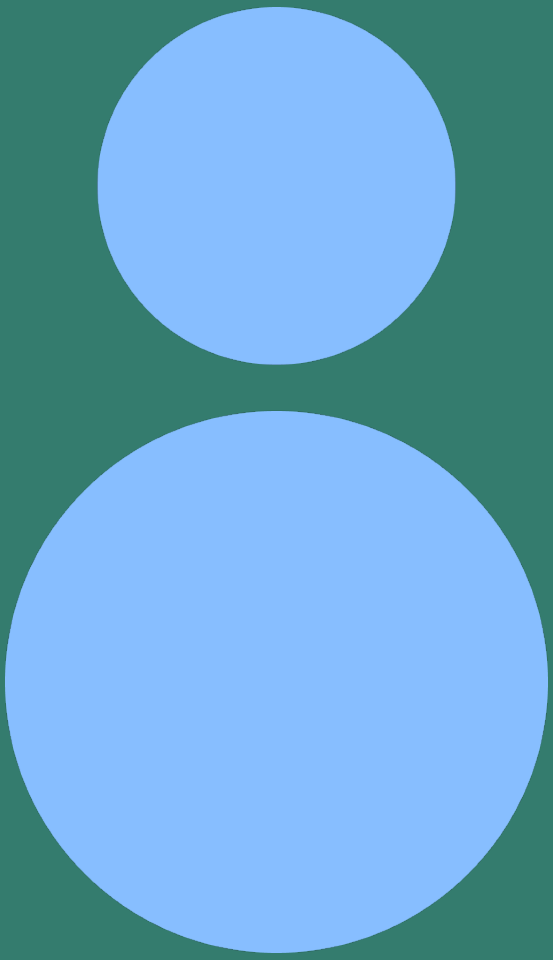
Understanding gut-brain disorders



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Contents

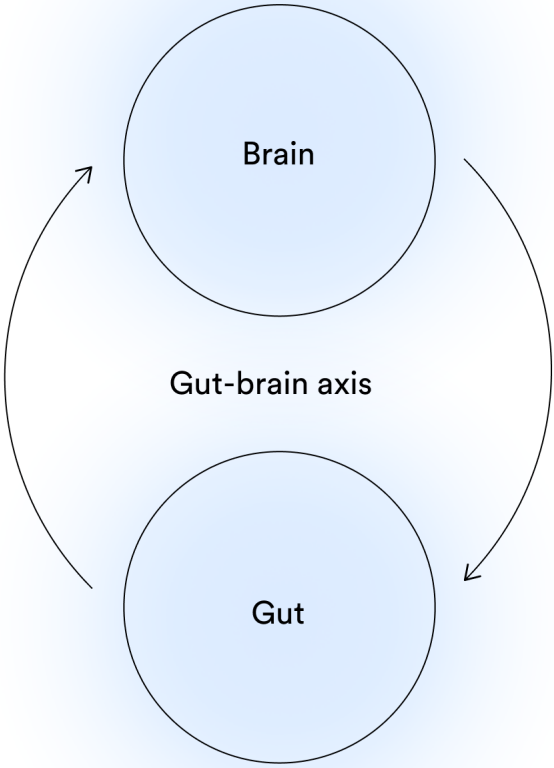
CHAPTER 1

How the gut and brain communicate

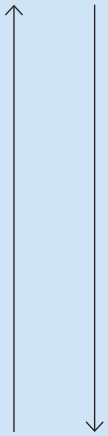
Have you ever wondered why you feel butterflies in your stomach when you're excited? Or why bad news can make you feel sick to your stomach? Or even why, in times of stress or anxiety, your digestive system seems to betray you?

These experiences are not mere coincidences. They are signs of a real and complex communication system between the gut and the brain. This system plays a central role in how we digest food, feel pain, and respond to stress.

Understanding how **the gut and brain communicate** helps explain why gastrointestinal symptoms can be very real, even when medical tests appear normal.



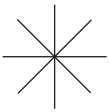
The gut-brain axis



The gut and brain communicate through a system known as the gut-brain axis. This two-way communication network allows messages to travel back and forth between the brain and the digestive system.

The brain sends signals that help guide digestion, including how quickly food moves through the stomach and intestines, and how sensitive the gut needs to be. At the same time, the gut sends messages back to the brain about fullness, pressure, movement, and discomfort.

Most of this communication happens automatically, without conscious effort. It's part of the autonomic nervous system, which controls body processes you don't have to think about, such as breathing, heart rate, and digestion.



The gut also has its own network of nerves called the enteric nervous system. This system helps coordinate digestion and sensation within the gut. While it can work on its own, it stays closely connected to the brain and shares information constantly.

