

# Phthalate Sensitivity

Biohacker Report

REPORT CATEGORY —



Sample Client

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DISCLAIMER

This report does not diagnose this or any other health conditions. Please talk to a healthcare professional if this condition runs in your family, you think you might have this condition, or you have any concerns about your results.

# Personal information

NAME

Sample Client

SEX AT BIRTH

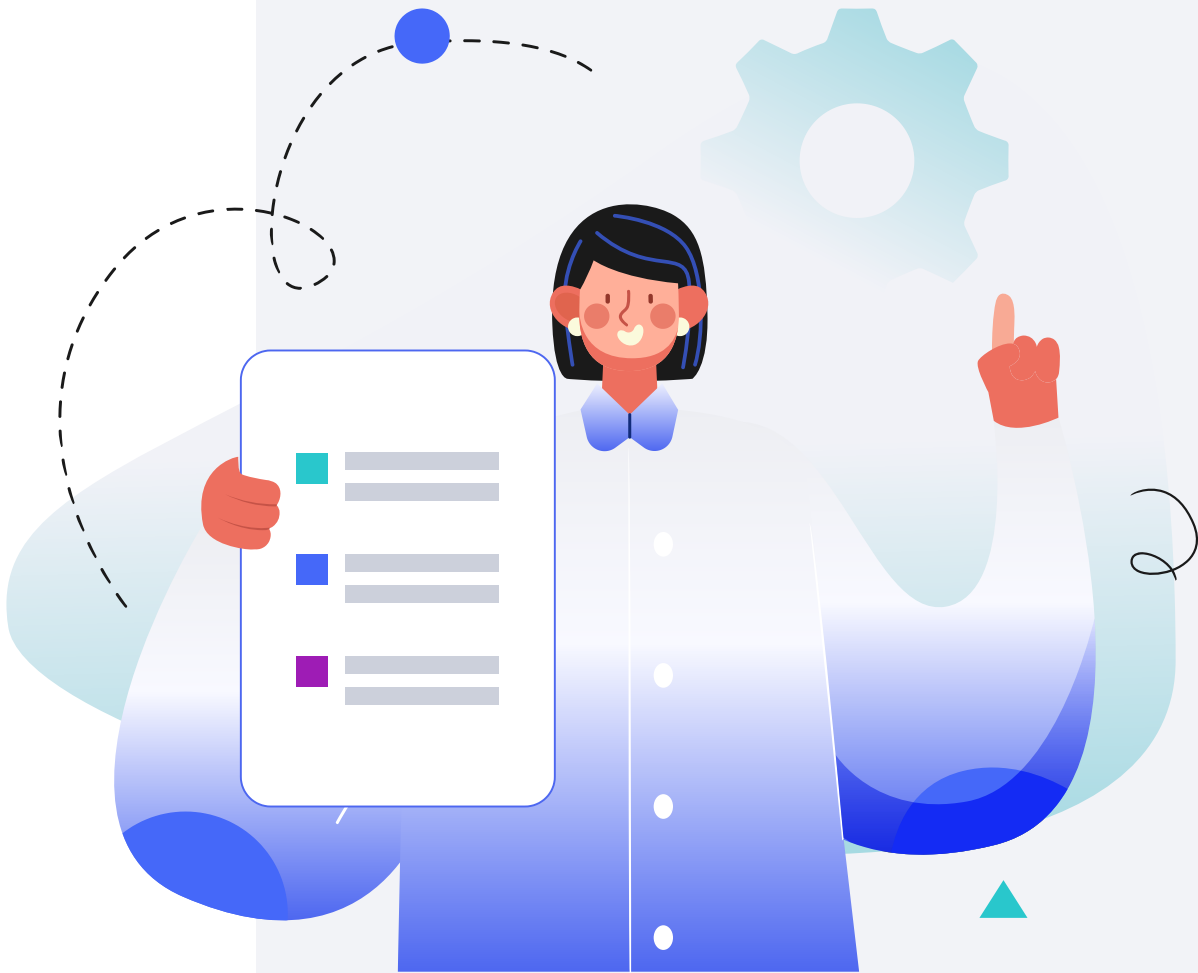
Male

HEIGHT

5ft 5" 165cm

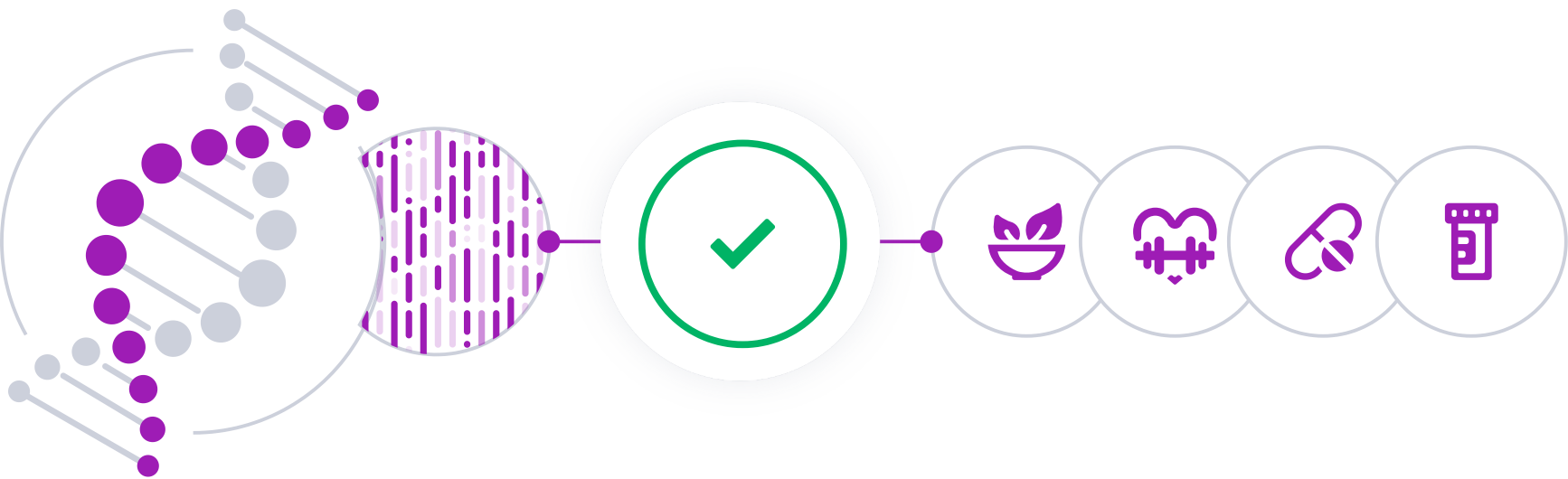
WEIGHT

137lb 62kg



# How this works

Our Wellness Reports analyze how your DNA influences your health.  
We then use this analysis to give you personalized risk estimates and recommendations.

