



All you need  
to know about

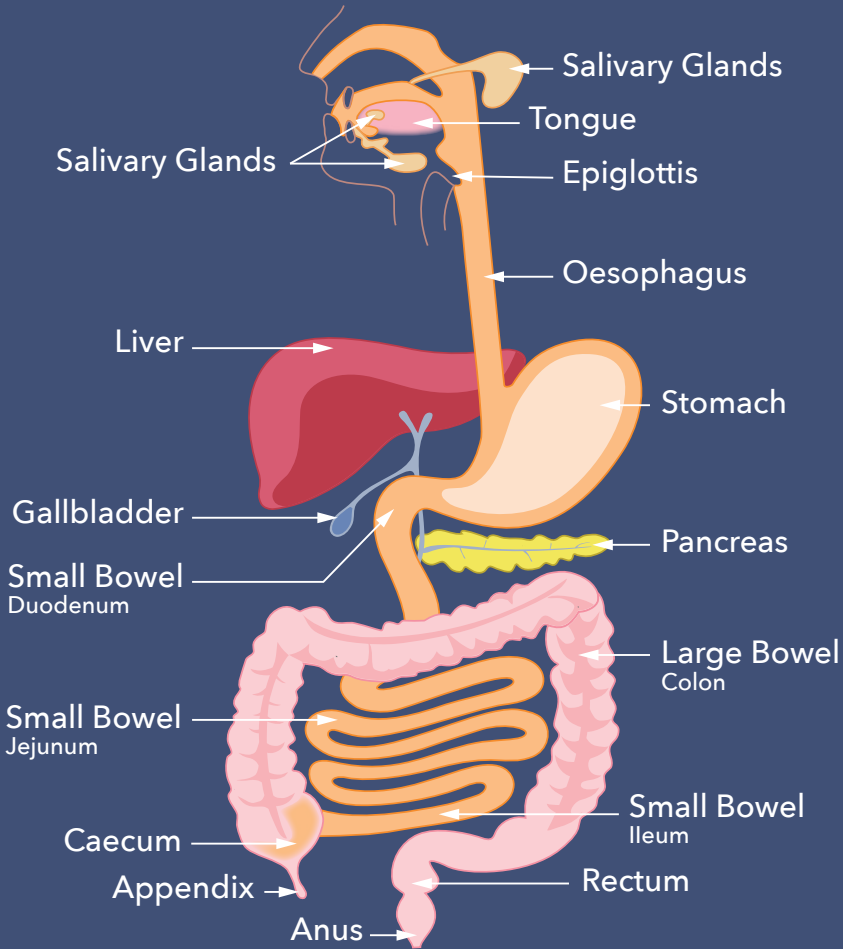
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# THE GUT MICROBIOME IN HEALTH AND DISEASE



# Our Digestive System

The digestive system runs from the mouth to the anus and includes the stomach, the small and large bowels (intestines) and a number of accessory organs. The role of the digestive system is to turn food and liquid into the building blocks that the body needs to function effectively. See the image of the digestive system below.



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# This booklet is about gut microbiome in health and disease

Your body is home to trillions of microbes, known as the gut microbiota, that reside in your digestive system. These microorganisms outnumber your human cells and comprise hundreds to thousands of different species. Literally a microbial zoo in your poo!

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# What is the gut microbiota?

Your gut microbiota is the collection of tiny living microorganisms including bacteria, viruses and fungi that live in your digestive system, mostly in your intestines (bowels). Everyone has a unique set of gut microorganisms. These microbes are super important for your health. They help:

- Break down food and absorb nutrients.
- Keep your immune system strong by teaching it what to fight off and what to leave alone.
- Control your weight and blood sugar levels.
- Affect your mood and brain, since your gut and brain are connected.

Everyone's gut microbiome is unique. Your diet, where you live, and even antibiotics can change it.

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## What does it do for you?

Your gut microbiome acts like a control centre. It quietly supports your health through many functions:

### 1. Digestion & nutrition

It helps break down complex foods (like fibre) that your body can't digest on its own. It produces nutrients like vitamin K and some B vitamins.

### 2. Immune system support

It trains your immune system to spot harmful invaders and not to react to harmless ones.

A healthy gut microbiome helps stop inflammation and autoimmune problems.

### 3. Mental health & brain function

Your gut and brain are connected (this is called the gut-brain axis).

Some gut bacteria make chemicals like serotonin. Serotonin is a natural body chemical called a neuromodulator, which affect mood, stress, and sleep. Serotonin can also be prescribed and is sometimes used as an antidepressant.