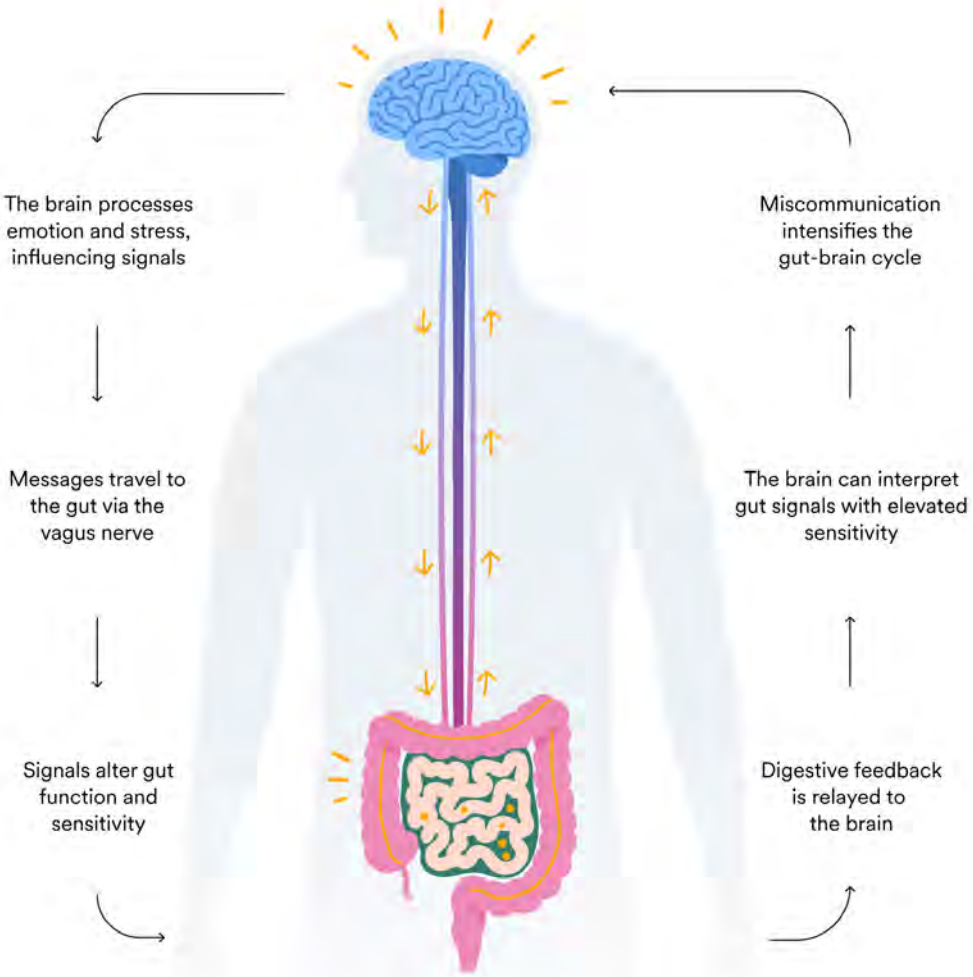
Messages travel along nerves and through chemical messengers in the body. One important pathway is the vagus nerve, which carries signals in both directions between the gut and the brain.

Together, these systems help the body manage digestion, sense what is happening inside the gut, and respond to stress, illness, and changes in routine.

The gut influences the brain.

The brain influences the gut.

The gut-brain axis



CHAPTER 2

Visceral hypersensitivity

Many people with ongoing digestive symptoms are told that their tests are normal, yet their pain, discomfort, or nausea feels very real. One of the key reasons this can happen is something called visceral hypersensitivity.

Visceral hypersensitivity means that **the gut has become more sensitive than usual to normal sensations.** “Visceral” refers to the internal organs, including the digestive tract. When sensitivity increases, everyday digestive activity can be felt more strongly or interpreted as uncomfortable or painful.

When normal digestion feels uncomfortable

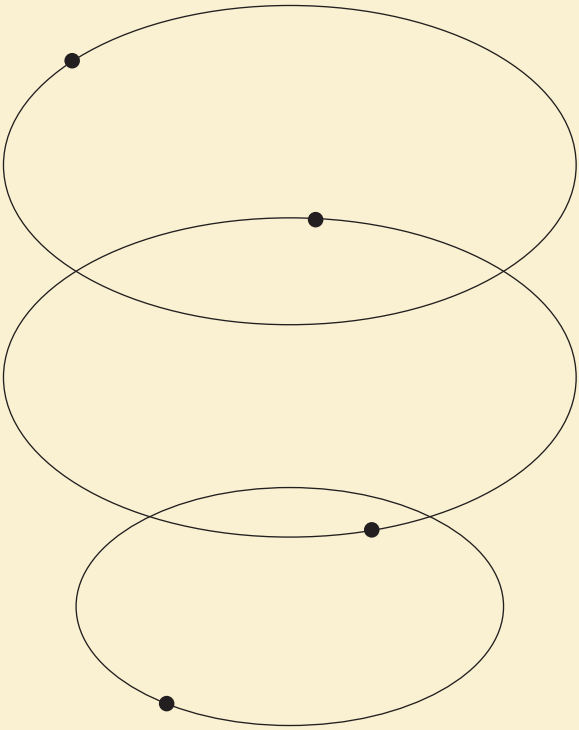
During digestion, the gut stretches, moves, and produces gas. These processes happen in everyone and are usually not noticed. For some people, however, **the nerves in the gut send stronger signals** to the brain during these normal processes.

As a result, sensations that would not bother most people can cause symptoms such as pain, bloating, pressure, nausea, fullness, or urgency.

The gut itself is not damaged, but **the signals being sent are louder or more easily triggered.** Like a volume dial, the communication system is still working, but the volume has been turned up.

This increased sensitivity can affect any part of the digestive tract. In the upper gut, it may lead to symptoms such as nausea, early fullness, upper abdominal pain, or discomfort after eating. In the lower gut, it may cause bloating, cramping, diarrhea, constipation, or a strong urge to open the bowels.

Many people experience a **mix of symptoms** that can change over time.



Why the gut becomes more sensitive

Visceral hypersensitivity usually begins with a **physical trigger,** such as illness, antibiotics, hormonal changes, or a period of prolonged stress. These events can disrupt communication between the gut and brain, causing the nerves in the gut to become over-reactive. Even after the gut tissue has healed, the nervous system may continue to **act as if there is a threat.**

When this happens, normal sensations like digestion, gas, or movement can be misread as danger. This can lead to symptoms such as pain, bloating, reflux, urgency, constipation, or diarrhea.

Stress can make this sensitivity stronger.

When the body is under stress, the nervous system becomes more alert. This lowers the threshold for discomfort, meaning sensations are felt more easily and more intensely.

