THE IMPORTANCE OF DIGESTIVE HEALTH

An introduction to our bacterial masters!

By Darren J Sassall ND.
“Once the diversity of the microbial world is catalogued, it will make astronomy look like a pitiful science.”
Julian Davies, Professor Emeritus, Microbiology and Immunology, UBC
“The lining of your gut is as thin as an eyelid. It takes just four days to regenerate itself and over a lifetime, it will help process 25 tonnes of food. It is far more sensitive and permeable than your skin and is the true interface between your body and the outside world”.

Anthony Haynes, clinical nutritionist and founder of The Nutrition Clinic in London
An Introduction to your GIT

- The gastrointestinal (GIT) system is one of the most underappreciated systems in the body. It has a profound impact on our health, function, and well-being — both physical and emotional.

  “Death begins in the colon.”
  (Nobel prize winner and microbiologist Elie Metchnikoff)

- Based on his years of research in the early 1900’s, Metchnikoff concluded that disease and aging are mostly due to toxic bacteria in the gut.

- While that idea may seem a bit farfetched, when you have an understanding of the havoc that a dysfunctional gastrointestinal system has on the body, his theories suddenly become far more plausible.

  “The gut is always right.”
  Sharon Osbourne (Ozzy’s wife)
Old World Masters!
What are the functions of the gut?

- **Protection** – barrier to outside world, defence against bacteria, viruses, assorted pathogens and toxins.
- **Provides fuel** – breaks down food into glucose, amino acids and fatty acids.
- The absorptive surface of the GI tract is 200 times larger than the surface area of the skin (400 msq - the surface area of a regulation sized singles tennis court).
- **Eliminates waste**
- Provides a home for 100 trillion bacteria - more bacteria than there are known stars in the sky.
- 95% of the bodies “feel good brain chemical” serotonin is manufactured in the gut.
- The largest part of the immune system (80%) is found in the GALT (gut associated lymphoid tissue).
What are the functions of the gut?

- There are more neurons in the small intestine than in the entire spinal cord.
- It is the only system in the body that has its own, independently operating nervous system, called the enteric nervous system.
- All the neurotransmitters found in the brain are found in the gut.
- More than 400 bacterial species: half of the wet weight of colonic material (around 4 kg) is due to bacterial cells, whose numbers are around 20-fold the number of tissue cells forming the human body.
- Again, this means we have far more non-human cells and DNA in our bodies than human – are we then little more than walking bacterial super colonies?
Importance of GI health

Suffice it to say, if the body allocates this many resources to one particular system, it must be important. In fact, we should start treating our gut with care if we are interested in weight loss, muscle gain or overall health in general.
Fish don't get away with silent gas.
The role of bacteria in the gut

- Bacterial colonization of the gut begins at birth, as newborns are maintained in a sterile status until the delivery begins, and continues throughout life, with the populations of bacteria changing as the child ages.

- Bacteria provide the ‘software’ to drive our Human ‘hardware’ – a quarter tsp of fecal matter contains 100 million terabytes of information!

- Two tsp holds more information than all the computers currently in existence or data stored on a pile of CD’s reaching to the moon. Dr David Perlmutter
The role of bacteria in the gut

- One important role of intestinal microflora is the “barrier effect”, a mechanism used by bacteria already present in the gut to maintain their presence and to avoid colonization of the same intestinal sites by other microorganisms, including pathogens.
The role of bacteria in the gut

Functions of good bacteria:

- Regulate peristalsis and bowel movements
- Break down bacterial toxins
- Make vitamins (B1, B2, B3, B5, B6, B12 and K) and aid in absorption.
- Digest protein into amino acids (for use by the body)
- Produce antibiotics and antifungals
- Help breakdown sugars, lactose and oxalates
- Support immune system and increase number of immune cells.
The role of bacteria in the gut

- Reduce inflammation
- Balance intestinal pH
- Produce protective mucous for intestinal walls
- Regulation of fats (triglyceride and cholesterol regulation)
- Detoxification
- Protect against environmental toxins: mercury, pesticides, pollution
- Studies correlate decreased risk of asthma when infants are given probiotics.
The role of bacteria in the gut

