



**FUNCTIONAL  
MEDICINE**

Continuing Education

# **Mental Detox:**

## **A Holistic Approach to Detoxification**

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# Disclosure

Nicole Grams, PharmD, IFMCP disclosed no relevant financial relationships with any ineligible companies.

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# Objectives

## Part 1: Overview of Detoxification

1. Define “toxins” and identify sources
2. Review Phase I, II and III detoxification
3. Review factors that inhibit and support detoxification

## Part 2: Mental Detox

1. Review how stress affects detoxification
2. Identify symptoms of stress
3. Explore ways to reduce stress and find helpful ways to cope

# We are what we...



EAT



DRINK



BREATHE



TOUCH



CAN'T ELIMINATE



# What is a toxin/toxicant?

A chemical substance that causes structural damage or functional disturbance.

Toxin = biological origin

Toxicant = synthetic chemical

All substances are  
toxic, it is only the dose  
which matters.



## EXPOSURE

Where is it coming from?



## BIOTRANS- FORMATION

What does the body do  
with it?



## ELIMINATION

How does it leave the  
body?

## PLASTIC

Food wrappers, Bottles,  
Can linings, Electronics,  
Clothing, Literally almost  
everywhere...

## SOLVENTS/ VOCS

Cleaning products,  
Furniture, Carpet, Paint,  
Dry cleaning,  
"New Car Smell," etc.

## HEAVY METALS

Dental work, Cookware,  
Personal care products,  
Furniture, Food  
(especially seafood), etc.

## INDUSTRY

Air/Water/Soil Pollution  
from industrial activity,  
Automobile exhaust,  
Building materials, etc.

# SOURCES OF TOXINS

## -CIDES

Pesticides, Herbicides,  
Insecticides (Parks,  
Lawn care, Farms,  
Golf courses), etc.

## INGESTED SUBSTANCES

Food Additives,  
Medications, Nicotine  
products, Artificial flavors,  
Synthetic dyes, etc

## PARABENS

Cosmetic additives,  
Shampoo, Lotion,  
Makeup, Deodorant,  
Perfume/cologne, etc

## MOLD

Damp basement,  
Carpeting, Walls,  
Ceiling tiles, Old  
buildings, etc.



## BACTERIA, YEAST, VIRUSES

Microbiome,  
Microvirome, Dysbiosis,  
Acute or chronic  
infections, etc.

## FOOD

Gluten, Casein (dairy),  
Sugar, Charred/burnt  
food, Natural  
phytochemicals,  
Poisons, etc.

## CELLULAR BYPRODUCTS

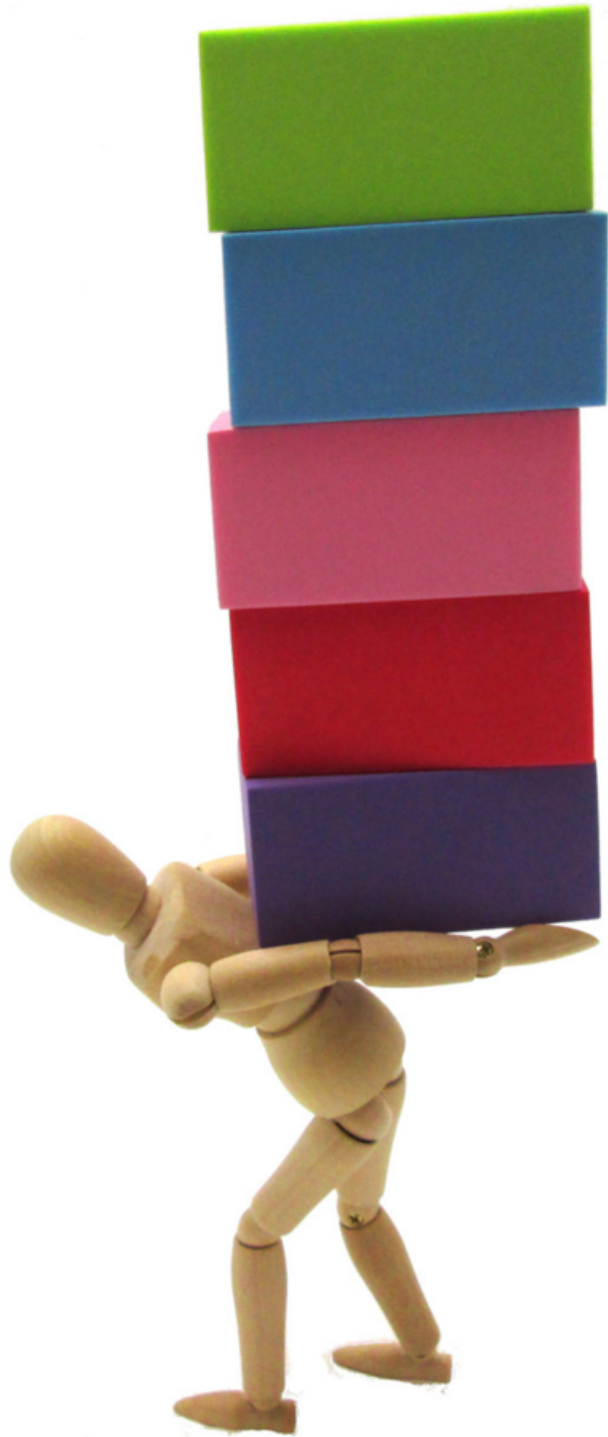
Enzymatic reactions,  
Mitochondrial reactions,  
Respiration, Reduction,  
Oxidation, Hydrolysis,  
etc.

## STRESSORS, EMOTIONS

Hormone fluctuations,  
Cytokines, Nutrient  
depletion, etc.