Certain foods can also trigger symptoms, not because they are harmful, but because they are moving through a gut that is already on high alert.

This does not mean symptoms are “caused by stress”. Instead, **stress acts as an amplifier,** turning up the volume on signals that are already there.

Pain without damage

One of the most confusing aspects of disorders of the gut-brain interaction is that pain can occur without visible injury or disease. This can feel hard to understand, **especially when medical tests are normal.**

Pain is not always a sign of damage. It's a signal created by the nervous system to protect the body. In visceral hypersensitivity, this protective system becomes overactive. The brain receives repeated warning signals from the gut and **interprets them as pain or discomfort,** even during normal digestion.

This helps explain why symptoms can be intense, unpredictable, and persistent, and why they can vary from day to day.

Why understanding sensitivity matters

Understanding visceral hypersensitivity **provides a clear medical explanation for symptoms** that may otherwise feel mysterious or dismissed. It also helps explain why treatments that focus on calming the nervous system and improving gut-brain communication can be effective.

Reducing sensitivity is not about ignoring symptoms or pushing through pain. It's about helping the gut and brain learn to interpret signals in a more balanced way, so normal digestive processes no longer trigger distress.

In the next chapter, we will look at how stress and symptoms can reinforce each other, and how this cycle can keep gut sensitivity switched on.

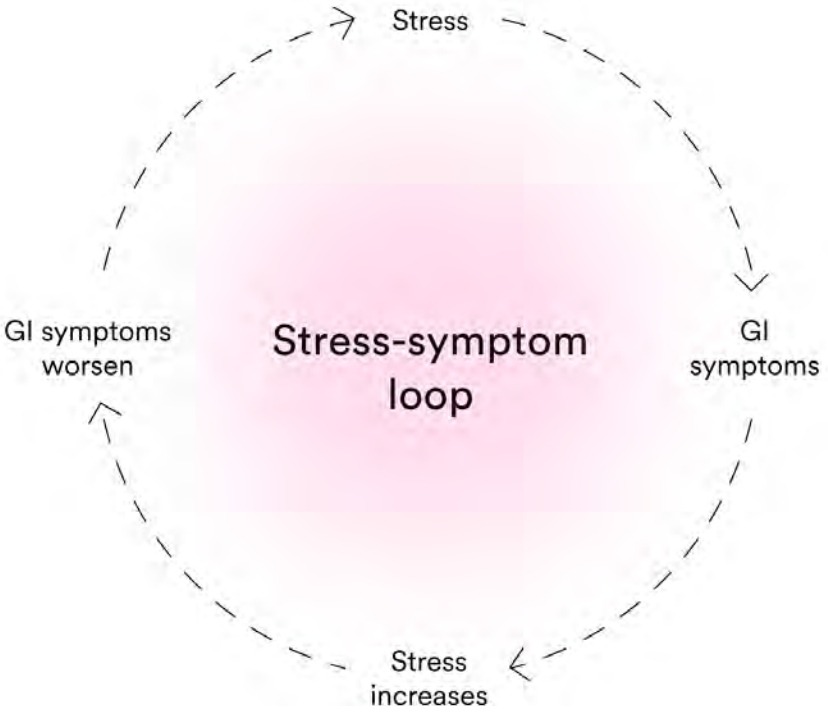
CHAPTER 3

The stress-symptom loop

For many people with ongoing digestive symptoms, stress and symptoms become closely linked. Symptoms increase stress, and stress, in turn, worsens symptoms.

Over time, this can create a cycle **that feels hard to break.**

This is known as the stress-symptom loop, and it's a common feature of gut-brain disorders.



How stress affects the gut

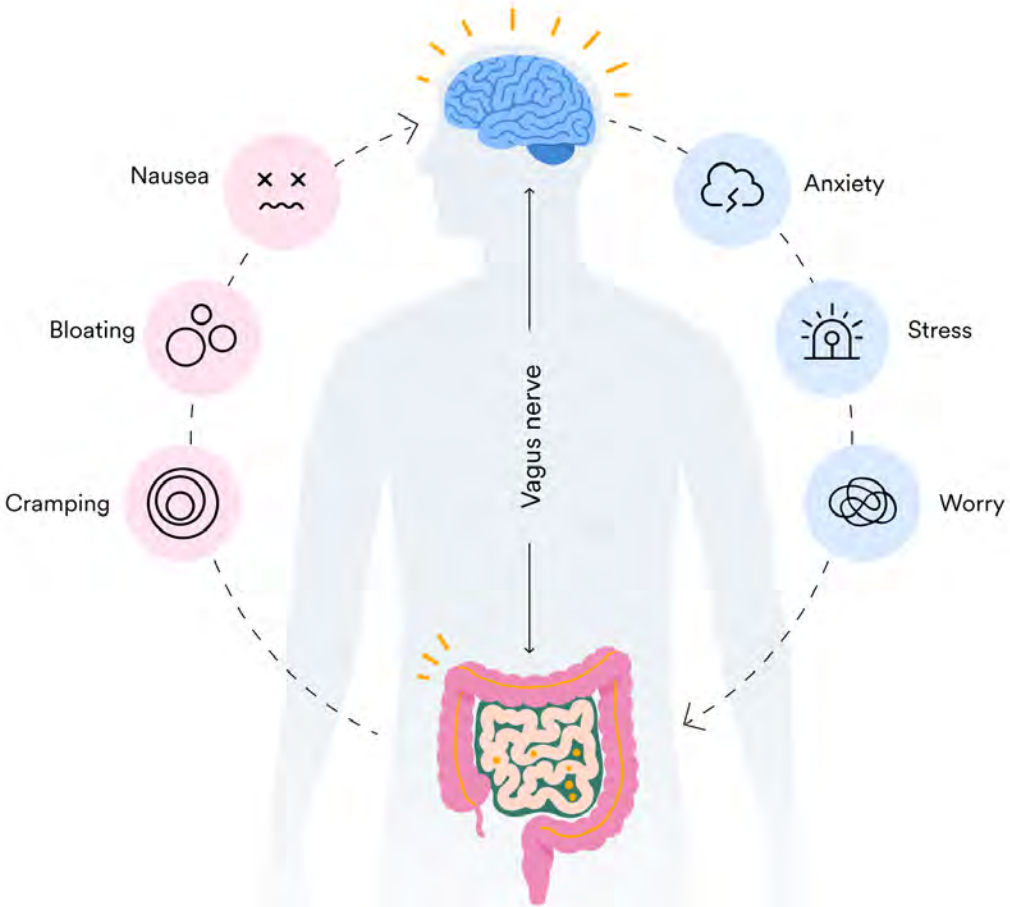
When the brain senses stress or threat, it activates the body's stress response. This response is designed to protect you in the short term, but it also affects digestion.

