The Microbiome & how Gut Health can Influence the Musculo-Skeletal System.
About Me

• I studied Osteopathy at Victoria University, and graduated in 2000.
  • Bachelor of Science (Clinical Science)
  • Masters of Health Science (Osteopathy)

• I studied to be a Health Coach through IIN in 2015

• I started studying Naturopathy 3 times over the past 20 years before finally starting and finishing my qualifications through AIAS, graduating in early 2018.
  • Advanced Diploma of Naturopathy

• I also studied Nutritional Medicine through AIAS, graduating in early 2018.
  • Advance Diploma of Nutritional Medicine
“Osteopathic healthcare includes a thorough primary care assessment and the application of a range of manual therapies and health promotion strategies tailored to the individual, that aim to optimise function and health” [1].

“Osteopaths use multiple clinical approaches including manual therapy, exercise advice and prescription, lifestyle advice and education where appropriate”.

Aims of this Webinar

• Give an overview of Gut Health, probiotics and prebiotics.
• Help Osteopaths feel more confident to offer advice to patients in terms of nutritional advice, while still staying within scope of practice
• Help practitioners prescribe probiotics for common Musculo-skeletal conditions, in an evidence based manner
• Help practitioners understand some common dietary lifestyle advice strategies for common musculo-skeletal conditions
• Help practitioners know where to look for sound nutritional advice
• Help practitioners know where to look for and purchase supplements
• Help practitioners know where to look for, and how to offer appropriate testing to patients.
Disclaimer
The GIT

- Forms a 9 metre long ‘tube’ from mouth to anus
- It’s surface area covers between 240-400 m²
- About the size of a tennis court
The Microbiome

• Can be considered an additional human organ
  • This ‘microbe’ organ weighs 1-1.5kg

• The Human GIT microflora contains $10^{14}$ CFU/ml viable microorganisms
  • This is 10x the number of cells in the human body
  • From over 1000 different species

CFU = Colony Forming Units
The Microbiome

- **Stomach & Duodenum**
  - $10^1$-$10^3$ CFU/ml
    - Lactobacilli
    - Streptococci
    - Yeasts

- **Jejunum and ileum**
  - $10^4$-$10^8$ CFU/ml
    - Lactobacilli
    - Enterobacteriaceae
    - Streptococci
    - Bacteroides
    - Bifidobacteria

- **Colon**
  - $10^{10}$-$10^{12}$ CFU/ml
    - Bacteroides
    - Bifidobacteria
    - Streptococci

- Fusobacteria
- Enterobacteriaceae
- Clostridia
- Veilonella
- Lactobacilli
- Proteus
- Straphylococcus
- Pseudomonas
- Yeasts

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Dr. Andrea Robertson
Osteopath - Naturopath - Nutritionist
The Microbiome

- The colonic microflora is believed to be the most important part of the GIT microflora.
- The bacterial concentrations here are greater than anywhere else in the GIT.
- Bacteria can be either:
  - Potentially harmful
  - Health promoting
Health benefits of the colonic microbiome.

- Modulate the immune system
- Enhanced GIT motility and function
- Improved digestion and nutrient absorption
- Production of vitamins
- Xenobiotic metabolism
- Colonisation resistance
- Production of SCFAs
- Production of polyamines
- Weight management
Eubiosis

The normal state of affairs in the health GIT.

Dysbiosis

Qualitative and quantitative changes in the intestinal flora, their metabolic activity or their local distribution that produces harmful effects on the host.

Modern diet and lifestyle, as well as the use of pharmaceutical drugs, has lead to the disruption of the normal intestinal microflora and/or its activities [2].

Dysbiosis

Dysbiosis is believed to play a part in many chronic and degenerative diseases.

Two types:
• Small intestinal dysbiosis
  • Small intestinal bacterial overgrowth (SIBO)
• Colonic dysbiosis

Causes of Dysbiosis

• Antibiotics
• Chemotherapy
• Stress
• C-section delivery
• Birth location
• Formula feeding
• Diet
  • Sulphates & Sulphites (preservatives)
  • High protein diet
  • Diet high in animal protein
  • Diet high in fat
  • Diet high in milk fat
  • Diet high in refined carbohydrates
  • Artificial Sweeteners
Examples: Dysbiosis & the MSK system.
Diet, Microbiota, and Gut Permeability-The Unknown Triad in Rheumatoid Arthritis.

Guerreiro CS¹,², Calado Å³,⁴, Sousa J¹,², Fonseca JE³,⁵,⁶.

Abstract
Growing experimental and clinical evidence suggests that a chronic inflammatory response induced by gut dysbiosis can critically contribute to the development of rheumatic diseases, including rheumatoid arthritis (RA). Of interest, an adherence to a Mediterranean diet has been linked to a reduction in mortality and morbidity in patients with inflammatory diseases. Diet and intestinal microbiota are modifying factors that may influence intestinal barrier strength, functional integrity, and permeability regulation. Intestinal microbiota may play a crucial role in RA pathogenesis, but up to now no solid data has clarified a mechanistic relationship between gut microbiota and the development of RA. Nonetheless, microbiota composition in subjects with RA differs from that of controls and this altered microbiome can be partially restored after prescribing disease modifying antirheumatic drugs. High levels of Prevotella copri and similar species are correlated with low levels of microbiota previously associated with immune regulating properties. In addition, some nutrients can alter intestinal permeability and thereby influence the immune response without a known impact on the microbiota. However, critical questions remain to be elucidated, such as the way microbiome fluctuates in relation to diet, and how disease activity may be influenced by changes in diet, microbiota or diet-intestinal microbiota equilibrium.
Role of Gut Microbiota in Rheumatoid Arthritis.

Maeda Y1,2,3, Takeda K4,5.

Abstract
Rheumatoid arthritis (RA) is a systemic autoimmune disease, caused by both genetic and environmental factors. Recently, investigators have focused on the gut microbiota, which is thought to be an environmental agent affecting the development of RA. Here we review the evidence from animal and human studies that supports the role of the gut microbiota in RA. We and others have demonstrated that the abundance of *Prevotella copri* is increased in some early RA. We have also used gnotobiotic experiments to show that dysbiosis in RA patients contributed to the development of Th17 cell-dependent arthritis in intestinal microbiota-humanized SKG mice. On the other hand, *Prevotella histicola* from human gut microbiota suppressed the development of arthritis. In summary, *Prevotella* species are involved in the pathogenesis of arthritis.
Obesity


Diet, Gut Microbiota, and Obesity: Links with Host Genetics and Epigenetics and Potential Applications.

