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INTRODUCING YOUR
GUT BACTERIA



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The Microbiome

- Our microbiome is one of the most complex systems in the body and one we are just beginning to understand.
- It is great to know all that it does for us but in the end the most important information is going to be what you can do for it and how to feed it
- A healthy microbiome will do right by you and you do not need to worry about what it is doing
- The issue is what do you do when you do not have a healthy one

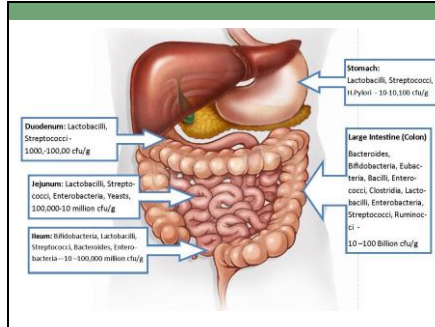


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Microflora

- Intestinal flora 1.5 kg
- We would die with 5 years of birth if we did not have them as we would not develop a proper immune system
- 1000 species and 5000 strains
- 100,000 billion viable microbes in the intestines
- 1000 billion viable microbes on the skin

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Microbiome

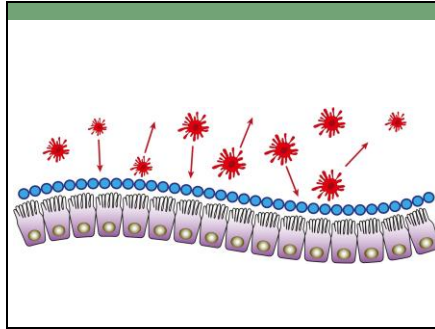
- Each of us is unique – the microbiome is like a finger print
- Anywhere we have a mucosal surface we have good bacteria – oral cavity, respiratory tract, gastrointestinal tract, genito-urinary tract, skin - each one is different
- Very complex dynamic community
- 80% of our immune system is in the gut and in constant communication with the good bacteria

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Gut Microflora

- 50 % of poo consists of bacteria
- Microflora produces 2 litres of gas per day
- Carpet of micro-organisms on the epithelial layer protects bad bacteria from entering
- Yeast can only cause problem if the yeast can attach to cell receptors – good bacteria can protect the layer and prevent attachment.
- Antibiotic resistance means that our pathogenic bacteria has become resistant to the antibiotics

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What is Normal Microflora?

- It is the microbes that reside within the human gastrointestinal, urogenital tract and skin etc.
- It is both persistent and stable and under normal circumstances, does not elicit an acute immune response
- It represents 85 % of the total microbes in the gastro intestinal system
- Good bacteria in the GIT migrates to colonize the urogenital tract and the vaginal tract

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Dysbiosis

A diagram showing a cross-section of a mucosal surface. The surface is covered by a layer of blue, oval-shaped cells. Below this layer is a layer of purple, rectangular cells. Red, star-shaped microbes are shown on the surface, with red arrows pointing towards them, indicating an immune response.

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Types of Organisms in The Gut

- Good bacteria such as lactobacillus, bifidobacterium, basillus
- Bad bacteria such as Clostridium (C. Difficile), E. Coli, Streptococcus
- Fungi such as Aspergillus Niger
- Yeast such as Candida Albicans



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Immune tolerance

- We have immune tolerance to good bacteria just like we do to a baby during the pregnancies and ourselves
- If we develop an intolerance to the good bacteria
 - inflammation and chronic conditions of colitis, Chrohn's etc.
- Resolving allergy and autoimmunity is re-establishing immune tolerance to bacteria

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The Normal Human Microflora-Adult

- The intestinal residentail microflora reaches its adult composition and is fully formed by age 2
- How it develops is dependent on baby consuming all the major food groups during this time and environmental and genetic factors
- Residential bacteria potential is also set by age 2



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Residential Flora

- Is acquired rapidly during & after birth
- Changes continuously throughout life
- Reflects the age of person
- Reflects the nutrition of person
- Reflects genetics of person
- Reflects environment of person
- Reflects sex of person



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Adult Microflora

- Adult microflora is subject to change based on diet, stress, antibiotics
- A theory of aging - the increase of bad bacteria producing toxic substances in the large bowel is a factor of aging
- Bad bacteria, which are part of the normal gut flora, produce toxic substances such as ammonia
- Good bacteria must exist in higher numbers to protect us
-85% of total microbes



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Diversity

- The bacteria that is native to you is known as residential bacteria
- The amount and diversity of these strains develops in each of us by the age of two
- Many factors determine how well we develop our microbiome when we are infants
- Stress, diet, lifestyle, drugs especially antibiotics all play a role in how we maintain our microbiome
- We lose diversity and microorganisms when we are older but should we?

