

Dyslexia

DNA Health Report

REPORT CATEGORY —



COGNITION

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

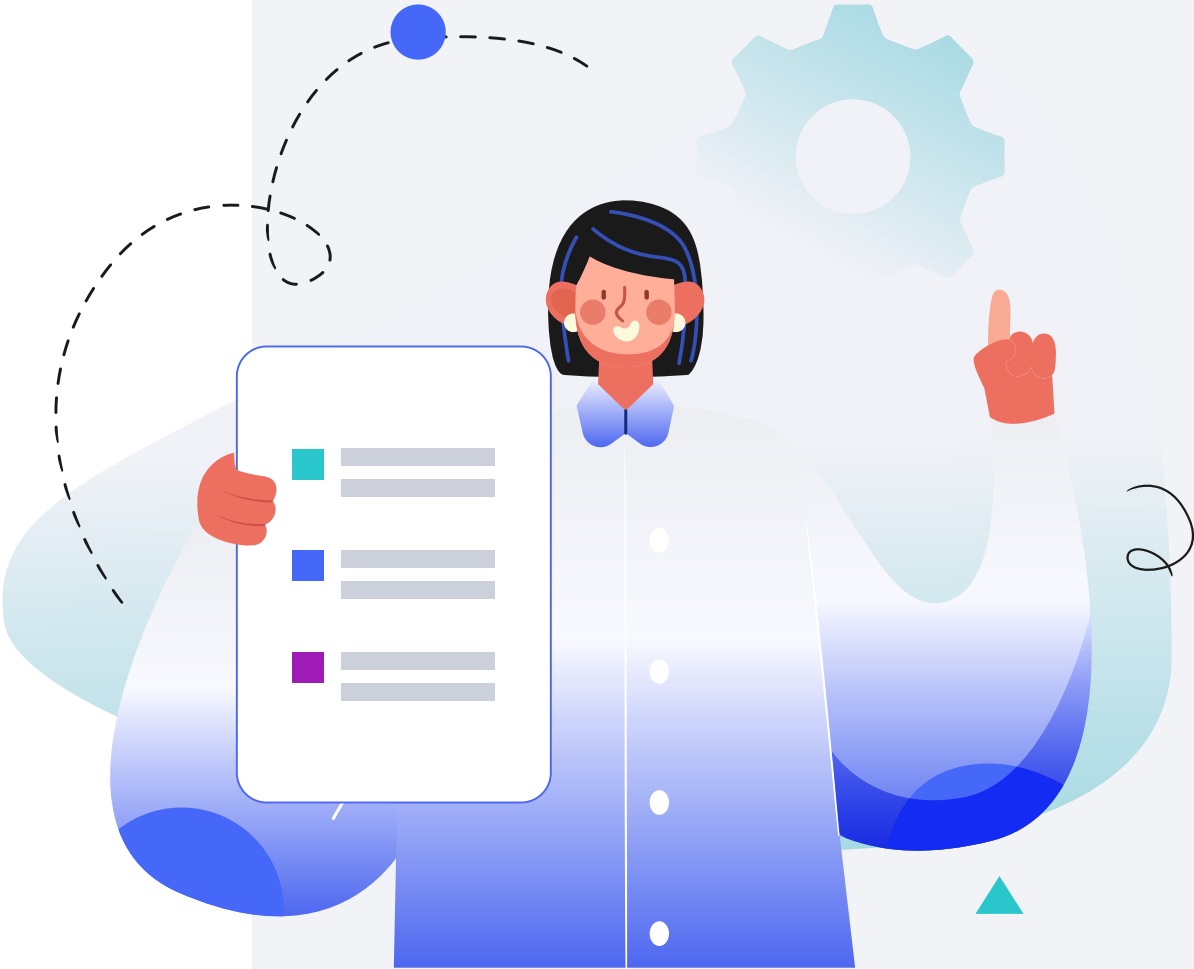
