

THE HEALTHY GUT FOR AGING WELL



Aging

- A focus on health and aging always produces the same statement

“Things just do not work as well when we are older”

The question is why?

If we were a car – replace the parts and the car can live forever

We can't replace our parts

But car parts can't regenerate themselves but our cells replace themselves all the time



Aging

- This means the potential to function well is available in theory
- There are many theories to aging:
 - Free radical damage
 - Wear and tear
 - Toxicity
 - Inability of telomeres to be maintained
 - Insufficient nutrients
 - Lack of movement
 - Stress
 - Inflammation

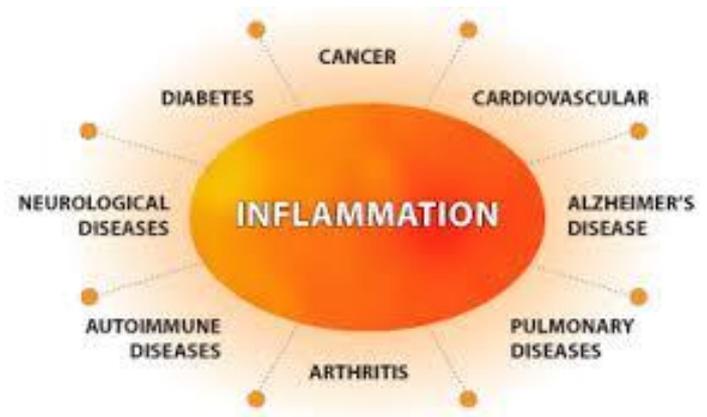
Wear and Tear

- This is the weakest of all the theories
- With body parts that can replace themselves – it implies we should not wear out
- So the question is why would we wear out?
- Nutrients and lack of them?
- Lack of exercise (use it or lose it)?
- Too many stressors?
- Inability of the body to regulate itself for some reason?
- Chemicals, pollution and drugs that damage us?



