



Disorders of Gut-Brain Interactions: Functional Abdominal Pain

A JOURNEY TOWARDS WELLNESS

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Hi! I'm Matthew.

I am 11 years old.

I just moved to a new school
this September.

For the past few months, I have been having
stomach pain every morning when I wake up.

It's gotten so bad that sometimes, I can't go
to school. Help!

**My stomach hurts, and
I don't know why!**



Hi Matthew!

**I'm Dr. Treisha.
I'm a pediatric
gastroenterologist.**

I see lots of kids with stomach pain, just like you!

**feeling pain in the stomach is
really common**

For some kids, stomach pain happens everyday. It can also stop them from doing things they want to do.

It can be really confusing!



Most families feel **confused** and even **frustrated** when these symptoms go on for a long time.

Sometimes, people even suggest that it may all be in their head!

Especially when there is no clear pattern, food makes it worse, all the tests come back normal, and **nothing seems to work.**

It makes sense that everyone might worry that something bad has been missed.

We know that no matter what is causing these symptoms, **it's not all in your head**. These symptoms can be very uncomfortable.

When doctors see kids with this type of stomach pain, we take a “two paths” approach.

We will ask questions, do a physical check-up, and run tests to make sure **nothing dangerous** is happening to you (no **red flags**).

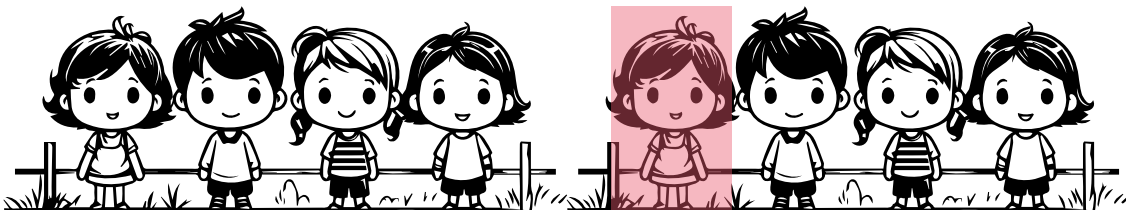
... while also starting **treatment** for one of the most common causes of abdominal pain in kids: **functional abdominal pain**.

Functional abdominal pain is pain coming from the stomach and intestines (together known as the **gut**) that regularly comes and goes. It happens when the brain thinks there are pain signals coming from the gut, even though there's no damage to the GI tract (more on this later!). It is unclear why some kids have it, although we think it is due to a change in the **gut-brain interaction**.

It's also really, really common!

1 of every 8

kids around the world have functional abdominal pain!



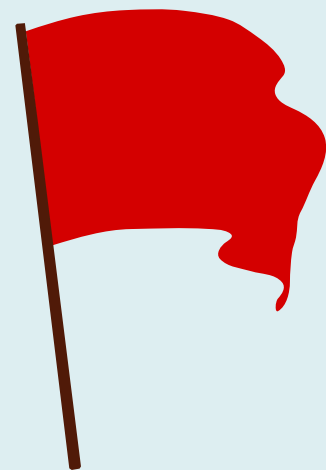
this translates to 13.5%

When doctors see kids with chronic abdominal pain (meaning pain that's been going on for a long time), we ask about symptoms called **red flags**.

These symptoms can help us figure out if anything dangerous is happening.

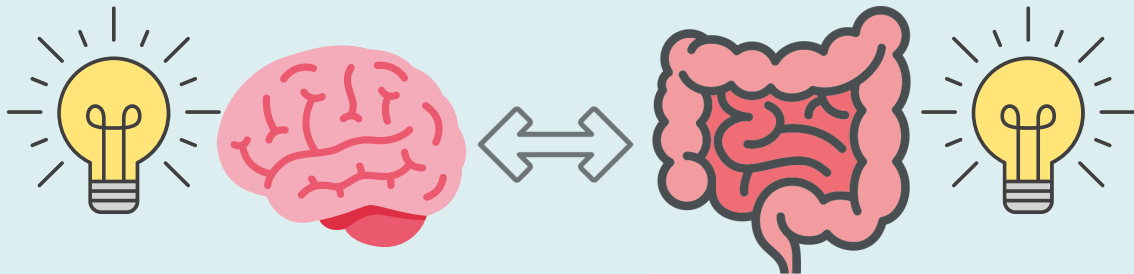
Red flags include:

