

CRHR1 (Stress/HPA Axis)

Gene Report

REPORT CATEGORY —



MENTAL HEALTH

Sample Client

Report date: 15 January 2026

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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

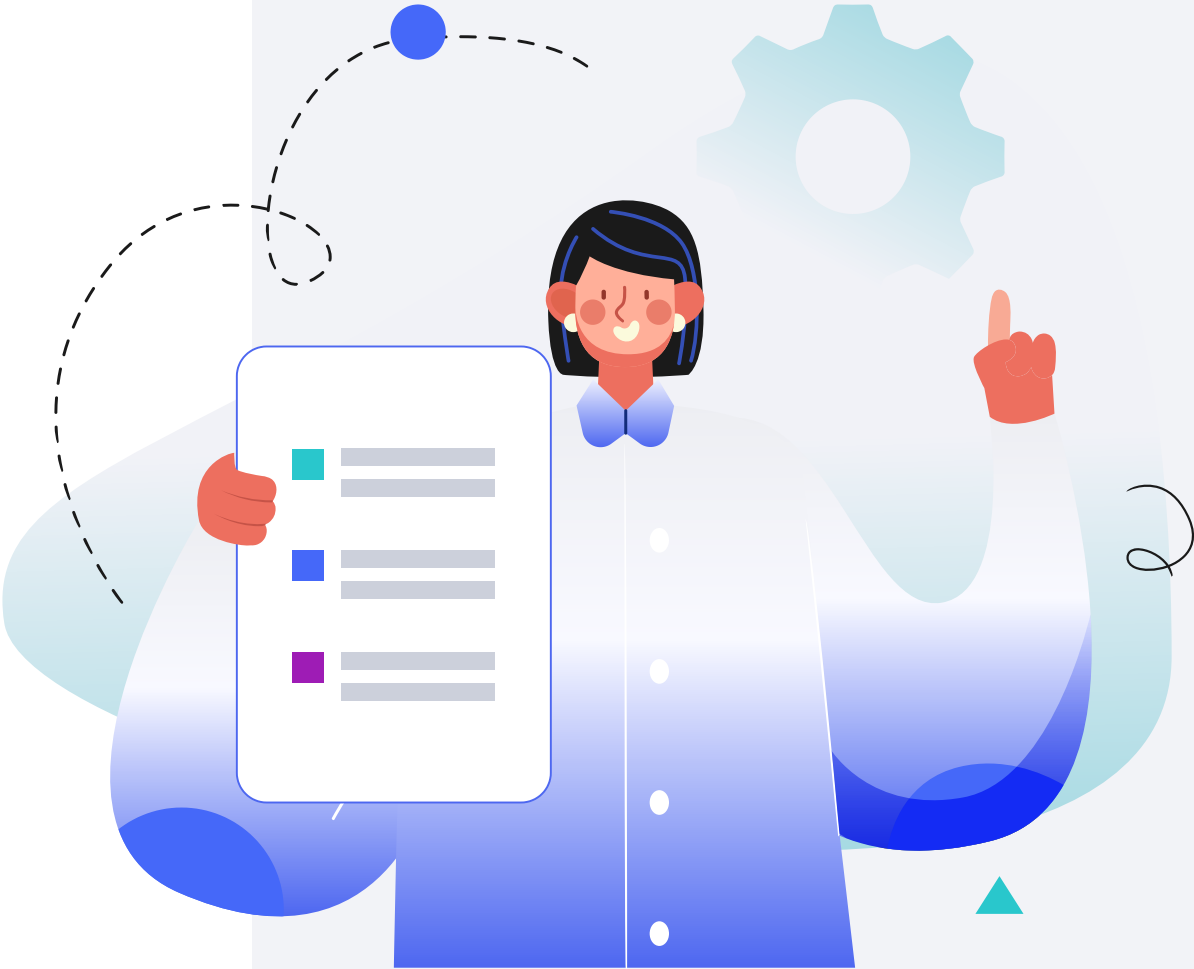
Male

HEIGHT

5ft 5" 165cm

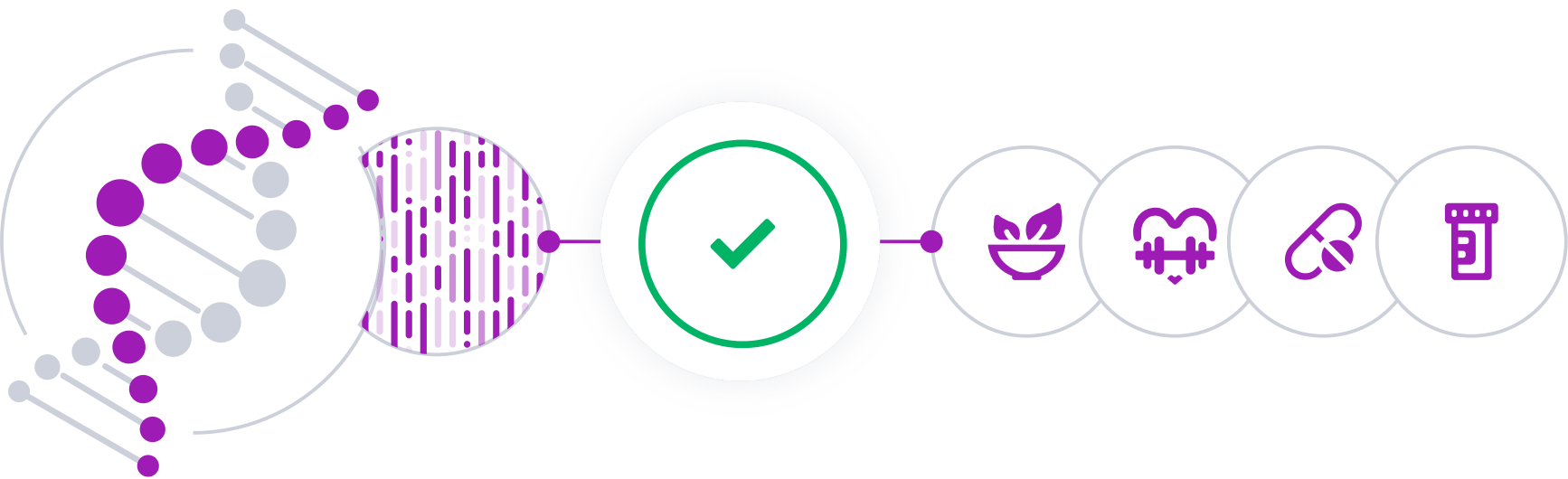
WEIGHT

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.