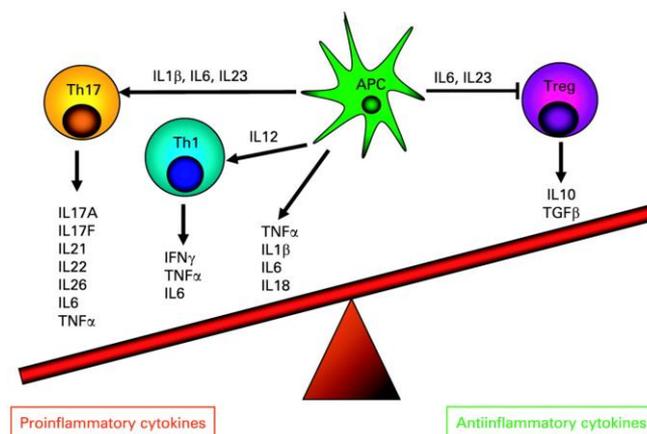
The Role of Inflammation

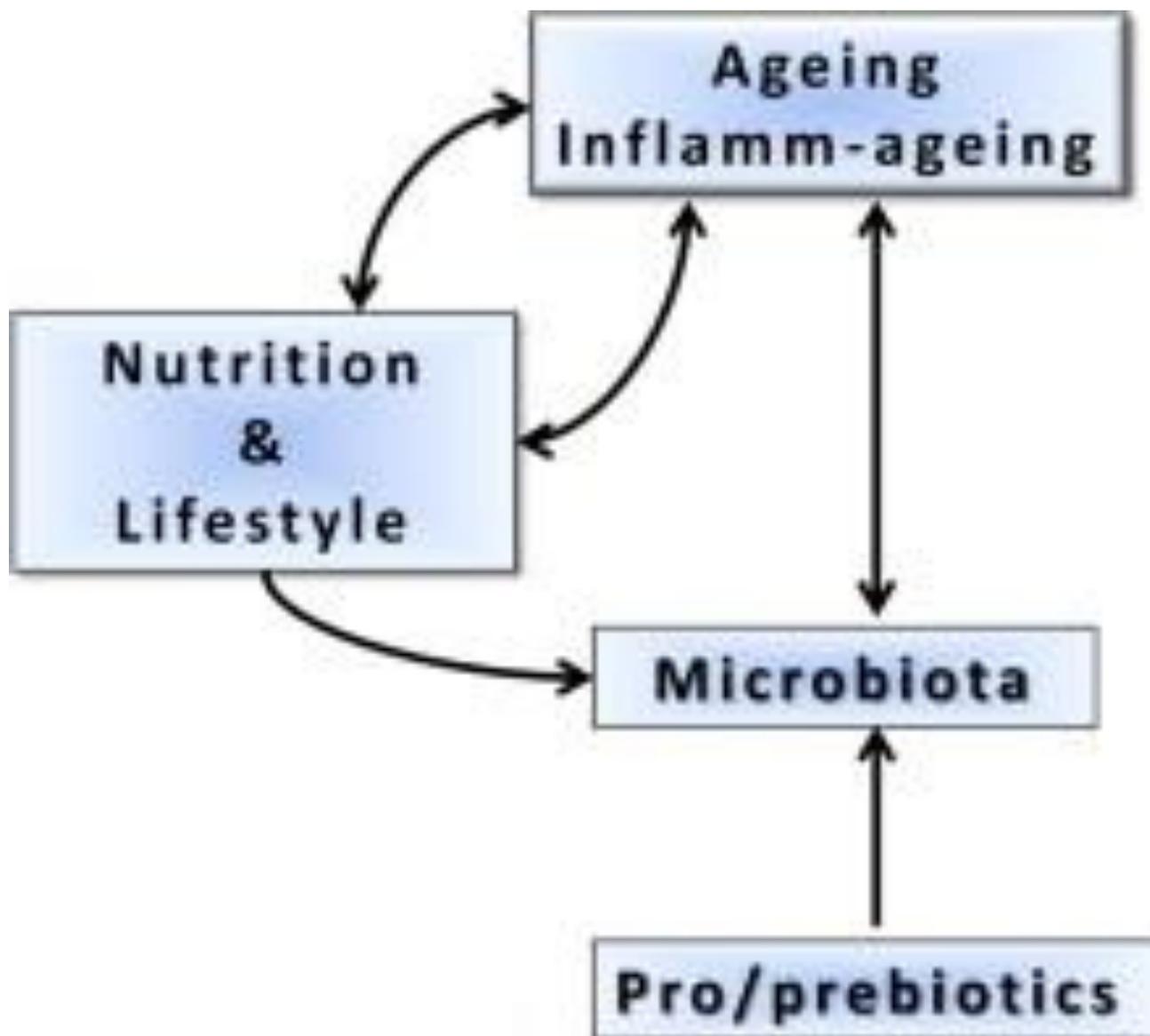
- Chronic, low grade inflammation is considered a major factor in aging
- Blood tests reveal inflammatory markers in connection to all conditions of aging – heart disease, cancer, diabetes Alzheimer's, arthritis, osteoporosis, dementia, etc.
- The exact connection is not fully understood
- One theory – immune products, leukocytes, cytokines cause damage to tissue including healthy cells



Inflammation

- IL-6 and TNF-Alpha can down regulate insulin, and hormones connected regulating to HBP
- Another theory suggests damaged cells and cellular debris accumulate with age
- This would include free radicals and cells damaged by free radicals, amyloid plaque, AGEs and these cause the damage which produces a chronic inflammatory response
- It is hard to have a conversation about inflammation without discussing the role of the gut bacteria





Inflammation and Gut Bacteria

- We already know that gut bacteria regulates inflammation in the body
- Numerous strains are anti-inflammatory such as include *L. rhamosus* GG, *L. breve*, *L. casei*, *L. plantarum*, *Streptococcus thermophilus*
- Short chain fatty acids (SCFA) such as butyrate promote t-reg cells which in turn, promote IL-10 the anti-inflammatory cytokine



Dysbiosis

- Bad bacteria produces endotoxins (like LPS) which trigger inflammatory responses
- They lock onto gut lining receptors and can trigger an inflammatory response
- Endotoxins also enter the blood stream through leaky gut and trigger responses the production of inflammatory cytokines (IL-6, TNF Alpha etc) which damage tissues in organs such as the liver and the brain



Gut Bacteria and Aging

- We know that gut bacteria changes as we age
- Older people are more likely to suffer from dysbiosis than younger people (without other factors present)
- Partly because of age factor
- Partly because elderly are prescribed antibiotics more than younger adults
- A study looking at 187 elderly people prescribed antibiotics found that that were alterations to their microbiota and concluded that this affects long-term health