Cuevas-Sierra A¹, Ramos-Lopez O¹, Riezu-Boj JI¹,², Milagro FI¹,³, Martinez JA¹,²,³,⁴.

Author information

Abstract

Diverse evidence suggests that the gut microbiota is involved in the development of obesity and associated comorbidities. It has been reported that the composition of the gut microbiota differs in obese and lean subjects, suggesting that microbiota dysbiosis can contribute to changes in body weight. However, the mechanisms by which the gut microbiota participates in energy homeostasis are unclear. Gut microbiota can be modulated positively or negatively by different lifestyle and dietary factors. Interestingly, complex interactions between genetic background, gut microbiota, and diet have also been reported concerning the risk of developing obesity and metabolic syndrome features. Moreover, microbial metabolites can induce epigenetic modifications (i.e., changes in DNA methylation and micro-RNA expression), with potential implications for health status and susceptibility to obesity. Also, microbial products, such as short-chain fatty acids or membrane proteins, may affect host metabolism by regulating appetite, lipogenesis, gluconeogenesis, inflammation, and other functions. Metabolomic approaches are being used to identify new postbiotics with biological activity in the host, allowing discovery of new targets and tools for incorporation into personalized therapies. This review summarizes the current understanding of the relations between the human gut microbiota and the onset and development of obesity. These scientific insights are paving the way to understanding the complex relation between obesity and microbiota. Among novel approaches, prebiotics, probiotics, postbiotics, and fecal microbiome transplantation could be useful to restore gut dysbiosis.
Obesity

[Physiological patterns of intestinal microbiota. The role of dysbacteriosis in obesity, insulin resistance, diabetes and metabolic syndrome].

[Article in Hungarian]
Halmos T.*, Suba P.*

Author information

Abstract
The intestinal microbiota is well-known for a long time, but due to newly recognized functions, clinician’s attention has turned to it again in the last decade. About 100 000 billion bacteria are present in the human intestines. The composition of bacteriota living in diverse parts of the intestinal tract is variable according to age, body weight, geological site, and diet as well. Normal bacteriota defend the organism against the penetration of harmful microorganisms, and has many other functions in the gut wall integrity, innate immunity, insulin sensitivity, metabolism, and it is in cross-talk with the brain functions as well. It's a recent recognition, that intestinal microbiota has a direct effect on the brain, and the brain also influences the microbiota. This two-way gut-brain axis consists of microbiota, immune and neuroendocrine system, as well as of the autonomic and central nervous system. Emerging from fermentation of carbohydrates, short-chain fatty acids develop into the intestines, which produce butyrate, acetate and propionate, having favorable effects on different metabolic processes. Composition of the intestinal microbiota is affected by the circadian rhythm, such as in shift workers. Dysruption of circadian rhythm may influence intestinal microbiota. The imbalance between the microbiota and host organism leads to dysbacteriosis. From the membrane of Gram-negative bacteria lipopolysaccharides penetrate into the blood stream, via impaired permeability of the intestinal mucosa. These processes induce metabolic endotoxaemia, inflammation, impaired glucose metabolism, insulin resistance, obesity, and contribute to the development of metabolic syndrome, type 2 diabetes, inflammatory bowel diseases, autoimmune and carcinogenesis. Encouraging therapeutic possibility is to restore the normal microbiota either using pro- or prebiotics, fecal transplantation or bariatric surgery. Human investigations seem to prove that fecal transplant from lean healthy individuals into obese diabetic patients improved all the pathological parameters. Wide spread use of bariatric surgery altered gut microbiota and improved metabolic parameters apart from surgery itself. Pathomechanism is not yet completely clarified. Clinicians hope, that deeper understanding of complex functions of intestinal microbiota will contribute to develop more effective therapeutic proceedings against diabetes, metabolic syndrome, and obesity.
Adhesive Capsulitis


Adhesive capsulitis: An age related symptom of metabolic syndrome and chronic low-grade inflammation?

Pietrzak M 1.

Abstract

Adhesive capsulitis (AC) is very poorly understood, particularly it's underlying etiology. Obesity and metabolic syndrome, which are strongly associated with chronic low grade inflammation, are becoming increasingly understood to underlie a raft of morbid states including upper limb pain syndromes, diabetes (DM), cardiovascular disease (CVD), cancer and central nervous system dysfunction and degeneration. Notwithstanding age, two of the strongest established risk factors for AC are DM and CVD. The hypothesis argues that similar to DM and CVD, the inflammation and capsular fibrosis seen in AC is precipitated by metabolic syndrome and chronic low grade inflammation. These pathophysiological mechanisms are highly likely to be perpetuated by upregulation of pro-inflammatory cytokine production, sympathetic dominance of autonomic balance, and neuro-immune activation. The hypothesis predicts and describes how these processes may etiologically underpin and induce each sub-classification of AC. An improved understanding of the etiology of AC may lead to more accurate diagnosis, improved management, treatment outcomes, and reduce or prevent pain, disability and suffering associated with the disease. The paper follows on with a discussion of similarities between the pathophysiology of AC to general systemic inflammatory control mechanisms whereby connective tissue (CT) fibrosis is induced as a storage depot for leukocytes and chronic inflammatory cells. The potential role of hyaluronic acid (HA), the primary component of the extracellular matrix (ECM) and CT, in the pathophysiology of AC is also discussed with potential treatment implications. Lastly, a biochemical link between physical and mental health through the ECM is described and the concept of a periventricular-limbic central driver of CT dysfunction is introduced.
How does dysbiosis influence the MSK system?
Dysbiosis

Intestinal Hyperpermeability (Leaky Gut)

Systemic inflammation

In treating musculo-skeletal conditions we need to address systemic inflammation also
Intestinal Hyperpermeability (Leaky Gut)

• What is it?
• How does it come about?
• What can it lead to?
• What to do about it:
  • Reduce stress
  • Reduce toxic load
  • Improve diet
  • Eliminate any dietary irritants
  • Address any parasites, yeast overgrowth and/or bacterial imbalances
  • Improve any bacterial dysbiosis
Intestinal Hyperpermeability