Male

HEIGHT

5ft 5" 165cm

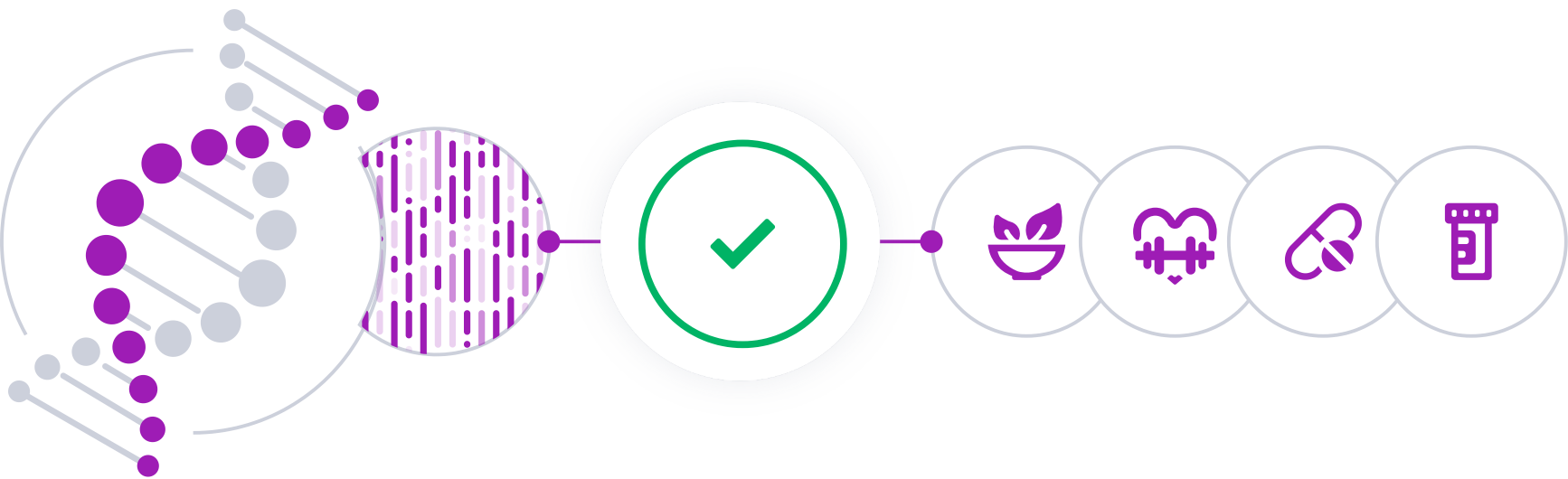
WEIGHT

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.