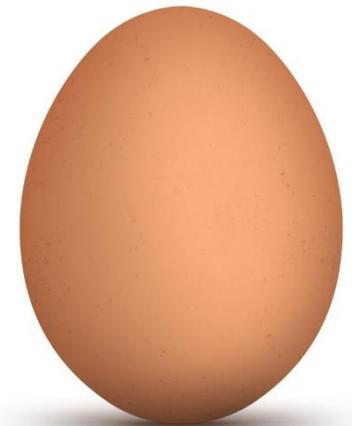
- In a recent research article:
- *“the gut ecosystem shows the potential to become a promising target for strategies able to contribute to the health status of older people. In this context, the consumption of pro/prebiotics may be useful in both prevention and treatment of age-related pathophysiological conditions”*

Biagi et al, Pharmacological Research Volume 69, Issue 1, March 2013

Chicken or Egg?

- Bacteroides and Firmacutes are prevalent in adults and the elderly at about the same levels
- What changes is the types of bacteria more E coli (proteobacteria), Staphylococcus (firmicute) and less Bifidobacteria (actinobacteria)
 - Reasons suggested:
 - Lower salivary function
 - Neuron degeneration affecting gut function
 - Less gut motility
 - Leads to constipation and decrease in good and increase in bad bacteria

Or

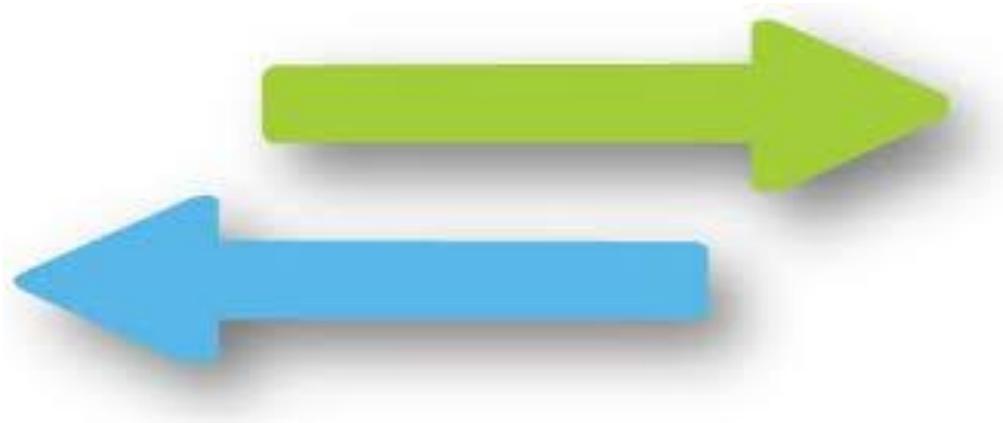


- The decrease in bifidobacteria is essential for regulating function within the body:
 - Helps maintain gut-brain function
 - Produces SCFA which maintain gut motility and intestinal function
 - Prevents constipation
 - Increases immune function



Whatever the case

- It means we have to support all the systems as we age to keep our good gut bacteria levels
- Or we have to have to maintain our good gut bacteria levels (or improve them) in order to maintain the function of our systems



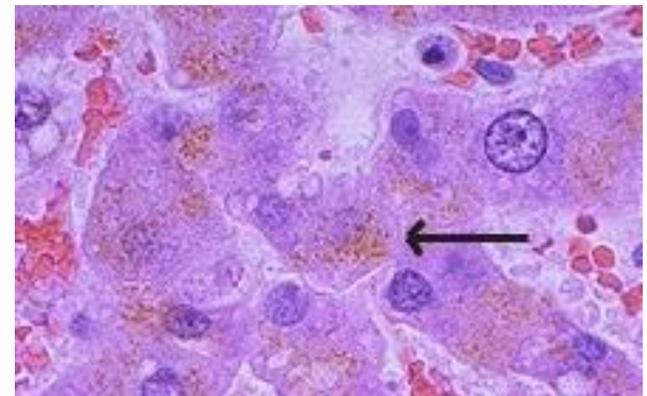
Chicken or Egg

- Same is true for inflammation
- One study of centenarians found increased production of IL-6 and IL-8 inflammatory cytokines which increase proteobacteria such as E coli
- Lower T cell activity was also found
- But is this because there is already lower bifidobacteria and SCFA that is allowing the higher levels of IL-6 or IL8?



Research

- Research into probiotics and aging found that *L. gasseri* helps extend aging in certain types of worms – by protecting against oxidative stress and stimulating immune response
- Also inhibited lipofuscin (yellow-brown pigment cells aka liver spots) found in the liver, kidney, heart muscle, retina, adrenals, nerve cells, ganglion cells and the brain
- Improved mitochondrial function and improved expression of stress resistance genes.