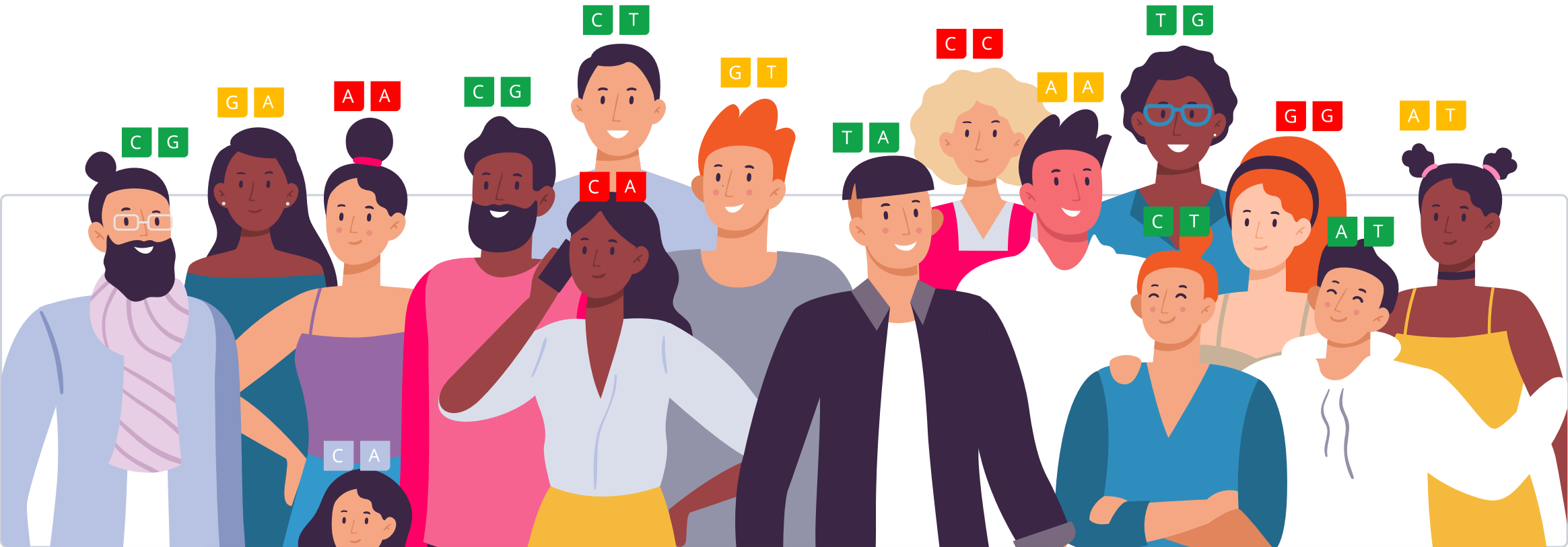


Similarly, our Trait Reports look at how your DNA influences your traits.



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

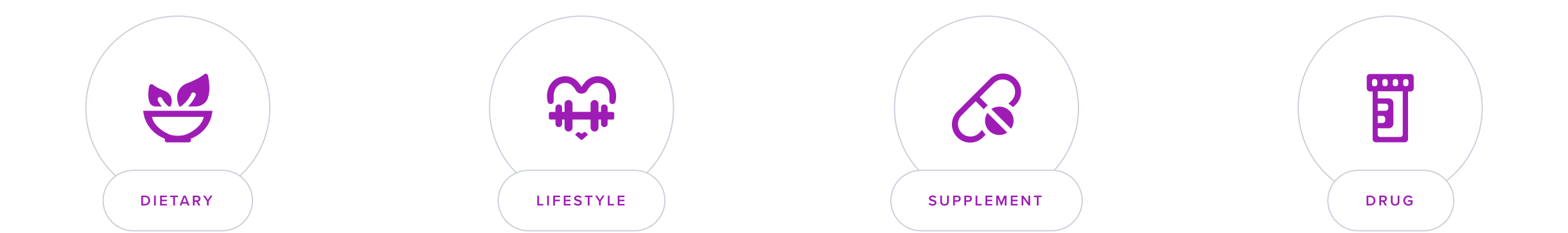
You have 2 risk alleles

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

The [CRHR1](#) gene encodes a receptor for [CRH](#), the first hormone of the [HPA axis](#) [\[R\]](#), [\[R\]](#).

CRH is released from a region of the brain called the hypothalamus and can subsequently bind to its receptors in the pituitary gland to stimulate the release of ACTH. This hormone, in turn, mediates the release of the stress-related hormone [cortisol](#) from the adrenal glands [\[R\]](#).

Stress activates the HPA axis, resulting in cortisol release. Hence, CRH receptors play a significant role in [stress response](#) and related disorders. Contrary to [CRHR2](#), this receptor promotes anxiety, arousal, and depression upon activation [\[R\]](#), [\[R\]](#).

CRHR1 Genetics

Two variants, ‘A’ at [rs12938031](#) and ‘C’ at [rs4792887](#), have been associated with increased odds and severity of [PTSD](#). These variants are believed to increase *CRHR1* expression or activity [\[R, R\]](#).

Another variant believed to increase CRHR1 activity, ‘G’ at [rs12944712](#), has been associated with acute PTSD symptoms in children. However, the ‘A’ allele at this polymorphism is the one associated with [depression](#) [\[R, R\]](#).

The ‘G’ variant of [rs17689882](#), which may also increase CRHR1 activity, has been associated with depression due to childhood trauma in young adulthood [\[R\]](#).

The ‘A’ variant of [rs110402](#) is believed to decrease *CRHR1* expression. This variant has been associated with relatively higher rates of [chronic fatigue](#). However, this variant may protect from depression linked to childhood abuse and [IBS](#). In IBS patients, the ‘A’ variant is associated with predomination of diarrhea in men and constipation or mixed symptoms in women [\[R, R, R, R, R, R\]](#).

Finally, the ‘G’ allele of [rs242924](#), which may increase CRHR1 activity, has been associated with higher IBS rates and associated anxiety. This variant has also been associated with major depression in adults who suffered from childhood abuse. However, this variant may be protective against chronic fatigue [\[R, R, R\]](#).