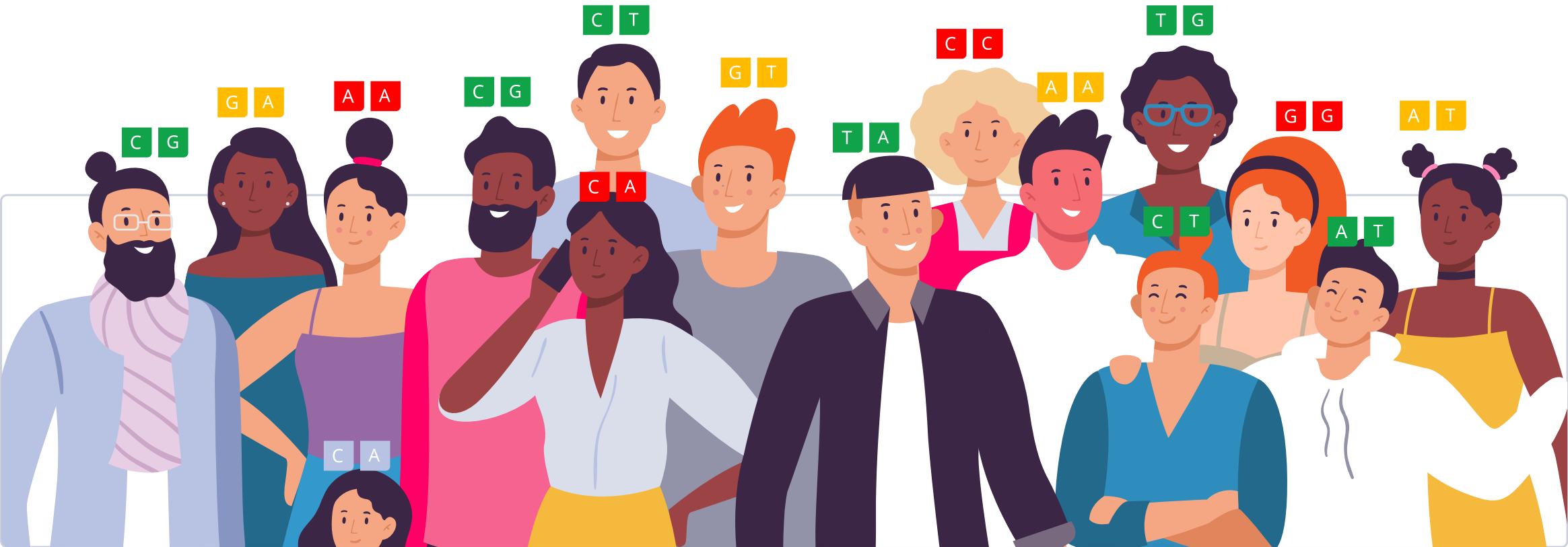


Similarly, our Trait Reports look at how your DNA influences your traits.



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

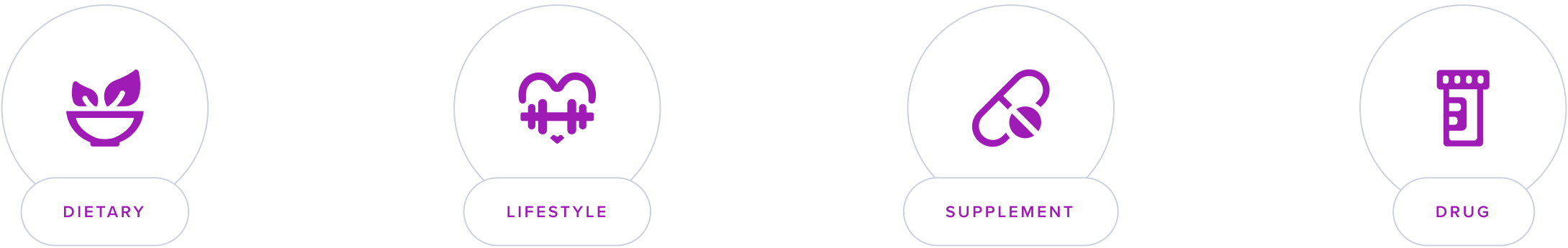
You have 2 risk alleles

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

Dyslexia is a learning disorder affecting reading skills. It involves issues with identifying speech sounds and learning how they relate to letters and words (decoding). It is a result of individual differences in areas of the brain that process language [R].

Contrary to some popular beliefs, **dyslexia doesn’t involve problems with intelligence, hearing, or vision** [R].

Early assessment and intervention are crucial. Dyslexia sometimes goes undiagnosed until adulthood, **but it's never too late to seek help**. Lack of help and support can lead to long-term learning, social, behavioral, and economic issues [R].

Some common dyslexia symptoms in teens and adults include [R]:

- Difficulty reading
- Slow and labor-intensive reading and writing
- Problems spelling
- Avoiding activities that involve reading
- Mispronouncing or problems retrieving words
- Difficulty summarizing a story
- Difficulty doing math word problems

Risk Factors and Genetics

Dyslexia is a learning disorder affecting reading skills. It involves issues with identifying speech sounds and learning how they relate to letters and words (decoding).

About **40-60%** of the differences in dyslexia may be due to genetics. Involved variants may play a role in brain function and development. They may also be linked to other conditions, including [\[R\]](#):

- Bipolar disorder
- ADHD
- Schizophrenia

A **family history** of dyslexia and other reading difficulties is a major risk factor. Factors like **poor support and care** for a child with dyslexia may greatly contribute to its complications [\[R\]](#).



MORE LIKELY

More likely to have dyslexia based on 176 genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
POM121	rs77059784	GG
KAT2B	rs17805117	TT
C1ORF87	rs12737449	GG
/	rs75197892	GG
GSDMB	rs12453682	TT
/	rs11600333	GG
LRRC37A	rs12150530	TT
RNF144B	rs2064081	GG
SH2B3	rs7310615	GG
GNAQ	rs10869969	CC
FHIT	rs1026989	TT
UNC119B	rs4767921	GG
SETDB2	rs7328782	TT
STMND1	rs2876430	TT
PCCB	rs13082684	AG
/	rs906549	TC
BCL11B	rs7160112	TA
NRXN1	rs6749530	CT
SGCD	rs867009	AG
ADGRL2	rs564753333	TT
PDE4D	rs114353145	AA
UNC5D	rs117723510	GG
FUT10	rs79445414	TT
/	rs115653413	CC