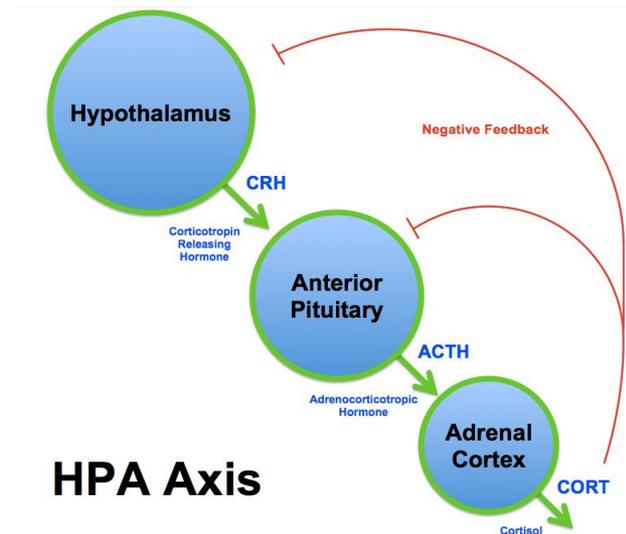
Chicken/Egg Key Areas of Focus

- All of these systems have a bidirectional relationship with each other
 - Adrenals
 - Thyroid
 - Brain/ CNS
 - Liver
 - Digestive function
- Your goal is working on these areas simultaneously with the client



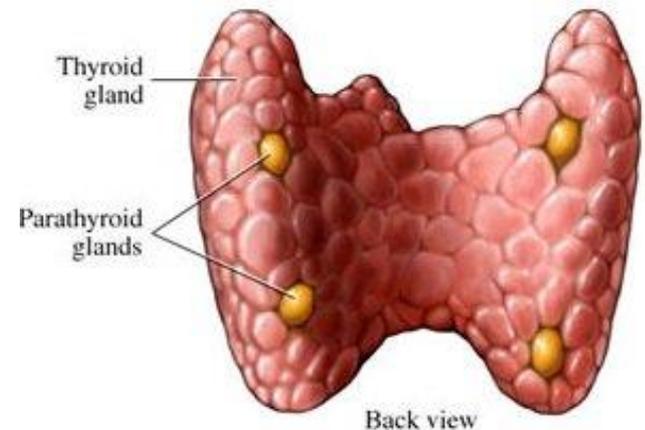
Adrenals

- Stress depletes good gut bacteria, encourages the growth of bad and increases gut lining permeability
- Is an adult life of stress a factor in change of gut bacteria?
- Or does poor diet and lifestyle affect gut health that in turn affects the adrenals – causing the resulting stress on the body
- HPA axis is one of bi-directional networks involved in the brain-gut connection (immune, CNS,)
- Animal models show poor reactions to stress when good gut bacteria is low and more stimulation of the HPA axis



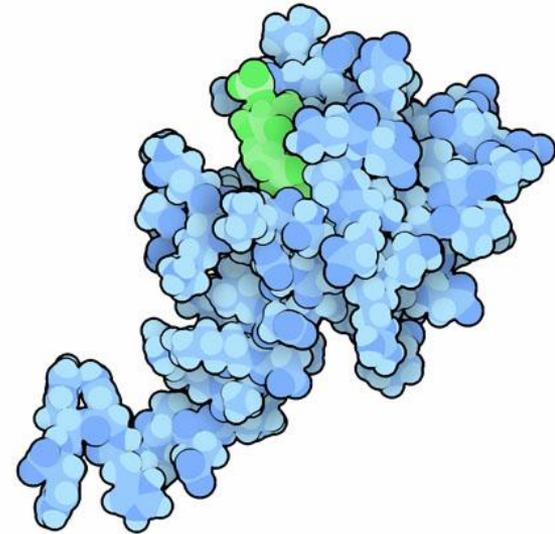
Thyroid

- Thyroid is affected by both the adrenals and the liver – both are affected by the gut – affecting metabolism
- Elderly have lower metabolic function
- Poor gut health suppresses thyroid function
- T4 and T3 protect gut health
- The gut helps convert T4 to T3
- The conversion requires an enzyme called intestinal sulfatase – made by gut bacteria
- Also acetylation activity is needed for T3 conversion (SCFA acetate)