### 4. Metabolism & weight

Gut microbes influence how your body stores fat and balances blood sugar.

An unbalanced microbiome may be linked to obesity and type 2 diabetes.

### 5. Protection from harmful microbes

Good bacteria in your gut help crowd out harmful ones, reducing your risk of infections.

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## What happens if your gut microbiota gets out of balance?

**Dysbiosis** happens when the balance of gut microbes is out of balance. This means there are too many harmful microbes or not enough helpful ones. Dysbiosis can result from several factors, including a poor diet—especially high sugar or processed foods, stress, lack of sleep, antibiotics, or illness.

This imbalance can lead to problems like:

- **Digestive issues**  
(bloating, gas, diarrhoea, constipation).
- **Weakened immunity**  
(getting infections more easily).
- **Inflammation**  
in the gut and other parts of the body.
- **Mood changes**  
(anxiety, depression) due to the gut-brain connection.
- **Skin problems**  
like acne or eczema.
- **Metabolic issues**  
such as weight gain or insulin resistance. Insulin resistance happens in people with type 2 diabetes.



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# How can you influence your gut microbiome?

To keep your gut microbiome healthy, focus on your diet, lifestyle, and avoid unnecessary disruptions to your lifestyle. Here are some key strategies:

## 1. Eat a diverse range of foods

Diversity in your diet leads to a more varied gut microbiome. They offer fibre that nourishes good bacteria.

Focus on:

*Fruits, vegetables, legumes, whole grains, nuts.*

For healthy eating please see

Guts UK information here:

[gutscharity.org.uk/info/healthy-eating](https://gutscharity.org.uk/info/healthy-eating).

## 2. Consume fermented foods

These foods contain probiotics (live beneficial bacteria and sometimes fungi).

These include:

*yogurt, kefir, sauerkraut, kimchi, miso, tempeh, and kombucha.*

Check to ensure the product is also healthy in other respects, for example, it's not too high in salt, sugar or fat.

The NHS website has information how to check food labels.

[www.nhs.uk/live-well/eat-well/food-guidelines-and-food-labels/how-to-read-food-labels/](https://www.nhs.uk/live-well/eat-well/food-guidelines-and-food-labels/how-to-read-food-labels/).

## 3. Include prebiotic-rich foods

These "feed" the good bacteria in the gut.

Examples are:

*garlic, onions, leeks, asparagus, bananas, oats, jerusalem artichokes.*

## 4. Limit artificial sweeteners and processed foods

Studies show that aspartame and other artificial sweeteners can harm the gut microbiome. Highly processed foods can reduce gut microbiome diversity.

Examples are:

*processed meats, (sausages, burgers, ham, salami), white bread and processed cheese.*

## 5. Avoid overuse of antibiotics

Only take antibiotics when necessary and prescribed. They can kill both harmful and beneficial bacteria. However, if you are prescribed antibiotics, always complete the course.

## 6. Exercise regularly

Physical activity is associated with a more diverse and balanced gut microbiome. Please see here for suitable examples:

[nhs.uk/live-well/exercise/](https://nhs.uk/live-well/exercise/).

## 7. Stay hydrated

Water helps maintain the gut mucosal lining, which helps protect the barrier of the intestines and supports good bacteria.

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## 8. Manage stress

Chronic stress can negatively affect your gut microbiome. Practices like meditation, deep breathing, or yoga may help.

## 9. Sleep well

Aim for 7-9 hours of quality sleep per night. Circadian rhythms are your body's natural 24-hour clock, governing the sleep-wake cycle, for example. The rhythms influence the balance of gut microbiota.





## How do scientists look at the gut microbiome?

Checking your gut microbiome typically involves analysing a stool (poo) sample. Poo samples are collected in special collection tubes and sent to a processing laboratory where the DNA is extracted, and the types and abundance of the different bacteria is defined. Your findings can then be compared to databases to generate a report of your gut microbiome health.

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## Should I get my gut microbiome checked?

Guts UK do not recommend commercial microbiome (poo) tests. It is important to emphasise that a gut microbiome report cannot diagnose a disease. The science to interpret gut microbiome data is still evolving and many approaches lack regulation. Also, the gut microbiome changes over time and is influenced by diet, stress, climate and geography, so a single gut microbiome assessment will not provide a holistic impression of your gut microbiome. If you wish to know more about commercial microbiome tests, contact [info@gutscharity.org.uk](mailto:info@gutscharity.org.uk) or call **0207 486 0341** for a copy of the Gut Microbiome (Poo) Testing leaflet.

