

# Digestion 101

BY DR. SURINDER POONIAN

**T**he digestive system is made up of the gastrointestinal (GI) tract, liver, pancreas, and gallbladder. The GI tract, or 'gut', starts at the mouth and includes the oesophagus, stomach, small intestine, large intestine, finally ending at the anus. This system is needed to extract nutrients from food in order to sustain bodily functions.

Ayurvedic medical sciences call the gut our 'second brain', placing a huge emphasis on digestion — it is believed that when gut functions are not optimum, the rest of the body suffers as a consequence.

Bacteria in the GI tract known as gut microflora aid digestion. Our gut is home to approximately 100,000,000,000,000 (100 trillion) microorganisms!<sup>1</sup> Breastfeeding is associated with protection from a number of infections and is encouraged to develop a healthy gut microflora.<sup>2</sup> The gut is home to around two thirds of our immune system; if the system is down or if there is a tip in the balance of gut flora ("good" versus "bad" bacteria), we find ourselves experiencing discomfort or disease.



## The Digestive System

So, you've just eaten a scrumptious meal. What happens next?

- **Mouth:** Food enters here, and this is where digestion starts. We use our teeth to chew and the enzyme salivary amylase is secreted to help with the break down of food. Many of us tend to inhale our food as we are so busy which has a direct impact on the quality of digestion. Slow down and chew your food! This will aid the digestive process and also make you feel fuller after your meal, which prevents overeating.
- **Oesophagus:** The food moves into the oesophagus, a muscular tube that runs between the mouth and the stomach. As the food meets the lower oesophageal sphincter, the sphincter relaxes and lets food pass into the stomach in a controlled manner.

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### References

<sup>1</sup> Bäckhed F et al. *Host-Bacterial Mutualism in the Human Intestine. Science* 2005;307:1915-20.

<sup>2</sup> Wold AE1, Adlerberth I. *Breast feeding and the intestinal microflora of the infant--implications for protection against infectious diseases. Adv Exp Med Biol* 2000;478:77-93.

- **Stomach:** It stores swallowed food and liquid. It is the size of a clenched fist when empty and then expands as food enters. The stomach produces an acid of around pH 1.9 to help break down the food further. Drinking water between meals rather than with meals allows the stomach pH to remain acidic, which permits better digestion.
- **Small intestine:** Peristalsis moves the food and mixes it with digestive ‘juices’ from the pancreas, liver and intestine. The walls of the small intestine absorb nutrients from the GI tract transporting them to the blood. The nutrients are then delivered to the rest of the body.
- **Large intestine:** Home to 3-4 kilograms of bacteria and 5-6 foot long. Undigested parts of food from the GI tract lining reach the large intestine by peristalsis. Water is absorbed here with any remaining nutrients. Stool is produced and is stored in the sigmoid colon until it is passed to the rectum for a bowel movement. It usually takes between 24-36 hours for stool to pass through the colon. The bacteria of the gut microbiome ferment whatever food comes through – if this part of the gut is not functioning at optimum, gas produced from fermentation leads to bloating.
- **Rectum:** An 8 inch chamber that connects the colon to the anus. The rectum receives stool from the colon, holds the stool and informs us via signals to the brain when it is time for evacuation. If it is appropriate to expel, the sphincter relax and the rectum contracts. If it is inappropriate, the sphincters contract allowing us to temporarily hold our stools.
- **Anus:** Made up of the pelvic floor muscles, and internal and external sphincters which regulate elimination of stools. The internal sphincter prevents expulsion when we are asleep or are not aware of stool and the external sphincter prevents expulsion when we have the urge to defecate. Healthy bowel movement can range from 1 to 7 times a day!<sup>3</sup>

### The Liver

The liver is responsible for detoxification and removes substances from the bloodstream that could potentially be harmful. It produces and secretes bile and purifies the blood after absorption in the small intestine. Lifestyle and food choices such as alcohol, caffeine, pesticides and refined sugars can affect the function of the liver.