GENE	SNP	GENOTYPE
AUTS2	rs3735260	AA
NFIB	rs12555752	GG
B3GAT1	rs77867811	AA
TTC14	rs7625418	AA
BABAM2	rs1969131	CC
/	rs719166	AA
/	rs57431669	CC
MITF	rs13097431	CC
SMARCA2	rs10964508	AA
CCDC171	rs3122702	GG

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	Transcranial Direct Current Stimulation (tDCS)	30 minutes	2	Play Music Instruments	20 minutes
3	Nerve Stimulation	30 minutes	4	Cognitive Training	15 minutes
5	Psychotherapy	1 hour	6	Auditory Training	20 minutes
7	Speech Therapy	45 minutes	8	Avoid Cadmium Exposure	
9	Transcranial Alternating Current Stimulation (tACS	20 minutes	10	Biofeedback	
11	Limit Manganese Exposure		12	Music Therapy	30 minutes
13	Exercise At Least One Hour a Day	1 hour	14	Ginkgo	120 mg
15	Mindfulness-Based Stress Reduction (MBSR)	2 hours	16	Metalinguistic Training	30 minutes
17	Limit Copper Intake		18	Verbal Working Memory Training	20 minutes

1



Transcranial Direct Current Stimulation (tDCS)

IMPACT3 / 5

EVIDENCE3 / 5

How to implement

Use a tDCS device for 20 to 30 minutes per session, targeting specific brain areas depending on the desired outcome. Sessions can be daily or a few times a week, under the guidance of a medical professional or trained specialist to ensure safety and effectiveness.

TYPICAL STARTING DOSE

30 minutes

Description

Transcranial Direct Current Stimulation (tDCS) is a non-invasive brain stimulation technique that uses a low electrical current to modulate neural activity. It has been investigated for its potential in cognitive enhancement, mood regulation, and pain management.

How it helps

Non-invasive brain stimulation techniques, especially tDCS, may help with dyslexia and other neurodevelopmental disorders [\[R\]](#), [\[R\]](#).

A review including 7 studies of people with dyslexia found tDCS safe and useful for improving reading accuracy, word frequency, reading speed, reading fluency, and auditory processing [\[R\]](#).

2



Play Music Instruments

IMPACT2 / 5

EVIDENCE2 / 5

How to implement

Set aside at least 20-30 minutes daily to practice playing a musical instrument. Consistency is key, so try to maintain this routine for at least several months to potentially notice benefits related to mental health, cognitive function, and hand-eye coordination.

TYPICAL STARTING DOSE

20 minutes

Description

Playing musical instruments is a form of creative expression that can enhance cognitive abilities, improve fine motor skills, and provide emotional and stress-relief benefits.

How it helps

Musical training, specifically instrumental training, may improve phonological skills, which are critical for reading. A study found that dyslexic children participating in instrumental music training showed improved reading and related disorders [\[R\]](#).

Music training may also help enhance temporal processing skills, which are often impaired in people with dyslexia. These skills are crucial for managing the timing aspects of speech sounds. Musicians with dyslexia, for example, have shown equivalent auditory sensitivity and rhythm perception compared to non-dyslexic musicians [\[R\]](#).

3



Nerve Stimulation

IMPACT2 / 5

EVIDENCE2 / 5

How to implement

Nerve stimulation can be implemented by daily sessions of 15-30 minutes using a device specifically designed for this purpose. These devices often use electrical currents to stimulate nerves through the skin, which can be adjusted in intensity according to comfort. It's important to consult a healthcare provider for guidance on the specific type of nerve stimulation that may be most beneficial for your condition.

TYPICAL STARTING DOSE

30 minutes

Description

Nerve stimulation techniques involve the use of electrical impulses, like transcutaneous electrical nerve stimulation (TENS) or other methods to activate nerves, potentially providing relief from chronic pain, improving muscle function, and aiding in physical therapy.

Health professionals can stimulate your nerves using different strategies [\[R\]](#).