During stress, the nervous system may:

- *Speed up or slow down bowel movements*
- *Increase sensitivity in the gut*
- *Redirect blood flow away from digestion*
- *Make the gut more alert to sensation*

For someone with visceral hypersensitivity, this **heightened state can make normal digestive activity feel uncomfortable or painful.** Nausea, bloating, cramping, urgency, or changes in bowel habits may become more noticeable during stressful periods.

Stress affects the gut



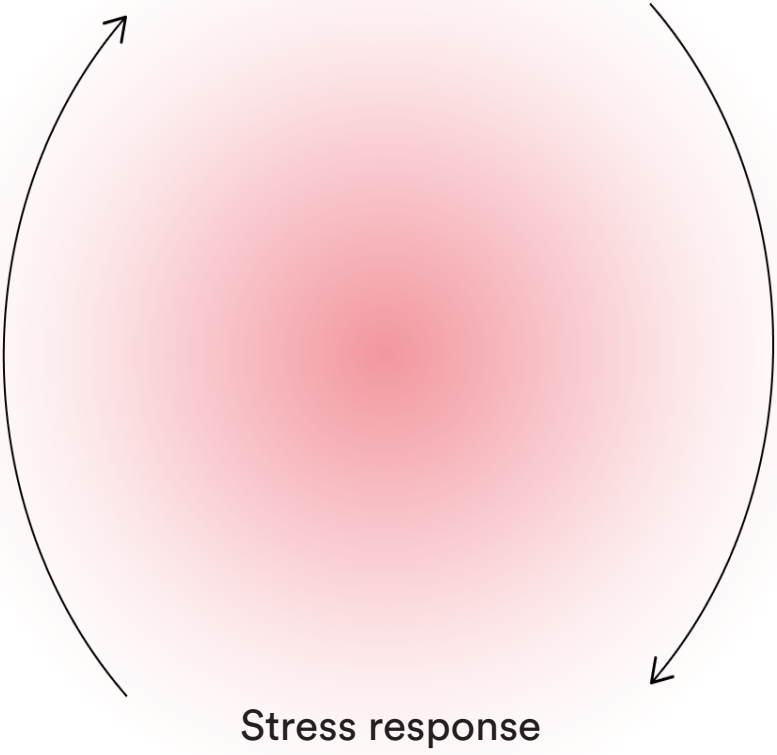
How gut symptoms increase stress

Digestive symptoms themselves can also be stressful. Pain, urgency, nausea, or unpredictable bowel habits can create worry about eating, leaving the house, working, or being in social situations.

Many people find themselves **constantly monitoring their gut,** anticipating symptoms, or planning their day around bathrooms and “safe” foods. This ongoing alertness **keeps the nervous system switched** on and can make the gut even more sensitive.

Over time, the brain may begin to associate everyday situations — such as meals, travel, or work — with the expectation of symptoms.

This expectation alone can activate the stress response and trigger gut discomfort.


Gut sensitivity
Stress response

A self-reinforcing cycle

This is how the stress-symptom loop develops. **Stress increases gut sensitivity and symptoms. Symptoms increase stress and vigilance.** The nervous system remains in a heightened state, and the loop continues.

Importantly, this does not mean symptoms are imagined or psychological. The symptoms are real, physical experiences driven by changes in gut-brain signaling and nervous system regulation.

Understanding this loop helps explain why symptoms can flare during stressful times; why they may persist even when the original trigger has passed; and why breaking the cycle often requires addressing both the gut and the nervous system.

“Gut symptoms are very real and driven by what happens between the gut and the brain... Helping patients understand that this is a real, physical interaction between the brain and the gut can make all the difference in treatment. ”

Dr. Megan Riehl, GI Psychologist, University of Michigan

CHAPTER 4

Gut-brain therapies

When digestive symptoms are driven by changes in gut-brain communication, treatment often needs to do more than focus on food or medication alone. This is where gut-brain therapies come in.

Gut-brain therapies are **evidence-based treatments** designed to support how the brain and digestive system communicate. They aim to calm the nervous system, reduce gut sensitivity, and help the body respond to normal digestion in a more balanced way.

These therapies don't suggest that symptoms are imagined or "all in your head." Instead, they recognize that the brain and gut are closely linked, and that working with this connection can help reduce real physical symptoms.

> *Both **American Gastroenterological Association** (AGA) and **American College of Gastroenterology** (ACG) recommend gut-brain therapies based on High quality research studies showing significant symptom improvement compared to controls.*

Why gut-brain therapies are used

In gut-brain disorders, the nervous system can become stuck in a heightened state. Signals from the gut may be amplified, stress responses may be easily triggered, and normal digestive activity may feel uncomfortable or painful.

