

NONTOXICLAB



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THE PURE HOME GUIDE

A Field Manual for the Non-Toxic Interior

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No part of this guide constitutes medical advice. Every health claim carries a study-type label in brackets so the evidence can be weighed by the reader.

A NOTE FROM THE AUTHOR

Foreword

This guide began as a checklist. Then I watched it fail readers. People would download a list of swaps, fix two things, and quit. The list was correct. The framework was missing. Without a way to think about chemical exposure, every item on the list looked equally urgent, which meant nothing was urgent.

So this version starts with a way to think.

The first three pages teach the model. Hazard is not the same as risk. Dose matters more than presence. Most exposures route through household dust and food contact, not through fumes you can smell. Perfection is impossible. The realistic goal is reducing your body burden over years, not reaching zero this weekend.

After those three pages, the rest of the book rewards the framework. Five short explainers walk through the biology. Eight room chapters list the swaps that matter, ranked by impact and cost. A 30-day quick start gets you moving. A year-one roadmap pulls the timeline out so big purchases land at the right moment, not all at once.

I did not write this to alarm anyone. I wrote it because I was tired of guides that did. Every claim in here has a study-type label in brackets so you can weigh the evidence yourself. Where the evidence is thin, I say so. Where something is probably fine under normal use, I say that too.

Read it once. Pin it to a wall. Come back when you are buying a mattress, repainting a room, having a baby, or replacing a pan.

Lara Voss

NONTOXICLAB · 2026

A PRIMER IN FIVE IDEAS

How to Read This Guide

Five ideas, then everything else. If you stop reading here, you still leave with most of what matters.

01 Hazard is not risk

A chemical can be hazardous in a beaker and pose no real risk in your home. Risk depends on dose, frequency, and route. The right question is never 'is this chemical bad,' it is 'how much am I actually getting, how often, and through what pathway.' Most consumer-product exposures are low and sporadic. A small number are high and chronic. Those are the ones worth changing.

02 Dose and frequency matter more than presence

Trace contamination is everywhere. Detecting a substance does not mean it reaches a level that affects you. Daily exposure across years is the pattern that builds body burden. A single weekend with a candle does not. Optimize for the things you do every day.

03 Dust dominates most exposure

Settled house dust carries flame retardants, phthalates from vinyl, PFAS from treated textiles, and lead in older homes. Hand-to-mouth behavior in toddlers concentrates the same dust into a daily exposure that adults do not experience. A weekly HEPA vacuum and damp mop on hard floors is one of the highest-impact swaps in the book, and it costs nothing.

04

Some bodies absorb more

Pregnant people, infants, and children under five are not just sensitive readers of the same exposures. They have different biology. Higher breathing rate per kilogram. Permeable skin. A blood-brain barrier still under construction. A developing endocrine system that hormones at parts-per-trillion can rearrange. The priority list changes for these households. Sidebars throughout the book flag where.

05

Perfection is not the goal

Per CDC NHANES biomonitoring and the European HBM4EU study, virtually every American has detectable phthalates, bisphenol replacements, and PFAS in blood and urine. The goal is not zero. The goal is reducing body burden, in the order that gives you the most return for the time and money you spend. Three or four swaps deliver most of the benefit. The rest is fine-tuning.

HOW CHEMICALS ACTUALLY REACH THE BODY

Three Exposure Pathways

Almost every household exposure routes through one of three doors. Which door matters more depends on the substance and the room.

Inhalation

Volatile organic compounds from new furniture and paint. Synthetic fragrance from candles, plug-ins, and dryer sheets. Combustion byproducts from gas stoves.

[indoor air monitoring, EPA exposure factors]

ACTION. *Open windows daily. Skip plug-in air fresheners. Vent gas cooking. Use a HEPA + carbon air purifier in the bedroom.*

Ingestion

Drinking water. Heated plastic in food contact. Dust on hands transferred to food. Lead paint chips in older homes. Pesticide residue.

[NHANES dietary biomonitoring, EPA UCMR]

ACTION. *Filter drinking water. Replace heated-plastic food contact (cutting boards, hot food in plastic, plastic utensils in nonstick pans). Wash hands before eating.*

Dermal and dust

Personal care absorbed through skin. Settled house dust on bare feet, hands, toys. Textile coatings transferring on contact.