Many strategies use magnetic fields or electric currents. Examples include [\[R\]](#), [\[R\]](#), [\[R\]](#):

- [Transcutaneous electrical nerve stimulation](#) (TENS)
- Transcranial direct current stimulation (tDCS)
- Transcranial magnetic stimulation (TMS)
- Transcutaneous auricular vagus nerve stimulation (taVNS)

Nerve stimulation may improve [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Cognition
- Mood
- Pain
- Seizures
- Tinnitus

How it helps

Nerve stimulation may help with dyslexia by improving [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Reading accuracy, speed, and fluency
- Language comprehension
- Attention

[Transcranial direct current stimulation](#) (tDCS) may be particularly helpful. Other studied techniques include [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Repetitive transcranial magnetic stimulation (rTMS)
- Transcranial alternating current stimulation (tACS)

Combining nerve stimulation with reading techniques may improve reading skills [\[R\]](#).

Please note: Nerve stimulation may not be safe for people that have metal implanted devices, have epilepsy, or are pregnant. Some types of nerve stimulation should also be avoided by people with bleeding disorders or heart disease. Do not use TENS on damaged or infected skin or on sensitive areas of the body. Consult your doctor before using nerve stimulation devices of any kind [\[R\]](#), [\[R\]](#), [\[R\]](#).

4



Cognitive Training

IMPACT2 / 5

EVIDENCE2 / 5

How to implement

Engage in exercises that challenge your brain for at least 15 minutes per day, five days a week. This can include puzzles, memory games, learning a new language, or playing a musical instrument.

TYPICAL STARTING DOSE

15 minutes

Description

Cognitive training involves structured exercises and activities designed to improve specific cognitive functions, such as memory, attention, and problem-solving skills. It can be beneficial for individuals looking to enhance cognitive abilities or address cognitive challenges associated with conditions like Alzheimer's disease or attention deficit hyperactivity disorder (ADHD).

Cognitive training programs guide you through challenging tasks. They aim to support some cognitive functions, including [\[R\]](#):

- Memory
- Attention
- Problem-solving skills

Some scientists like to think of the brain as a muscle. They say people should “use it or lose it.” In line with this, cognitive training can be considered “brain exercise.” It is often provided through computer programs [\[R, R\]](#).

How it helps

Cognitive training may improve reading skills **in children with dyslexia**, such as [\[R, R\]](#):

- Fluency
- Pronunciation
- Comprehension
- Speed

Examples of training that may improve reading include [\[R, R\]](#):

- Visual perceptual training
- Visually-based reading acceleration
- Playing action video games

Targeting working memory may also help improve reading skills and posture [\[R, R\]](#).

Please note: *There is no evidence that cognitive training would provide the same benefits for adults with dyslexia.*

5



Psychotherapy

IMPACT2 / 5

EVIDENCE2 / 5

How to implement

Schedule and attend regular sessions with a licensed psychotherapist, typically once a week for 50-60 minutes, over a period of several months to years depending on your individual needs and progress. Consistency is key, and the duration can vary widely based on personal goals and the type of psychotherapy being practiced.

TYPICAL STARTING DOSE

1 hour

Description

Psychotherapy is a broad term for therapeutic approaches that address mental and emotional health issues through talking and counseling. It can be used to treat a wide range of psychological and emotional challenges.

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

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

- Depression
- Anxiety disorders
- PTSD
- OCD
- Weight problems
- Eating disorders

Cognitive-behavioral therapy (CBT) is a type of psychotherapy. 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

Psychotherapy (for 10 months) may **improve well-being and quality of life** in people with dyslexia by [\[R\]](#):

- Reducing procrastination
- Increasing optimism
- Improving self-esteem

Psychotherapy during childhood may also improve coping skills leading to [\[R, R\]](#):

- A greater feeling of control
- Less worrying or quitting over difficulties

6



Auditory Training

IMPACT

2 / 5

EVIDENCE

2 / 5

How to implement

Engage in auditory training exercises for 15-20 minutes daily. These exercises can include using computer programs or apps designed to improve listening skills, practicing listening to audiobooks with varying speeds and pitches, or working with a therapist trained in auditory processing. Continue this practice for at least 3 to 6 months to notice improvements in auditory processing skills.

TYPICAL STARTING DOSE

20 minutes

Description

Auditory training involves exercises and activities designed to improve auditory processing skills, often used in individuals with hearing difficulties or language processing disorders to enhance listening and communication abilities.

How it helps

A study found that audiovisual training without linguistic material caused plastic changes in the auditory cortex, which were indexed by enhanced electrophysiological mismatch negativity and faster reaction times to sound changes. Importantly, these changes were accompanied by improvements in reading skills, indicating that dyslexia may be ameliorated by special training programs that impact general auditory perceptual deficits [\[R\]](#).