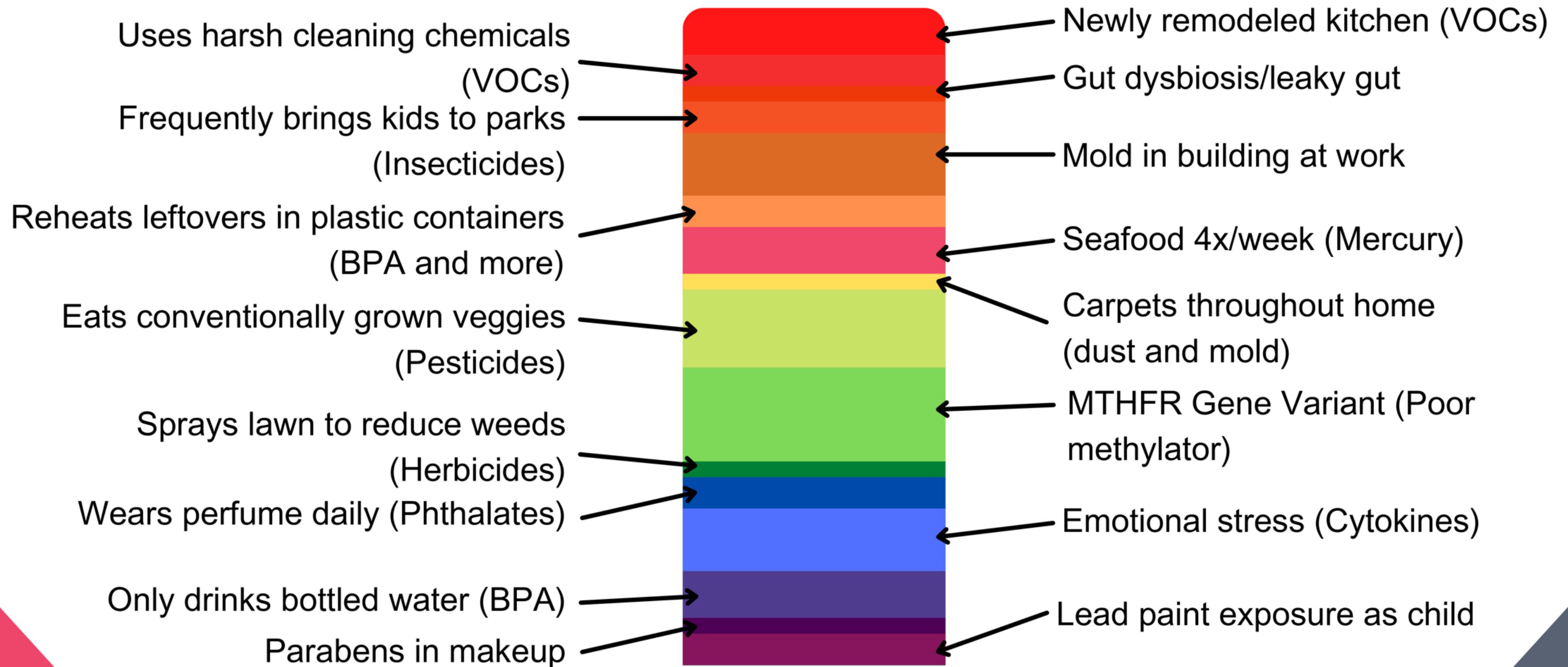
# SOURCES OF TOXINS

# Toxic Load



$$\begin{aligned} &\text{Total Toxic Exposure} \\ &\quad (\text{minus}) \\ &\text{Ability to Biotransform} \\ &\quad (\text{minus}) \\ &\text{Ability to Excrete} \\ &\quad (\text{equals}) \\ &\text{Total Body Burden} \end{aligned}$$

# Where's the Tipping Point?



# Synergistic Effects


$$1 + 1 = 3$$

- Biologic effects of many toxicants are not linear and can be profound, even at very low doses.<sup>1</sup>
- Consider synergistic effects and amplified responses

The question is not  
"Is your patient toxic?"

**How toxic is  
your patient?**

**&**

**Is toxicity causing  
symptoms or  
stopping healing?**

# Symptoms are EVERYWHERE!

HEADACHES,  
BRAIN FOG,  
FATIGUE,  
INSOMNIA,

AUTOIMMUNE  
OR ENDOCRINE  
DISORDERS,  
CHRONIC  
INFECTIONS

JOINT PAIN,  
MUSCLE  
ACHES

CONGESTION,  
BAD BREATH,  
POSTNASAL  
DRIP

SENSITIVITIES  
TO SCENTS,  
FOOD,  
MEDICATION

ANXIETY  
DEPRESSION  
IRRITABILITY

INTERRUPTED  
SLEEP,  
CHRONIC  
FATIGUE

HORMONE  
IMBALANCES,  
INFERTILITY

ASTHMA,  
ALLERGIES,  
RASHES,  
ACNE, ECZEMA

NEUROLOGICAL  
ISSUES,  
TREMORS,  
NUMBNESS,  
TINGLING

BLOOD SUGAR  
IMBALANCES,  
INSULIN  
RESISTANCE

UNEXPLAINED  
WEIGHT GAIN,  
ESPECIALLY  
ABDOMINAL

PMS,  
MENSTRUAL  
ISSUES,  
FIBROIDS

GAS,  
BLOATING,  
CONSTIPATION,  
DIARRHEA

*...even when standard labs are "normal."*

# Which of the following best defines a toxin?

- a. A substance that causes structural damage or functional disturbance
- b. A nutrient used by cells for normal function
- c. A substance that has no effect on the body
- d. A hormone produced by the body

# Which of these hobbies is least likely to increase toxin exposure?

- a. Photography
- b. Gardening
- c. Golfing
- d. Painting
- e. All of these hobbies come with potential risk of toxin exposure



# Which are common sources of toxins?

- a. Organic fruits and vegetables
- b. Food containers and cosmetics
- c. Exercise and physical activity
- d. Fresh air and clean water



## EXPOSURE

Where is it coming from?