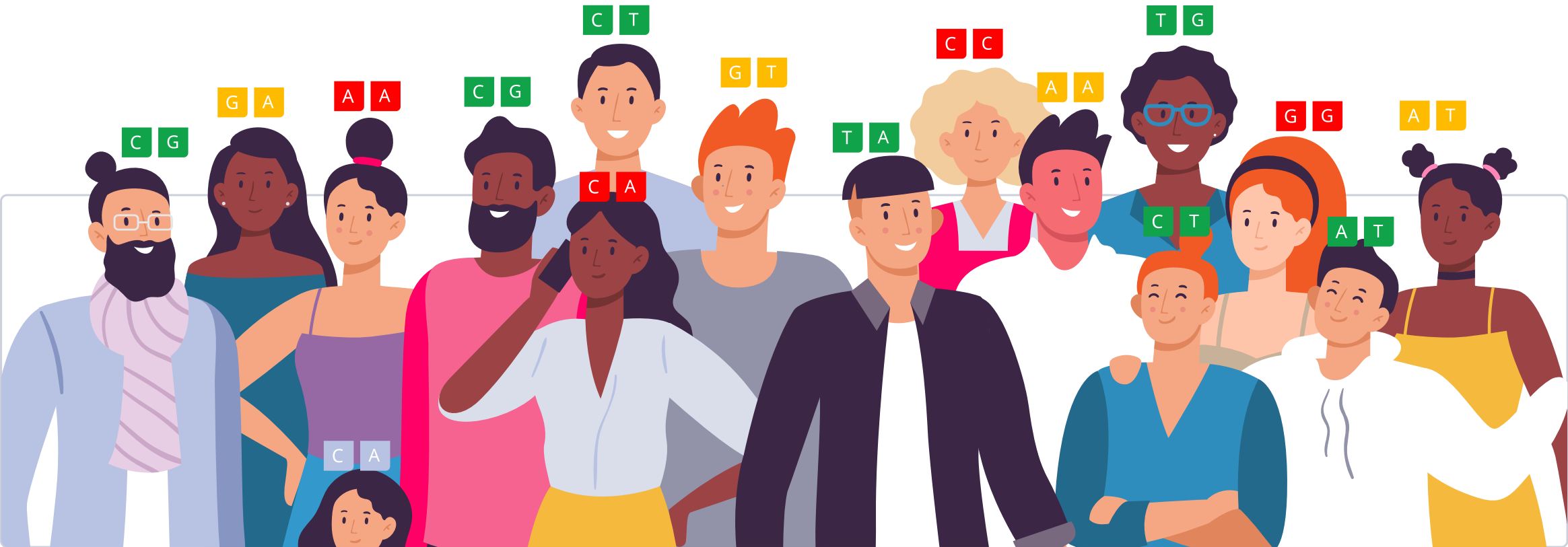


Similarly, our Trait Reports look at how your DNA influences your traits.



Your DNA is like an instruction manual — it contains a lot of information.  
You can think of it as a blueprint for your body.

Genetic variants are parts of DNA that differ from person to person. Some can make you more vulnerable to certain health issues, while others may influence traits such as eye color.



We use artificial intelligence and machine learning to analyze all this information.  
We then summarize your results as a risk score or display it on a gauge.

In total, we analyze up to 83 million genetic variants.

When we give a risk score, the risk icon tells you if you are at a higher or lower risk compared to other people:



Genotype color info:

AA

You don't have any risk alleles

AA

You have 1 risk allele

AA

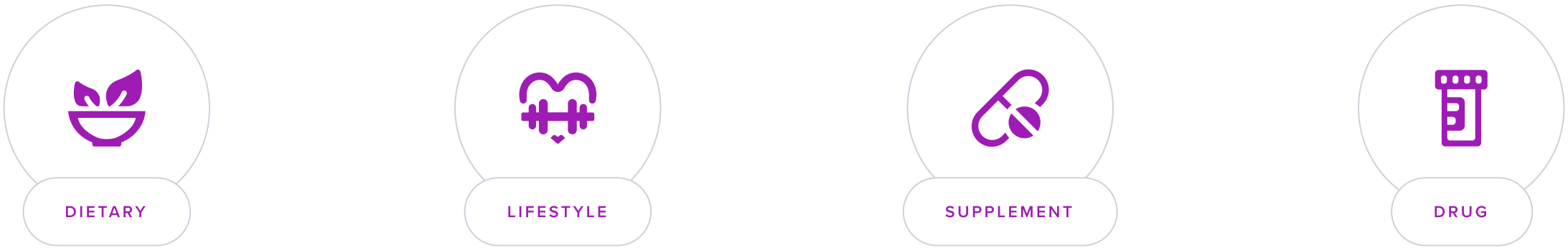
You have 2 risk alleles

Your risk is also displayed as a percentile. This will tell you how your risks compare to our sample population. The lower your percentile number, the lower your risk. The "50th percentile" would be an average risk.

Similarly, the gauge tells you your relative risk score compared to our sample population, or it indicates a specific trait or haplotype you are more likely to have based on your genetic variants.

When applicable, we also list top evidence-based recommendations that may help lower your risk. The focus is on recommendations that may be of benefit to you, based on your genetics.

Our recommendations come in four categories: lifestyle, diet, supplements and drugs.  
The following icons tell you which category a recommendation falls into:



Our team of scientists also ranks each recommendation.  
We rank based on impact and the strength of evidence in the medical literature.

Impact shows how strongly a recommendation will affect your health in a certain area.  
Evidence is how much scientific support there is for the recommendation. Rankings are from 1 to 5 (low to high):



# Impact

Impact scores range from 1-5. These scores reflect how much of an effect each recommendation can have. An impact score of 5 predicts the biggest effect.

When a recommendation affects something we can measure, we use those measurements to assign the impact score. For example, a recommendation that decreases cholesterol by 20% will have a higher impact score than one that decreases it by 5%.

Some recommendations affect things that we cannot directly measure, like stress or mood. For these, the impact score is based on how well they work relative to other recommendations and standard treatments. The best ones get the highest scores.