LOWER ACTIVITY

Likely lower CRHR1 activity based on 6 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
ARHGAP27	rs4792887	CC
MAPT	rs12944712	GG
CRHR1	rs17689882	GG
MAPT	rs12938031	GA
MAPT	rs242924	TT
MAPT	rs110402	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.

DOSAGE		DOSAGE	
1	Cognitive-Behavioral Therapy (CBT)	2	Relaxation Techniques30 minutes
3	Aromatherapy30 minutes	4	Omega-3 (Fish Oil)2000 mg

1



Cognitive-Behavioral Therapy (CBT)

IMPACT

5 / 5

EVIDENCE

5 / 5

How to implement

Schedule weekly sessions with a certified cognitive-behavioral therapist for a period of 5 to 20 weeks. Engage actively in exercises assigned by your therapist both during sessions and as homework to apply CBT strategies to daily life.

Description

Cognitive-behavioral therapy (CBT) is a psychotherapeutic approach that has been effective in treating various mental health conditions by helping individuals identify and change negative thought patterns and behaviors. It is widely used for conditions like depression, anxiety, and phobias.

Psychotherapy (talk therapy) involves talking about your health with a licensed therapist. It may improve the way you react to certain experiences [\[R\]](#).

Talk therapy is a great way to improve many conditions, including [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Depression
- Anxiety disorders
- PTSD
- OCD
- Substance use disorder
- Bipolar disorder

Cognitive-behavioral therapy (CBT) is a type of talk therapy. CBT aims to change the way you think about your life and yourself. Through CBT, a therapist can help you develop healthy coping mechanisms [\[R\]](#).

How it helps

Cognitive-behavioral therapy (CBT) is the best type of talk therapy for stress relief. CBT can help almost anyone under stress, including [\[R\]](#), [\[R\]](#), [\[R\]](#):

- People with anxiety
- People with depression
- Students
- Caregivers
- Cancer patients

CBT may reduce your levels of the stress hormone [cortisol](#) and balance the HPA axis. After going through CBT, people often feel less anxious and more relaxed [\[R\]](#), [\[R\]](#), [\[R\]](#).

2



Relaxation Techniques

IMPACT

4 / 5

EVIDENCE

4 / 5

How to implement

Incorporate relaxation techniques such as deep breathing exercises, meditation, or yoga into your daily routine. Spend at least 15-30 minutes each day practicing one of these techniques, preferably in a quiet, comfortable space without interruptions.

TYPICAL STARTING DOSE

30 minutes

Description

Relaxation techniques encompass various methods like deep breathing, yoga, meditation, and progressive muscle relaxation, aimed at reducing stress and promoting mental and physical relaxation. Practicing these techniques regularly can help manage stress, improve mental clarity, and enhance overall emotional well-being.

We all get stressed from time to time.

[Stress](#) can help you deal with a challenge or avoid danger. However, **it’s not healthy to be stressed for a long time** [\[R, R\]](#).

Relaxation techniques such as [yoga](#) and [meditation](#) can relieve stress in different ways. Most of them focus on breathing and help you get rid of negative thoughts and emotions [\[R\]](#).

People use relaxation techniques to improve conditions like [\[R, R, R\]](#):

- Anxiety
- Depression
- Chronic pain

Progressive muscle relaxation is another relaxation technique. In this technique, you focus on tensing and relaxing different parts of your body. It is common to start with the toes and slowly work your way up to the neck and head [\[R, R\]](#).

Autogenic training is a relaxation technique that a person may carry out on their own. It uses exercises that take the mind’s attention to bodily sensations such as warmth and heaviness [\[R, R\]](#).

How it helps

Psychosocial stress is the primary HPA axis activator. Excessive CRHR1 stimulation mediates various adverse effects of stress, both mental and physical [\[R, R\]](#).

Relaxation techniques aim to improve stress and anxiety. They may be effective for both daily stress and stress from major health problems [\[R, R, R\]](#).