- blood in the poop
- unintentional weight loss
- difficulty or painful swallowing
- persistent vomiting
- waking up to poo at night
- urinary symptoms (changes in frequency of peeing or urgency to pee, painful or bloody pee, back pain)
- skin rashes
- joint pain
- growth delay



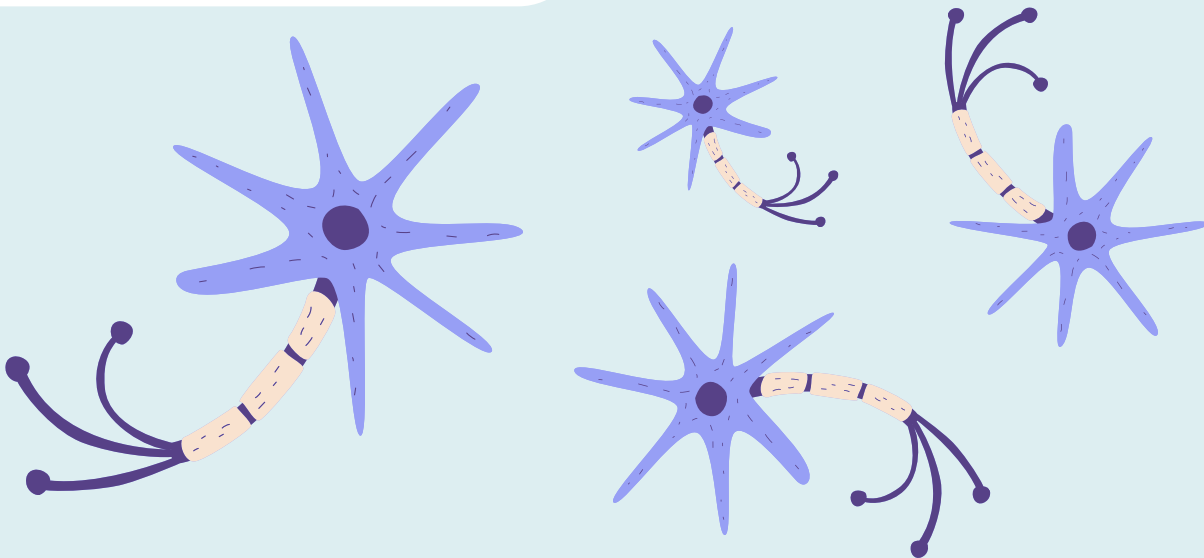
What causes functional abdominal pain?

To learn about functional abdominal pain, we first have to talk about the fascinating **gut nervous system!**



Your gut has many special cells called **neurons.**

They come together to form the **vagus nerve.**

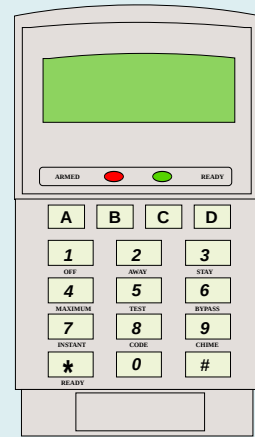


The **vagus nerve** carries information from your gut to your brain. Your brain then takes this information and makes sense of it so it can tell your gut to do its job of breaking down food and absorbing nutrients. This is known as the **gut-brain interaction.**

To understand why functional abdominal pain happens, let's imagine that your **brain is a house alarm**, and your **digestive system is the house**.