- Inhibit binding/colonisation of pathogenic bacteria
- Improve epithelial function (wall of GI tract) and aid healing of tissues ensuring barrier integrity (preventing ‘leaky gut’).
- Increase immune regulation
Pathogens often become established when the integrity of the microbial flora is impaired through:

- Stress
- Illness
- Antibiotic treatment
- Changes in diet
- Or physiological alterations in the gut.
Trouble in paradise

You make me SICK!

When germ relationships go bad
Trouble in paradise

If you have any symptoms such as...

- gas
- bloating
- burping after meals
- inadequate digestion (feeling like you have a brick in your stomach after you eat)
- undigested food in your stools
- foul smelling stools
- constipation
- diarrhea
- burning in the stomach
- bad breath
- nausea
Trouble in paradise

...you can be sure you have some type of gastrointestinal dysfunction.

However, many other symptoms typically aren’t experienced in our GI systems. Often, things like hormonal imbalances, behavioral disorders, depression, migraines, allergies, eczema and autoimmune disease all can be traced back to GI system problems.

“All disease begins in the gut”

Hippocrates, the father of modern medicine.
Trouble in paradise

- Bottle-feeding along with over-use of antibiotics and use of the contraceptive pill has set the stage for increasingly abnormal gut flora with each passing generation.

- Add to that a diet of processed junk food and excessive consumption of high fructose corn syrup and you have a prescription for disaster in terms of intestinal health.

- It's important to realize that processed foods and sugar almost exclusively feed pathogens in your digestive system, allowing them to proliferate.
Increased Intestinal Permeability or Leaky Gut Syndrome
Leaky Gut Syndrome (LGS) is a condition in which the ability of the intestinal wall to keep out large and undesirable molecules is reduced. Substances that are normally kept within the intestines are "leaking" across the intestinal wall. This happens when the spaces between the cells of the intestinal wall become enlarged; macromolecules, antigens and toxins will then make their way to the bloodstream.
Leaky Gut Syndrome

Factors affecting mucosal immune system resulting in intestinal barrier dysfunction, autoimmunity and nervous system abnormalities

Dietary Proteins & Peptides  Antibodies  Drugs & Xenobiotics  Physical Stress  Infections  Cytokines  Neurotransmitters  Enzymes

INTESTINAL BARRIER DYSFUNCTION
FOOD ALLERGY & INTOLERANCE
IMMUNE SYSTEM ABNORMALITIES
AUTOIMMUNITY

INFLUENCE ON THE BLOOD-BRAIN BARRIER AND NEUROAUTOIMMUNITY
Conditions associated with LGS

- Allergic disorders
- Ankylosing spondylitis
- Arthritis
- Asthma
- Autism
- Coeliac disease
- Chemotherapy
- Childhood hyperactivity
- Chronic fatigue syndrome
- Crohn’s disease
- Cystic fibrosis
- Eczema
- Endotoxemia
- Environmental illness
- Food allergies or sensitivities
- Giardiasis
- HIV positive
- Hives
- Inflammatory bowel disease
- Intestinal infections
- Irritable bowel syndrome
- Liver dysfunction
- Malabsorption
- Malnutrition
- Multiple Sclerosis
- Multiple chemical sensitivities
- NSAID enteropathy
- Pancreatic insufficiency
- Psoriasis
- Rheumatoid arthritis
- Schizophrenia
- Systemic lupus erythematosus
- Thermal injury
- Trauma
- Ulcerative colitis
Symptoms associated with LGS

- Abdominal pain
- Aggressive behaviour
- Anxiety
- Asthma
- Bed wetting
- Bloating
- Chronic joint pain
- Chronic muscle pain
- Confusion
- Constipation
- Diarrhoea
- Fatigue and malaise
- Fevers of unknown origin
- Fuzzy thinking
- Wind
- Indigestion
- Mood swings
- Nervousness
- Poor exercise tolerance
- Poor immunity
- Poor memory
- Primary biliary cirrhosis
- Recurrent bladder infections
- Recurrent vaginal infections
- Shortness of breath
- Skin rashes
- Toxic feelings
The emerging links between our **gut microbiome and the central nervous system** are regarded as a paradigm shift in neuroscience with possible implications for not only understanding the pathophysiology of stress related psychiatric disorders, but also their treatment.

