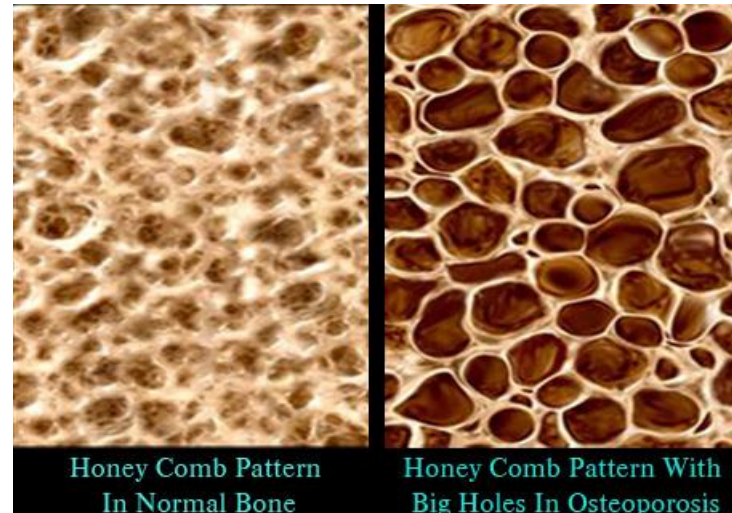


OSTEOPOROSIS, ARTHRITIS, CFS & FIBROMYALGIA



Osteoporosis

- Good bacteria aids the absorption of calcium
- L reuteri, L casei and L gasseri help with calcium absorption and increasing bone density
- Chronic inflammation affects bone re-absorption (osteoclasts) and decreases bone formation (osteoblasts)
- Good bacteria lowers chronic inflammation



Osteoporosis

- *Lactobacillus reuteri* increases vitamin D levels by about 25%.
- In a study of 25 women 50-79 years of age, analysis of their microorganisms status found higher levels of bad bacteria than the healthy women in the control group indicating dysbiosis was present
- Other studies (animal and one human) show probiotics can help build bone density

Building Bone Density

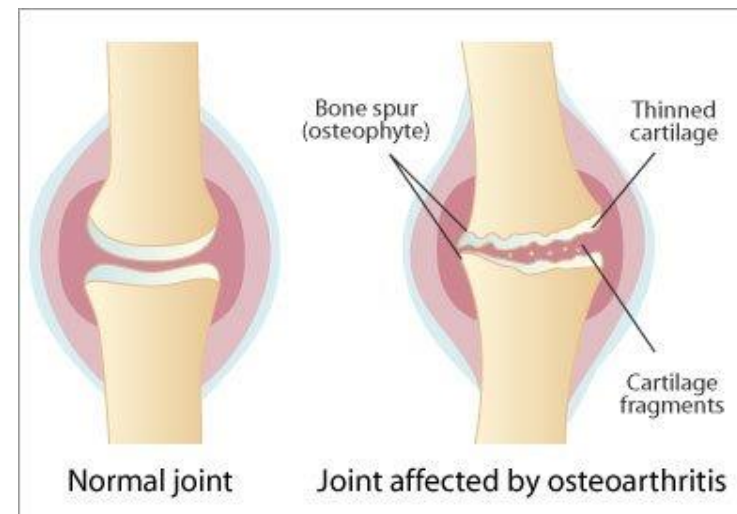
- Increase mineral solubility due to production of short chain fatty acids;
- Producing the phytase enzyme by bacteria to overcome the effect of mineral phytates;
- Reducing intestinal inflammation followed by increasing bone mass density
- Hydrolysing prebiotics in the intestines by *Lactobacillus* and *Bifidobacteria*.

Osteoarthritis

- Predisposition to GIT disturbances is common in people with musculoskeletal conditions
- The gut microflora regulates inflammation in the body
- Free radicals and inflammation linked to cartilage destruction
- Pro-inflammatory cytokines increase nitric oxide – too much can damage tissues and inhibit collagen formation in cartilage

Osteoarthritis

- Good Bacteria regulates cytokines
- Liver function also involved in inflammatory response
- NSAIDs, aspirin and ibuprofen further damage the gut lining and increases dysbiosis exacerbating the condition
- Sulfur essential to maintaining cartilage



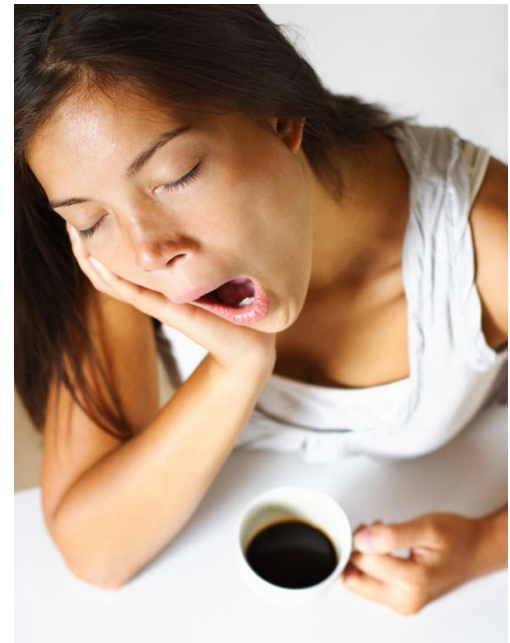
Sulfur

- Glycosaminoglycans (GAGs) - building blocks of joint cartilage, and GAG molecules
- linked together in chains by disulfide bonds – contains two sulfur molecules
- Sulfur maintains cross-linking of connective tissue and strengthens them
- Bad Bacteria, especially Streptococcus, Enterococcus and Prevotella, turn sulfur into hydrogen sulfide gas.



Chronic Fatigue Syndrome

- Cause is unknown and it causes a variety of symptoms include fever, aching, and prolonged tiredness and depression
- Often develops after a viral infection
- Low grade inflammation has been linked to depression as has leaky gut which are both present in CFS sufferers



Chronic Fatigue Syndrome

- A study of 43 CFS sufferers and 36 healthy controls found a gut composition of too much bad bacteria in those with CFS in comparison to the controls
- Gut dysbiosis is linked to fatigue and poorer immune functions
- A CFS protocol must include a major gut health protocol

Fibromyalgia

- In one study of 84 patients with fibromyalgia and 111 with IBS tested positive in a LBT (Lactulose Breath Test) which measures abnormal bacterial levels
- Low endocrine and immune function are also factors – both of which can be affected by bacteria in the intestines
- Whether this is a cause or another factor is still unknown



In Conclusion

- All of these conditions have an inflammatory component and all have a connection with gut dysbiosis
- Employing a gut health protocol for all of these conditions is essential to correct an underlying imbalance
- Probiotic supplements and fermented foods can play an important role as well as continue current protocols