

Optimise Your Gut Health

Our digestive system starts at the mouth and includes the oesophagus, stomach, duodenum, small and large intestines, rectum and anus. From beginning to end, the adult digestive system is estimated to be around 9-metres long. It is designed to turn the food we eat into microscopic particles that our cells can use for energy, maintenance, growth, and repair.

Gut Flora / Intestinal Microbiota

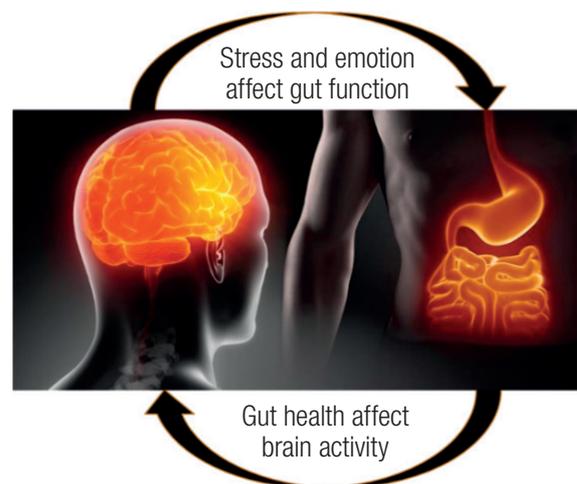
Our gastrointestinal tract is inhabited by 1×10^{13} to 1×10^{14} microorganisms called microbiota. Although estimates do vary, it has been said that there are more than 10 times the number of microbiota compared to the number of cells in our entire body. Adult microbiota comprises more than 1,000 species and more than 7,000 strains and they have numerous important roles in our body, including:

- producing vitamins and minerals, including B-vitamins
- safeguarding us from external pathogens
- aiding in the metabolism of sugars and lipids
- modulating intestinal motility
- influencing our immune response
- supporting intestinal barrier homeostasis (intestinal permeability)
- producing hormones and neurotransmitters
- aiding metabolism of medications



The Bi-Directional Gut-Brain Communication

We have appreciated the impact that the brain has on our gut function for some time. Many gut conditions are often blamed on stress and poor mental health. However, we are now beginning to understand that the health of our gut also has an influence on our mental health and general brain function. This is called the bi-directional gut-brain communication. It seems that our brain can affect our gut and our gut can affect our brain. When either is compromised it can lead to a snowball effect where one exacerbates the other and problems do not resolve until one, or both, are corrected. The gut is said to influence our brain through our microbiota, the integrity of our gut lining, inflammatory processes in our gastrointestinal tract, and its ability to break down foods and absorb essential nutrients. It is becoming increasingly understood that if you want to have a healthy brain, you must also have a healthy gut.



It seems that the balance of the different strains and species of our microbiota is important for our general health. When there is an imbalance in the composition of our intestinal microbiota, a condition known as intestinal dysbiosis results. This can lead to biological disturbances that can affect our whole body, including our brain. In figure on the opposite page, some of the main agents that can lead to intestinal dysbiosis are detailed. There is some research to suggest that people with depression and anxiety have a different microbial composition compared to healthy individuals²⁵.