LPS and Thyroid

- Lipopolysaccharide (LPS) – produced by bad bacteria
 - Reduce thyroid hormone levels
 - Dull thyroid hormone receptor sites
 - Increase amounts of inactive T3
 - Decreases TSH
 - Promote autoimmune thyroid disease
-
- And conversely, low thyroid function makes it difficult to have a healthy gut – peristalsis, digestive juices require good thyroid function



Exercise

- Numerous studies have shown that exercise helps with longevity and quality of life – even when started in old age
- Many animal studies show exercise can change the quality and quantity of gut bacteria
- Exercise can also modify the effects of a high-fat diet on gut bacteria (more bacteroidetes and lower firmicutes)
- Exercise is an important aspect to include in a gut health program



Menopause

- Vulvovaginal atrophy – commonly associated with menopausal females
- Study of 87 females 35-60 – those with VVA had lower lactobacillus communities than controls
- *Lactobacillus crispatus* more commonly found in fertile women than post-menopausal women
- *L. iners*, *L. crispatus*, *L. gasseri*, *L. jenesenii*, *L. acidophilus*, *L. fermentum*, *L. plantarum*, *L. brevis*, *L. casei*, *L. vaginalis*, *L. delbrueckii*, *L. salivarius*, *L. reuteri*, and *L. rhamnosus*
- In general, probiotics and fermented foods have demonstrated a benefit to supporting healthy vaginal bacteria environment after menopause



Menopause

- Hot flashes and menopausal symptoms are related to adrenals glands and stress (excess cortisol)
- Good bacteria can lower cortisol, lower anxiety and depression, improve energy, make nutrients more available to strengthen other systems
- Probiotics and fermented foods contain good bacteria
- Fermented foods can easily help menopausal symptoms



Study

- In another study, of healthy volunteers, waking cortisol levels were lowered and focus on positive information rather than negative information increased after taking prebiotics for three weeks
- In particular it was GOS, not FOS or the placebo
- GOS is high in yogurt and kefir which will also deliver probiotics
- Probiotics have already demonstrated an ability to help with depression and anxiety (which accompanies hot flashes)



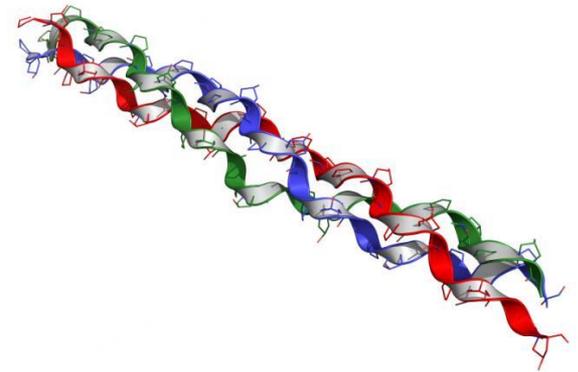
Prostatitis

- Prostatitis is an inflammation of the prostate gland caused by a bacterial infection
- Usually preceded by a bladder infection
- Indicates low bacteria in the first place
- Complicated by antibiotics (for bladder infection)
- Probiotics – lactobacillus and bifidusbacteria are important
- Fermented foods also helpful



Aging Skin

- 2008 study - a skin cream containing the probiotic, *Streptococcus salivarius* ssp. *thermophilus* (*S. thermophilus*) was applied to the skin of elderly Caucasian women.
- Results showed increased skin ceramide levels¹, over the control
- Also showed increased hydration.
- *L. rhamnosus*, *L. fermentum*, *L. casei* helps with collagen
- *L. johnsonii* with carotenoids or kefir with carotenoids helpful for UV damage



Probiotic skin products

- Mother Dirt: <http://motherdirt.com/>



- Dr. Ohhira's Magoroku skin lotion [lherb](#)



- Andalou Naturals [Well.ca](#)



Strategy

- Lower stress and support the adrenals
- Help the liver
- Support the thyroid
- Exercise
- Consume probiotics and fermented foods
- Consume prebiotics
- Supplements for gut health
glutamine, butyrate, aloe vera etc



And Finally...

- As gut health knowledge increases – more products for the gut will be directed at issues of aging
- We have strategies now that we can use for gut health and to support other systems
- The key is the client – what can you get them to do
- It has got to be a way of life, not a protocol
- Explaining gut health in terms of aging may provide the currency the clients need to make changes and find what works for them