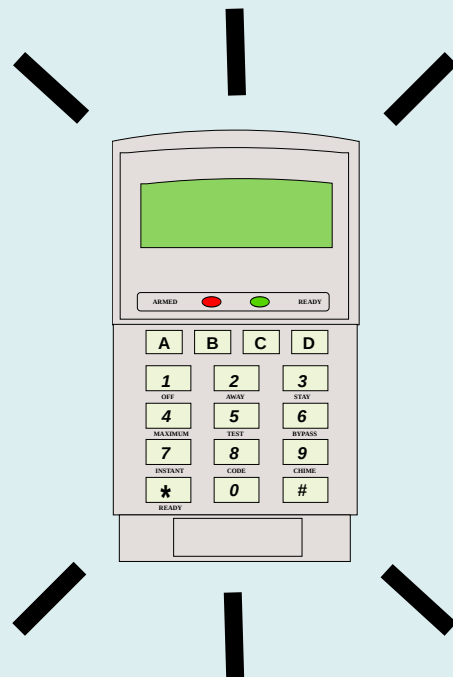


Digestive system



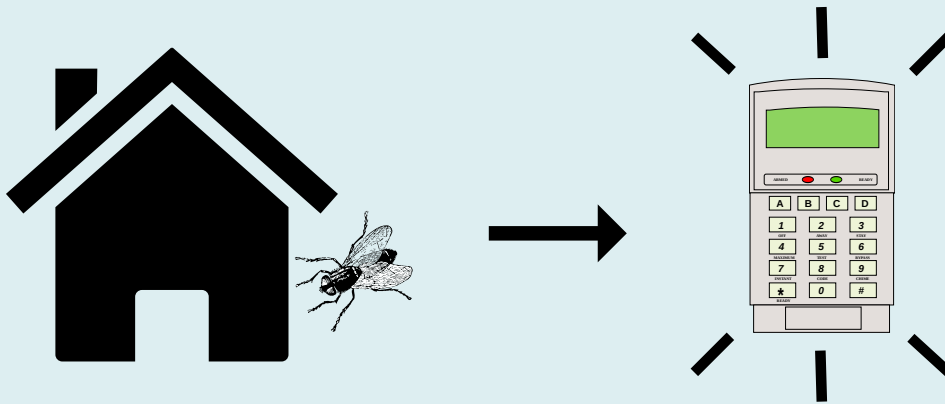
Brain

If a burglar tries to break into your house, the **house alarm will ring**. That means it's working correctly.