Frontiers in Cellular Neuroscience. October 2015. 9 - 392
Immune response to bacterial toxins
Molecular Mimicry – the gut and autoimmune disease
Gluten and Celiac disease

Depiction of the intestinal mucosa with emphasis on the factors involved in the development of celiac disease in individuals with HLA-DQ2/DQ8 positive.

Factors: MECHANICAL STRESS, CHEMICAL INJURY, INFECTIONS, Bacterial toxins, Dietary gluten peptides, Gluten deamination and cross-linking by tTGase, Production of proinflammatory cytokines (TNF-α, IFN-γ), Production of IgG, IgM, IgA antibodies to gluten, transglutaminase, tight junction proteins and other tissue proteins.

Processes: Damage to fibroblast and endothelial cells, Increased cross-linking activity, Release of tTGase and activation, Release of tight junction proteins, Further contribution to autoimmunity, Mucosal destruction and epithelial cell apoptosis.
Food Sensitivity – Allergy or Intolerance?

**Terminology**

- **Adverse Reaction to Food**
  - **Immunemediated**
    - IgE: **Type I Allergy**
      - Classic ‘Allergic’ Reaction
    - IgG: **Type III Allergy**
      - ‘Food Intolerance’
  - **Non-immunemediated**
    - Enzyme Deficiency
    - Pharmacological Effect
    - Chemical Effect

Common Terminology: Food Intolerance
Food Sensitivity – Allergy or Intolerance?

- Food intolerance is different to food allergy
- Reaction is not immediate
- Symptoms are many and varied
- Symptoms are the result of the immune system being overloaded
- Overload can be a result of a compromised immune system or increased gut permeability
- 95% of people have IgG antibodies and these can be high in people without symptoms
Food Sensitivity – Allergy or Intolerance?

- **Allergy (Immediate onset)**
  IgE-mediated, skin test positive, often self-diagnosed. Classical and permanent.

- **Intolerance (Delayed onset)**
  IgG-mediated, skin test negative, rarely self-diagnosed. Are Cyclic and associated with Food Intolerance.
Food Sensitivity – Allergy or Intolerance?

- Partially digested food allergens produce opioid chemicals that increase your appetite and decrease your metabolism.
- The more you eat the worse it gets.
- These foods can make you feel “high”, can produce cravings and generally mess with brain chemistry.
- It’s like using your mobile phone with one bar of reception rather than 5 – you miss every second word, it drops out occasionally, misunderstandings occur and it makes communication very difficult.
Food Sensitivity – Allergy or Intolerance?

- Continued eating of suspect / reactive food perpetuates the problem whereas avoidance decreases symptoms.
- The way forward for resolution is ‘fixing the gut’ – you remove the cause and you have no symptom.
- Treating in this way allows for reintroducing of problem foods over time as the gut heals.
- Yes you avoid reactive foods in the short term to enable healing, but the expansion of the diet over time rather than restricting food choices is the goal.
An infinite number of internal and external insults produce injury to all cells. The initial acute defensive response to protect the cell from damage and contain the insult is appropriate and correct. However, if the insult(s) continue, then the cell (organ) becomes damaged as an innocent bystander. The processes inherent in this are similar in all cells (organs) and lead to specific recognizable patterns of response which are later defined as a “disease” in each respective organ. Thus, cardiovascular disease, neurological disease, gastrointestinal disease and cancer, all have similar processes. The finite measurable responses are inflammation, oxidative stress and immune dysfunction.
Infinite insults - Finite response
An introduction to our Bacterial Masters!
SUPPORT BACTERIA!

it's the only culture some people have
The strain of bacteria is the key

Each probiotic strain, independent of its genus and species is unique and, thus, the properties and the human health effects of each strain have to be assessed in a case-by-case manner.