• **Reduce stress**
  - Reduce toxic load
  - Improve diet
  - Eliminate any dietary irritants
  - Address any parasites, yeast overgrowth and/or bacterial imbalances
  - Improve any bacterial dysbiosis
Reduce Stress

- Exercise
- Meditation
- Yoga
- Breathing exercises
- Relaxation techniques
- Float therapy
- Massage
- Osteopathy treatment
- Cranial Osteopathy
- Counseling / Psychology
Intestinal Hyperpermeability

• Reduce stress

• **Reduce toxic load**
  • Improve diet
  • Eliminate any dietary irritants
  • Address any parasites, yeast overgrowth and/or bacterial imbalances
  • Improve any bacterial dysbiosis

Dr. Andrea Robertson
Osteopath - Naturopath - Nutritionist
Reduce Toxic Load

• Reduce use of:
  • Plastic food storage
  • Plastic water bottles
  • Make-up/hair/beauty products with chemicals
  • Cleaning products with chemicals
  • Pesticides
  • Fragrant candles (non-organic)
  • Perfumes (non-organic)
  • Nail polish (non-organic)
  • Sunscreens (non-organic)
  • Spray tans / fake tans (non-organic)

• Reduce intake of:
  • Preservatives
  • Colourings
  • Additives
  • Trans fats

• My favourite online shopping website: www.nourishedlife.com.au
Intestinal Hyperpermeability

- Reduce stress
- Reduce toxic load
- **Improve diet**
  - Eliminate any dietary irritants
  - Address any parasites, yeast overgrowth and/or bacterial imbalances
  - Improve any bacterial dysbiosis
Improve Diet

• Eat fruits and vegetables from all colours of the rainbow, aim for organic
• Eat more greens
• Eat more good fats, less bad fats
• Drink more water
• Eat less processed foods
• Eat less processed sugars
• Drink less alcohol
• If eating meat, not too much, and aim for organic / grass fed

Eat Real Food, Not Too Much, Mostly Plants
Intestinal Hyperpermeability

• Reduce stress
• Reduce toxic load
• Improve diet

• **Eliminate any dietary irritants**
  • Address any parasites, yeast overgrowth and/or bacterial imbalances
  • Improve any bacterial dysbiosis
Eliminate any dietary irritants

• The patient could eliminate one or more of the 3 main common culprits:
  • Gluten
  • Dairy
  • Sugar
• Or they could eliminate any allergens that they think may be specific to them

• The only way to know for sure is to do an elimination diet.
• This is complex and can take months.
• IgG and IgA food intolerance testing is common among alternative health practitioners as an easier option than an elimination diet. I’ll let you know soon why I’m not keen on them.
Eliminate any dietary irritants

• Elimination Diet
  • The patient will need to eliminate all common reactive foods:
    • Wheat
    • Soy
    • Eggs
    • Chocolate
    • Coffee
    • Refined sugars
    • Citrus
    • Dairy
      • Butter
      • Cheese
      • Milk
      • Ice-cream
      • Cream
  • If any of these foods are causing an irritation to the patient, they will notice an improvement in symptoms within 7-10 days.
Eliminate any dietary irritants

- They need to stay on this elimination diet for 1 month.
- After this, the patient will challenge different foods by adding them 1 by 1 back into the diet.
  - They can add their favourite food first and have lots of it over 1-2 days.
  - They need to be observant of any symptoms appearing.
  - They then need to stop eating that food, and wait 3-4 days after all symptoms have settled before repeating the process with the next food to see how that then responds in the body.
  - If no symptoms seem to appear, wait 3-4 days after the 1-2 days of eating that food, before adding the next food in.
- Foods need to be separated, ie for eggs, you would add back in whites separately to yolks.
- You would separate dairy, and test cream, butter, milk, cheese, yoghurt, ice-cream separately
- You would advise the patient to keep a food diary around symptoms
- The challenge takes 3-4 months to work out the worst irritants.
- Once the elimination/challenge is finished, you would advise the patient to stay off all irritating foods for 6-12 months, and then only eat once every 3-4 days, so that if they do eat it, and it causes a reaction, their body has time to settle again before eating it and reacting again.
Eliminate any dietary irritants

- Food intolerance testing
  - Nutripath – IgA and IgG
  - IgA and IgG reactions are known as delayed response reactions, that include food sensitivities, where IgE responses are immediate and are considered a true food allergy. IgA and IgG reactions may not happen immediately, but can take hours or days to show us, causing symptoms related to inflammation like headaches, fatigue, brain fog or joint pain.
  - While you can test for IgG and IgA for food reaction, this is not diagnostic of hypersensitivity or allergy, but sensitivity and intolerance, as well as inflammation. **These tests are controversial as the results are commonly not reproducible** and are not as reliable as elimination diets for working out food sensitivities.
  - You might consider IgG and IgA testing if an elimination diet may be too difficult or time consuming for the patient to undertake.
  - I don’t ever do them with my patients as if the results are not reproducible, then they are not accurate enough for me.

| Allergy Panel IgG GENERAL Foods (96 Foods) - Delayed reaction (Blood Spot) - (Test Code 3206) | 3206 | Almond, Amaranth, Apple, Apricot, Avocado, Banana, Barley, Beans (Kidney, Lima, Pinto), Beef, Beet, Blueberry, Broccoli, Buckwheat, Cabbage, Capsicum (green), Carrot, Casein, Cauliflower, Celery, Cheese (Cheddar, Cottage, Mozzarella), Chicken, Clam, Cocoa, Coconut, Cod, Coffee, Corn, Crab, Cranberry, Cucumber, Egg White (Chicken), Egg Whole (Duck), Egg Yolk (Chicken), Garlic, Gliadin (Wheat), Gluten (Wheat), Grape, Grapefruit, Halibut, Hazelnut, Honey, Lamb, Lemon, Lentil, Lettuce, Lobster, Milk (Cow, Goat), Mushroom, Oat, Olive, Onion, Orange, Papaya, Pea (green), Peach, Peanut, Pear, Pecan, Pineapple, Plum, Pork, Potato (Sweet), Potato (White), Pumpkin, Radish, Raspberry, Rice (white), Rye, Sesame seed, Salmon, Scallop, Shrimp, Snapper, Sole, Soy Bean, Spelt, Spinach, Strawberry, String bean, Sugar cane, Sunflower seed, Tomato, Tuna, Turkey, Walnut, Wheat, Whey, Yeast (Baker’s, Brewer’s), Yoghurt, Zucchini | 1x Allergy Spot Card | $260.00 |
Intestinal Hyperpermeability

- Reduce stress
- Reduce toxic load
- Improve diet
- Eliminate any dietary irritants

- **Address any parasites, yeast overgrowth and/or bacterial imbalances**
  - Improve any bacterial dysbiosis
Address any parasites, yeast overgrowth and/or bacterial imbalances

Stool testing:

- Nutripath: CDSA2 – takes about 3 weeks
  - Nutripath
  - CDSA2
  - Takes about 3 weeks

- Doctors Data – Comprehensive Stool Analysis +/- Parasitology $419 - $499 – from rnlabs.com.au – takes 6-7 weeks.