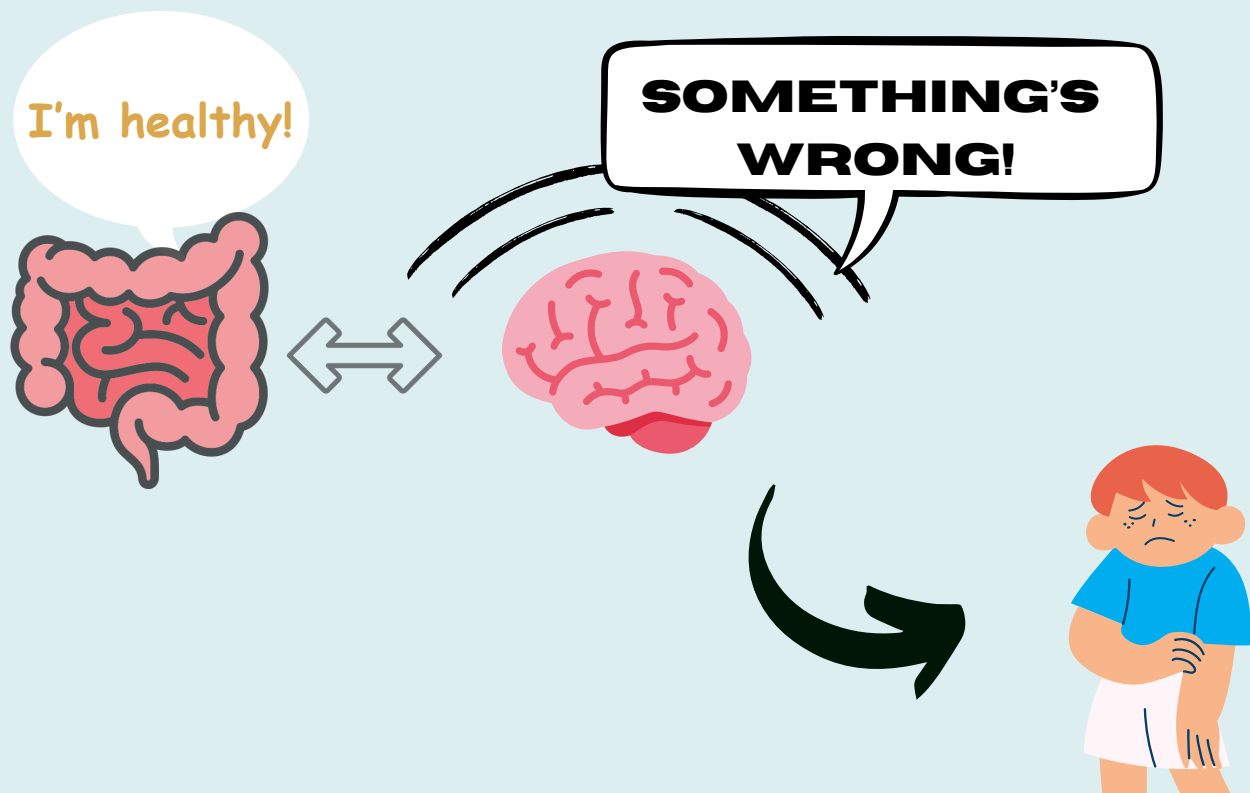


Your brain and your digestive system work the same way. If something is wrong with your tummy, signals from your digestive system are sent to your brain. **Your brain processes this information and sends it back to your tummy as pain.**

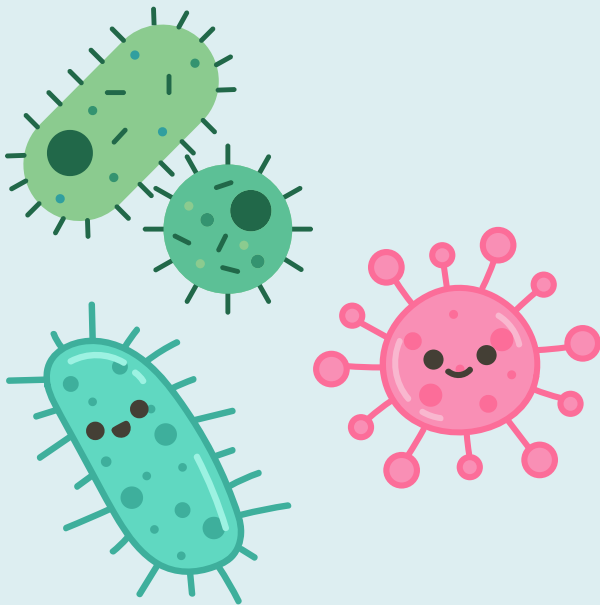
Sometimes, the house alarm can become too sensitive. If a fly lands on your house, it may ring to warn you of a break-in.



Similarly, your brain can also become too sensitive (or **hypersensitive**). Your digestive system may be healthy and talking normally to your brain, but the brain thinks these “normal signals” mean something is wrong and causes abdominal pain.



your gut and you



Your **gut microbiome** and your **poop** also plays a big role in functional abdominal pain!



DID YOU KNOW:

Your gut contains **TRILLIONS** of bacteria!

Most bacteria help us break down food and make vitamins. They're really helpful!

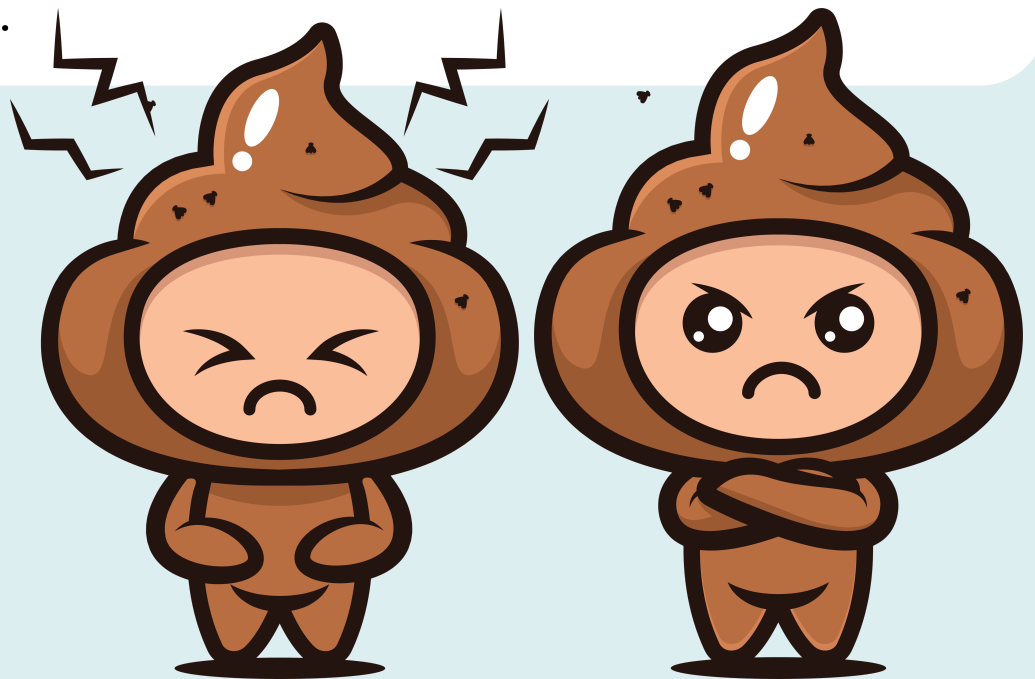
Some bacteria can cause and worsen our abdominal pain. When these "bad" bacteria break down food, they create a lot of **gas**. When too much gas is made, it **STRETCHES** the intestine. When the gut-brain connection is **hypersensitive**, this can be interpreted as pain.