Lactobacillus (Genus)
Acidophilus (Species)
NCFM (Strain)
Types of bacteria in the gut

The small intestine has a bacterial load that consists of anaerobes such as lactobacilli, streptococci, enterobacteria as well as *Bifidobacterium* spp., *Bacteroides* spp., and clostridia at levels of \(10^4–10^8\) colony forming units (CFU) per mL.

The colon is more heavily colonized, with a total population of \(10^{11–10^{12}}\) CFU/mL of contents. The colonic microflora is dominated by strict anaerobes such as *Bacteroides* spp., *Clostridium* spp.
This figure outlines the intestinal bacterial populations and their effects, positive or negative, on health.
E. coli bacteria
Staph. bacteria
Microbe colony
Eshel ben Jacobs bacterial vortices
Staph aureous biofilm
10 Tips For A Healthy Gut

1. Breastfeed for at least a year to promote growth of beneficial bacteria.

2. Chew well to enable salivary enzymes to digest food.

3. Limit drinks with meals because liquid dilutes digestive enzymes.

4. Limit medications that destroy good gut bacteria (antibiotics destroys good as well as bad bacteria), the birth control pill (increases estrogen levels which alters the pattern of bacterial growth).

5. Eat foods that have been prepared for easy digestion; slow cooked meats, fermented grains, soaked seeds and nuts, cultured dairy.
10 Tips For A Healthy Gut

6. Work with a skilled professional to treat gut dysbiosis, gut permeability, food allergies (IgG, IgE and other tests).

7. Limit/eliminate wheat, dairy, soy and corn which all contain hard-to-digest proteins.

8. Rotate foods for variety and eat 15-20 different food types in a day to enable a good intake of a wide variety of phytonutrients that support gut and overall health.

9. Avoid additives as they often trigger inflammation. Benzoids and nitrites interact with bacteria to create carcinogens in the gut.

10. Avoid/limit processed foods, especially high GI foods such as sugar and carbohydrates, as these feed gut germs (bacteria, yeast...).
Fermented Foods – rich in probiotics

- Raw sauerkraut
- Kombucha
- Kefir (dairy or coconut based)
- Dairy based yoghurt (see www.progurt.com.au)
- Fermented food products (pickles, miso, tofu etc)

Pre-biotics are non digestible fibres and are the food source for good bacteria (pro-biotics). Examples include: inulin, fructooligosaccharides, larch arabinogalactans
Diet and lifestyle guidelines

- Ensure your diet is fibre-rich and consists of fresh vegetables, fresh or frozen fruit, fresh ocean fish, rice, and green leafy salads with vinegar and olive oil.

- Fibre and water are both important for bowel regularity. Consider replacing caffinated and carbonated drinks with clean water.

- Aim to maintain a good balance between soluble fibre (such as an apple) and insoluble fibre (such as oats, which produces a larger, firmer stool).

- Avoid alcohol, tobacco, caffeine, refined sugars and processed foods including sweet snacks and bottled juices.

- Avoid food or drinks containing preservatives E220 through to E227.
Dietary and lifestyle guidelines

- At least 30 minutes of physical exercise is recommended daily. Try to participate in as much extra physical activity as possible, such as walking barefoot outdoors.

- Try to incorporate sunshine and saltwater into your routine. Increase your amount of daily sunlight exposure so you can also absorb more Vitamin D.
Take Home Message

- Drink clean water
- Eat healthy, antioxidant rich, non-toxic food
- Let go of negative toxic thoughts (the body and mind are one and an imbalance in one affects the other).
- Get plenty of pure sunshine, sunscreen free
- Remember to laugh and play

“If you heal the gut, you heal the brain”
Need some help?
Contact us today...

www.corenaturopathics.com.au
Phone 1300 855 008