Another study on auditory perception training showed effects on reading performance in female students with dyslexia, supporting the hypothesis that auditory perception training influences students' functional reading skills [\[R\]](#).

7



Speech Therapy

IMPACT

2 / 5

EVIDENCE

2 / 5

How to implement

Attend speech therapy sessions with a certified speech-language pathologist for 45 to 60 minutes per session, 1-2 times per week, for a period that can range from a few months to over a year, depending on the specific needs and progress.

TYPICAL STARTING DOSE

45 minutes

Description

Speech therapy is a specialized form of therapy that focuses on improving communication skills, speech fluency, and language development in individuals with speech and language disorders, offering support for improved communication and quality of life.

Speech therapy is used to assess and treat speech and communication problems. It helps people develop the skills needed for more effective communication. It is used to treat everything from childhood speech disorders to speech impairments caused by stroke or brain injury.

Speech and language therapy (SLT) aims to improve [\[R\]](#), [\[R\]](#):

- Communication
- Eating
- Drinking
- Swallowing

These programs support children and adults who [\[R\]](#):

- Recover from a stroke or brain injury
- Have speech disorders (e.g., stuttering)
- Have swallowing or joint disorders

How it helps

Intensive training using modified speech that emphasizes phonological elements may improve phonological performance in children with dyslexia. This suggests that specific training in phonological awareness may be beneficial for dyslexic people [\[R\]](#).

Studies have also shown that various phonological and whole-word reading programs may enhance the reading skills of children with different subtypes of dyslexia [\[R\]](#).

Direct one-on-one speech and language therapy (SLT) interventions have been effective across various areas of language for older children with developmental language disorders, including those with dyslexia [\[R\]](#).

8



Avoid Cadmium Exposure

IMPACT1 / 5

EVIDENCE1 / 5

How to implement

To avoid cadmium exposure, refrain from smoking or exposure to secondhand smoke, reduce consumption of foods high in cadmium like shellfish, liver, kidney meats, and certain leafy vegetables, and use ceramic or glass containers instead of plastic when microwaving food. Limit intake of cadmium-contaminated workplace air by using protective gear if you work in battery manufacturing, welding, or metal refining industries.

Description

Avoiding cadmium exposure is essential to prevent potential health risks associated with this heavy metal, such as kidney damage and increased cancer risk. Reducing exposure to cadmium-containing products and contaminated foods is crucial.

Heavy metals are elements naturally found in the environment. They are also used for agricultural, industrial, and medicinal purposes. Some can even be found in small amounts in your body [\[R\]](#), [\[R\]](#).

Long-term exposure to high amounts of heavy metals can be harmful to your health [\[R\]](#), [\[R\]](#).

Heavy metals that are most often linked to health problems include [\[R\]](#), [\[R\]](#):

- Lead
- Cadmium
- Arsenic
- Chromium
- Mercury

How it helps

Cadmium exposure may damage the nerves and affect cognitive development. A study found that **children with dyslexia may have higher cadmium levels** [\[R\]](#), [\[R\]](#), [\[R\]](#).

Cigarettes and food grown on contaminated soil are major sources of cadmium exposure [\[R\]](#).

Please note: *There is no evidence for the link between cadmium exposure and dyslexia in adults.*

9



Transcranial Alternating Current Stimulation (tACS)

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

To implement tACS as a lifestyle adjustment, you should use a device designed for transcranial alternating current stimulation, following the manufacturer's instructions. Typically, sessions can range from 20 to 40 minutes and should be done consistently, about 3-5 times a week. It's important to consult with a healthcare professional before starting to ensure it's safe for you.

TYPICAL STARTING DOSE

20 minutes

Description

Transcranial Alternating Current Stimulation (tACS) is a non-invasive brain stimulation technique that uses alternating electrical currents to modulate neural activity. It has potential applications in cognitive enhancement, pain management, and neuropsychiatric disorders.

How it helps

In a study of 30 adults, including 15 with dyslexia, a 20-minute tACS session improved phonological processing and reading accuracy [\[R\]](#).

10



Biofeedback

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Attend biofeedback sessions once or twice a week for about 8 to 10 weeks. During these sessions, a therapist will guide you through exercises to control different body functions, such as heart rate or muscle tension, using monitors that provide feedback on your physiological state. Practice the techniques learned during sessions at home daily to improve symptoms and manage your condition.