your gut and you

The same thing happens when you're constipated!

Constipation means you might have **uncomfortable** poops (meaning that it is difficult to poop), or you may have **infrequent** poops (meaning that you may go several days without pooping.)

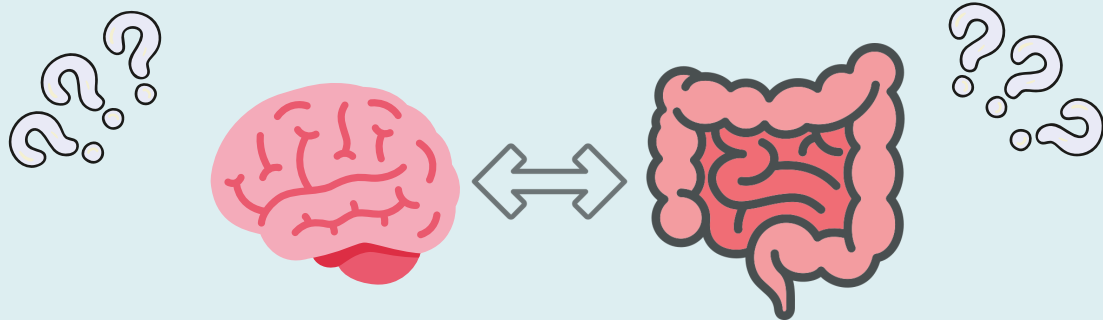
When you're constipated, all of that poop builds up in your intestines and causes the intestines to **STRETCH**. When the gut-brain connection is **hypersensitive**, this can be interpreted as pain.



Doctors don't know exactly why the brain starts misunderstanding gut signals and why the **gut-brain interaction** becomes hypersensitive. We know it can happen after an infection or illness.

We also know that **anxiety is more likely to keep sending the signals.**

Since our brain and our body work so closely together, we think that the **mind-body connection** plays an important role and there is an element of **somatization** in functional abdominal pain too (more on this later!).



If the gut and brain are miscommunicating, it is known as the

Disorder of Gut-Brain Interaction (DGBI)

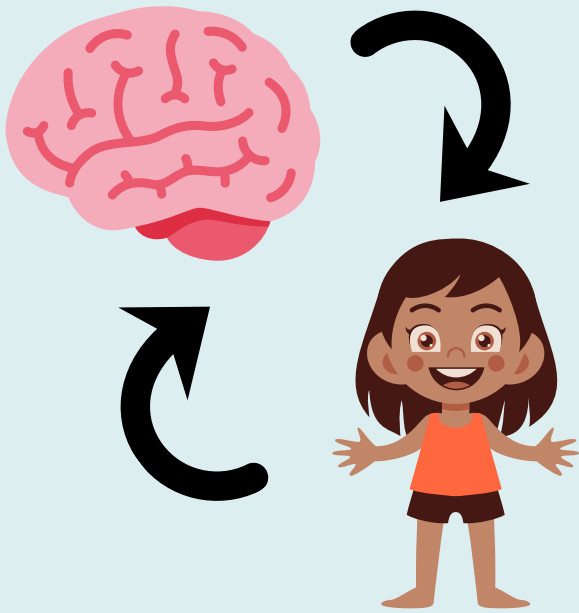
Functional abdominal pain is one type of **disorder of gut-brain interaction.**



What is the

MIND-BODY CONNECTION AND SOMATIZATION?





Your brain and your body are always talking to each other.

When you're nervous about a test, you might feel butterflies in your stomach.