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Current research

- Is focused on diversity – so the types of good bacteria and number of strains
- Many health conditions are linked to lack of diversity
- Exposure to the outside world increases diversity
- Rural Africans have greater diversity because they are exposed to more dirt and nature (and lower incidence of common intestinal disorders as well as lower levels of heart disease, cancer and diabetes, obesity and allergies)

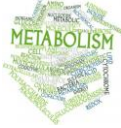


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Weight Loss

- Lack of diversity has been cited in numerous conditions for westernized cultures
- The latest is for weight gain and weight loss
- Lack of diversity has been link to weight gain
- A recent study has linked fibre to promoting more diversity in favour of bacteria that are better for utilizing carbs, proteins and fats and better vitamin and mineral absorption which improves metabolism

– Holscher et al., 2014



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Small Intestines

- The length of the small intestines is 20 feet
- Average transit time is 2 hours
- Flow rate faster than colonization rate
- It is necessary for the bacteria to attach in order for the good bacteria to colonize
- Bacterial layer one cell thick
- Digestion is completed and nutrients are absorbed into the blood stream in the small intestines



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Large Intestines

- Length of the large intestines is about 6 feet
- Flow rate slower (18 -24 hours) than colonization rate
- Attachment is not necessary for colonisation
- Bacterial layer in mucous up to 200 cells thick
- Waste material is eliminated through the colon



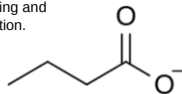
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- This means it is far easier to maintain or re-establish proper levels of good bacteria in the colon than in the small intestine
- It also explains the why there is so much more bacteria in the colon than the small intestines
- This is why there is so much digestive distress, leaky gut, food allergies etc.
- This means strategies must focus on protection and nutrition for the microflora in the small intestines

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Nutrients For Energy

- The small intestines need glucose and glutamine for energy and the colon needs short chain fatty acids such as butyrate
- The colon ferments carbohydrates to produce short chain fatty acids (SCFA) which provide the energy for the colon and are also used throughout the body
- SCFA are essential for brain health, stabilizing blood sugar, protecting the gut lining and helping to control inflammation.



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Gut Flora Is Essential For...

- Aids the digestion of all foods
- Works synergistically with all nutrients to aid absorption
- Involved in the production of specialty enzymes such as lactase
- Increase the bioavailability of phytonutrients and makes them more beneficial
- Regulates inflammation in the body
- For antibody development
- Developing of 'immune tolerance' mechanisms
- Decreasing susceptibility to infection



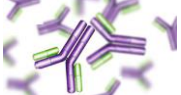
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- Helps detox out toxins and heavy metals
- Produces neurotransmitters and short chain fatty acids for the brain and communicates with the brain
- Helps to stabilize blood sugar, regulate blood pressure, prevents allergies and autoimmune conditions from developing,
- Lowers cortisol levels, helps with depression and brain function by improving memory and cognitive ability
- **Protects the gut lining and prevents leaky gut**

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Good Bacteria and The Immune System

- Drives the development of the our antibody system, our cell-mediated immunity and all immune tolerance systems during the neonatal period
- 'Enables' the immune systems to give the correct response to food and environmental substances
- Makes sure the immune system to reacts quickly and appropriately to potential pathogens



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Brain Gut Connection

- Communication goes both ways
- A healthy gut sends the right signals to the brain and a healthy brain sends the right signals to the gut
- Stress can adversely affect the gut, causing changes in gastrointestinal motility and secretion
- It can have a negative effect on regenerative capacity of gastrointestinal lining and blood flow
- Having a negative effects on intestinal microflora
- It can also inhibitive nutrient absorption and digestive enzyme output

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Gut To Brain

- The gut makes neurotransmitters and has a direct connection to the brain
- Probiotics and prebiotics have been shown to modify brain chemistry reducing anxiety and creating a more positive focus
- Studies show they can also help decrease cortisol levels and stimulate other neuroendocrine responses



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Good Bacteria

- Is anerobic and is know primarily as lactic acid bacteria (LAB)
- The two main species are the lactobacilli and the bifido bacterium
- The production of lactic acid changes the ph of the intestinal tract making it more synergistic for good bacteria and less optimal for bad bacteria and yeast
- Good bacteria can have a synergistic relationship with yeast and fungus to produce helpful enzymes
- Good bacteria are considers gram-positive and bad bacteria is considered gram-negative

In Conclusion

- Many aspects of the gut bacteria are not well understood
- It is the subject of a lot of current research and so information will be changing as researchers
- It is important that we know how the good bacteria can help us or how lack of it can be related to our health concerns
- More importantly, how we support the health of the good bacteria will be the key to securing better health outcomes.