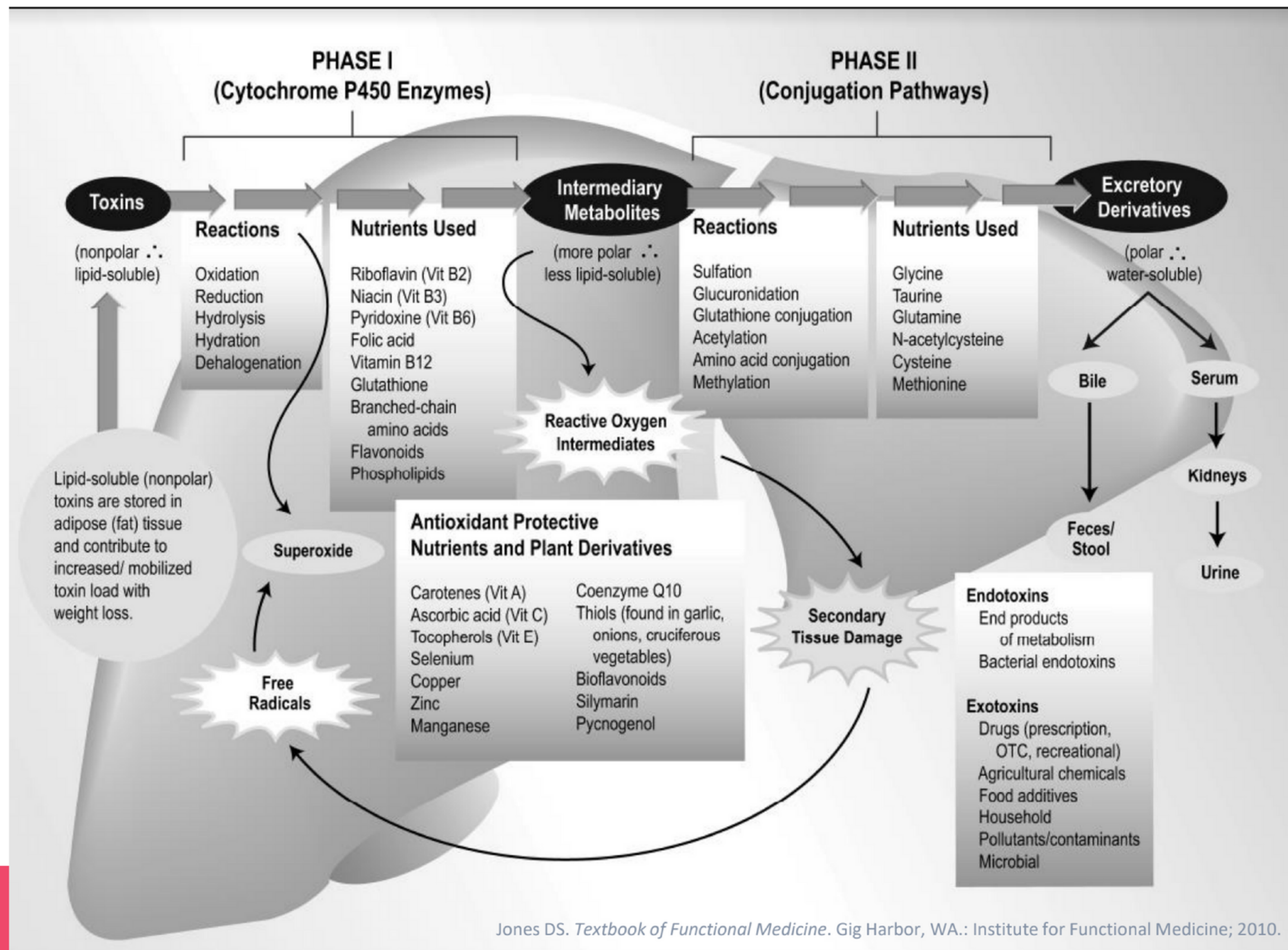
## BIOTRANS- FORMATION

What does the body do  
with it?



## ELIMINATION

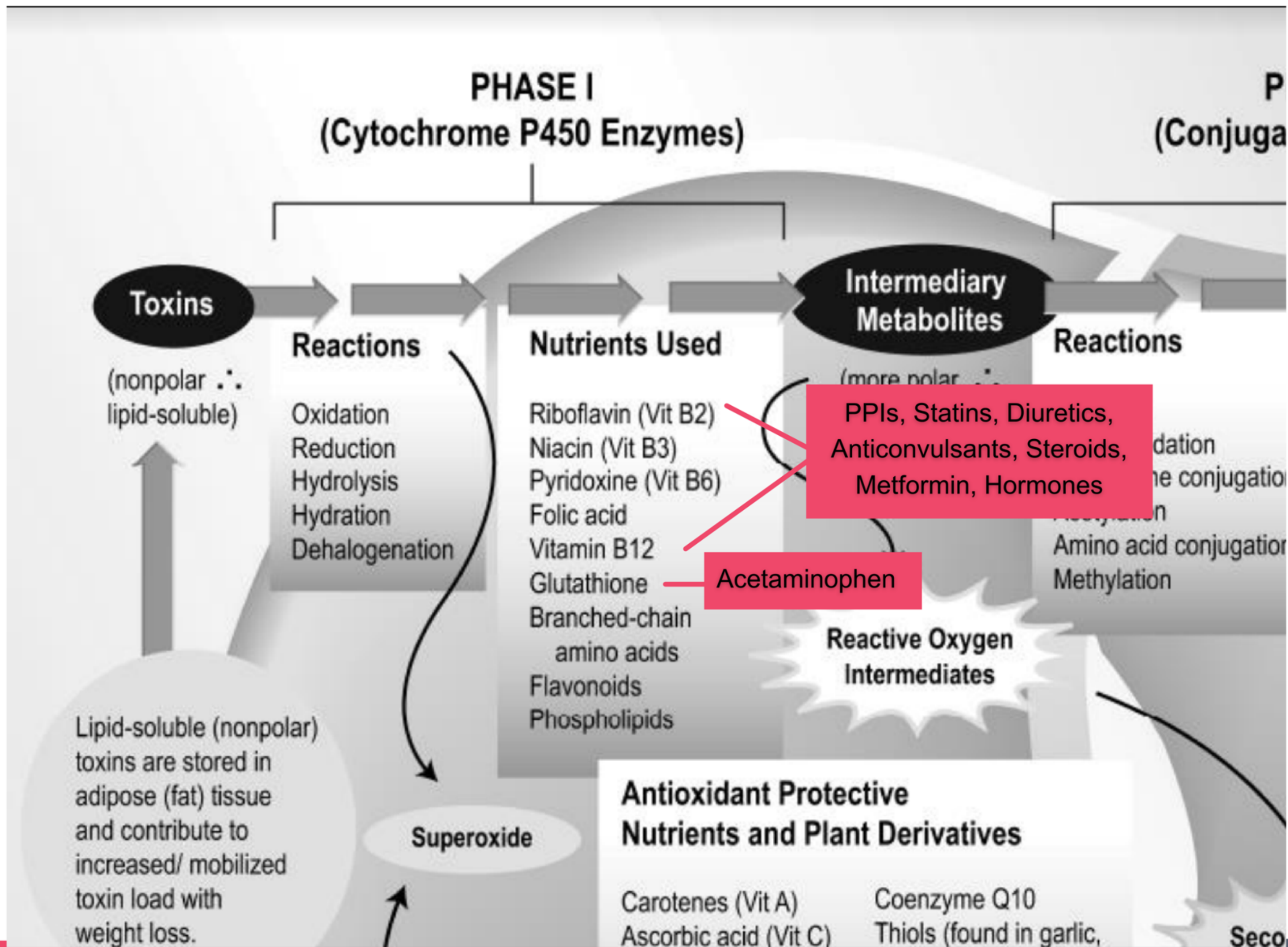
How does it leave the  
body?



Consider how many  
CYP Enzyme  
Inducers/Inhibitors and  
Substrates there are!