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# How will the gut microbiome impact future healthcare?

The future for the gut microbiome in healthcare is hugely exciting! We continue to uncover links between the gut microbiome and a wide range of conditions.

There is still so much to learn, however, in the future, we can expect:

## Microbiome-based diagnostics

Using gut microbiome screening or 'biomarker discovery' to help earlier disease detection for more health conditions

## Disease risk reduction

Modifying the gut microbiome through diet and lifestyle interventions.

## Personalised medicine

Using gut microbiome information to tailor disease management including treatment options.

## Microbiome-targeted treatments

Development of more drugs derived from the gut microbiome such as novel probiotics and products derived from our experience of faecal microbiota transplantation (FMT). FMT is a treatment where a poo sample from a healthy donor is used to treat a person who has an illness. Currently this is only used to treat a recurring *C-Difficile* bacterial gut infection.

References available on request.



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# Guts UK

is the national charity  
for the digestive system



Our three main areas of work are:

- Information and support
- Raising awareness and public education
- Research with patient and public involvement and engagement (PPIE)

Guts UK provides information and support to people affected by digestive conditions and symptoms. We raise vital awareness about our guts and fund life-changing research into the digestive system. Our mission is a world where digestive conditions are better understood, better treated and everyone who lives with one gets the support they need.

## Get in touch

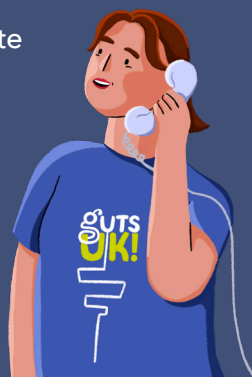
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If you need information and support for digestive conditions or symptoms, please call our freephone Helpline on **0300 102 4887** (Monday to Friday, 10am to 2pm).

Alternatively you can use the online form on our website at [www.gutscharity.org.uk/helpline](http://www.gutscharity.org.uk/helpline).

For general enquiries about anything else, please call us on **0207 486 0341** or email [info@gutscharity.org.uk](mailto:info@gutscharity.org.uk).

You can find out more about Guts UK at [www.gutscharity.org.uk](http://www.gutscharity.org.uk).



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25<sub>FT</sub> IS A  
LOT OF GUTS  
TO UNDERSTAND

Far too many of us ignore or shrug off what our gut is telling us. 58% of people are embarrassed to talk about their digestive condition or symptoms.

Guts UK exists to change that. We empower people to seek help.

**IT'S TIME THE UK GOT  
TO GRIPS WITH GUTS**

**Support Guts UK today**

[www.gutscharity.org.uk](http://www.gutscharity.org.uk)



# Donation Form



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Surname   
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Guts UK Reference: C0017

If you wish, please share with us your motivation for giving today. This will help us tailor our thank you:

Please tick here if you do not wish to receive a thank you letter to acknowledge your donation.

I would like to support Guts UK with a donation of

£5  £10  £25  £50  £100  £500  Other £

I enclose a cheque payable to Guts UK  OR Please debit my credit/debit card

Card no.     Expiry   CVC / Security code   
Address   
(if different from above)

OR

Please call me on  to take my details

Signature(s)  Date

We are incredibly grateful for all donations made to Guts UK in support of our work. We will write to thank you for your donation but understand that sometimes, donors prefer not to receive this kind of communication. Please tick here if you do not wish to receive a thank you.

**Please turn every £10 I donate into £12.50 at no extra cost to me, by adding gift aid to my donation.** Add Gift Aid

I am a UK taxpayer, please treat all donation I make or have made to Guts UK in the past 4 years as Gift Aid donations until further notice.  
For more information on Gift Aid please see below.

Signature(s)  Date

*giftaid it* I am happy for all gifts of money that I have made to Guts UK charity (Core) in the last four years and all future gifts of money that I make to be Gift Aid donations. I am a UK taxpayer and understand that if I pay less Tax & Capital Gains Tax in that year that the amount of Gift Aid claimed on all my donations across all charities, it is my responsibility to pay any difference. Guts UK charity claims 25p for every £1 you donate from the tax you pay for the current tax year. If your circumstances, name or address change please do let us know.

**Welcome to Guts UK**

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Alternatively, you can:  
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or go to **gutscharity.org.uk/donate**.