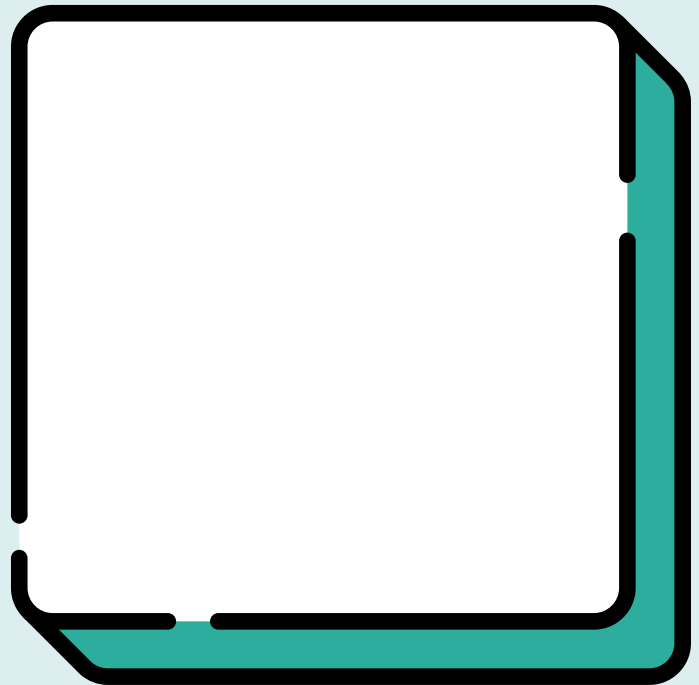


When you're sad, you might cry.

Butterflies in your stomach and crying are examples of **somatic symptoms**. Somatic symptoms are body reactions to our emotions. They happen because of the **mind-body connection**.

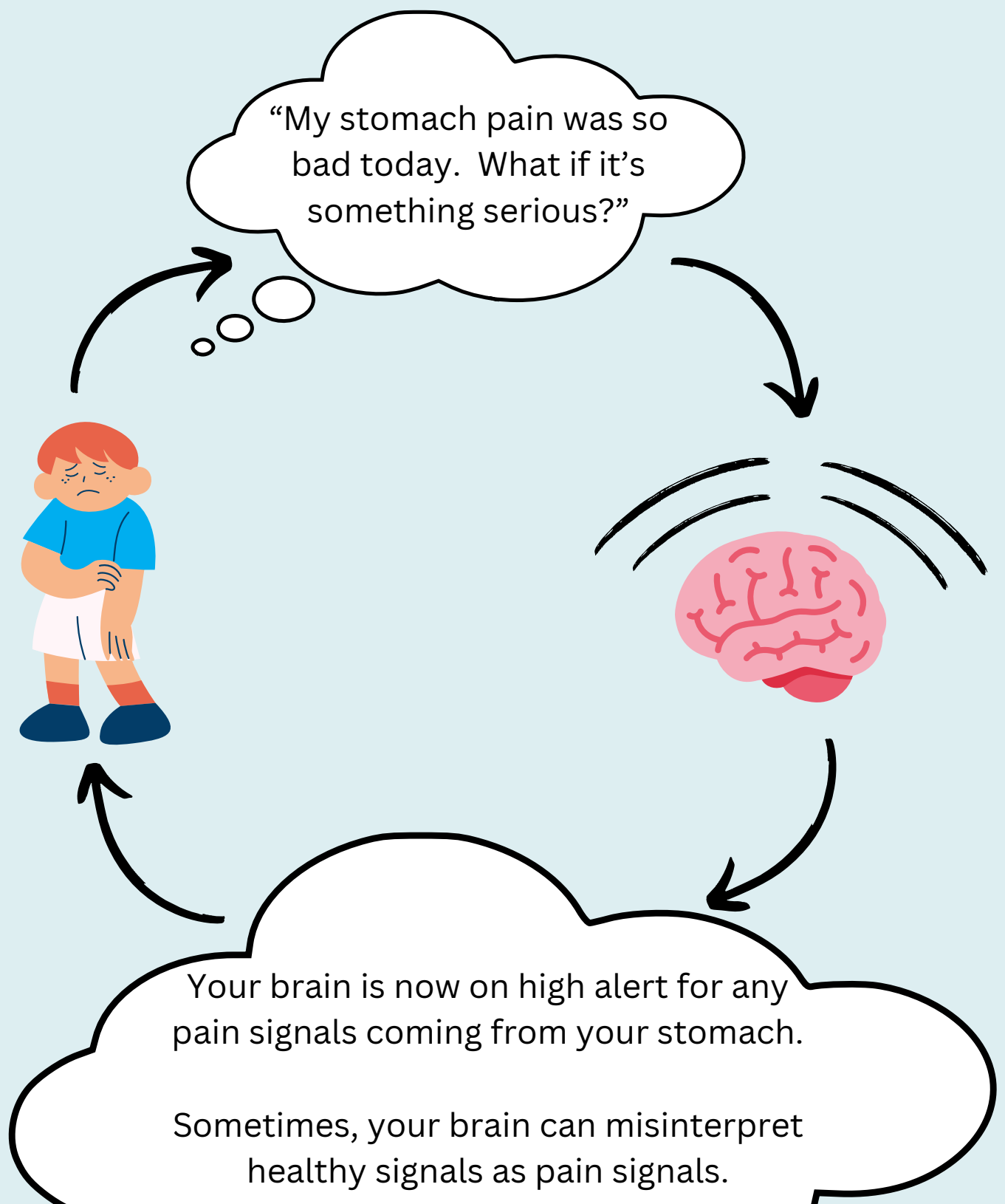
Somatic symptoms are **normal**. **Everyone experiences them!** But, in some kids, they start noticing that their somatic symptoms happen more often or become more bothersome than before.