Gut-brain therapies are used to help:

Reduce visceral hypersensitivity

Improve regulation of the nervous system

Break the stress-symptom loop

Reduce visceral hypersensitivity

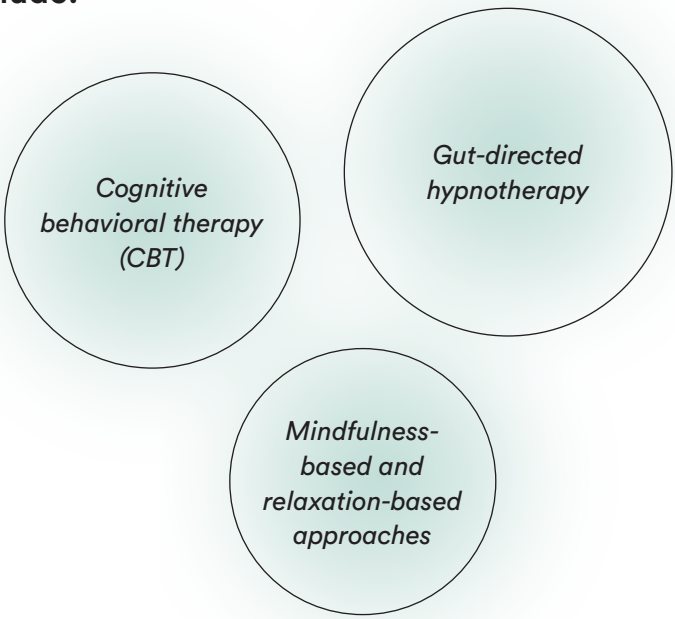
By supporting these processes, gut-brain therapies can help symptoms become less intense, less frequent, and less disruptive over time.

Common types of gut-brain therapies

There are several different approaches that fall under the umbrella of gut-brain therapy.

While they use different techniques, they share a common goal: improving communication between the brain and the gut.

Some of the most commonly used gut-brain therapies include:



These therapies are well researched and included in clinical guidelines for the management of gut-brain disorders.

How these therapies work

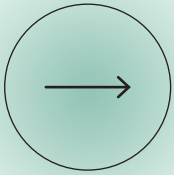
Gut-brain therapies work by helping the nervous system become less reactive to gut sensations. Over time, they can help the brain interpret signals from the digestive system in a less threatening way.

This may involve:

Reducing automatic stress responses

Changing how attention is directed toward symptoms

Helping the body spend more time in a calm, regulated state



Supporting more predictable digestion and bowel patterns

Importantly, these therapies work through **learning and repetition.** Just as the nervous system can learn to become overly sensitive, it can also learn to respond more calmly.

Working alongside other treatments

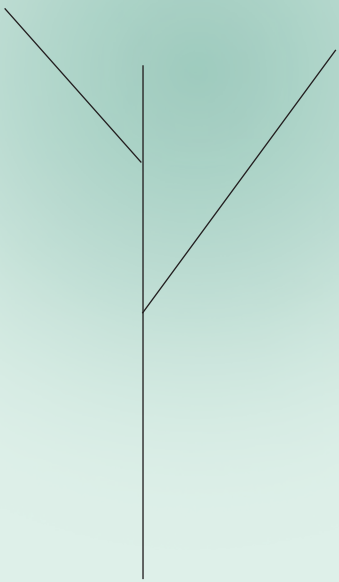
For gut-brain disorders, symptoms can be managed in different ways, and each approach plays a different role.

One helpful way to think about treatment is to imagine it as a tree:

Gut-brain therapy works at the roots, helping regulate how the gut and brain communicate and respond to signals over time. Because it targets the underlying patterns driving symptoms, change is gradual and builds with practice — much like building strength through regular training at the gym.

Other approaches, such as dietary changes or medications, tend to work more at the branches.

They can be very helpful for managing symptoms more directly or **providing short-term relief,** especially while deeper regulation is taking place.



For many people, the most effective care involves a combination of approaches:

Gut-brain therapy to address the underlying gut-brain miscommunication

Dietary or medical treatments help manage symptoms along the way

There is no single 'correct' combination. Treatment plans are usually personalized based on symptoms, preferences, and medical history, and may change over time.

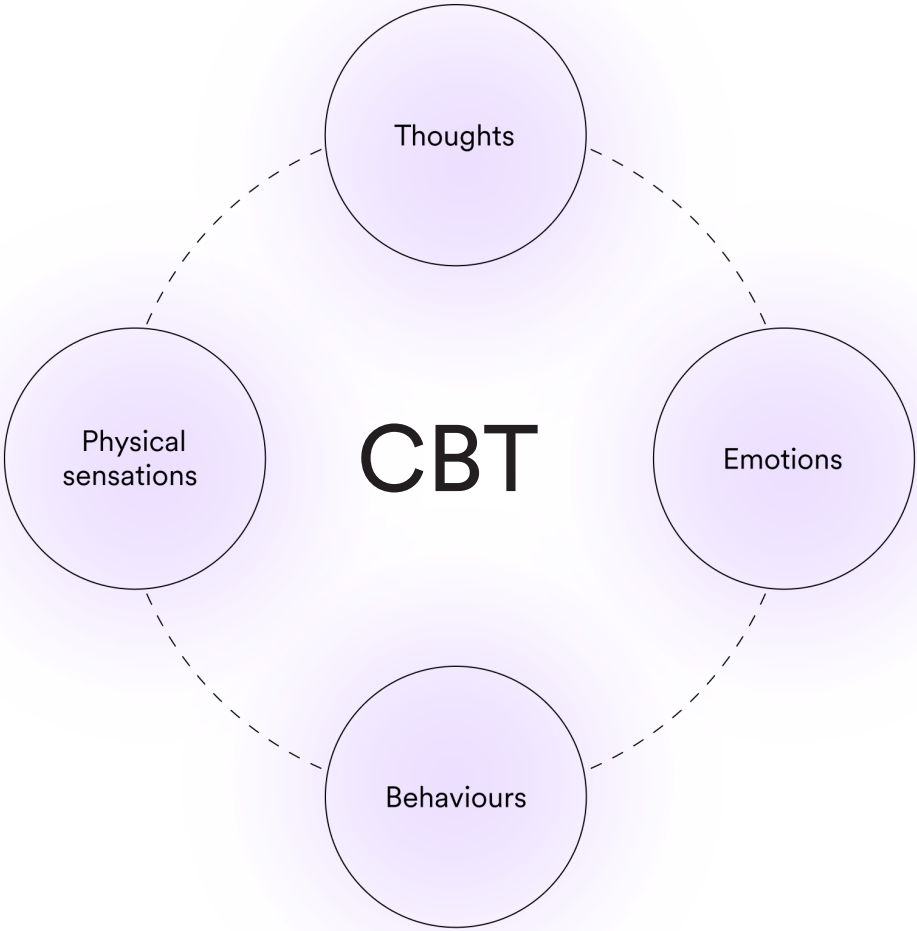
In the next chapters, we'll look more closely at specific gut-brain therapies, including cognitive behavioural therapy and gut-directed hypnotherapy, and explain how they help support calmer gut-brain communication in practice.