- uBiome – American company - Takes 6-7 weeks. $99

- Microba – Australian company – Takes about 4 weeks $349
Intestinal Hyperpermeability

- Reduce stress
- Reduce toxic load
- Improve diet
- Eliminate any dietary irritants
- Address any parasites, yeast overgrowth and/or bacterial imbalances

- **Improve any bacterial dysbiosis**
Improve any bacterial dysbiosis

• Probiotics
  • Definition: Live microorganisms which when administered in adequate amounts confer a health benefit on the host
  • Includes:
    • Specific supplements containing freeze-dried bacteria
    • Fermented foods such as yoghurt, sauerkraut, kimchi and kefir

• Prebiotics
  • Definition: a nondigestible food ingredient that beneficially affects the host by selectively stimulating the growth and/or activity of one or a limited number of bacteria in the colon.
Probiotics

Why do you choose a certain probiotic?

- Brand loyalty
- Glossy brochure / educational material
- Rep brings you lunch
- Mega high CFU counts (CFU = Colony Forming Units)
- Multiple species
- Strain Specificity
Probiotics

Characteristics of bacteria (actions and qualities) are strain specific, i.e., strains of bacteria within the same species may vary in regards to:

- Shelf stability
- Resistance to gastric acids and bile salts
- Adherence capacity and method of adherence to the intestinal mucosa
- Colonisation capacity
- Ability to produce anti-microbial compounds
- Clinical efficacy
Probiotics

Strain Specificity

What is a strain?
Bacterial naming system:

<table>
<thead>
<tr>
<th>Genus</th>
<th>Species</th>
<th>Strain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lactobacillus</td>
<td>acidophilus</td>
<td>LA5</td>
</tr>
</tbody>
</table>

- You cannot extrapolate research conducted on one strain to another – even if they are within the same species.
- Concept of strain specificity has only become known in the last 20 years.
- Some supplement companies are aware of this but choose to ignore it, and therefore rely on practitioner ignorance to sell their supplements.

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Osteopath - Naturopath - Nutritionist
Probiotics

The most important part of prescribing probiotics is choosing the right strain for the job.

The Probiotic Advisor – Dr Jason Hawrelak
Annual Subscription $49

Conditions Index
• Quality of evidence – star rating
• Summary of results of evidence for a whole list of conditions
• Where the strain is found in food sources and in supplements, relevant to Australia, Canada and USA.
Probiotics

How do they work?

• Compete with potentially pathogenic bacteria and fungi along the GIT for the limited space that is available.
  • Car Park Theory: If more parks are taken by commensal bacteria, it is less likely that pathogenic bacteria or fungi can park there also.
• Antagonism against potentially pathogenic microorganisms
• Interact with immune cells
• Produce beneficial compounds in the gut
  • SCFA’s
  • Polyamines
• Anti-inflammatory activity
• Modify GIT Transit
• Decrease visceral hypersensitivity
• Strengthen the intestinal barrier
Probiotics

Dosage

• Minimum effective dosage appears to differ by strain.
• Best practice is to ensure the supplement contains bacteria in concentrations ≥ 10^9 CFU/dose (unless research shows otherwise).
• If a formula contains multiple strains, each strain must be present in amounts ≥ 10^9

Advise patients to take each dose 1-2 x per day
Evidence Based Probiotic Prescription

Rheumatoid Arthritis

**Bacillus coagulans GBI-30 6086**

RA patients received either a combined micronutrient/probiotic supplement (GB30 2 x 10^9 CFU/day; n=22) or placebo (n=22) for 60 days, in addition to their standard anti-arthritic medications. The pain scale (p=0.046) and patient pain assessment scores (p=0.052) improved in the probiotic group. No significant improvement was seen in disability, functionality and blood marker (ESR, CRP) outcomes. [Mandel et al, 2010],

Food sources: Mojo Kombucha
Supplement sources: Nature’s Way AU Daily Probiotic Vita Gummies
Evidence Based Probiotic Prescription

Migraine

Lactobacillus brevis W63, Lactobacillus salivarius subsp. salivarius W24, Bifidobacterium bifidum W23, Bifidobacterium lactis W52, Lactococcus lactis W58, Lactobacillus acidophilus W37, Lactobacillus casei W56, Lactococcus lactis W19

Individuals who suffer from migraines (n=29) received 2g daily of probiotics (B. bifidum W23, B. lactis W52, L. acidophilus W37, L. brevis W63, L. casei W56, L. salivarius W24, Lc. lactis W19 and W58; 2.5 10^9 CFU/g) for 12 weeks. Compared to baseline, there was a significant decrease in the mean number of migraine days/month (from 6.7 to 5.2); migraine intensity (from 6.3 to 5.5); and use of over-the-counter analgesics (29% reduction) after treatment. The Migraine Disability Assessment Scale (MIDAS) score improved from 24.8 to 16.6 (P=0.031). [de Roos et al, 2015].
Evidence Based Probiotic Prescription

Bone Fracture – for enhance recovery

**Lactobacillus casei Shirotake**

Elderly patients with an acute distal radius fracture who received LcS probiotic drink (6.5 x 10^9 CFU twice daily) for 6 months exhibited a significantly faster pace of functional recovery and reduced pain incidence when compared to the placebo group. [Lei et al, 2016].