If there is a lot of research that shows a recommendation works especially well for your genotype, the impact score gets increased.

## Recommendation Evidence

- 5 / 5
- Recommendations that are considered effective and generally recommended by experts and medical bodies.
- 
- 4 / 5
- Recommendations that are considered likely effective and that have multiple independent meta-analyses and a great many studies supporting them.
- 
- 3 / 5
- Recommendations that are considered possibly effective and have many studies supporting them
- 
- 2 / 5
- Recommendations that have insufficient evidence, with two or several clinical trials supporting them, or many studies but with ambiguous results.
- 
- 1 / 5
- Recommendations that have insufficient evidence, with a single clinical trial, or with many studies most of which didn't find support for the recommendation.
- 
- 0 / 5
- No evidence in humans.

## Genotype-specific Evidence

- High-quality
- Direct evidence that a recommendation helps more in people with your gene variant (many clinical trials, a few large clinical trials, or a meta-analysis).
- Medium-quality
- Direct evidence that a recommendation helps more in people with your gene variant (a few clinical trials or one large clinical trial).
- Low-quality
- Direct evidence that a recommendation helps more in people with your gene variant (a single clinical trial or more trials with inconsistent results).
- Indirect
- A recommendation may help more in people with your gene variant because it targets a specific gene or protein affected by your variant (e.g., MTHFR, dopamine).
- In theory
- A recommendation may help more in people with your gene variant because it targets a specific mechanism affected by your variant (e.g., inflammation, oxidative stress).



## Some things to keep in mind:

- Genetics doesn’t play a considerable role in a condition or a trait.
- There is not enough research available to estimate a genetic predisposition.
- There are technical limitations to estimating or presenting a genetic predisposition.
- The topic is sensitive, and a genetic predisposition should only be estimated and presented by a healthcare professional.

# Introduction

Phthalates are a group of chemicals commonly used as plasticizers to make plastic more flexible and harder to break. They are found in a wide range of consumer products, including toys, vinyl flooring, wall coverings, detergents, food packaging, pharmaceuticals, and personal care products like nail polish, hair sprays, aftershave lotions, and perfumes.

Sources of exposure to phthalates include:

- Plastic products: Phthalates are widely used in PVC plastics, which are found in numerous household items.
- Personal care products: Many cosmetics and personal care products contain phthalates.
- Food packaging: Food and beverages stored in plastic containers with phthalates can lead to dietary exposure.
- Indoor environments: Phthalates can leach out into the air from products like vinyl flooring, affecting indoor air quality.

Phthalates are regulated in many countries, particularly in products for children. However, since they are so widespread in consumer products, complete avoidance can be challenging.

Phthalates are associated with several health concerns, including:

- Endocrine disruption: Phthalates can mimic or interfere with the body's hormones, potentially leading to reproductive and developmental problems.
- Reproductive health: Exposure to certain phthalates has been linked to reproductive issues, including reduced sperm quality and fertility issues in men and women.
- Children's health: Phthalates might impact the health and development of children, with prenatal exposure being particularly concerning.
- Chronic diseases: Some studies suggest a link between phthalate exposure and an increased risk of chronic diseases like asthma, allergies, and obesity.



# Genetics of Phthalate Sensitivity

In the body, phthalates are mainly broken down in the liver and partly in the gut. Phthalate breakdown takes place in several steps. The enzyme encoded by the [CYP2C9](#) gene allows their oxidation into secondary metabolites. Certain variants of this gene, such as ‘T’ at [rs1799853](#), ‘C’ at [rs1057910](#), and ‘C’ at [rs12248560](#), have been associated with lower urinary levels of secondary metabolites, suggesting increased phthalate sensitivity [\[R, R\]](#).

Most of these secondary metabolites undergo a reaction called conjugation to allow their elimination with urine. A family of enzymes called UDP-glucuronyl transferases is responsible for this reaction. For instance, a variant of the [UGT1A7](#) gene (‘T’ at [rs11692021](#)) has been associated with decreased phthalate breakdown [\[R\]](#).

Some strategies to reduce exposure to phthalates include:

- Choosing phthalate-free products: Look for phthalate-free labels on toys, personal care products, and food packaging.
- Avoiding plastic containers for food and drink: Use glass, stainless steel, or BPA- and phthalate-free plastics, especially for hot food and liquids.
- Ventilation: Ensure good ventilation in the home to reduce indoor air exposure.
- Read labels: Be cautious with products that list "fragrance" or "perfume" as these can contain phthalates.