CHAPTER 5

Cognitive behavioral therapy

Cognitive behavioral therapy, often called CBT, is one of the most commonly used gut-brain therapies for ongoing digestive symptoms. When adapted for gut symptoms, CBT focuses on how the brain, nervous system, and digestive system interact.

CBT does not suggest that symptoms are imagined or caused by negative thinking. Instead, it recognizes that **thoughts, emotions, behaviours, and physical sensations all influence each other** through the gut-brain connection.



How CBT supports the gut-brain connection

When someone lives with ongoing digestive symptoms, it's natural to become alert to changes in the body. **Over time, the brain may learn to scan for symptoms,** expect discomfort, or prepare for the worst. This can increase stress responses and make the gut more sensitive.

CBT helps by gently changing these patterns. It supports the brain in responding to gut sensations in a calmer and more balanced way, which can reduce stress signals sent to the digestive system.

CBT for gut symptoms often focuses on:

- *Reducing fear and worry related to symptoms*
- *Changing unhelpful thought patterns that increase stress*
- *Reducing avoidance of food, activities, or situations*
- *Improving confidence in managing symptoms*

CBT is practical and skills-based

CBT is a structured, practical approach. Rather than focusing only on past experiences, it helps people build skills they can use in daily life.

These skills may include:

- *Gradually reintroducing avoided foods or activities*
- *Learning how stress affects the gut and nervous system*
- *Practicing ways to respond differently to gut sensations*
- *Building coping strategies for flare-ups*

Over time, these skills can help break the stress-symptom loop and reduce how strongly the gut reacts to everyday situations.

CBT and digestive symptoms over time

CBT works through learning and repetition. Just as the nervous system can learn to become more sensitive, it can also learn to feel safer and less reactive.

For some people, CBT helps **reduce the intensity or frequency of symptoms.** For others, it improves quality of life by making symptoms feel more manageable and less frightening. Many people experience a combination of both.

CBT can be used on its own or alongside other treatments, including dietary changes, medication, and other gut-brain therapies. The right approach depends on each person's symptoms, needs, and preferences.

In the next chapter, we will explore gut-directed hypnotherapy and how it works to support gut-brain communication and reduce digestive sensitivity.

CHAPTER 6

Gut-directed hypnotherapy

Gut-directed hypnotherapy is a type of gut-brain therapy that focuses on changing how the brain and digestive system communicate. It's well researched, has been used for many years in the treatment of gut-brain disorders, and is included in clinical guidelines for their management.

Unlike stage hypnosis or entertainment hypnosis, gut-directed hypnotherapy is a **clinical approach** designed to support the nervous system and reduce digestive sensitivity.

How gut-directed hypnotherapy works

In gut-brain disorders, **the brain and gut can become stuck in patterns** of heightened sensitivity and stress response. Signals from the gut may be amplified, and normal digestive activity may be interpreted as uncomfortable or painful.

Gut-directed hypnotherapy works by **helping the nervous system enter a calmer, more regulated state**. In this state, the brain becomes less reactive to gut sensations and more open to learning new patterns of response.

Over time, repeated sessions can help **reduce visceral hypersensitivity**. The brain learns to interpret signals from the digestive system as less threatening, which can lead to fewer symptoms or symptoms that feel less intense.

Supporting the nervous system

During gut-directed hypnotherapy, **attention is gently guided inward while the body relaxes.** Breathing slows, muscles soften, and the stress response quiets. This helps shift the nervous system **away from fight-or-flight** and toward a state that supports digestion and comfort.

This calm, focused state allows the brain to practise responding differently to gut sensations.

Rather than scanning for symptoms or reacting automatically, the nervous system has an opportunity to reset how strongly it responds.

This process does not require effort or concentration from the person receiving therapy. There is no need to “try” to relax or control symptoms. The work happens through repetition and **learning within the nervous system.**

Changing patterns over time

Just as the gut and brain can learn patterns of sensitivity, they can also learn patterns of safety and ease. Gut-directed hypnotherapy works gradually, **building change over time** rather than aiming for immediate symptom removal.

Some people notice changes in symptom intensity or frequency. Others notice improvements in how manageable symptoms feel, or how quickly they recover after a flare-up. These changes reflect improved regulation and communication between the gut and brain.

Gut-directed hypnotherapy can be used on its own or alongside other treatments, including CBT, dietary approaches, and medication. **The best approach** depends on individual symptoms, preferences, and support needs.