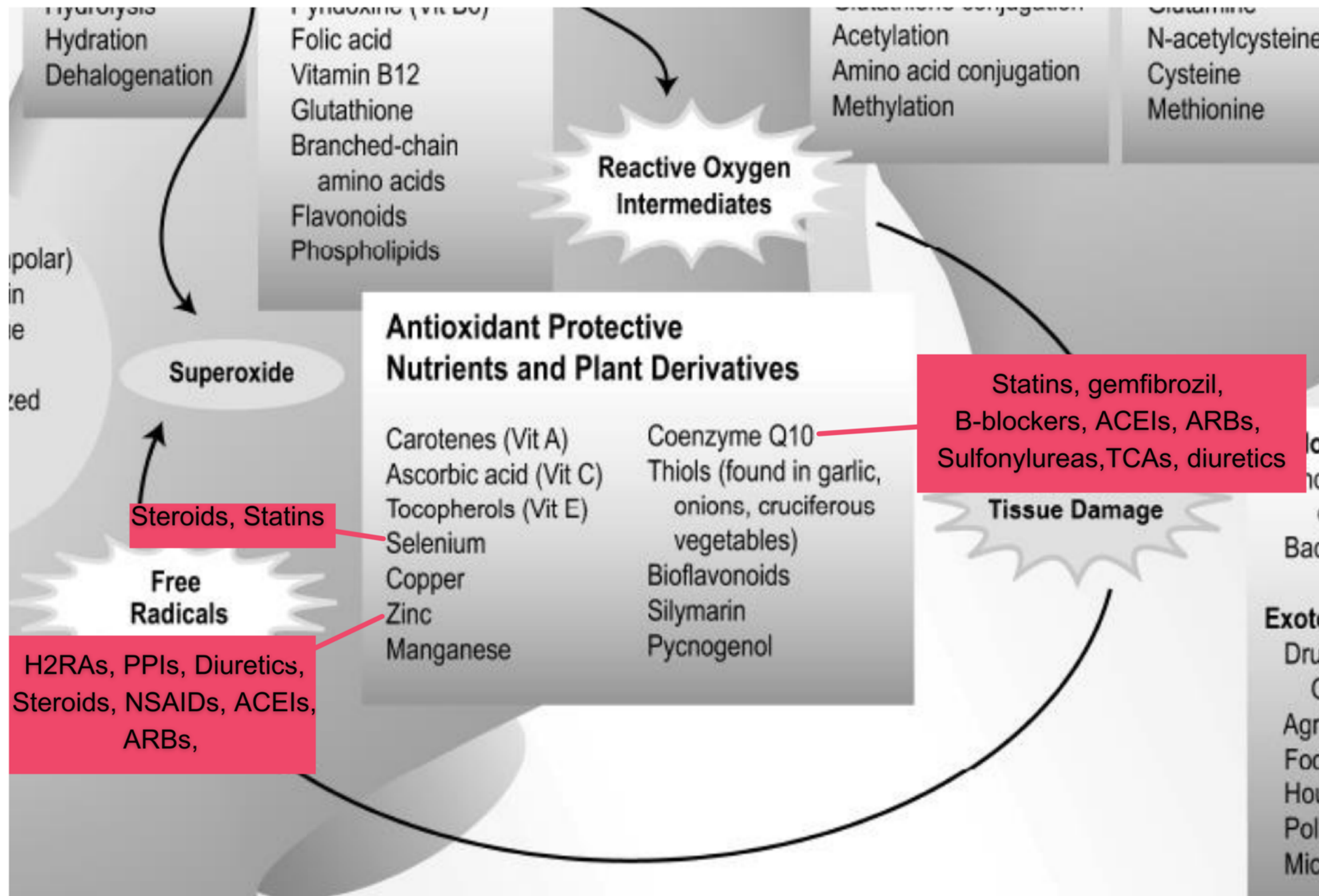
Hint: There are A LOT

# DRUG INDUCED NUTRIENT DEPLETION<sup>1</sup>



1. Mohn ES, et al. Evidence of Drug-Nutrient Interactions with Chronic Use of Commonly Prescribed Medications: An Update. *Pharmaceutics*. 2018 Mar 20;10(1):36. doi: 10.3390/pharmaceutics10010036. PMID: 29558445; PMCID: PMC5874849.

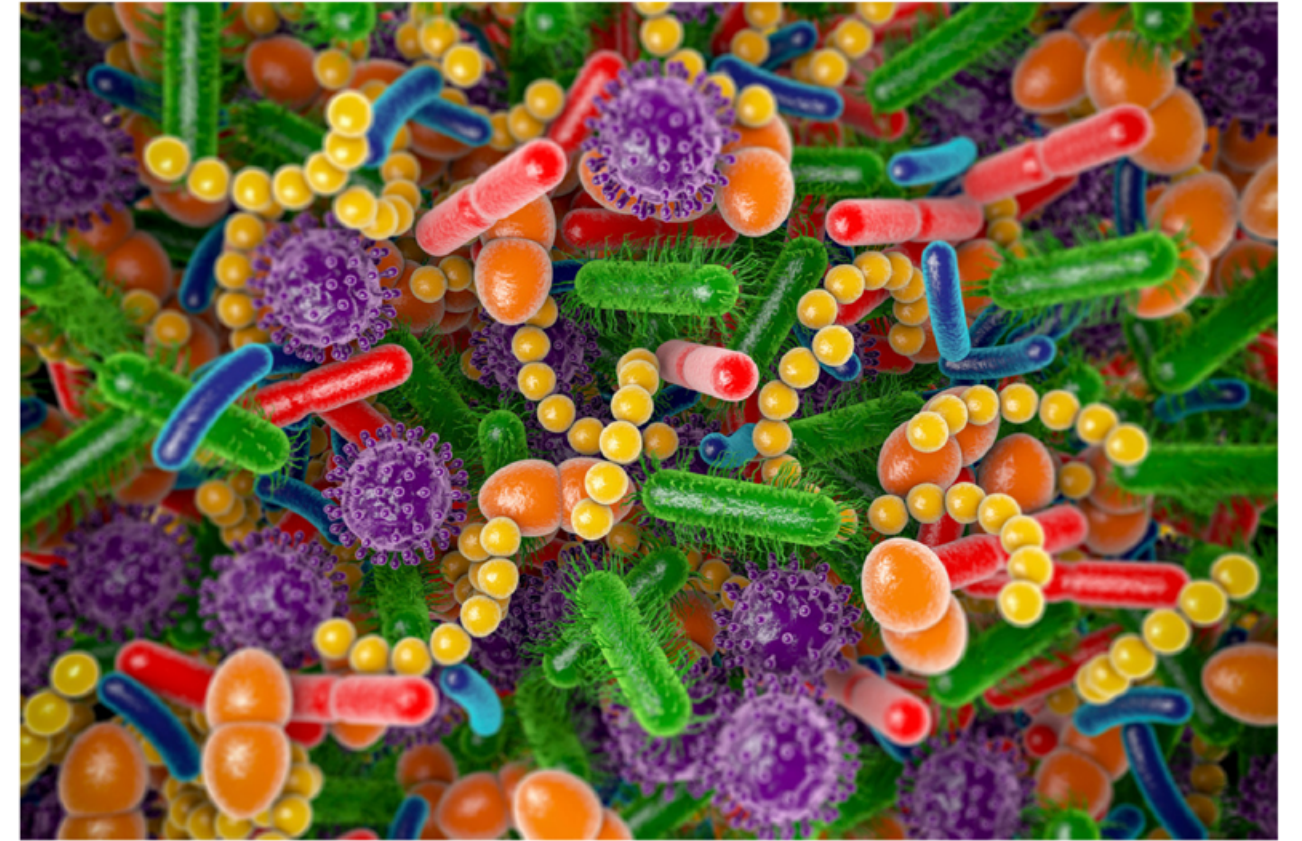
# DRUG INDUCED NUTRIENT DEPLETION<sup>1</sup>



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# Don't forget about the microbiome!!

Prevents absorption and metabolizes toxins/toxicants, xenobiotics<sup>1</sup> and heavy metals<sup>2</sup>



1. Jeong HG, et al. Role of intestinal microflora in xenobiotic-induced toxicity. Mol Nutr Food Res. 2013 Jan;57(1):84-99. doi: 10.1002/mnfr.201200461.

2. Arun, K. B., et al. (2021). Probiotics and gut microbiome – prospects and challenges in remediating heavy metal toxicity. Journal of Hazardous Materials, 420, 126676. <https://doi.org/10.1016/j.jhazmat.2021.126676>



# Storage

- Lipophilic toxins are stored in adipose tissue
  - Reducing body fat enhances excretion (and may cause symptoms!)
-



# Which phase of liver detoxification creates MORE reactive intermediate metabolites?

- a. Phase I
- b. Phase II
- c. Phase III
- d. None of the above

When guiding patients through their detox process, which phase of liver detoxification should be prioritized FIRST?