[Stapleton dust studies, dermal absorption literature]

ACTION. *Vacuum with HEPA weekly. Damp mop hard floors. Choose untreated textiles for items that touch skin all day (sheets, sofa, baby clothes).*

THE HIGH-IMPACT LIST

If You Only Do Five Things

Three to four swaps deliver most of the benefit available to a typical household. Here are the five we would do first, with the evidence behind each.

01**Filter drinking water for PFAS**

An NSF/ANSI 53 or 58 certified filter for the contaminants in your local water report. PFAS detection is near-universal in US biomonitoring; the EPA finalized the first federal MCLs for six PFAS in 2024.

[NHANES, EPA 2024 PFAS MCL, regulatory]

02**Vacuum with HEPA, damp mop hard floors weekly**

Settled dust is the primary exposure route for flame retardants, phthalates, PFAS, and lead. Reducing the dust reservoir reduces the exposure. Costs nothing if you already own a vacuum with a real HEPA filter.

[Stapleton et al., dust biomonitoring]

03**Replace heated-plastic food contact**

Heat plus fat plus plastic is the worst migration combination. Glass containers for hot leftovers. Wood or maple cutting boards. Stainless or wood utensils for nonstick pans. Skip plastic in the microwave.

[migration studies, FDA food contact assessments]

04

Cut synthetic fragrance

Candles, plug-in fresheners, dryer sheets, and conventional cleaning sprays carry phthalate-containing fragrance compounds. Switch to fragrance-free or essential-oil-only versions where you can. The bedroom and laundry are the two highest-yield rooms.

[Steinemann, indoor air VOCs]

05

Open windows daily

Indoor air is typically two to five times more polluted than outdoor air. Fifteen minutes of cross-ventilation a day flushes most of it. Free, instant, no purchase required.

[EPA indoor air, building science]

PLATE I

Why your floor matters more than your fumes

The Dust Pathway



PLATE I · *The Dust Pathway*

Settled house dust is a chemical reservoir. Flame retardants migrate out of upholstered foam and bond to dust particles. Phthalates do the same from vinyl flooring and shower curtains. PFAS comes off treated textiles. Lead chips in older homes. Once dust collects on a floor, it gets resuspended every time you walk across it, and toddlers gather it in handfuls. A weekly HEPA vacuum on carpet plus a damp mop on hard floors removes the reservoir. The single most effective non-buying swap in this book.

[Stapleton et al., Mitro et al., human dust monitoring]

Vacuums without true HEPA filtration redistribute fine dust into the air. Look for sealed-system HEPA, not 'HEPA-style.'

PLATE II

Hormones work at parts per trillion

Endocrine Disruption at Low Dose



PLATE II · *Endocrine Disruption at Low Dose*

Hormones in the body operate at concentrations a million times lower than the drugs in your medicine cabinet. The endocrine system listens for tiny signals and amplifies them. Substances that mimic or block hormone signals can therefore matter at doses far below traditional toxicology thresholds. The classic dose-response curve runs straight; many endocrine disruptors run non-monotonic, with effects at low doses that are absent at higher ones. This is why phthalates, bisphenols, and certain pesticides earn special attention in pregnancy and early childhood, and why the regulatory standard 'the dose makes the poison' was written before this biology was understood.

[vom Saal, Vandenberg, endocrine society statements, animal + in vitro]

Most endocrine-disruption evidence is animal and in vitro. Human epidemiology is harder to design. The mechanism is not in dispute; the magnitude in real life is.

PLATE III

Why PFAS gets ranked above BPA

Bioaccumulation and Half-Lives



PLATE III · *Bioaccumulation and Half-Lives*

Two chemicals can be equally hazardous in a test tube and behave very differently in your body. BPA clears in hours; PFOA's half-life in humans is roughly two to four years. PBDE flame retardants stay in fat tissue for years. The half-life decides whether a one-time exposure ever leaves you, and which exposures keep accumulating across decades. This is the operational reason drinking-water PFAS is the first item on the high-impact list. Removing the source today still leaves yesterday's PFAS in your blood for a long time.

[human pharmacokinetic studies, ATSDR profiles]

Persistence is not the same as toxicity, but for substances that are toxic at low dose, persistence multiplies the consequences.

PLATE IV

Why pregnancy and infancy weigh more

The First Thousand Days



PLATE IV · *The First Thousand Days*

From conception through age two, the body is being designed. Cells migrate to their adult positions. The endocrine system establishes its set points.

The brain grows from a hundred billion cells to its adult architecture.

