residue of any produce item; thin, porous skin
2	Spinach	Absorbs pesticides readily; eaten whole
3	Kale, collard greens, mustard greens	Multiple pesticide residues detected regularly
4	Peaches	Thin skin, high residue retention
5	Pears	Thin skin; multiple residues
6	Nectarines	Similar to peaches; high residue
7	Apples	Eaten whole with skin; consistently high residue
8	Grapes	Thin skin; eaten whole
9	Bell peppers and hot peppers	Porous skin; high residue
10	Cherries	Eaten whole; high residue
11	Blueberries	Thin skin; eaten whole
12	Green beans	Residue retained in flesh

Lower-priority items (thick peel you do not eat): avocados, onions, sweet corn, pineapple, mangoes, asparagus, sweet peas (frozen), kiwi, cabbage, mushrooms, cantaloupe, honeydew melon.

Source: Environmental Working Group Dirty Dozen list, updated annually at ewg.org.

Table 3 — Water Filtration Guide

Contaminant	Pitcher Filter	Activated Carbon (Under-Sink)	Reverse Osmosis
Chlorine and chloramines	Good	Excellent	Excellent
Lead	Moderate (certified only)	Good (certified only)	Excellent
PFAS	Poor–Moderate	Good (certified only)	Excellent
Arsenic	Poor	Poor	Excellent
Nitrates	Poor	Poor	Excellent
Microplastics	Moderate	Good	Excellent
Cost	Low	Moderate	Moderate–High
Maintenance	Replace filter every 2 months	Replace filter every 6–12 months	Annual membrane + filter

Recommendation: For households with young children or pregnant women, a certified reverse osmosis system under the kitchen sink is the highest-yield single investment in this guide. For renters or those unable to install a system, a pitcher filter certified by NSF/ANSI for lead and PFAS removal is a meaningful step.

Daily-Life Exposure Guide

The Kitchen

The kitchen is where three of the six doorways — plastic, PFAS, and ultra-processed food — converge most intensely.

Gas stoves push nitrogen dioxide levels indoors to levels that would exceed outdoor air quality standards. Run the range hood every time you cook. If you cannot vent to the outside, open a window. A portable HEPA air purifier in or near the kitchen is a meaningful secondary measure.

Non-stick cookware is the most common household PFAS exposure. Replace scratched or damaged non-stick pans with stainless steel, cast iron, carbon steel, or ceramic. This is a one-

time cost that pays off for years. You do not need to replace everything at once — start with the pan you use most.

Plastic food storage releases more chemical residue when heated. Never microwave food in plastic. Never pour hot food or liquid into plastic containers. Replace plastic food storage with glass or stainless steel over time, starting with the containers you use most often.

Canned food often uses epoxy linings that contain bisphenols. When possible, choose fresh, frozen, or glass-jarred alternatives, especially for acidic foods like tomatoes.

The Bathroom and Personal Care

Fragranced products — shampoos, conditioners, body washes, lotions, perfumes, hair sprays, and deodorants — are among the most common phthalate exposures in daily life. The word “fragrance” on a label is not a meaningful disclosure; it can legally cover dozens of undisclosed chemicals. Switching to fragrance-free or naturally scented personal-care products is one of the highest-yield plastic-chemistry reductions available, especially for children and pregnant women.

Vinyl shower curtains off-gas phthalates and other volatile chemicals, especially when warm. Replace with fabric (cotton or polyester-free) or glass alternatives.

Thermal-paper receipts contain bisphenols that absorb through the skin. Decline paper receipts when you can, or handle them briefly and wash hands afterward.

The Bedroom

The bedroom is where children spend the most concentrated time in any single room. It is also where flame retardants, synthetic dust, and air quality matter most.

HEPA filtration in the bedroom is the single highest-yield indoor air intervention. Run it continuously, especially at night. Change the filter on schedule.

Mattresses and foam furniture may contain flame retardants that migrate into dust. Look for products marketed as made without added flame retardants. For children’s mattresses, organic cotton or wool options are available and worth the investment.

Children’s sleepwear labeled “flame resistant” may be treated with chemical flame retardants. Snug-fitting cotton sleepwear is inherently flame-resistant by fit and does not require chemical treatment.