- a. Phase I
- b. Phase II
- c. Phase III
- d. None of the above



## EXPOSURE

Where is it coming from?



## BIOTRANS- FORMATION

What does the body do  
with it?



## ELIMINATION

How does it leave the  
body?

# How do toxins (and their metabolites) leave the body?

- a. Feces
- b. Urine
- c. Sweat
- d. Breath
- e. All of the above

# FACTORS THAT AFFECT Detoxification

## STRESS

Finances, Relationship, Career, Life events, Trauma

## FOOD

Sugar, Processed foods, Synthetic ingredients

## ALCOHOL

Modulating liver function, Nutrient depletion

## SEX

Male vs. Female

## MEDICATIONS

CYP450 Metabolism of drugs, Nutrient depletion

## GENETICS

Polymorphisms, Ethnicity

## AGE

Reduced blood flow, Smaller liver volume

## LIFESTYLE

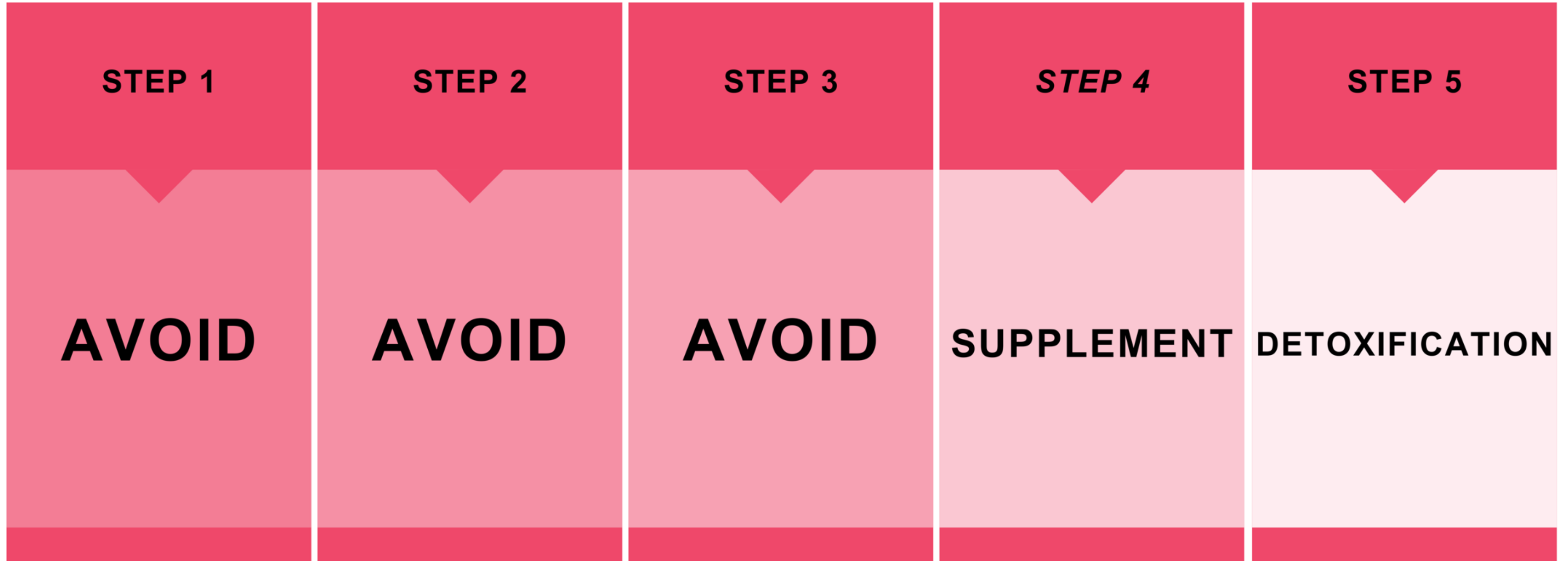
Reduced mitochondrial capacity, and reduced movement through lymph

1. Mayo Foundation for Medical Education and Research. (2022, April 8). Liver disease. Mayo Clinic. Retrieved April 16, 2023, from <https://www.mayoclinic.org/diseases-conditions/liver-problems/symptoms-causes/syc-20374502>

2. Guy J, Peters MG. Liver disease in women: the influence of gender on epidemiology, natural history, and patient outcomes. *Gastroenterol Hepatol (N Y)*. 2013 Oct;9(10):633-9. PMID: 24764777; PMCID: PMC3992057.

So what can we DO  
about it???

## WHAT WE CAN DO ABOUT IT:



Step 1, 2 and 3  
AVOID  
(minimize exposure)



# 10 Ways to Decrease Toxin Exposure

- Avoid Pesticides/Herbicides in home/lawn/garden
- Filter toxins from water
- Non-Toxic cleaning products
- Non-Toxic building materials/carpets in home (e.g. remodel)
- Use clean cosmetic products, nail polish, fragrance
- Eat a nutrient-dense diet

- Organic food whenever possible (esp. meat and dairy, dirty dozen)
- Monitor consumption of large fish
- Avoid amalgam fillings (or consider safe removal)
- Store/heat food in non-plastic containers
- Clean furnace filters regularly, use an air filter, keep houseplants



# FRUITS, VEGETABLES, AND ANIMAL PRODUCTS

Aim for

- Organic
- Grass fed/Finished
- Pasture Raised
- Wild caught



1. Harsh, C. (2016, May 27). Blog: | organic is clearly better when it comes to reducing toxic, synthetic pesticides. Center for Food Safety. Retrieved April 16, 2023, from <https://www.centerforfoodsafety.org/blog/4384/organic-is-clearly-better-when-it-comes-to-reducing-toxic-synthetic-pesticides>

2. Roggeman S, de Boeck G, De Cock H, Blust R, Bervoets L. Accumulation and detoxification of metals and arsenic in tissues of cattle (*Bos taurus*), and the risks for human consumption. *Sci Total Environ*. 2014 Jan 1;466-467:175-84. doi: 10.1016/j.scitotenv.2013.07.007. Epub 2013 Jul 31. PMID: 23906855.