Exposures during this window can shift the trajectory in ways that exposures at thirty cannot. Phthalates during pregnancy associate with changes in male reproductive development. Lead at any prenatal level is associated with measurable IQ effects. This is not alarm; it is why the nursery and pregnancy chapters carry sidebars the rest of the book does not need.

[Swan, Trasande, Lanphear, human epidemiological]

If you are pregnant or planning, the highest-yield swaps are drinking water, fragrance, plastic food storage, and clean air in the bedroom. Everything else can wait.

PLATE V

Why a toddler's exposure is not your exposure

Hand to Mouth, Floor to Face



PLATE V · *Hand to Mouth, Floor to Face*

Toddlers crawl on floors, put hands in mouths roughly fifteen times an hour, mouth toys and edges of furniture, and breathe at close to twice the adult rate per kilogram of body weight. The same room concentrations expose them to substantially more, by every route. The play area, the nursery floor, and any textile they spend hours on warrant more attention than the equivalent surfaces in an adult bedroom. The EPA's exposure factors handbook quantifies this; the practical takeaway is that toddler-zone hard floors should be the cleanest hard floors in the house.

[EPA exposure factors, behavioral studies]

A budget-friendly play mat in cotton or wool, rotated and washable, beats a treated rug at any price.



Chapter I

KITCHEN

Where heat, fat, and food contact compound

CHAPTER I · KITCHEN

More daily exposure decisions happen in the kitchen than in any other room. Water you drink. Plastic that touches hot food. Coatings that off-gas at frying temperatures. Fragrance from cleaning sprays. The room rewards a small number of well-chosen swaps. Skip the rest until something breaks and needs replacing anyway.

● HIGH IMPACT · LOW COST

Filter drinking water \$50-\$400

NSF/ANSI 53 or 58 certified for the contaminants in your municipal report. Pitcher, under-sink, or whole-house, in that order of cost.

Glass food storage for hot leftovers \$30-\$80

Pyrex or any borosilicate. Plastic for cold pantry storage is fine.

Wood or maple cutting board \$30-\$120

End-grain maple lasts decades. Plastic boards shed microplastics into food at every cut.

● HIGH IMPACT · HIGHER COST

One good cookware set \$150-\$900

Cast iron for daily searing, stainless for everything else, one ceramic or enameled cast iron piece for acidic foods. Skip PTFE nonstick at any price.

Range hood vented outdoors \$200-\$1,200

Gas combustion releases NO₂ and particulates. A ducted hood at 300+ CFM, used every cook, is the fix. Recirculating hoods do not help.

● LOWER IMPACT · REPLACE WHEN WORN

Replace plastic utensils touching nonstick pans

\$15-\$40

Wood or stainless. Scratched nonstick releases more particles.

Avoid air fryers with PTFE-coated baskets

\$80-\$250

Look for stainless or ceramic-coated baskets if you use one daily.

WHAT TO AVOID

- PTFE/PFAS nonstick coatings
- Plastic cutting boards
- Plastic in microwave with hot or fatty foods
- Bottled water as the default



Chapter II

BATHROOM

Skin, steam, and what survives the drain

CHAPTER II · BATHROOM

Personal care delivers chemicals through skin and inhalation in a small humid room. The dose adds up across products used daily. The fix is not buying clean versions of every item; it is reducing the count and choosing fragrance-free for the few that remain.

● HIGH IMPACT · LOW COST

Fragrance-free everything

\$0 (next refill)

Hand soap, body wash, lotion, deodorant, shampoo. Synthetic fragrance is the largest delivery vehicle for phthalates in personal care.

Replace PVC shower curtain

\$15-\$40

PEVA, EVA, or fabric. PVC shower curtains off-gas phthalates in warm humid air.

Ventilation fan during and after every shower

\$0 if installed

Twenty minutes after the water stops, minimum. Reduces mold and chloramine concentration.

● HIGH IMPACT · HIGHER COST

Shower filter for chloramine

\$40-\$120

If your municipal water uses chloramine and you have sensitive skin, a KDF/carbon shower filter helps measurably.

● LOWER IMPACT · REPLACE WHEN WORN

Hydrogen peroxide for mold instead of bleach

\$5

3% solution. Equally effective on most household mold, less respiratory load.