Description

Biofeedback is a type of therapy that teaches people how to control certain body functions, such as heart rate, blood pressure, and muscle tension. It can be used to treat a variety of conditions, including stress, anxiety, and chronic pain.

Biofeedback is a kind of “**brain training**” in which sensors are attached to your body. They detect information like your heart rate, temperature, and breathing rate. By seeing this information, you may be better able to control these functions [\[R\]](#), [\[R\]](#).

Biofeedback is used to help with [\[R\]](#), [\[R\]](#):

- Gut problems
- Chronic pain
- Migraines
- Insomnia
- Attention

[Neurofeedback](#) is a form of biofeedback that measures brain activity in real time [\[R\]](#).

How it helps

Neurofeedback (EEG-based, 2x/week for 10 weeks) may improve spelling and speaking skills in children with dyslexia [\[R\]](#), [\[R\]](#).

Please note: *There is no evidence that biofeedback would provide the same benefits for adults with dyslexia.*

11



Limit Manganese Exposure

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Avoid consuming water with high levels of manganese by using filters certified to remove it, especially if your water comes from a well. Limit the intake of dietary supplements containing manganese unless prescribed, and use personal protective equipment if you work in industries with manganese exposure, such as welding or mining.

Description

Limiting excessive manganese exposure, whether through water, food, or environmental sources, helps prevent potential neurological and cognitive health issues. Maintaining a balanced manganese intake supports long-term well-being.

[Manganese](#) (Mn) is an essential trace mineral, which means we need it in very small amounts. It helps support metabolism, antioxidant protection, immunity, and more [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#).

People are more likely to have excess manganese than to be [deficient](#). The safe upper limit for manganese intake is **11 mg** per day [\[R\]](#), [\[R\]](#).

Occupational exposure to manganese is a potential concern for miners, welders, battery manufacturers, mechanics, and people dealing with pesticides [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#).

[Manganese toxicity](#) damages the nerves. In some cases, it can result in *manganism*, which has symptoms similar to Parkinson’s disease [\[R\]](#).

How it helps

Excessive manganese exposure may damage the nerves and affect brain function. **Some children with dyslexia may have higher urinary manganese levels** [\[R\]](#), [\[R\]](#).

Occupational exposure to manganese is a potential concern for miners, welders, battery manufacturers, mechanics, and people dealing with pesticides [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#).

Please note: *There is no evidence for the link between manganese exposure and dyslexia in adults.*

12



Music Therapy

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Engage in music therapy sessions for at least 30 minutes a day, three times a week. These sessions can involve listening to music, playing an instrument, singing, or writing songs, facilitated by a certified music therapist if possible.

TYPICAL STARTING DOSE

30 minutes

Description

Music therapy is a therapeutic approach that uses music to address physical, emotional, cognitive, and social needs. It can improve mental health, enhance emotional expression, and support overall well-being.

[Music](#) therapy is a form of therapy that involves making, reflecting on, and/or listening to music. It can be applied individually or in groups and may not require the presence of a therapist [\[R\]](#).

Music therapy provides tools for body relaxation and positive imagery. It aims to improve communication, quality of life, and well-being [\[R\]](#), [\[R\]](#).

How it helps

Group music therapy may **improve reading comprehension, writing skills, and attention** in children with dyslexia [\[R\]](#).

Please note: *There is no evidence that music therapy would provide the same benefits for adults with dyslexia.*

13



Exercise At Least One Hour a Day

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Dedicate a minimum of 60 minutes to moderate-intensity activities such as brisk walking, swimming, or cycling. Do this most days of the week, aiming for at least 5 days to optimize benefits.

TYPICAL STARTING DOSE

1 hour

Description

[Exercise](#) can do wonders for your health. It can help you lose weight, improve your heart health, boost your mood, and more [\[R\]](#).

There are many ways you can be active. You can walk, run, swim, dance, or play team sports. **Everything counts, and it's never too late to start!**

Try to get at least **60 minutes of moderate physical activity on most days**, including walking. **Getting a mix of cardio (min 150 min/day) and strength training (min 2 times a week) may be optimal.**

How it helps

Exercise programs have shown long-term improvements in motor skills, speech/language fluency, phonology, and working memory in children at risk of dyslexia. Notably, while reading and spelling speeds were not changed, reading skills improved [\[R\]](#).