In the next chapter, we will look at the role diet plays in digestive symptoms and how they interact alongside other treatments.

CHAPTER 7

Diet and digestive symptoms

Food can play an important role in digestive symptoms, but its role is often complex. Some people notice clear links between what they eat and how they feel, while others find that symptoms occur regardless of diet. This variation is common in gut-brain disorders.

Not all dietary approaches are helpful for all types of digestive symptoms, and the role of diet can differ between upper and lower digestive symptoms.

Dietary approaches aim to reduce symptom triggers in the gut. They don't directly change gut sensitivity or gut-brain communication, but they can reduce the physical load on the digestive system and help some people feel more comfortable.

The low FODMAP diet

One of the most widely used dietary approaches for digestive symptoms is the low FODMAP diet. This approach **reduces certain types of carbohydrates** that are poorly absorbed in the small intestine and can ferment in the gut.

When these carbohydrates reach the gut, they can draw in fluid and produce gas. In people with sensitive digestion, this can lead to symptoms such as bloating, abdominal pain, diarrhea, constipation, or a feeling of pressure or fullness.

The low FODMAP diet is usually followed in three stages:

Short-term reduction phase

Structured reintroduction phase

Personalization phase

The goal is not long-term restriction, but identifying **which foods trigger symptoms** for each individual.

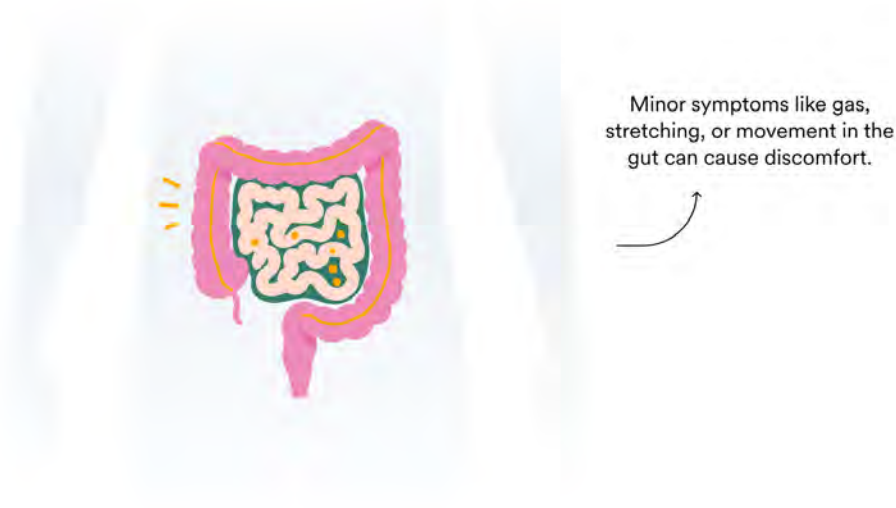
Diet and gut sensitivity

Dietary approaches work by **reducing triggers in the gut,** not by changing how sensitive the gut is. This helps explain why some people still experience symptoms even when following a strict diet, and why symptoms can return during times of stress or illness.

For people with visceral hypersensitivity, even small amounts of gas, stretching, or movement in the gut can cause discomfort. In these cases, diet may help reduce symptoms, but it may not fully address the underlying sensitivity.

This is also why some people find that dietary changes work best when combined with other approaches that support **gut-brain communication.**

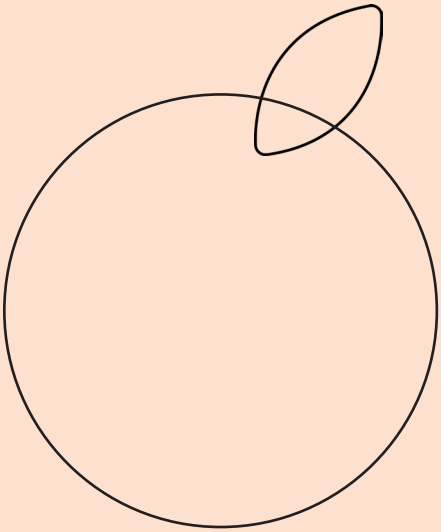
Gut sensitivity



Individual responses to diet

There is no single diet that works for everyone. Some people find significant relief with dietary changes, while others notice little difference. Symptoms can also change over time, meaning foods that were once tolerated may later cause discomfort, or vice versa.

Dietary approaches are best guided by a healthcare professional, such as a dietitian, to avoid unnecessary restriction and ensure nutritional balance.



Using diet alongside other treatments

Dietary strategies are often used alongside medical care and gut-brain therapies. **Each approach works in a different way,** and combining them may provide broader symptom support for some people.

The most effective treatment plan is one that considers **symptoms, lifestyle, preferences, and overall well-being,** rather than focusing on a single solution.

CHAPTER 8

The Nerva program

Nerva is a structured gut-brain therapy program that has been clinically proven to help regulate communication between the gut and brain.

Your program

Over six weeks, you'll be guided through an evidence-based combination of therapies that focus on:

- *Reducing visceral hypersensitivity*
- *Calming threat signaling between the gut and brain*
- *Normalizing digestive sensation and motility over time*

Your session takes just 15 to 20 minutes a day, and you'll be guided through a combination of:

Gut-directed hypnotherapy (GDH)

Listen to relaxing daily sessions that target the gut-brain connection.

CBT-informed coaching

Understand your triggers, why flare-ups happen and what the root cause is.

Symptom tracking and reporting

Track your symptoms to gain insights and share progress with your provider.