WHAT TO AVOID

- PVC shower curtains
- Synthetic fragrance in any leave-on product
- Antibacterial soaps with triclosan (largely banned but check)
- Talc in body powder



Chapter III

BEDROOM

Eight hours of contact

CHAPTER III · BEDROOM

You spend a third of life on a mattress, breathing whatever it emits, against textiles your skin contacts continuously. The room rewards a small number of careful purchases more than any other. Sequence matters: pillow first because it is closest to your face and cheapest to replace; sheets next; then the topper or mattress when the existing one is genuinely worn.

● HIGH IMPACT · LOW COST

GOTS organic cotton or linen sheets **\$80-\$200**

Wrinkle-free finishes use formaldehyde resins. Plain organic cotton is the swap.

Down or wool pillow **\$60-\$180**

Polyester pillows release fine fibers. Down or wool last longer and breathe better.

HEPA + carbon air purifier **\$200-\$600**

Run continuously in the bedroom. Cleanest air during the longest exposure window of the day.

● HIGH IMPACT · HIGHER COST

Natural latex mattress topper **\$300-\$800**

Lower-cost path to the benefits of a natural-latex mattress without replacing the whole bed.

Natural latex or organic hybrid mattress **\$1,200-\$3,500**

When the current one is genuinely worn. GOLS-certified latex, GOTS-certified cotton cover, no chemical flame barriers.

● LOWER IMPACT · REPLACE WHEN WORN

Zero-VOC paint at next repaint**\$45-\$80/gallon**

Mid-pregnancy or twelve weeks before a baby moves in if applicable.

WHAT TO AVOID

- Wrinkle-free sheets (formaldehyde)
- Polyurethane foam mattresses with chemical flame barriers
- Memory foam toppers in hot rooms
- Synthetic fragrance in the bedroom



Chapter IV

NURSERY

The most consequential room in the house

CHAPTER IV · NURSERY

Infants breathe faster, absorb more through skin, spend more time on the floor, and put hands in mouths constantly. The same room concentrations deliver substantially more exposure to a baby than to an adult. Sequence the swaps to the timeline: paint and any new wood furniture twelve to fourteen weeks before move-in to off-gas; mattress and air purifier in the third trimester; floor and textile choices last.

● HIGH IMPACT · LOW COST

Air purifier running continuously **\$200-\$600**

HEPA + carbon. Start in third trimester. Continue at least the first six months.

GOTS organic cotton bedding and sleep sack **\$60-\$140**

Skip pillows and blankets in the crib until age one regardless of material.

Open windows daily **\$0**

Even in cold weather, fifteen minutes a day flushes accumulated VOCs.

● HIGH IMPACT · HIGHER COST

GREENGUARD Gold organic crib mattress **\$200-\$500**

Avoid memory foam (suffocation risk regardless of chemistry). Look for organic cotton or natural latex with a wool flame barrier instead of chemical retardants.

Solid wood crib and dresser **\$300-\$1,200**

Engineered wood off-gases formaldehyde. Solid hardwood with low-VOC finish, given twelve weeks to settle, is the swap.

● LOWER IMPACT · REPLACE WHEN WORN

Cotton or wool play mat**\$60-\$200**

Rotated and washable. Most baby-marketed play mats are foam treated with flame retardants.

WHAT TO AVOID

- Engineered wood furniture for at least six months pre-arrival
- PVC crib mattress covers (phthalates)
- Memory foam in cribs (any age)
- Conventional carpet with chemical backing in nursery

FOR PREGNANCY, INFANTS, AND CHILDREN UNDER FIVE

If you are pregnant: paint and bring new furniture in early in the second trimester at the latest. Twelve weeks of off-gassing before the baby arrives is the goal. Air purifier and mattress can wait until third trimester.



Chapter V

LIVING ROOM

Where textiles release into the air you share

CHAPTER V · LIVING ROOM

Couches, rugs, and curtains hold their chemistry for years. Buying right once is cheaper than buying twice. The biggest single decision is the sofa: foam-and-fabric construction without flame retardants, no PFAS stain treatment, frame in solid wood. Done well, it lasts fifteen years; done poorly it sheds into your living room dust the entire time.

● HIGH IMPACT · LOW COST

HEPA vacuum weekly, damp mop hard floors

\$0-\$300 for HEPA vacuum

The dust-pathway swap from page seven. Most important non-buying change in the house.

Beeswax or soy candles only, sparingly

\$0

Or skip candles entirely. Paraffin combustion releases benzene and toluene; fragrance carries phthalates.