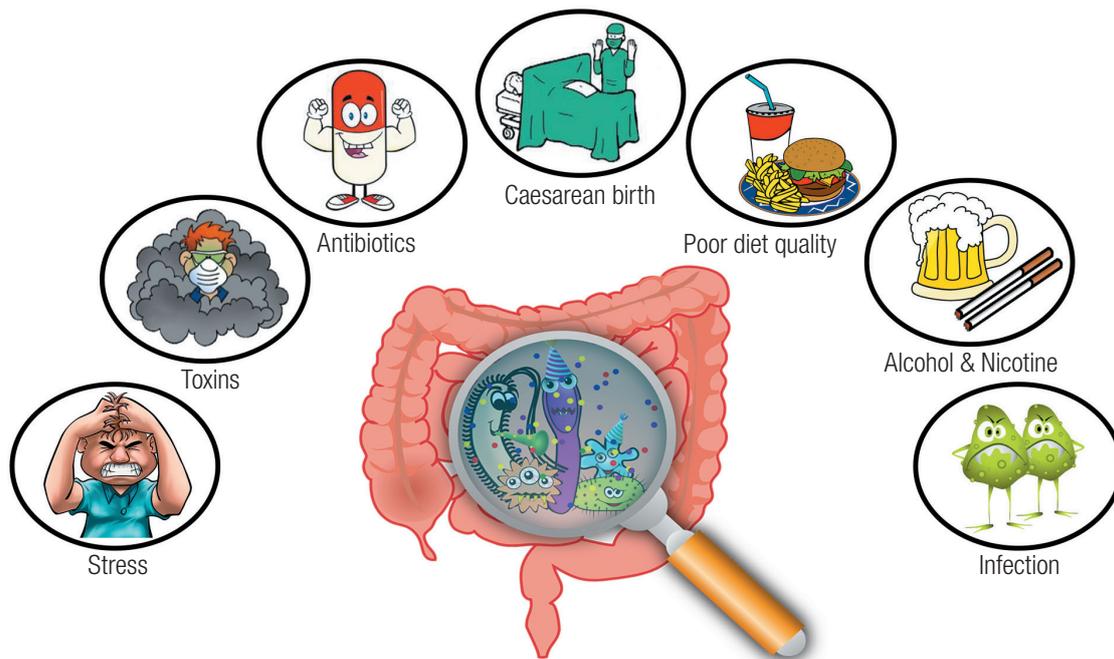


Figure: Lifestyle and Environmental Factors Affecting Our Intestinal Microbiota

HOW GUT MICROBIOTA AFFECTS MENTAL HEALTH

- Influences the stress response (fight or flight response)
- Affects neurotransmitter production such as GABA (anxiety), serotonin (depression & anxiety), and dopamine (depression, bipolar disorder, & schizophrenia)
- Influences the immune system and inflammatory processes
- Promotes neurogenesis/ neuroplasticity (e.g., increases levels of brain-derived neurotrophic factor)
- Influences activity of the vagus nerve which is responsible for the parasympathetic “rest and digest” nervous system

Intestinal Permeability (Leaky Gut)

Throughout our intestinal tract we have a tight lining of cells. A healthy intestinal lining allows only properly digested fats, proteins, and carbohydrates to pass into our bloodstream and lymphatic system. It also acts as a barrier to keep out bacterial products, foreign substances, and large undigested molecules. However, damage to the intestinal lining can lead to a condition known as ‘intestinal hyperpermeability’, or a ‘leaky gut.’ The tight junctions between cells become too permeable (leaky) which allows toxins, microbes, and undigested food particles to enter the bloodstream. This triggers an immunological and inflammatory response which can have devastating effects on our whole body, including our brain. There are some studies to show that adults with depression and other mental health disorders suffer from a greater prevalence of leaky gut²⁶. Lifestyle and dietary factors that can damage the intestinal lining are summarised in the figure on the opposite page. You will notice that many of these are similar to the factors that can contribute to intestinal dysbiosis.

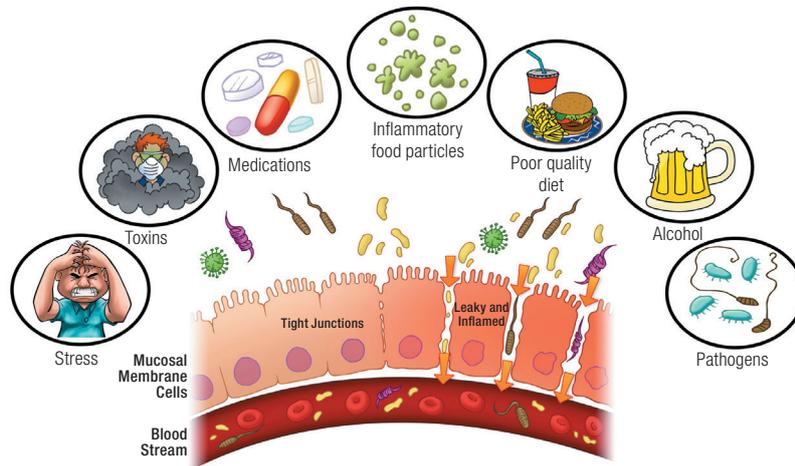


Figure: Lifestyle and Environmental Factors Affecting Intestinal Permeability (Leaky Gut)

Could a compromised gut function be affecting your mental wellbeing?

Given the significance of gut health on our brain function, it is important to determine if disturbances in your gastrointestinal tract may be having a negative effect on your mental health. If you suffer from any of the symptoms detailed in the following box or present with some of the risk factors, then it is important to introduce changes to improve the health of you gastrointestinal system. Even if you do not suffer from many symptoms or have minimal risk factors, taking steps to improve your gut health makes sense to enhance the overall health of your brain and body.

Symptoms and risk factors associated with compromised gut function

Place a mark if you regularly suffer from the following symptoms	Mark any of the risk factors below that apply to you.
<input type="checkbox"/> Diarrhoea	<input type="checkbox"/> Diagnosis of any digestive disorder
<input type="checkbox"/> Constipation	<input type="checkbox"/> Current/ historical use of medications
<input type="checkbox"/> Stomach bloating	<input type="checkbox"/> Antibiotics
<input type="checkbox"/> Soft/ hard stools	<input type="checkbox"/> Antacids
<input type="checkbox"/> Excess wind	<input type="checkbox"/> Laxatives
<input type="checkbox"/> Burping	<input type="checkbox"/> Anti-inflammatories
<input type="checkbox"/> Extended fullness after meals	<input type="checkbox"/> Ulcer medications
<input type="checkbox"/> Food allergies/ intolerances	<input type="checkbox"/> History of gastrointestinal infections
<input type="checkbox"/> Abdominal cramps	<input type="checkbox"/> Poor diet
<input type="checkbox"/> Acid reflux/ indigestion	<input type="checkbox"/> Excess alcohol consumption
<input type="checkbox"/> Undigested food in stool	<input type="checkbox"/> Smoking
<input type="checkbox"/> Foul-smelling breath	<input type="checkbox"/> Illicit drug use
<input type="checkbox"/> Intolerance to high-fat foods	<input type="checkbox"/> High stress
<input type="checkbox"/> Muscle aches and pains	<input type="checkbox"/> History of stomach ulcers
	<input type="checkbox"/> Regular use of antibiotics during childhood