Deep breathing techniques

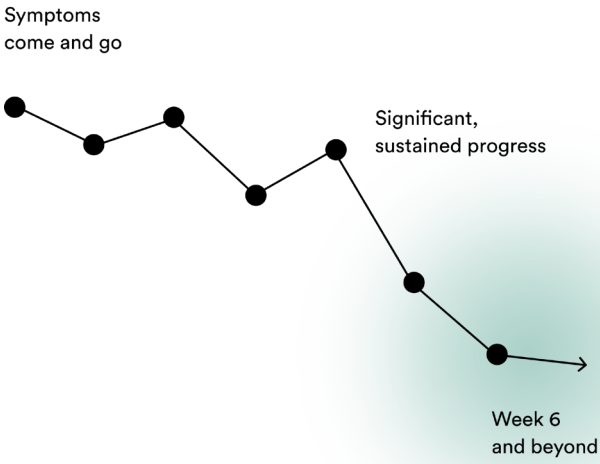
Calm flare-ups with science-based deep breathing exercises.

What to expect from results

Around 90% of Nerva members report meaningful symptom improvement after 4-6 weeks of the program, and clinical trials[1] show these improvements can be maintained after the program ends.

That said, progress with gut-brain therapy is rarely a straight line and symptoms can come and go along the way. This is normal and expected as the gut-brain system learns to respond differently over time. Think of gut therapy like training a muscle. **Change doesn't happen overnight, it comes from consistent practice over time.** Some days symptoms may improve, other days they may flare. This is normal and expected as the gut-brain system learns new, calmer response patterns.

Some changes are subtle at first — for example, feeling less overwhelmed by symptoms even before they change physically. These early shifts often signal that the nervous system is beginning to settle, setting the foundation for more noticeable improvements over the weeks that follow.



Weeks 1-2

In the first couple of weeks, changes are often subtle. Many people notice improvements in sleep, they feel calmer, or find they're worrying less about symptoms. Even if symptoms haven't changed yet, feeling less overwhelmed is a meaningful sign that the **gut-brain system is beginning to settle.**

Weeks 3-4

With regular sessions, gastrointestinal changes often become more noticeable around this point. Symptoms may start to feel less intense, occur less often, or be less disruptive when they do happen.

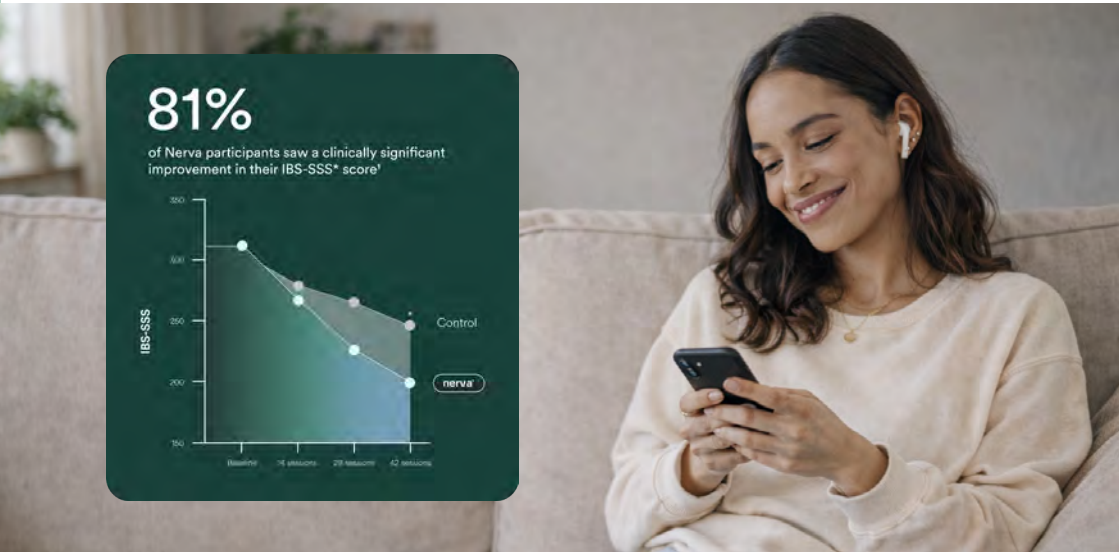
Weeks 5-6

By the final weeks, many people report clearer **improvements in day-to-day comfort and quality of life. Symptoms tend to take up less space,** and people report having more confidence in their body, which enables them to socialize, travel and exercise freely, alongside a sense of freedom with food choices.

Ongoing

Once the nervous system has been recalibrated through the Nerva program, these changes become the new normal. Research has shown the results from the Nerva program are maintained over time.

In clinical trials, **81% of patients** who completed the 6-week program **maintained symptom improvements over time[1].**



Clinical effectiveness

Nerva's efficacy and safety has been demonstrated across five published clinical studies, including a large peer-reviewed randomized controlled trial[1], showing that Nerva:

- ***Reduced abdominal pain severity in 71%** of participants in the intervention group, compared to 35% for control*
- *Was **clinically effective with pain,** diarrhoea and constipation*
- ***Improved quality of life and mental wellbeing,** including reduced anxiety for participants using Nerva.*

Working alongside your healthcare provider

Nerva is designed to be used alongside the guidance of your healthcare provider. Many people use it at the same time as other treatments, such as dietary approaches or medication.

Nerva focuses on gut-brain regulation, meaning there are **no known physical side effects or interactions with medications.** The therapy is also complementary to dietary interventions.

- *No known physical side effects*
- *No interaction with medications*
- *Complements dietary interventions*

There is usually no need to stop other treatments while using Nerva, unless your healthcare provider advises otherwise. If you're ever unsure how Nerva fits into your overall care plan, your healthcare provider is the best person to guide you.

References and further reading

This booklet summarizes information from clinical guidelines, randomized control trials and peer-reviewed research on gut-brain disorders and therapies:

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