● HIGH IMPACT · HIGHER COST

Sofa: TB117-2013 compliant, no PFAS treatment

\$1,500-\$5,000

Ask the brand directly: 'no added flame retardants, no PFAS stain treatment.' Get it in writing. Frame in solid wood, cushions in down or natural latex.

Wool or natural-fiber rug

\$300-\$2,000

Wool, cotton, or jute. Synthetic rugs with rubber backing release VOCs for months.

● LOWER IMPACT · REPLACE WHEN WORN

Natural-fiber throw pillow covers

\$30-\$80

Linen, cotton, wool. Easy to wash, and they touch skin daily.

WHAT TO AVOID

- PFAS stain treatments on furniture
- Paraffin candles, especially scented
- Plug-in air fresheners
- Synthetic rugs with chemical backing



Chapter VI

LAUNDRY

The room with the loudest fragrance

CHAPTER VI · LAUNDRY

Conventional laundry products are the largest household source of synthetic fragrance, and the dryer vents that fragrance into your home and yard. The fix is unusually clean: replace detergent, drop dryer sheets, drop fabric softener, and most of the issue resolves. Cold water also works for eighty to ninety percent of loads.

● HIGH IMPACT · LOW COST

Fragrance-free or EWG-verified detergent \$15-\$30

The detergent itself, not just 'free and clear' marketing. Branch Basics, Molly's Suds, and others are verified.

Wool dryer balls instead of dryer sheets \$15

Eliminate static, no fragrance vent, last for years. A budget swap with outsize benefit.

Skip fabric softener entirely \$0

It coats fibers in synthetic fragrance and quaternary ammonium compounds. The wool balls handle softness.

Cold water for everything that does not need hot \$0

Most loads. Saves energy and is gentler on fabric.

● LOWER IMPACT · REPLACE WHEN WORN

Sodium percarbonate for whitening \$10-\$20

Oxygen bleach, not chlorine bleach. Equally effective for most household whitening, much lower respiratory load.

WHAT TO AVOID

- Conventional fabric softener
- Dryer sheets
- Chlorine bleach in routine wash
- Optical brighteners

A rooftop terrace with a white sofa and a gold side table, overlooking a city skyline and Central Park. The scene is captured during a soft sunset or sunrise, with a warm, golden light. The terrace is partially covered by a wooden pergola structure with white wisteria flowers hanging from it. The city skyline in the background is dense with skyscrapers, and Central Park is visible in the middle ground.

Chapter VII

OUTDOOR AND GARDEN

Where pesticides, hoses, and patio fabrics live

CHAPTER VII · OUTDOOR AND GARDEN

The garden is where the family does what it should be doing more of: spending time outside. The chemistry of the space deserves a few thoughtful choices. Drinking-water-safe hose, no broadcast pesticide application near play areas, patio cushions you actually trust.

● HIGH IMPACT · LOW COST

Drinking-water-safe garden hose \$30-\$80

NSF/ANSI 61 certified. Conventional PVC hoses leach lead and phthalates, especially in sun.

Skip glyphosate and broadcast pesticide \$0

Hand-pull, mulch heavily, accept some clover. Broadcast application is the largest residential pesticide exposure.

Mosquito control with Bti only \$10-\$20

Bacillus thuringiensis israelensis dunks in standing water. No fogging.

● HIGH IMPACT · HIGHER COST

Outdoor furniture without PFAS treatment \$400-\$2,000

Specifically ask. Most performance fabric is treated. Solution-dyed acrylic or untreated polyester are alternatives.

● LOWER IMPACT · REPLACE WHEN WORN

Covered storage to keep cushions out of UV and rain \$50-\$150

Doubles their life and reduces fabric breakdown into dust.

WHAT TO AVOID

- PVC garden hoses (lead, phthalates)
- Pressure-treated wood for play structures (older formulations)
- Broadcast pesticide application
- PFAS-treated patio cushions

A dark classic car, possibly a Mercedes-Benz, is parked in a garage. A light fixture is mounted on the wall above the car, casting a warm glow. The car's side profile is visible, showing the rear window and a wheel with a Mercedes-Benz logo.

Chapter VIII

GARAGE AND UTILITY

The room that vents into the others

CHAPTER VIII · GARAGE AND UTILITY

Anything stored in an attached garage can find its way into the house: gasoline vapors, idling engines, paints, solvents. Treat it as outdoor storage, not as another closet.