Food sources: Yakult, Yakult Light
Supplement sources: None in Australia atm
Evidence Based Probiotic Prescription

Following NSAID use

<table>
<thead>
<tr>
<th>Lactobacillus rhamnosus GG</th>
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</thead>
<tbody>
<tr>
<td>★★★</td>
</tr>
<tr>
<td>LGG pre-treatment significantly reduced gastric permeability caused by indometacin administration (P=0.012) [Gotteland et al, 2001].</td>
</tr>
</tbody>
</table>

Food sources: Parmalat Vaalia
Supplement sources: LOTS! The ones I use are: Metagenics Ultra Flora LGG, Metagenics Ultra Flora Restore, Metagenics Ultra Flora Immune Control, Metagenics Ultra Flora Immune Enhance, Metagenics Ultra Flora Mother & Baby.
Evidence Based Probiotic Prescription

Otitis Media - Prevention

<table>
<thead>
<tr>
<th>Lactobacillus rhamnosus GG, Bifidobacterium lactis Bb12</th>
</tr>
</thead>
<tbody>
<tr>
<td>★★★★★ 56% reduced risk of otitis media in toddlers (P=0.014); 48% reduced risk of antibiotic prescription (P=0.015); 49% reduced risk of recurrent respiratory tract infections (P=0.022) [Rautava et al, 2009].</td>
</tr>
</tbody>
</table>

Food sources: Parmalat Vaalia
## Evidence Based Probiotic Prescription

### Physical Performance – Exercise recovery

<table>
<thead>
<tr>
<th>Bacillus coagulans GBI-30 6086</th>
</tr>
</thead>
</table>

★★★★

Athletic males (n=29) who consumed protein (20g casein) combined with probiotic BC30 (1 x 10^9 CFU/day) for 14-days significantly increased post-exercise recovery at 24 and 72 h, and decreased muscle soreness at 72 h in comparison to 14-day protein supplementation alone. [Jäger et al, 2016],

Food sources: Mojo Kombucha
Supplement sources: Nature’s Way AU Daily Probiotic Vita Gummies
Evidence Based Probiotic Prescription

Weight Management

**Bifidobacterium lactis B420**

In overweight and obese adults, supplementation for 6 months with B420 (1010 CFU/day) resulted in a 4% change in body fat mass vs placebo (P=0.002). B420 with, or without, polydextrose fibre (12g/d) resulted in reduced caloric intake compared to placebo. Changes in blood zonulin levels and hsCRP were associated with corresponding body fat changes. [Stemann et al, 2016],

Supplement sources: Metagenics Ultra Flora Control, Metagenics Ultra Flora MetaControl
Prebiotics

Most commonly available

- FOS – Fructooligosaccharides
  - Garlic, onions, jerusalem artichokes, chicory root, dandylion leaves, yacon root
  - Targeted microbes: Bifidobacteria

- Lactulose
  - UHT milk
  - Targeted microbes: Lactobacilli & Bifidobacteria

- GOS – Galactooligosaccharides
  - Human milk, Cow’s milk
  - Targeted microbes: Lactobacilli & Bifidobacteria
  - Supplements: Bimuno Daily

- PHGG – Partially Hydrolysed Guar Gum
  - Supplements: Biomedica Laxpro
Uses of FOS

• Dsybiosis
• Enhancement of immunity
• Enhanced absorption of calcium in osteoporosis and osteopenia
  • Via a decrease in colonic pH which results in increased solubility of calcium, increased colonic venous blood flow, enlarged colonic villi, enhanced expression of calbindin-D9K (the active calcium transport route).
• Damaged intestinal or colonic musoca
• Promotion of satiety

Dosage

• 10g day
• Start with a lower dose first and build up because can cause bloating and wind.
Prebiotics - GOS

Uses of GOS

- Dsybiosis
- Constipation
- Increased resistance to infections
- In the treatment of IBS
- Improved absorption of calcium
- Metabolic Syndrome – decreasing systemic inflammation
- Prevention of GIT infections
- Prevention of traveller’s diarrhoea

Dosage

- 2.5-15g/day. Mostly don’t need to go over 5g/day
- Start with a lower dose first and build up
Prebiotics - Lactulose

Uses of Lactulose

• Dsybiosis
• Candidiasis
• Constipation
• Damaged intestinal or colonic mucosa
• Alcoholic fatty liver disease
• Lowered immunity
• Prevention of UTI’s

Dosage

• 10g 2 x day (in constipation dose is 15-40g/day, in liver disease is 35g/day)
• Start with a lower dose first and build up because can cause bloating, diarrhoea, abdominal pain and wind.
Prebiotics – PHGG

Uses of PHGG – Partially Hydrolysed Guar Gum

- Dsybiosis
- Constipation
- IBS
- SIBO

Dosage
- 5 g / day
G.E.R.D / Reflux / Indigestion
What we, as Osteopaths, can do

• Visceral manipulation techniques on the stomach
  • Medial / lateral glide technique
  • Vertical motion technique
    • Brisbane – Early April 2019
    • Adelaide – early Oct 2019

• Structural techniques on diaphragm, cervical region and thorax

• Offer advice:
  • Eat smaller portions
  • Chew food really well
  • Don’t eat too much at night
  • Avoid rich, spicy or fatty foods
  • Refer to a Naturopath as they can offer great support with herbal medicines and support patients to come off PPI’s over a period of 6-12 months.

Dr. Andrea Robertson
Osteopath - Naturopath - Nutritionist
IBS
What we, as Osteopaths, can do

• Visceral manipulation techniques on the small and large intestines
  • VM1 – www.barralinstitute.com.au
    • Brisbane – Early April 2019
    • Adelaide – early Oct 2019

• Structural techniques on lumbar and pelvic regions

• Offer advice:
  • Food elimination diets
  • Avoid known or common food sensitivities like gluten, dairy, citrus, soy and refined sugars.
  • Correct nutritional deficiencies in B Vitamins, Zinc, Vit A, Vit C, Vit D
  • Avoid eating too many different types of foods at the one time
  • Stick to one type of starch at each meal
  • Eat foods slowly, chew well, and eat in a calm atmosphere
  • Eat more steamed vegetables than raw ones
  • FODMAP diets – only a short term treatment, patients shouldn’t be on long term
SIBO
What we, as Osteopaths, can do

• Visceral manipulation techniques on the sphincters - IVC
    • Brisbane – Early April 2019
    • Adelaide – early Oct 2019