# EWG's Dirty Dozen

1. Strawberries
2. Spinach
3. Kale/Collard/Mustard Greens
4. Peaches
5. Pears
6. Nectarines

7. Apples
8. Grapes
9. Bell and Hot Peppers
10. Cherries
11. Blueberries
12. Green Beans

# EWG's Clean Fifteen

1. Avocados
2. Sweet corn\*
3. Pineapple
4. Onions
5. Papaya\*
6. Sweet Peas (frozen)
7. Asparagus
8. Honeydew Melon

9. Kiwi
10. Cabbage
11. Mushrooms
12. Mangoes
13. Sweet Potatoes
14. Watermelon
15. Carrots

\*Non-organic may be GMO



# MERCURY IN FISH

Highest in

- Shark
- Swordfish
- Halibut
- Tuna

3-4x higher in tuna steaks  
(vs. canned)

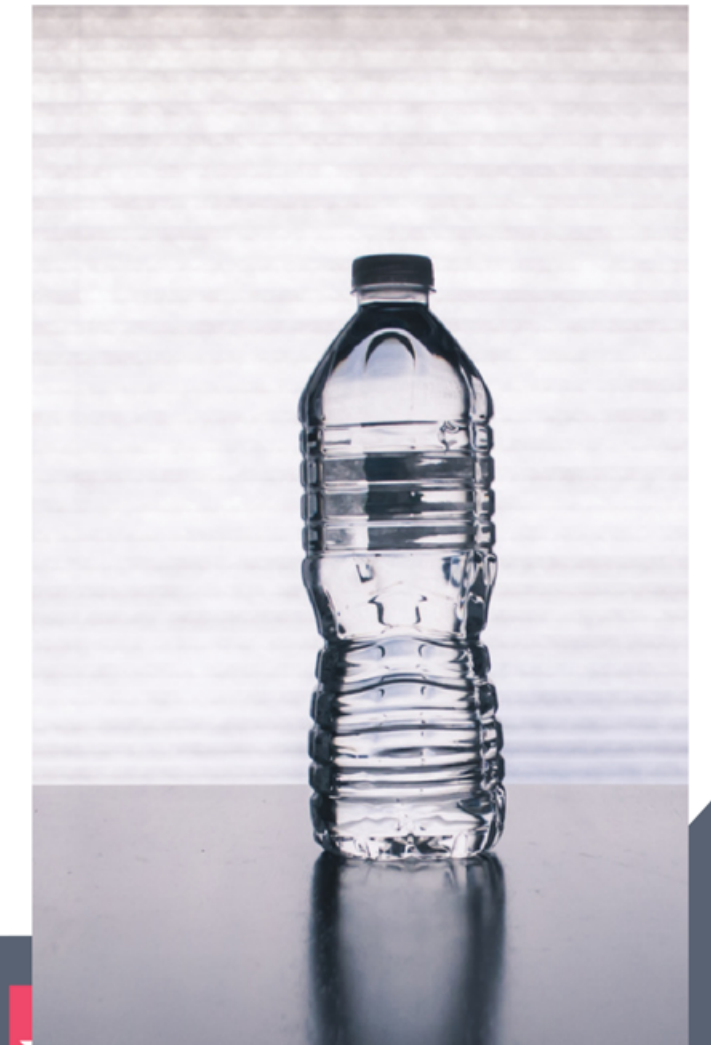
# Amalgam Removal by Biological Dentist

The Safe Mercury Amalgam Removal Technique (SMART)

19 point safety recommendation list, including:

- High volume air filtration system
- Pre-treatment with charcoal and chlorella rinse
- Protective gowns and covers for all personnel in room
- Respiratory-grade mask for all personnel in room
- A full body, impermeable barrier, as well as a full head/face/neck barrier for patient
- Nasal air supply for patient