● HIGH IMPACT · LOW COST

Never idle a car in the garage \$0

Even with the door open. Carbon monoxide and benzene drift inside.

Store paint, solvents, gasoline outside the house envelope \$0-\$300

If the garage is attached, a sealed exterior shed or detached storage is better.

Seal the door between garage and house \$30-\$100

Weatherstripping and a self-closing hinge if you have an attached garage. Reduces infiltration of vehicle and storage VOCs.

WHAT TO AVOID

- Indoor idling, even briefly
- Gasoline cans inside the house
- Open paint cans stored long-term

A FOUR-WEEK SEQUENCE

30-Day Quick Start

If you are the kind of reader who needs momentum, here it is. Four weeks, sequenced for impact, none of it expensive.

WEEK 1

Water and dust

- ✓ Order a NSF/ANSI 53 certified water filter (pitcher is fine for now).
- ✓ Vacuum with HEPA on Saturday. Damp mop hard floors. Repeat weekly from here.
- ✓ Open every window for fifteen minutes.

WEEK 2

Kitchen plastics and fragrance

- ✓ Move all hot leftovers into glass.
- ✓ Replace plastic utensils that touch nonstick.
- ✓ Pull plug-in fresheners and conventional candles. Open a window instead.

WEEK 3

Personal care and laundry

- ✓ Switch to fragrance-free hand soap, body wash, and lotion at next refill.
- ✓ Replace dryer sheets with wool dryer balls.
- ✓ Switch detergent to fragrance-free or EWG-verified at next refill.

WEEK 4

Bedroom audit

- ✓ Run the air purifier in the bedroom continuously.
- ✓ Replace one pillow with down or wool.
- ✓ Order GOTS-certified sheets to swap in at the next sheet rotation.

A TWELVE-MONTH SEQUENCE

Year One Roadmap

The thirty-day plan handles the cheap, fast wins. The bigger swaps belong on a longer timeline, paced by realistic budgets and life events. Move purchases up when something breaks; do not throw out functional items to swap them out today.

Months 1-3

- Finish the thirty-day plan if you have not.
 - Replace plastic cutting board with end-grain wood.
 - Replace one piece of cookware (cast iron is the cheapest entry).
 - Switch household cleaner to a single fragrance-free concentrate (Branch Basics, Force of Nature, etc.).
-

Months 4-6

- Mattress topper or pillow upgrade if budget allows.
 - Range hood ducted to outside if you have gas and the kitchen vents recirculating.
 - Audit any remaining synthetic-fragrance products and replace at refill.
 - Add a HEPA + carbon purifier to the second-most-used room.
-

Months 7-9

- When painting any room, choose zero-VOC. Mid-pregnancy or twelve weeks before a baby if applicable.
 - If you are buying outdoor furniture, ask about PFAS treatment in writing.
 - Replace any garden hose with NSF/ANSI 61 certified.
 - Swap one rug to wool or natural fiber when the current one wears.
-

Months 10-12

- Mattress replacement if the current one is genuinely worn (eight to ten years).
 - Sofa replacement if the current one is shedding or pre-2013 foam.
 - Whole-house water filter if the budget allows and your municipal report supports it.
 - Annual check: re-read pages four through six and reset priorities.
-

THE PAGE THAT EARNS THE REST

What We Do Not Know Yet

The replacement chemistries for the substances we are most worried about are mostly unstudied at the scale that matters. BPS and BPF replaced BPA in many polycarbonates; their endocrine activity in vitro looks similar, and human long-term data is years away. GenX and other short-chain PFAS replaced PFOA and PFOS for the same reason; they appear to clear the body faster, but their environmental persistence is comparable, and the human evidence is in its first decade. New brominated and organophosphate flame retardants replaced PBDEs; some are now being detected in human serum at levels that are climbing, not falling.

Mixture effects are largely uncharacterized. Almost every laboratory study tests one chemical at a time. Real households see hundreds simultaneously, at low doses, over decades. Whether the combined load matters more than the individual pieces is a question regulators acknowledge and cannot yet answer.

Individual variation in detoxification is real, measurable in genetic tests, and not yet clinically actionable. Two readers of this guide can have meaningfully different body burdens after the same year of swaps. The general advice still holds; the magnitude of benefit varies.

What we are confident about: dust matters, dose matters, the developmental window matters, and the most common high-impact swaps are the ones already on the high-impact list. What we are not confident

about: how much benefit any given household will see in any given year. The honest answer to 'how much will this help' is 'less than you hope, more than zero, and the alternative is worse.'