• Structural techniques on lumbar and pelvic regions
• Refer for breath testing or to a Naturopath for specific treatment
• Offer advice:
  • Have breaks of greater than 90 minutes between eating to allow time for the Migratory Motor Complex to work.
  • Food elimination diets
  • Avoid known or common food sensitivities like gluten, dairy, citrus, soy and refined sugars.
  • Correct nutritional deficiencies in B Vitamins, Zinc, Vit A, Vit C, Vit D
  • Avoid eating too many different types of foods at the one time
  • Stick to one type of starch at each meal
  • Eat foods slowly, chew well, and eat in a calm atmosphere
  • Eat more steamed vegetables than raw ones
  • FODMAP diets – only a short term treatment, patients shouldn’t be on long term
Special Diets
Diet for Intestinal Dysbiosis

• Increase:
  • Green vegetables
  • High-fibre diet
  • Bitter foods: artichoke, ginger, broccoli, radicchio, rocket, brussel sprouts, chicory, asparagus, endive, kale, grapefruit, chocolate (90-100%), dandelion, eggplant

• Reduce:
  • Meat
  • Sugar and sweet foods
  • Spicy foods
  • Fried foods
  • Fatty and rich foods
  • Salty foods
  • Alcohol
  • Caffeine
  • Coffee
Special Diets
Diet for Leaky Gut

• Zinc helps to strengthen the tight junctions and therefore improve barrier function of intestinal epithelial layers.
• Foods rich in Zinc:
  • Oysters
  • Meat
  • Eggs
  • Seafood
  • Black-eyed peas
  • Tofu
  • Whole grains
  • Wheat germ
• Supplements:
  • Zinc Citrate
  • Zinc Picolinate
Special Diets
Diet for Leaky Gut

• Glutamine enhances intestinal absorption of nutrients & decreases intestinal permeability. Needs to be at high doses of 20g/day for it to work.

• Foods rich in Glutamine:
  • Bone broth
  • Grass fed whey protein
  • Grass fed raw dairy
  • Grass fed beef
  • Spirulina
  • Cabbage
  • Asparagus
  • Broccoli
  • Venison
  • Organic poultry

• Supplements:
  • Metagenics – Glutagenics + many others
**ANTI-INFLAMMATORY DIET**

**What is Systemic inflammation?**

In the past, you may have thought of inflammation as a swollen joint from arthritis or a rolled ankle. You are definitely correct in your thinking, however you are thinking of acute inflammation, our body’s healing response to a local injury or local problem. What I am talking about here though, is systemic inflammation, which is inflammation on a more silent, chronic, or all-over-body level. Systemic inflammation is invisible, however it can also be interpreted as whole body fluid retention. Systemic inflammation is occurring inside the body where it can’t be seen. Just because you can’t see it however, doesn’t mean it isn’t dangerous. Just about every disease state that is around today, is, at least in part, caused by systemic inflammation. These include but are not limited to: chronic, ulcerative colitis, autoimmune disease, rheumatoid arthritis, cardiovascular disease, obesity, type 2 diabetes, osteoporosis, and even depression.

**Why an anti-inflammatory diet?**

Eating an anti-inflammatory diet allows you to naturally reduce the level of systemic inflammation in your body through the foods you eat.

**Causes of systemic inflammation**

**Dietary**
-Trans-fats
- Omega – 6 fatty acids
- Refined sugars
- Gluten
- Refined grains
- Alcohol
- Food additives
- Red meat
- Dairy

**Environmental factors**
- Smoking or passive smoke
- Pollution
- Pesticides/herbicides
- Heavy metals
- Chemicals and airborne irritants

**Stress**
- Workplace
- Relationships
- Personal
- Psychological

**Acute and Chronic illness**
- Excess weight / obesity
- Heart disease
- Arthritis
- Celiac disease
- COPD/disease

**Genetics**
- Family history

The best way to prevent or reverse systemic inflammation is to reduce exposure to the above factors. Exercising 3-5 days per week for at least 30 minutes per session will also help to reduce systemic inflammation. Another important factor to consider is stress reduction. Yoga and/or meditation, which decrease cortisol levels, can help.

Also choose to eat more anti-inflammatory foods such as:
- Blueberries
- Goji, cacao
- Goji, tealea
- Wild-caught salmon
- Olives
- Turmeric
- Olive leaf tea
- Virgin olive oil
- Leafy greens
- Sweet potatoes
- Broccoli

You also need to make sure you have enough Omega-3 fatty acids in your diet as they are the best anti-inflammatory drug’s around. Eat oily fish such as salmon 2-3 times per week, and also supplement daily with a good quality high dose fish oil. These factors combined are all a great way to fight against silent inflammation.
### Special Diets

#### The Anti-inflammatory Diet

**Swapping in / Swapping Out**
Rather than cutting out foods, I’d like you to think of swapping certain foods IN as you swap certain foods OUT. Have a look at this chart below for some ideas to change over to an anti-inflammatory diet.