Synthetic bedding (polyester, microfiber) sheds microplastic fibers during use and washing. Natural-fiber bedding (cotton, linen, wool) is a lower-exposure alternative, especially for infants.

The Living Room and Furniture

Foam furniture — sofas, armchairs, and cushions — may contain flame retardants that migrate into household dust over time. Damp dusting and damp mopping (rather than dry dusting, which redistributes particles) significantly reduces the dust burden. HEPA vacuuming is more effective than standard vacuuming.

Shoes off at the door is one of the simplest and most underrated interventions in this guide. Shoes track in lead, pesticides, polycyclic aromatic hydrocarbons, and other outdoor pollutants that otherwise become part of your indoor dust and your children's play areas.

Produce and Food Shopping

Use Table 2 above as your shopping reference. The practical rule: **if the skin is thin and you eat it whole, buy organic when possible**. If the peel is thick and you do not eat it, conventional is acceptable.

Wash all produce thoroughly regardless of organic or conventional status. Peeling thin-skinned produce reduces but does not eliminate residue.

For meat, fish, and dairy: the mitochondrial concern here is primarily about what the animals were fed and what medications they received, not about direct plastic or pesticide exposure. Grass-fed and pasture-raised options tend to have better fatty-acid profiles. Wild-caught fish lower in the food chain (salmon, sardines, anchovies, trout, mackerel) carry lower mercury loads than large predatory fish.

Medications

The mitochondrial concern with medications is not a reason to avoid necessary treatment. It is a reason to use medication thoughtfully.

Acetaminophen is safe at recommended doses for appropriate durations. The risk is in chronic use, high doses, and especially in stacking — taking multiple products that each contain acetaminophen without realizing the total daily dose is adding up. Check labels on cold medicines, sleep aids, and combination pain relievers.

NSAIDs (ibuprofen, naproxen, aspirin) are appropriate for short-course use. Chronic daily use for pain management without addressing the underlying cause is the pattern to avoid.

Antibiotics are essential for bacterial infections and should be taken as prescribed when genuinely indicated. The mitochondrial concern applies primarily to unnecessary use — antibiotics prescribed for viral illnesses, or taken "just in case." Fluoroquinolones (ciprofloxacin, levofloxacin) carry the strongest mitochondrial signal and should be reserved for infections where they are genuinely the best choice.

The Eight-Step Action Sequence

Use this as your implementation roadmap. Each step builds on the one before it.

Week	Action
Week 1	Start daily movement — 30-minute walk every day, add 2 resistance sessions per week
Week 2	Cut ultra-processed food and sweet drinks as the default
Week 3	Install or upgrade water filtration (reverse osmosis or certified pitcher)
Week 4	Replace worst plastic exposures: water bottles → stainless steel or glass; scratched non-stick pans → cast iron or stainless steel
Week 5	Add a HEPA filter to the bedroom; start shoes-off-at-the-door habit
Week 6	Audit produce shopping using the Dirty Dozen list; switch high-priority items to organic
Week 7	Review medication habits with your physician; address sleep schedule and bedroom light environment
Ongoing	Talk to your physician about whether therapeutic ketosis is appropriate for your situation

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A Note on Therapeutic Ketosis

Therapeutic ketosis is the most specialized item in this guide and the one most likely to be confused with casual low-carb dieting. The distinction matters.

Therapeutic ketosis means raising blood beta-hydroxybutyrate (BHB) into a defined range — generally 1.5 to 5 mmol/L for most clinical applications — confirmed with a fingerstick blood ketone meter. At this level, the body is running heavily on ketones, which can be a more efficient fuel for stressed mitochondria, especially when glucose metabolism is impaired.

The strongest clinical evidence is in pediatric epilepsy (decades of standard use), mild cognitive impairment and Alzheimer’s disease (multiple trials showing cognitive improvement), and Parkinson’s disease. Promising work is emerging in bipolar disorder, schizophrenia, multiple sclerosis, chronic kidney disease, and heart failure.

Therapeutic ketosis is not appropriate for everyone. It requires medical supervision in type 1 diabetes, certain rare metabolic disorders, and several other clinical situations. If you are

otherwise healthy and want to explore it, structure a real ketogenic protocol, measure your BHB, and assess your response. If you carry a chronic condition, work with a physician who genuinely understands ketogenic metabolic therapy.

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