A WORKING VOCABULARY

Glossary

Eighteen terms that recur in this guide and across the chemical-exposure literature. The full living glossary, with citations, lives at nontoxiclub.com/glossary/.

BPA / BPS / BPF

Bisphenols. Endocrine-active compounds used in polycarbonate plastics and can liners. BPA is regulated; BPS and BPF replaced it and show similar in vitro activity.

Where it shows up: Polycarbonate plastics, can linings, thermal receipts.

Phthalates

Plasticizers that soften PVC and act as fragrance carriers. Reproductive and developmental toxicants.

Where it shows up: Vinyl flooring, shower curtains, fragranced products, soft plastic toys.

PFAS

Per- and polyfluoroalkyl substances. Persistent in environment and body; six are now under federal MCL in US drinking water (2024).

Where it shows up: Nonstick cookware, water-resistant textiles, food packaging, firefighting foam, drinking water.

PFOA / PFOS

Two long-chain PFAS phased out in US production. Half-lives in humans of two to four years.

Where it shows up: Legacy contamination, drinking water, biomonitoring serum.

Formaldehyde

IARC Group 1 human carcinogen. Off-gases from engineered wood and resin-treated textiles.

Where it shows up: MDF and particleboard furniture, wrinkle-free fabric, some adhesives.

PBDEs

Polybrominated diphenyl ether flame retardants. Largely banned but persist in furniture made before TB117-2013.

Where it shows up: Older upholstered foam, electronics, dust.

VOCs

Volatile organic compounds. Off-gas from new finishes, paint, and synthetic materials.

Where it shows up: Paint, new furniture, carpet, cleaning products.

Triclosan

Antimicrobial endocrine disruptor banned from over-the-counter hand soaps in 2016 but still appears in some products.

Where it shows up: Some toothpastes, older soap stocks, certain cosmetics.

Parabens

Preservatives with weak estrogenic activity. Methyl- and ethyl-paraben are widely tolerated; propyl- and butyl- carry more concern.

Where it shows up: Personal care products as preservatives.

Quaternary ammonium (quats)

Disinfectant class associated with respiratory irritation and possible reproductive effects.

Where it shows up: Disinfectant wipes, fabric softener, conventional cleaners.

1,4-Dioxane

Solvent contaminant of ethoxylated surfactants. Probable human carcinogen.

Where it shows up: Some shampoos, body wash, laundry detergents (as contaminant, not ingredient).

Glyphosate

Broad-spectrum herbicide. IARC classifies as probable human carcinogen; EPA disagrees.

Where it shows up: Lawn and garden weed control, conventional agriculture.

Lead

Neurotoxic metal. No safe blood level established for children.

Where it shows up: Pre-1978 paint, some imported pottery, older brass plumbing, soil near old highways.

Radon

Naturally occurring radioactive gas. Second leading cause of lung cancer in US after smoking.

Where it shows up: Soil gas entering homes, especially basements. Test kits are inexpensive.

Benzene

IARC Group 1 carcinogen. Combustion byproduct.

Where it shows up: Vehicle exhaust, gas stoves, paraffin candles, garage storage.

Naphthalene

VOC and probable human carcinogen.

Where it shows up: Mothballs, vehicle exhaust, some air fresheners.

Perchloroethylene

Dry-cleaning solvent classified as likely human carcinogen.

Where it shows up: Conventional dry cleaning. Wet-cleaning and CO₂-cleaning alternatives exist.

Microplastics

Plastic particles under 5mm. Increasingly detected in human tissue; health implications under active study.

Where it shows up: Plastic cutting boards, synthetic textiles, packaged food, drinking water.

THE REFERENCES BEHIND THE CLAIMS

Sources

Every health claim in this guide carries a study-type label in brackets. The numbers below correspond to those labels. Each reference links directly to the underlying study, agency program, or regulatory document.

01 [CDC, National Report on Human Exposure to Environmental Chemicals \(the NHANES biomonitoring program\). Detection rates for phthalates, bisphenols, and PFAS across the US population.](#)

[BIOMONITORING]

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AN IDEALIZED NON-TOXIC HOME

Floor Plan

Pin this to a wall. The labels mark the highest-yield decisions in each room, drawn after the manner of the architectural plates of the Penguin Nature Library. None of it is mandatory; all of it adds up.