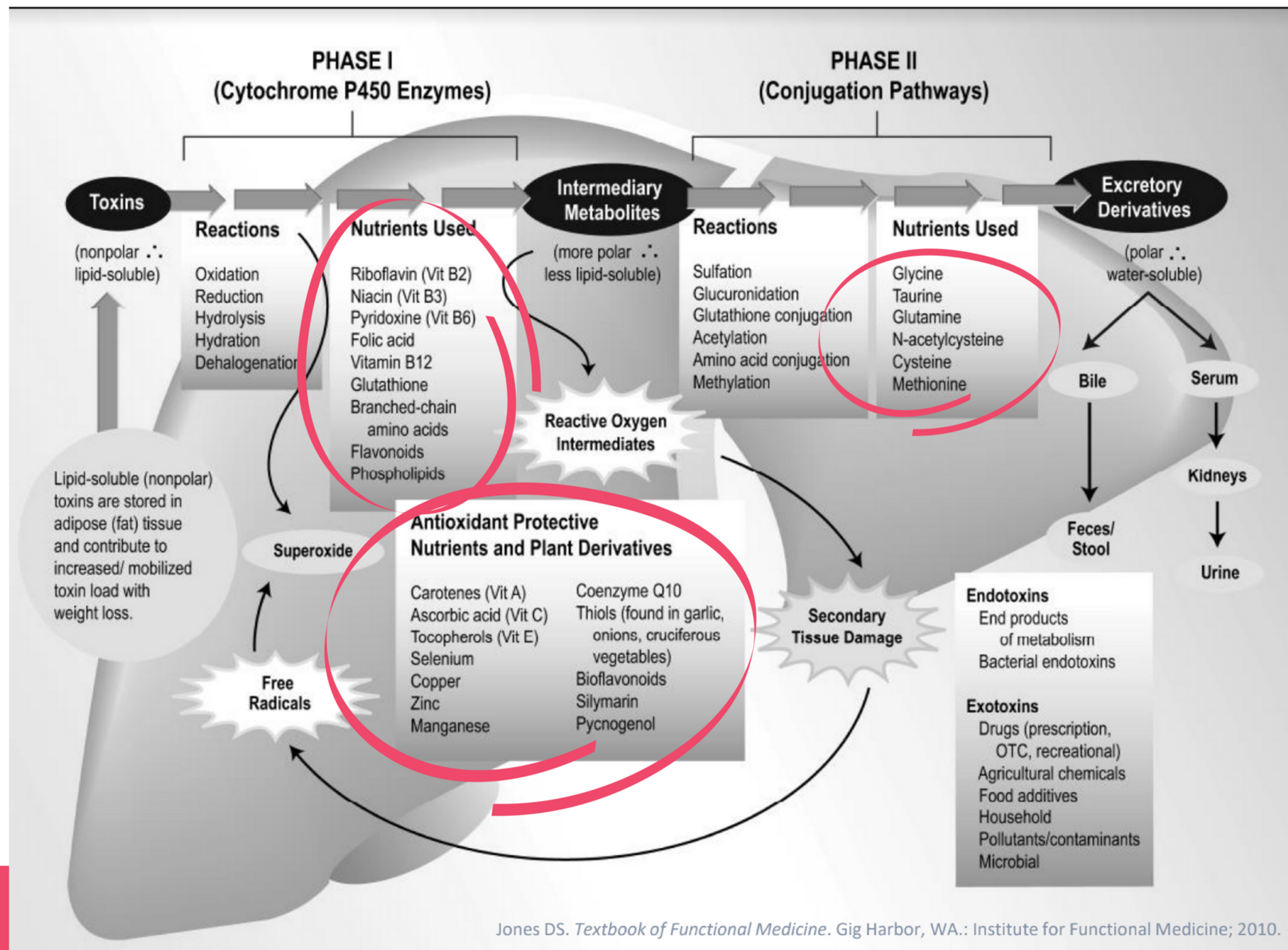




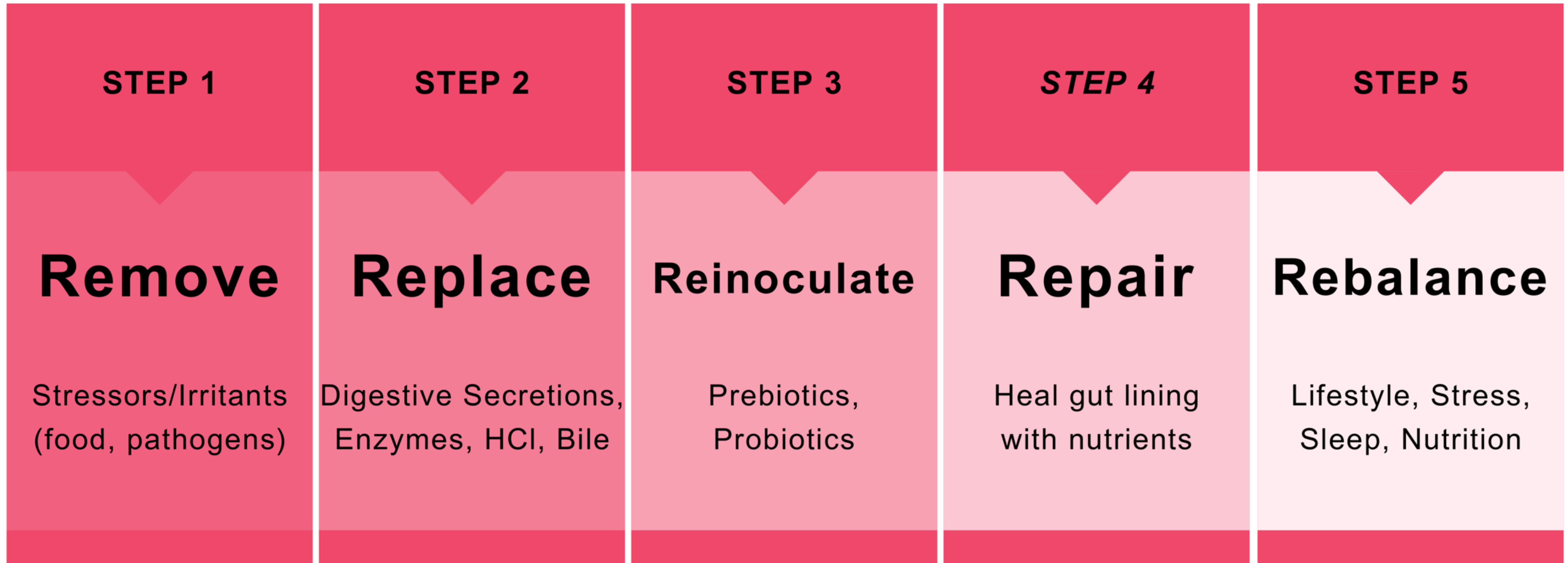
Step 4

SUPPLEMENT





# OPTIMIZE GUT HEALTH WITH THE 5-R GUT-HEALING PROTOCOL<sup>1</sup>



1. Pedre, V. (2023, January 24). This video introduction to the 5R framework for treating digestive disorders is presented by Vincent Pedre, Md.. The Institute for Functional Medicine. Retrieved April 3, 2023, from <https://www.ifm.org/news-insights/5r-framework-gut-health/>

# Step 5

# DETOXIFICATION



#2 is #1

1. Rozman K. Intestinal excretion of toxic substances. Arch Toxicol Suppl. 1985;8:87-93. doi: 10.1007/978-3-642-69928-3\_10. PMID: 3868385.
2. Goldin BR, Adlercreutz H, Gorbach SL, Warram JH, Dwyer JT, Swenson L, Woods MN. Estrogen excretion patterns and plasma levels in vegetarian and omnivorous women. N Engl J Med. 1982 Dec 16;307(25):1542-7. doi: 10.1056/NEJM198212163072502. PMID: 7144835.



# Nutrition

- Eat your veggies!!  
(especially cruciferous)
  - Remove inflammatory foods
  - Pay attention to blood sugar
-



# Sweating

- Heavy metals released<sup>1</sup>
- BPA released in sweat<sup>2</sup>
- Use of saunas (traditional or infrared)
- Exercise/exertion

1. Sears ME, Kerr KJ, Bray RI. Arsenic, cadmium, lead, and mercury in sweat: a systematic review. J Environ Public Health. 2012;2012:184745. doi: 10.1155/2012/184745. Epub 2012 Feb 22. PMID: 22505948; PMCID: PMC3312275.

2. Genuis SJ, Beeson S, Birkholz D, Lobo RA. Human excretion of bisphenol A: blood, urine, and sweat (BUS) study. J Environ Public Health. 2012;2012:185731. doi: 10.1155/2012/185731. Epub 2011 Dec 27. PMID: 22253637; PMCID: PMC3255175.

# Movement (Exercise)

- Increases breathing
- Increases blood circulation
- Increases sweat production
- Moves lymph fluid throughout body





# Sleep

- Cellular-level detoxification<sup>1</sup>
- "Brain Wash" happens during sleep
- Neurotoxic waste flushed from brain/spinal cord<sup>2</sup>

1. Inoué S, Honda K, Komoda Y. Sleep as neuronal detoxification and restitution. *Behav Brain Res.* 1995 Jul-Aug;69(1-2):91-6. doi: 10.1016/0166-4328(95)00014-k. PMID: 7546322.

2. Xie L, Kang H, Xu Q, Chen MJ, Liao Y, Thiyagarajan M, O'Donnell J, Christensen DJ, Nicholson C, Iliff JJ, Takano T, Deane R, Nedergaard M. Sleep drives metabolite clearance from the adult brain. *Science.* 2013 Oct 18;342(6156):373-7. doi: 10.1126/science.1241224. PMID: 24136970; PMCID: PMC3880190.





# Hydration

- Blood circulation (more liver filtration)
  - Helps flush toxins through urine
  - Reduces constipation (support Phase III)
  - Supports cellular level waste removal
-

# What is the **most** effective way to reduce toxic load?

- a. Supplements to support the liver
- b. Exercising and drinking water
- c. Avoid exposure
- d. Eating lots of vegetables

# Which of the following has the most potential to interfere with detoxification?

- a. Adequate hydration
- b. Constipation
- c. Increasing physical activity
- d. 7-8 hours of sleep nightly

We've covered the basics  
of *physical* detoxification...

How about the connection  
between the mind and body?