Likely typical phthalate sensitivity based on 4 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

| GENE   | SNP        | GENOTYPE |
|--------|------------|----------|
| NOC3L  | rs12248560 | CC       |
| UGT1A7 | rs11692021 | TT       |
| CYP2C9 | rs1799853  | CC       |
| CYP2C9 | rs1057910  | AA       |

The number of "risk" variants in this table doesn't necessarily reflect your overall result.



# Your Recommendations

Your recommendations are prioritized according to the likelihood of it having an impact for you based on your genetics, along with the amount of scientific evidence supporting the recommendation.

You’ll likely find common healthy recommendations at the top of the list because they are often the most impactful and most researched.

- 1

Air Purifier
- 2

Avoid Exposure to Parabens
- 3

Avoid Phthalate Exposure
- 4

Dietary Antioxidants
- 5

Dietary Omega-3 Fatty Acids
- 6

Avoid Exposure To Organic Solvents
- 7

Avoid BPA (Bisphenol A) Exposure

1



Air Purifier

IMPACT

0 / 5

EVIDENCE

0 / 5

## How to implement

Install an air purifier in your home, ideally in the rooms you spend the most time in, such as your bedroom and living room. Keep the air purifier on for at least 12 hours each day, or continuously if possible, to effectively reduce airborne contaminants. Regularly clean or replace the filters according to the manufacturer's instructions to maintain its efficiency.

## Description

Air purification is the process of cleaning the air around us. Using a high-quality air purifier with a HEPA filter helps remove harmful particles like dust, smoke, and bacteria. Having clean air to breathe can help boost your health by reducing allergies, asthma problems, and even certain infections.

## How it helps

Using air purifiers can significantly reduce indoor air pollutants including phthalates, which are commonly found in dust. This can decrease the exposure and sensitivity reactions.

2



Avoid Exposure to Parabens

IMPACT

0 / 5

EVIDENCE

0 / 5

## How to implement

Check the labels of personal care products such as lotions, shampoos, and cosmetics. If they list methylparaben, propylparaben, butylparaben, or ethylparaben among the ingredients, choose alternative products that are paraben-free. Aim to do this consistently for all personal care purchases.

## Description

Avoiding exposure to parabens involves avoiding personal care and cosmetic products that contain these synthetic preservatives. This is done to minimize the potential risk of skin irritation and to reduce the likelihood of exposure to compounds that may disrupt hormone regulation.

## How it helps

Parabens, like phthalates, are endocrine disruptors found in many personal care products. Avoiding parabens can lessen the cumulative effect of these chemicals on the body.

3



Avoid Phthalate Exposure

IMPACT

0 / 5

EVIDENCE

0 / 5

## How to implement

To avoid phthalate exposure, check product labels and choose phthalate-free options for personal care items, plastics (look for recycling codes 3 and 7 or the letters 'V' or 'PVC'), and household products. Additionally, reduce the use of plastic containers for food storage, especially those not marked as 'phthalate-free', and avoid microwaving food in plastic containers. Aim to make these changes consistently in your daily life for long-term health benefits.

## Description

Avoiding phthalate exposure involves choosing phthalate-free products, such as personal care items and plastics, to minimize potential endocrine-disrupting effects and protect reproductive and hormonal health.

## How it helps

Phthalates are chemicals found in many products like plastics and cosmetics. Avoiding these products reduces the overall load of these chemicals in the body, helping to mitigate sensitivity.



4



Dietary Antioxidants

IMPACT

0 / 5

EVIDENCE

0 / 5

## How to implement

Incorporate foods rich in antioxidants, such as fruits (berries, oranges, plums), vegetables (spinach, kale, bell peppers), nuts (walnuts, almonds), and seeds (flaxseeds, chia seeds) into your daily meals. Aim for at least 5 servings of fruits and vegetables per day, ensuring a variety of colors to cover different antioxidants.

## Description

Dietary antioxidants are compounds found in foods that help neutralize harmful molecules called free radicals, potentially reducing the risk of oxidative stress-related diseases and supporting overall health. Examples include vitamins C and E, beta-carotene, and polyphenols.

Our cells sometimes produce molecules called **reactive oxygen species (ROS)** [\[R\]](#).