14



Ginkgo

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Take 120 mg of Ginkgo supplement daily, preferably with meals to aid absorption. This dosage is typically split into two 60 mg doses taken in the morning and evening for best results.

TYPICAL STARTING DOSE

120 mg

Description

[Ginkgo](#) (*Ginkgo biloba*) is an ancient tree used in traditional Chinese medicine [\[R\]](#), [\[R\]](#).

According to limited evidence, ginkgo leaf extract may help with [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Anxiety
- Dementia
- Eye problems
- Blood vessel problems
- Vitiligo

How it helps

In a study of 15 children with dyslexia, a single dose of ginkgo extract (80 mg) decreased dyslexia difficulties [\[R\]](#).

15

Mindfulness-Based Stress Reduction (MBSR)

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Enroll in an 8-week MBSR course, which includes a weekly 2.5-hour class, one all-day class after the sixth week, and 45 minutes of daily home practice guided by assignments and instructional recordings.

TYPICAL STARTING DOSE

2 hours

Description

Mindfulness-Based Stress Reduction (MBSR) is a structured program that teaches mindfulness techniques to reduce stress and improve overall mental and emotional health. MBSR has been shown to help individuals cope with chronic pain, anxiety, and other stress-related conditions.

How it helps

A study investigated the effects of MBSR on reading, attention, and psychological well-being among people with developmental dyslexia and/or attention deficits. The study found that while mindfulness meditation did not specifically reduce certain types of reading errors associated with dyslexia, it did lead to a general reduction in reading errors by 19%. This improvement was attributed to enhanced sustained attention, which helped the participants stay on the lexical route of reading. The study also reported improvements in mindfulness, stress reduction, and decreases in impulsivity among the participants [\[R\]](#).

16

Metalinguistic Training

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Incorporate metalinguistic training into your routine by setting aside 20 to 30 minutes daily. During this time, engage in activities that focus on understanding and manipulating language, such as playing word games, practicing synonyms and antonyms, or analyzing sentence structures. This practice can be done individually or in a group setting, with or without a professional guide.

TYPICAL STARTING DOSE

30 minutes

Description

Metalinguistic training is an educational approach that focuses on enhancing language awareness and comprehension skills. It can help improve reading and writing abilities, benefiting overall communication and cognitive development.

How it helps

A metalinguistic training program demonstrated syllable facilitation in Chinese compared to working memory training in a study of 41 children with dyslexia [\[R\]](#).

17



Limit Copper Intake

IMPACT1 / 5

EVIDENCE1 / 5

How to implement

Do not include copper supplements in your daily vitamin or supplement routine. Check the labels of any multivitamins or dietary supplements you are currently taking to ensure they do not contain copper. Ideally, you should also check copper levels in your tap water. If they are excessive, consider using a reliable water filter or drinking spring water.

Description

Taking too many copper supplements can cause a copper overdose in your body. This can be harmful, leading to issues like stomach pain, nausea, and even heart problems. For healthy individuals, the amount of copper obtained through a balanced diet is usually enough without needing supplementation. It's vital to maintain the natural balance of minerals in the body for good health.

Contaminated tap water can also be a source of excess copper.

How it helps

Excessive copper exposure may damage the nerves and affect brain function. **Children with dyslexia may have higher copper levels in the blood and hair** [\[R\]](#), [\[R\]](#), [\[R\]](#).

Tap water is a potential source of excess copper. Some pipes, fixtures, and other materials can cause excess copper to leach into tap water [\[R\]](#).

Please note: *There is no evidence for the link between copper exposure and dyslexia in adults.*

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Verbal Working Memory Training

IMPACT1 / 5

EVIDENCE1 / 5

How to implement

Dedicate 15 to 20 minutes daily to engaging in activities that challenge your verbal working memory, such as repeating lists of words, doing mental math, or practicing new languages. Continue this practice consistently for at least 8 weeks to observe improvements in verbal working memory.

TYPICAL STARTING DOSE

20 minutes

Description

Verbal working memory training involves exercises to improve the ability to temporarily store and manipulate verbal information. It can enhance cognitive skills, including language proficiency and problem-solving abilities.

How it helps

In a study of 36 children with dyslexia, a verbal working memory program targeting memory balance outperformed a traditional verbal working memory program in verbal working memory, reading skills, and postural control [\[R\]](#).