# STRESS!!!!!!

---



# COMMON EFFECTS OF STRESS

## BODY

- Headache
- Muscle Tension
- Muscle Pain
- Chest Pressure
- Fatigue
- Change in Sex Drive
- Stomach Upset
- Sleep Problems

## MOOD

- Anxiety
- Restlessness
- Lack of Focus
- Lack of Motivation
- Overwhelm
- Irritability
- Anger
- Sadness
- Depression

## BEHAVIOR

- Over/Undereating
- Angry Outbursts
- Crying
- Drug use
- Alcohol use
- Tobacco use
- Social Withdrawal
- Less Frequent Exercise

# Physical Symptoms of Stress<sup>1</sup>

Abnormal menstruation	Excessive sweating	Psoriasis
Arrhythmias	Fibromyalgia	Reflux/GERD
Arthritis	Frequent illness	Rosacea
Autoimmune flare	Hair loss	Shortness of breath
Chest tightness	Heart disease	Stomachache
Constipation	High blood pressure	Stroke
Depression	Hives/Itchiness	Tension headaches
Diarrhea	Insomnia	TMJ flare
Eczema	Irritable Bowel Syndrome	Vomiting
Excessive gas	Muscle spasms	Weight gain

1. Team, W. (2023, April 7). 10 strange things stress can do to your body. Cleveland Clinic. Retrieved April 22, 2023, from <https://health.clevelandclinic.org/things-stress-can-do-to-your-body/>

# What about CHRONIC stress?

- Damages mitochondria (reduced ability to metabolize toxins)
- Increased desire/cravings for junk food, tobacco, alcohol
- Increases energy (fat) storage in body
- Changes how your DNA expressed (epigenetics)
- Increases blood pressure, blood sugar, cholesterol
- Impacts immune system
  - Slower wound healing
  - Increased infections



# How does stress affect detoxification?

- Depletes nutrients faster than normal
  - Mg, Zn, Ca, Fe, Niacin<sup>1</sup>
- Impacts digestion
- Interferes with sleep
- ...and so many more ways!



1. Lopresti AL. The Effects of Psychological and Environmental Stress on Micronutrient Concentrations in the Body: A Review of the Evidence. Adv Nutr. 2020 Jan 1;11(1):103-112. doi: 10.1093/advances/nmz082. PMID: 31504084; PMCID: PMC7442351.

# How do you know you need a mental detox?



- Negative thoughts spiraling
  - Self criticism
  - Reacting instead of responding
  - Feeling overwhelmed or worried
  - Difficulty sleeping (racing thoughts)
-

# Impact of mental clutter



- Reduced productivity
- Difficulty focusing
- Increased stress levels
- Procrastination
- Lower quality of life

# Purpose of a Mental Reset

- Find better focus and balance
- Make it a habit or daily ritual!
- Take breaks from distractions/day-to-day stressors and refocus on:
  - Building relationships
  - Reaching goals
  - Time for yourself

But... WHY??

# What is Mindfulness?

"Mindfulness means maintaining a **moment-by-moment awareness** of our thoughts, feelings, bodily sensations, and surrounding environment, through a gentle, nurturing lens.

Mindfulness also involves acceptance, meaning that we **pay attention** to our thoughts and feelings **without judging them**—without believing, for instance, that there's a “right” or “wrong” way to think or feel in a given moment. **When we practice mindfulness, our thoughts tune into what we're sensing in the present moment** rather than rehashing the past or imagining the future."



# HEALTH BENEFITS OF MINDFULNESS

- Reduce anxiety/depression
- Lower blood pressure
- Improve sleep
- Cope with chronic pain
- Make healthier choices



# 4 Simple Ways to Add Mindfulness

- Take a slow, deep breath before eating  
(Increase parasympathetic tone)
- Shift focus to senses throughout the day  
(What can you see, hear, smell, touch, taste)
- Prioritize yourself every day - do something that's just for you  
(Even just for a few moments)
- Increase awareness of your thoughts  
(Would you be friends with the voice in your head??)

Reminder: Mindfulness is about both "positive" and "negative"



# Meditation

- Guided
- Silent
- Mantra
- Moving
- Inner Child
- Future Self
- Anything that feels GOOD or helps you OBSERVE your thoughts!



Challenge: Add 1 minute of meditation/intentional breathing per day.

# Journaling



- Gratitude
- Visual
- Intuition
- Musical
- Stream-of-Consciousness
- Mentor
- Unsent letters
- What's-Going-Well

# News and Social Media

Step 1. Turn it off.

Step 2. Stay informed, and be mindful of your consumption.

It's the media's job to keep you watching

- Dramatic headlines
- Clickbait
- Negative focus taps into your “survival” brain

Challenge: Turn off all news notifications on your phone.

# Screens and Television

Mindful consumption (be intentional)

- Watch a movie without looking at your phone
- No TV as background noise
- “No screen” dinnertime
- Set time limits on apps
- Scheduled times to check email

Challenge: NO SCREENS for at least one hour before bed!  
Wear blue-blocker glasses after the sun goes down.



# Digital Detox Suggestions

- Clean up email inbox
  - Delete unhelpful/unused apps
  - Turn off notifications on apps
  - No social media for 24 hours
  - No screens during meals
  - "Digital fasting"
-

# Alternative Therapies



- Aromatherapy
- Acupuncture
- Reiki
- Hypnotherapy
- Ayurveda
- Massage

# Therapy

- Talk therapy
  - Cognitive Behavioral Therapy (CBT)
  - Dialectical Behavior Therapy (DBT)
  - Acceptance and Commitment Therapy (ACT)
  - Marriage/Family Therapy
- Eye Movement Desensitization and Reprocessing (EMDR)
- Art/Dance/Music/Play Therapy
- Trauma Work

# Self Acceptance

- Embrace all parts of self (both positive and negative)
- Explore your feelings, values, and preferences
- Accept imperfections
- Set healthy boundaries





# Boundaries



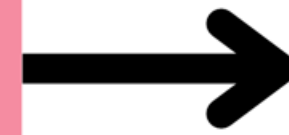
- Learn your personal limits
- Respect yourself enough to hold your limits
- Communicate boundaries to others

## Reminders:

- You may feel uncomfortable if you're not used to having/enforcing boundaries.
- It's about what YOU will do, not them.

# Examples of Boundaries

You need to stop yelling at me.



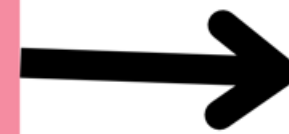
I will hang up the phone if you continue to yell at me.

I'm overwhelmed. My boss keeps piling things on and I can't do this much at once.



I only have time to do 3 of these tasks well this week. Which would you like me to prioritize and which can wait?

I constantly check emails and respond immediately



I check emails only at 9am, noon and at 4pm in order to have time for focused work in between.

# Affirmations and Iffirmations

- Make sure affirmations are activated in your body
- Use bridge thoughts if they are not
  - Example:
  - Current Belief: I struggle with sticking to my plan.
  - Desired Belief: I trust myself to follow through with my plan.
- Rephrase into an “IF”firmation by adding “What if” in front

Challenge: Find a positive spin on something that is frustrating for you.

# In which of the following ways does chronic stress interfere with detoxification?

- a. Disrupts sleep
- b. Nutrient depletion
- c. Increases inflammation
- d. Impacts digestion
- e. All of the above

# Which of the following is NOT a way to reduce stress and support detoxification?

- a. Regular physical activity
- b. Mindfulness and meditation
- c. Tobacco and alcohol use
- d. Proper sleep/rest

# Key Takeaways:

1. Toxins are present in our daily lives and come from many sources.
2. Supporting the body's ability to biotransform and eliminate toxins is important to reduce symptoms and prevent chronic inflammation.
3. Reducing stress and finding healthy coping mechanisms is important to having a well-balanced life.

Thank you!!