High levels of ROS can cause [oxidative stress](#) and damage our cells. Oxidative stress plays a role in many health conditions, including [\[R\]](#):

- High blood sugar
- Type 2 diabetes
- Heart disease

**Antioxidants are substances that help combat ROS** [\[R\]](#).

Antioxidants are found in many plants. Good sources include [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Fruits like tomatoes, berries, and pomegranates
- Vegetables like onions, spinach, and celery
- Chocolate
- Olive oil
- Wine

## How it helps

Antioxidants can help reduce oxidative stress caused by phthalates, protecting cells from damage.

5



Dietary Omega-3 Fatty Acids

IMPACT

0 / 5

EVIDENCE

0 / 5

## How to implement

Incorporate foods high in omega-3 fatty acids into your diet daily. This includes eating fish such as salmon, mackerel, and sardines at least twice a week. Alternatively, include a tablespoon of flaxseed oil or chia seeds in your daily diet.

## Description

[Omega-3 fatty acids](#) are some of the healthiest fats we can eat. They help lower inflammation and protect the heart, brain, and eyes. Our bodies produce less omega-3s than we need for optimal health, so it's important to get enough through food or supplements [\[R\]](#), [\[R\]](#), [\[R\]](#).

There are three major types of omega-3s: ALA, EPA, and DHA. **EPA and DHA are vital for mental and heart health** [\[R\]](#), [\[R\]](#), [\[R\]](#).

**Fatty fish are rich in EPA and DHA.** They include [\[R\]](#):

- Salmon
- Tuna
- Herring
- Sardines

For optimal health, try to get at least **two servings of fatty fish per week**. Fish oil supplements are available for those who don't eat fish regularly [\[R\]](#).

## How it helps

Omega-3 fatty acids can help reduce inflammation, which can be beneficial for those with phthalate sensitivity.

6

Avoid Exposure To Organic Solvents

IMPACT

0 / 5

EVIDENCE

0 / 5

## How to implement

Ensure to work in well-ventilated areas and wear protective gear when handling products like paints, varnishes, and adhesives. When possible, choose solvent-free or water-based products to minimize exposure. Regularly check labels for any solvents listed and strive to limit their use in both personal and professional settings.

## Description

Avoiding exposure to organic solvents, commonly found in paints, adhesives, and cleaning products, can protect against the potential health risks associated with inhalation or skin contact, such as respiratory issues and skin irritation.

Organic solvents are used in various industries and workplaces for tasks like cleaning, painting, and manufacturing.

However, their use can be hazardous to workers' health. Exposure to these solvents can lead to problems such as breathing difficulties, skin irritation, and reduced fertility [R].

## How it helps

Organic solvents can increase the absorption of phthalates through the skin and respiratory system. Avoiding them helps in reducing overall phthalate exposure.

7

Avoid BPA (Bisphenol A) Exposure

IMPACT

0 / 5

EVIDENCE

0 / 5

## How to implement

To avoid BPA exposure, choose BPA-free products, particularly when selecting food containers, water bottles, and baby bottles. Prefer glass, porcelain, or stainless steel containers, especially for hot food or liquids. Reduce use of canned foods as they may be lined with BPA and avoid handling thermal paper receipts, as they can contain BPA. When possible, select fresh or frozen foods over canned goods.

## Description

Avoiding BPA (Bisphenol A) exposure involves minimizing contact with products or containers containing this chemical, which is commonly found in plastics and can potentially disrupt hormone regulation.

BPA (bisphenol A) is a chemical used to make certain plastics and resins. BPA-containing plastics are often used in containers that store food and beverages. Plastics marked with **recycling code 3 or 7** may contain BPA [R].

BPA is a well-known hormone disruptor. Research has linked BPA exposure to diabetes, heart disease, altered behavior, and more [R].

## How it helps

BPA and phthalates often coexist in consumer products, and reducing exposure to BPA can concurrently lower exposure to phthalates, minimizing their combined adverse health effects.

# Next Steps

Remember, your genes only tell one important part of your health story!

Now that you've seen your DNA-based results for this health topic, let's take a look at other contributing factors.

# Your lab results

Your lab results are impacted by the combined effect of your genes, environment and lifestyle.

Lab tests will give you the best picture of your current health status, while your genes provide insight into your health predispositions and which recommendations are best for you.