<table>
<thead>
<tr>
<th>Swap Out</th>
<th>Swap In</th>
</tr>
</thead>
<tbody>
<tr>
<td>White bread</td>
<td>Spelt, Rye or Sourdough breads</td>
</tr>
<tr>
<td>Coffee</td>
<td>Dandelion tea</td>
</tr>
<tr>
<td>Black tea</td>
<td>Herbal tea</td>
</tr>
<tr>
<td>Margarine</td>
<td>Organic Butter</td>
</tr>
<tr>
<td></td>
<td>Mashed Avocado</td>
</tr>
<tr>
<td></td>
<td>Extra Virgin Olive Oil</td>
</tr>
<tr>
<td>Cow’s milk</td>
<td>Almond Milk</td>
</tr>
<tr>
<td></td>
<td>Coconut Milk</td>
</tr>
<tr>
<td></td>
<td>Rice or other nut milks</td>
</tr>
<tr>
<td></td>
<td>Organic goat’s milk</td>
</tr>
<tr>
<td>Cow’s cheese</td>
<td>Goats cheese</td>
</tr>
<tr>
<td></td>
<td>Sheep cheese</td>
</tr>
<tr>
<td>Yoghurt (filled with sugar)</td>
<td>Natural yoghurt</td>
</tr>
<tr>
<td></td>
<td>Goats yoghurt</td>
</tr>
<tr>
<td></td>
<td>Sheep yoghurt</td>
</tr>
<tr>
<td></td>
<td>Coconut yoghurt</td>
</tr>
<tr>
<td>Vegetable and Seed Oils</td>
<td>Extra Virgin Olive Oil</td>
</tr>
<tr>
<td></td>
<td>Coconut Oil</td>
</tr>
<tr>
<td></td>
<td>Macadamia Oil</td>
</tr>
<tr>
<td>Refined or Processed Sugar</td>
<td>Raw Honey</td>
</tr>
<tr>
<td></td>
<td>Organic Maple Syrup</td>
</tr>
<tr>
<td></td>
<td>Rice Malt Syrup</td>
</tr>
<tr>
<td>Table Salt</td>
<td>Sea Salt</td>
</tr>
<tr>
<td>White Rice</td>
<td>Brown Rice</td>
</tr>
<tr>
<td></td>
<td>Quinoa</td>
</tr>
<tr>
<td></td>
<td>Cauliflower Rice</td>
</tr>
<tr>
<td>Traditional Pasta</td>
<td>Zucchini Pasta, Buckwheat Pasta, Mung Bean Pasta</td>
</tr>
<tr>
<td>Chocolate (filled with sugar)</td>
<td>Raw Cacao</td>
</tr>
<tr>
<td></td>
<td>Homemade sweets (raw desserts)</td>
</tr>
<tr>
<td>Dried Fruit with <strong>Sulphur</strong></td>
<td>Sulphur free dried fruit</td>
</tr>
<tr>
<td>Processed ham and bacon</td>
<td>Nitrate free or preservative free organics ham and bacon</td>
</tr>
<tr>
<td>Pre-packaged salad dressings</td>
<td>Lemon juice, olive oil and/or Apple Cider Vinegar</td>
</tr>
<tr>
<td>Take away foods</td>
<td>Homemade foods</td>
</tr>
<tr>
<td>Store brought jam</td>
<td>Homemade chia jam</td>
</tr>
<tr>
<td>Packaged foods</td>
<td>Ready foods – fruit, vegetables and meats</td>
</tr>
<tr>
<td>Store brought mayonnaise</td>
<td>Homemade mayonnaise</td>
</tr>
<tr>
<td></td>
<td>Hummus</td>
</tr>
<tr>
<td>Packaged cereals</td>
<td>Buckwheat, quinoa or oat porridge</td>
</tr>
<tr>
<td></td>
<td>Homemade granola</td>
</tr>
<tr>
<td></td>
<td>Other breakfast ideas (see below)</td>
</tr>
<tr>
<td>Ice-cream</td>
<td>Banana Ice-cream</td>
</tr>
<tr>
<td>Fizzy drinks, Soda or Alcohol</td>
<td>Water</td>
</tr>
<tr>
<td></td>
<td>Sparkling water with fresh lime</td>
</tr>
<tr>
<td></td>
<td>Kombucha or Water Kefir</td>
</tr>
</tbody>
</table>
The Anti-inflammatory Diet

Special Diets

Helpful hints:

- Eat real foods, not too much, mostly vegetables.
- Eat fresh foods, bought recently and not left over for more than 1-2 days.
- Read the back of packaged foods – if there are more than 5 ingredients – don’t eat it.
- Read the ingredients of packaged foods – if there are any numbers – don’t eat it.
- Avoid white refined grains, white sugar & artificial sweeteners.
- Avoid cow’s milk and cheese, instead try goats or sheep’s dairy products.
- Avoid coffee and soft drinks. You really only need water, herbal teas and fresh juices.
- Make your minimal daily protein 2 portions the size of the palm of your hand (or 3 in pregnancy).
- Make sure you have protein at every meal or snack. It is the protein that fills you up and helps maintain muscle tone while losing weight.
- Use low glycemic carbohydrates where possible & only small amounts of high glycemic rice/pasta/bread as accompaniments to, not the basis of, your meal.
- Eat frequently at least every 4-5 hours to keep blood sugar levels stable & avoid cravings. Protein providing foods keep blood sugar levels stable for longer.
- Eat your biggest meal at lunchtime rather than for dinner – or, if that’s not possible make sure you have at least 2 hours between dinner and bedtime.
- Drink plenty of water (1-3 Lpa daily) – but remember many teas and all sweet drinks will reduce your fluid balance.
- Drinking more than one glass of water/liquid with a meal can reduce digestive activity. Avoid drinking too much water or liquid with meals.
- Fruit juice (even unsweetened) is high in sugar and low in fiber. Have a piece of fruit instead!
- Eat plenty of fruit (no more than 2-3 pieces a day), vegetables, nuts, seeds, legumes, whole grains, nuts & beans.
- Enjoy your food! And allow yourself the occasional ‘treat’ – then re-affirm your intentions to eat well and healthily 90% of the time.
- Replace common table salt with healthier sea salt.
- Make a delicious salad dressing to top your salad or as a dip for your steamed or baked vegetables. Choose from the following ingredients: cold pressed extra virgin olive oil, flaxseed oil, lemon juice, apple cider vinegar, whole grain mustard, garlic, natural yoghurt, tahini & fresh herbs.
- Drink herbal teas instead of coffee or soft drink – try peppermint, chamomile, licorice, dandelion tea and green tea.
- Try some alternative milks to dairy milk – nut milks, oat milk, rice milk, coconut milk or ‘Coco Quench’ – a delicious combo of coconut and rice milks that are delicious in hot drinks. Homemade is best, but read the back of the packets of bought milks for the best option with the least amount of numbers.
- “The body heals 8 times faster when you exercise regularly.” Kris Carr
- Develop a morning routine: try lemon juice in warm water or Apple Cider Vinegar
- Clean out your fridge and pantry. If ‘bad’ foods are not in the house, then you are less likely to eat them.
- Sprinkle turmeric on your meat and/or vegetables and salad. It is a great natural anti-inflammatory.
- Eat at least 6 types of seasonal vegetables/salad every day, especially greens.
- Eat 2 serves of fresh fruit daily in a variety of colours.
- Include 2-4 serves of raw nuts, seeds and cold pressed oils in the diet everyday.

Foods that are labeled as low fat, fat free or skinny are off limits. These foods are, in fact, not healthier for you at all. The fact is that these foods have been altered away from their natural state, and usually the “fat” that was originally present has been replaced with processed sugars or carbohydrates which get absorbed and stored as fat in the body and contribute to your overall systemic inflammation.