Can you think of any somatic symptoms you have experienced?



In kids with **functional abdominal pain**, sometimes we see that there is an **element** of somatization to the pain. What does that mean?

As you have more abdominal pain, you may start worrying about it. You might wonder when it will happen again, or how bad it will be. You may pay more attention to pain signals that you would normally ignore. You might even think, “why me?”



As this cycle repeats itself, your brain may become even MORE sensitive, and cause you to have worse pain more often.

This can stop you from going to school, playing outside, or even eating.

Will I have pain if I go to school?

What if my friends make fun of me?

I'm so worried.



I can't eat, I got stomach pain last time.

What if I can't write my test today?



Gee, thanks Dr. Treisha! How do I know if I have functional abdominal pain? And how will I feel better?

**Great question Matthew!
Let's go back to the beginning, when we talked about a two paths approach.**



Diagnosing functional abdominal pain is a process. We continue to work with you as your healthcare team on the “**two paths**” journey .

Functional abdominal pain is the **most likely diagnosis** when there are no red flags and basic investigations return normal.

We will continue to make sure nothing dangerous is happening to the body and look for other possible conditions.

At the same time, we want to **start treatments** for functional abdominal pain and work on strategies for the **mind-body connection** right away.



Breaking News

↓ READ MORE ↓

How do kids with functional abdominal pain feel better?

To get you feeling better, we aim to improve both your **physical (body)** and **mental (mind)** health.

At BC Children's Hospital, we can use the **3 P's model** to guide us:

Physical



Psychological



Pharmacological



Let's talk about these sections in more detail!

PHYSICAL HEALTH



Playing outside and exercising is important for your body and your mind. Start with as much activity as you can, and slowly aim for 30-60 minutes, 4 times a week!



Physical activity can help naturally decrease pain signals!

Yoga has been shown to help with functional abdominal pain in children.



Eating balanced meals with plenty of **high fiber** fruits and vegetables can be helpful for regular poops! High gas producing foods, called FODMAP foods, can worsen pain as well.

PSYCHOLOGICAL (MENTAL) HEALTH

Now that we've talked about ways to improve our physical health, let's talk about ways to improve our mental health.

We do this in **two ways**:

1. **Recognizing** when pain is happening, and finding ways to cope with the pain
2. **Reducing** the stress and anxiety that kids feel about their pain

How can you, your parents, and your care team work together to achieve these goals?

PSYCHOLOGICAL (MENTAL) HEALTH



**Let's talk about you,
Matthew, as an
example!**

**You wake up in the morning and you have bad
stomach pain. You wonder whether you can go to
school.**

**Let's pause and think about how you,
your parents, and your care team can
help you!**

PSYCHOLOGICAL (MENTAL) HEALTH

Family



It's hard to see Matthew in pain. But, we want to see him go to school and see his friends too.

- **validate** his emotions
- **distract** him from the pain,
- **reassure** him that he will okay, and
- **encourage** him to do his day-to-day activities.



Missing school or activities can make the pain more noticeable and make Matthew worse

Teachers

- encourage him while at school
- give him a special project.