Relaxation techniques that may improve stress include:

- **Mindfulness:** the practice of being aware of the present moment without any judgment [\[R, R, R, R, R, R, R\]](#).
- **Yoga:** combines breathing, stretching, and meditation to help calm you down [\[R, R, R\]](#)
- **Tai chi:** a calming Chinese martial art that combines exercise and meditation [\[R, R, R\]](#)
- **Progressive muscle relaxation:** involves tightening and relaxing muscle groups to help calm you down [\[R, R, R, R\]](#)
- **Biofeedback training:** measures bodily functions (such as breathing, heart rate, and muscle tension) and teaches you how to control them [\[R, R, R, R\]](#)
- **Guided imagery:** helps you picture positive, peaceful settings to reduce stress [\[R, R, R\]](#)
- **Applied relaxation:** combines muscle relaxation and breathing exercises to calm you down [\[R, R, R\]](#)

3



Aromatherapy

IMPACT

3 / 5

EVIDENCE

3 / 5

How to implement

Select essential oils like lavender, peppermint, or eucalyptus. Use a diffuser to disperse the scent into your room for 30-60 minutes at a time, up to 3 times a day. Alternatively, apply a few drops diluted in a carrier oil directly to your skin, such as on your temples or wrists, twice a day.

TYPICAL STARTING DOSE

30 minutes

Description

Aromatherapy is a holistic practice that uses the scents and aromas of essential oils to promote physical, mental, and emotional well-being. It is often used for relaxation, stress reduction, and to address various health concerns through inhalation or topical application of essential oils.

Aromatherapy uses concentrated plant extracts known as **essential oils**. They can be inhaled using a diffuser (a device that releases small amounts of oil into the air) or applied to the skin using a roller [\[R\]](#).

[Lavender](#) is a decorative flower and a calming herb and its essential oil is commonly used in aromatherapy. People use it to [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Reduce anxiety [\[R\]](#)
- Improve sleep quality [\[R\]](#), [\[R\]](#)
- Relieve pain [\[R\]](#), [\[R\]](#)

Essential oils can be harmful if not used properly. Tips for using them safely include [\[R\]](#), [\[R\]](#):

- Diluting them properly using a plant-based carrier oil (such as olive oil or almond oil)
- Using diffusers in a well-ventilated area for a maximum of 1 hour
- If using on the skin, testing a small area first and waiting a day before using more
- Keeping essential oils away from candles or other heat sources

How it helps

Aromatherapy (for 5-10 min) may help control stress by promoting relaxation [\[R\]](#), [\[R\]](#).

Studied essential oils include those of [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Lavender
- Rose
- Peppermint

Oil blends may also help e.g., clary sage, lavender, and bergamot.

Some of these essential oils may suppress CRH, leading to lower cortisol levels [\[R\]](#).

However, note that most studies are low-quality and some show that aromatherapy doesn’t reduce stress [\[R\]](#), [\[R\]](#).

Please note: Some essential oils may cause skin irritation, allergic reactions, sun sensitivity, or breathing problems. Avoid using them near the eyes, nose, or other sensitive areas. Some oils are not safe for children, pregnant women, or pets. Consult your health provider before using essential oils [\[R\]](#).

4



Omega-3 (Fish Oil)

IMPACT2 / 5

EVIDENCE2 / 5

How to implement

Take 1-2 g of omega-3 (fish oil) supplement daily, preferably with a meal to enhance absorption.

TYPICAL STARTING DOSE

2000 mg

Description

Omega-3 fatty acids are essential fats found in fatty fish like salmon, flaxseeds, and walnuts. They are known for their potential cardiovascular and brain health benefits, including reducing the risk of heart disease and supporting cognitive function.

[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 [\[R\]](#), [\[R\]](#).

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

- Salmon
- Tuna
- Herring
- Sardines

For optimal protection, 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 from [fish oil](#) (EPA and DHA) may balance the HPA axis and reduce CRH levels [\[R\]](#), [\[R\]](#).

Supplementing with omega-3s (0.3-3.4 g/day for 3-12 weeks) may make you more resistant to stress. It may prevent increases in [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Blood pressure
- Heart rate
- Muscle tension

Omega-3s may help with stress by:

- Lowering stress hormones [\[R\]](#), [\[R\]](#), [\[R\]](#)
- Boosting [dopamine](#) [\[R\]](#)
- Reducing inflammation [\[R\]](#)

Please note: Fish oil can interact with blood thinners (like aspirin, Plavix, Coumadin). Consult your doctor before taking fish oil [\[R\]](#).

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.