You need to give your body it’s best chance ever to operate at optimum health and wellness. One of the best ways to do this is to feed your body clean, natural foods that will fuel your body with vitamins, nutrient and minerals. This will not only allow your body to stay looking it’s very best, but it will also keep your organs and immune system operating at their very best capacity and therefore keep you healthy on the inside as well.
## The Autoimmune Protocol

### Foods to Include:

#### Vegetables
- artichoke
- arugula
- asparagus
- bok choy
- broccoli
- brussels sprout
- cabbage
- cauliflower
- celery
- chard
- collard green
- cucumber
- fennel
- green bean
- kale
- leek
- lettuce
- mushroom
- rhubarb
- snap pea
- spinach
- squash
- watercress

#### Roots
- beet
- carrot
- celeriac
- jicama
- onion
- parsnip
- turnip
- radish
- rutabaga
- shallot
- sweet potato
- yam

#### Meats
- beef
- bison
- buffalo
- lamb
- fish
- shellfish
- chicken
- turkey
- duck
- pork
- rabbit
- venison

#### Fruit
- apple
- apricot
- avocado
- banana
- blackberry
- blueberry
- cantaloupe
- cherry
- clementine
- coconut
- date
- fig
- grape
- grapefruit
- guava
- huckleberry
- honeydew
- kiwi
- lemon
- lime
- mango
- marionberry
- nectarine
- orange

#### Herbs
- basil
- bay leaves
- chamomile
- chives
- cilantro
- dill
- lavender
- lemon grass
- marjoram
- mint
- parsley
- peppermint
- rosemary
- sage
- spearmint
- tarragon
- thyme

#### Pantry Items
- apple cider vinegar
- anchovies
- arrowroot powder
- coconut flour
- coconut flakes
- coconut vinegar
- coconut aminos
- dates
- dried fruit
- olives
- salmon
- sardines
- tuna
- lime
- olive
- water kefir

#### Fats
- animal fat
- avocado oil
- coconut oil
- duck fat
- lard
- olive oil
- palm oil
- tallow

#### Offal
- bone broth
- liver
- kidney
- heart

#### Spices
- cinnamon
- cloves
- garlic
- ginger
- saffron
- sea salt
- shallots
- turmeric

#### Ferments
- sauerkraut
- fermented vegetables (carrot, beet, etc.)
- kombucha
- water kefir
### The Autoimmune Protocol

#### Foods to Avoid:

<table>
<thead>
<tr>
<th>Grains</th>
<th>Beans + Legumes</th>
<th>Eggs</th>
<th>Nightshades</th>
<th>Seeds</th>
<th>Nuts</th>
<th>Dairy</th>
<th>Alcohol</th>
</tr>
</thead>
<tbody>
<tr>
<td>amaranth</td>
<td>adzuki beans</td>
<td>chicken</td>
<td>cayenne</td>
<td>anise</td>
<td>almond</td>
<td>butter</td>
<td>NSAIDs</td>
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<tr>
<td>barley</td>
<td>black beans</td>
<td>duck</td>
<td>chili pepper</td>
<td>canola</td>
<td>brazil</td>
<td>cheese</td>
<td>aspirin</td>
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<tr>
<td>buckwheat</td>
<td>black-eyed peas</td>
<td>goose</td>
<td>eggplant</td>
<td>caraway</td>
<td>coffee</td>
<td>cream</td>
<td>ibuprofen</td>
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<tr>
<td>bulgur</td>
<td>chickpeas</td>
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<td>goji berry</td>
<td>chia</td>
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<td>corn</td>
<td>fava beans</td>
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<td>ground cherry</td>
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<td>hazelnut</td>
<td>ghee</td>
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<td>kamut</td>
<td>lentils</td>
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<td>habañero</td>
<td>cumin</td>
<td>macadamia</td>
<td>milk</td>
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<td>millet</td>
<td>lima beans</td>
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<td>jalepeno</td>
<td>fennel seed</td>
<td>mustard</td>
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<tr>
<td>oats</td>
<td>peanuts</td>
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<td>paprika</td>
<td>fennugreek</td>
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<tr>
<td>quinoa</td>
<td>kidney beans</td>
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<td>poblano</td>
<td>mustard</td>
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<tr>
<td>rice</td>
<td>soybeans</td>
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<td>potato</td>
<td>nutmeg</td>
<td>pumpkin</td>
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<tr>
<td>rye</td>
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<td>sweet pepper</td>
<td>poppy</td>
<td>sesame</td>
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<tr>
<td>sorghum</td>
<td></td>
<td></td>
<td>tobacco</td>
<td>sunflower</td>
<td>sunflower</td>
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<tr>
<td>spelt</td>
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<td></td>
<td>tomato</td>
<td>hemp</td>
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<td>teff</td>
<td></td>
<td></td>
<td>tomatillo</td>
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</tr>
<tr>
<td>wheat</td>
<td></td>
<td></td>
<td>wolf berries</td>
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</tr>
</tbody>
</table>

Optional Restrictions:

- fruit
- starchy vegetables
- gluten cross-reactive foods
- FODMAPs
My Favourite Resources for nutritional information and advice

- Probiotic Advisor
  - For evidence based prescription of probiotics
- Pubmed
- Clinical Key
- Mytavin
  - An online tool where you can check what medications a patient is on, and what evidence based nutritional deficiencies/symptoms may be a result of being on that medication.
- Health Masters Live
  - Offer Online Masterclasses in Natural Medicine in all sorts of areas.
  - Dr Jason Hawrelak – The Natural Gastrointestinal Masterclasses 1 & 2
- nPod
  - Online tool to find what supplements contain what ingredients, and compare with others
Supplement Companies
and some of my favourite supplements for gut health

- Integria
  - Mediherb - P2Detox
- Oborne
- Metagenics
  - A great range of probiotics
  - Glutagenics
  - MetaPure EPA/DHA
- Biomedica
  - Laxpro
  - Biomatrix
  - PeptEase
  - BicoZn
  - Enterocare
- Bioceuticals
  - UB75
- Mediherb
  - P2Detox
- Nutrition Care (order from Oborne)
  - Polybac
Testing Companies

- Nutripath
- Australian Clinical Labs
- Research Nutrition (RNLabs)
Naturopathic & Nutritional Support

I do offer online (Skype or Zoom) and phone consultations for Naturopathy and Nutrition if you would ever like any additional support for your patients.

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