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#### Reference

<sup>3</sup> The Liver Trust, Diet and Liver Disease <https://www.britishlivertrust.org.uk/liver-information/diet-and-liver-disease/>

**Foods to support the liver**

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|------------------------|--|
| Garlic                 | Helps to activate enzymes that can flush out toxins  |
| Beets                  | High in plant flavonoids which enhance function  |
| Leafy greens           | Spinach and lettuce have the ability to neutralise metals and chemicals  |
| Green tea              | Full of plant antioxidants known as catechins which enhance function   |
| Avocados               | Contain antioxidant called glutathione which helps to filter out toxins  |
| Cruciferous vegetables | Broccoli and brussels sprouts also increase the amount of glucosinolates (organic compounds) in our bodies that helps create enzyme production for digestion |
| Lemons                 | Cleanse out toxic materials and aid digestion  |
| Turmeric               | Digests fats and stimulates the production of bile   |

**The Modern Day Lifestyle**

The modern day lifestyle has a huge impact on our gut microflora. Antibiotics, medications, birth control, highly processed diet, reduction in consumption of dietary fibre, stress, and infections all contribute to varying levels of bacterial imbalance in the gut.

It is well-documented that antibiotics can have a devastating effect on the balance of gut microflora. A study in the Genome Medical Journal confirms that although the use of antibiotics in the last 80 years has saved millions of lives, there is “mounting evidence that they influence the function of the immune system’s ability to resist infection and our capacity to

digest food". In 2015, antibiotic resistance pathogens were estimated to cause over 50,000 deaths per year in Europe and America. This figure is expected to rise to 10 million by 2050.

The paper concludes that antibiotics can cause lasting detrimental changes to developing gut microflora. When antibiotics are taken, they wipe out a large proportion of the bacteria in the gut (good and bad) exposing the gut and making the body more susceptible to infections by other pathogens.

"A dysbiotic microbiome may not perform vital functions such as nutrient supply, vitamin production, and protection from pathogens. Dysbiosis of the microbiome has been associated with a large number of health problems and causally implicated in metabolic, immunological, and developmental disorders, as well as susceptibility to development of infectious diseases."<sup>4</sup>

### Is my digestive system fully functioning?

Some serious digestive issues include gastroesophageal reflux disease (GERD), diverticulitis, ulcerative colitis, celiac disease, Crohn's disease, irritable bowel syndrome and gallstones. These can often arise from a poor diet, allergy or intolerance.

Here are just a few signs your system may generally need some support: <sup>5</sup>

- Extra fluid retention – Every cell in the body excretes waste into the lymphatic system. The lymphatic system does not have a pump and fluid usually moves through movement, diaphragmatic breathing and massage. Fluid movement in the lymphatic system is needed to move waste away from the cells. When we are sedentary or have an excess of waste, the waste sits around the cells. The body then retains more fluid in an attempt to dilute the waste.

- Skin breakouts and congestion may be a sign that the skin is stepping in to help the body eliminate waste.
- Feeling super hungry.
- Poor energy.
- Digestive issues including diarrhoea or constipation.
- Cellulite – Waste cannot be left in the blood so the substances are moved away from the vital organs and they are typically stored in the fatty tissue of the thighs.

What can I do about it?

The spectrum of what could be irritating your intestine is vast. Common irritants or allergens include corn, dairy, eggs, nuts, wheat and grains containing gluten, soy and shellfish. Lack of balance in exercise and sleep can also affect digestion as well as emotions and the balance of good and not-so-good bacteria present.

The 4Rs are recommended to aid your gut back to health:<sup>6</sup>

- REMOVE factors causing inflammation. Eat a whole food diet and avoid processed drinks, flours and sugar. Eliminate corn, dairy, eggs, nuts, wheat, soy and shellfish.
- REPLACE nutrients vital for digestion including digestive enzymes (protease, lipase, amylase and pepsin) and hydrochloric acid.
- REINOCULATE to help regain a healthy microflora by eating fermented foods, taking prebiotics and probiotics.
- REPAIR the lining of your gut through good nutrition.

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#### References

<sup>4</sup> Langdon A et al. *The effects of antibiotics on the microbiome throughout development and alternative approaches for therapeutic modulation.* *Genome Med* 2016;8:39.

<sup>5</sup> Dr. Libby [www.drlibby.com](http://www.drlibby.com)

<sup>6</sup> Valerie Sjöberg, L.Ac. *Heal Your Gut with the 4R Program* [www.chopra.com/articles/heal-your-gut-with-the-4r-program#sm.00001so166cbs0f1bqts6hzpp6ozu](http://www.chopra.com/articles/heal-your-gut-with-the-4r-program#sm.00001so166cbs0f1bqts6hzpp6ozu)

Some simple action steps you can take for gut health:

- Drink plenty of water.
- Eat plenty of fermentable fibres (sweet potato, yams, leeks, onion, garlic).
- Eliminate the common irritants and food toxins.
- Eat fermented foods like kefir, yoghurt, kimchi, pickles and sauerkraut as well as probiotics under the guidance of a doctor or nutritionist.
- Manage your stress. 



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