Sporting Coaches

- include the child in participating in team or individual events
- create activities catered to physical capacity



It can be really challenging to make big changes all at once!
We like to use the concept of **graded-exercise therapy** to guide us in making gradual small steps towards improvement.

What does that look like?

Graded

A planned, deliberate, step-by-step increase in activity

Imagine stairs, not a slope. You check to see if step is solid and secure before proceeding. Each activity increase is very small.

Steps are not directed by your symptoms. You keep going even with mild-moderate symptoms.



It's important that at every step of the way, Matthew is supported.

This can take time, and knowing when to put on the brakes is just as important as increasing intensity.

These are all strategies
that have helped my other
patients.



- Recognizing the onset of pain
- Being aware of our emotions around the pain
- Validating feelings are key ways to help you.

While you recognize and accept your pain, you and your parents **can start working on identifying things that trigger abdominal pain.**

With time, your anxiety will come down as well. This stops the cycle of pain-worry-worse pain.

Try it in the worksheet!

The principles we just discussed are based on **mindfulness** and a type of therapy, called **Cognitive Behavioral Therapy**.

Many families find it helpful to see a psychologist to guide them through cognitive behavioral therapy.

Other types of therapy that have been found to be effective include **hypnotherapy** and **guided imagery**.

There are also mindfulness apps that help you work through mindfulness exercises.



BREATHR

Try this Breathr App:

<https://keltymentalhealth.ca/breathr>

PHARMACOLOGICAL (MEDICATION) OPTIONS

A short trial of medications can be considered. Medications are **meant to help with symptoms but do not cure**. Side effects are possible and medications should always be started in discussion with your doctor.

Some **over-the-counter options** include:



Buscopan[®]



Iberogast[®]

**Peppermint oil
capsules**



Probiotics



PHARMACOLOGICAL (MEDICATION) OPTIONS



Prescription medications that can be considered include:

- We can use medications to **modify feelings of intense pain** from the brain
 - **Amitriptyline / nortriptyline**
 - **Cyproheptadine**
- We can use medications to **reduce the spasms** from the gut
 - **Antispasmodics** like Bentyl[®] (Dicyclomine), Dicetel[®] (Pinaverium)
 - **Modulon[®]** (trimebutine)
- we can use medications to **help with stress** related to the pain
 - **SSRIs** - like Prozac[®] (fluoxetine), Zoloft[®] (sertraline), Paxil[®] (paroxetine), Celexa[®] (citalopram)





LET'S TALK ABOUT

YOUR

GOALS

WHEN TREATING
FUNCTIONAL
ABDOMINAL PAIN

Our goal when treating functional abdominal pain is to:

- 1. Improve quality of life**
- 2. Resume normal activity**

**Your abdominal pain may not go away completely.
And that's okay!**

Hopefully you have learned

- **How to recognize when the pain happens**
- **How to cope with the pain**
- **How to be less worried about your pain.**

Many kids find that as they get older, they notice their abdominal pain less and less. When it does happen (like they are very stressed for an exam), they know ways to help them through the pain.

Throughout this entire process, your team is here to help you when you need it!

More Support Resources

- **Uptodate Beyond the Basics is an excellent resource, written in patient-friendly language**
- **A very detailed article geared to healthcare workers.**
- **More information about FODMAP foods**
- **A collection of resources compiled by Stollery Children's Hospital in Edmonton.**
Relevant sections are:
 - **Abdominal Pain**
 - **Chronic Pain**
 - **Miscellaenous**
 - **Mental Health Resources**
 - **Apps for Relaxation/Mindfulness**
- **A video explaining Functional Abdominal Pain**
- **Mental Health Resources in BC**
 - **Kelty Mental Health: The BC Children's Kelty Mental Health Resource Centre provides mental health and substance use information and resources, assistance navigating the mental health system, as well as free personalized support from peer support workers for families across BC and Yukon.**
 - **Foundry BC**
 - **Foundry offers free and confidential mental health and wellness services for youth ages 12-24 in BC and their families.**
 - **Somatization Handbook**
 - **A detailed handbook written by a team of pediatric psychiatrists and psychologists at BC Children's Hospital, full of ideas to support kids with somatic symptoms**
 - **BC Crisis Center**
 - **A 24/7 phone line and online services that provides immediate access to confidential support**

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