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EXERCISE AND SLEEP

Healthy Gut

Slide 2

Sleep and Exercise

- Sleep and exercise – two of the most important elements for health
- As important as diet
- So are you surprised that there is a gut connection for both of these elements?
- By now – probably not

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Stages of Sleep

- Sleep involves nonREM (rapid eye movement) sleep and REM sleep which we cycle between all night long
- There are 3 stages for nonREM each lasting 5-15 minutes

Stage 1: Eyes are closed but it easy to wake up

Stage 2: Light sleep – heart rate slows and body temp drops to get the body ready for a deeper sleep

Stage 3: Deep sleep – hard to rouse and feel disoriented when wakened

This is the time the body repairs – immune system strengthens, replace bone and muscles tissues etc.

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Sleeping

- As we age, we have more trouble falling into a deep sleep and we also get less hours of sleep – even though we still need the same amount of sleep as we did when we were younger
- REM sleep occurs 90 minutes after you fall asleep – the first time is about 10 minutes and then each time after that is longer with the last one may be up to an hour
- The brain is active and intense dreams occur – heart rate speeds up and breathing quickens
- Babies spend 50% of the time in REM – adults only 20%

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How Do Microbes Affect Sleep

- Many of the systems we have discussed as having interaction with our microbes are involved with sleep
- The gut interacts with the HPA axis to shape normal sleep – cortisol inhibits cytokines and low cortisol is needed for sleep as cytokines play a role
- Immune system – low levels of cytokines (IL-1 and TNF alpha) induce nonREM sleep
- Excessive cytokine production disrupt sleep – IL6 interferes with nonREM
- Dysbiosis and LPS are associated with excessive cytokine production

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What Does This Mean?

- Excess inflammation plays a role in interfering with nonREM sleep
- We get less nonREM sleep as we age and we are more inflamed as we age
- Good gut bacteria is anti-inflammatory and plays a role with these elements affecting sleep
- Lowering inflammation with good gut health strategies and creating an environment that may help improve sleep may also be the key to slow aging

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How Does Sleep Affect the Gut

- We have to have good gut bacteria to sleep well
- However, lack of sleep affects the levels of our good gut bacteria
- Good bacteria is regulating our circadian rhythm
- They also sleep when we sleep
- We go to bed with one set of microbes and wake up with another – similar to the way we re-generate our body tissues and repair

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How Does Sleep Help The Gut

- If we sleep well – then we maintain good bacteria levels
- If we sleep poorly – then it favours dysbiosis
- Consistent poor sleep leads to more significant dysbiosis
- Circadian rhythms are patterns of brainwave activity, hormones, cell regeneration and biological activities that occur on a daily basis.
- Sleeping well at the right time each day is essential to keeping the circadian rhythms functioning properly
- Dysbiosis may also lower metabolism during sleep and contribute to weight gain, according to one mouse study

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What To Do

- Helping clients get better sleep is important for a good gut health protocol
- Go to bed at a set time and get up at the same time as much as possible
- Avoid bright lights near bedtime
- Avoid eating or exercising close to bedtime
- Sleep in dark space – light tricks the body into thinking it is time to be awake.
- Develop a relaxing routine before bed whether it is taking a bath, deep breathing exercises or having a nice cup of herbal tea such as chamomile or valerian.
- For those who have irregular work and therefore, sleep schedules, consider talking to a practitioner about taking melatonin

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What To Do

- Check the quality of clients mattress and pillows
- Pink noise machine can aid sleep quality better than white noise
- Eat prebiotic foods, especially those with resistant starch to produce short chain fatty acids (which help regulate cytokines)
- If SIBO is present or other cause of issues with resistant starch – then an anti-microbial may be needed
- Butyrate supplements can be helpful if you are not sure how they digest resistant starch

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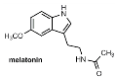
Melatonin



- Melatonin decreases as we age and cortisol increases as we are awake longer
- Melatonin supplements can be helpful in the short term to help restore ideal times for circadian rhythms – take it earlier that bedtime to change
- Helping client restore better melatonin production is best (reduce stress and cortisol)
- Take probiotics which can help melatonin levels which, in turn, help restore circadian rhythms.
- Sleep is one more example of the potential problems caused by dysbiosis and why we should be focused on improving our gut health.

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Exercise - The Good

- One study of rugby players showed they had greater diversity of microbes than two control group (non-athletes matched for size and BMI or age)
- Study also found the athletes ate a wider range of foods as well
- Dysbiosis and leaky gut has been connected to athletes having exercise-induced inflammation
- Another study (rats) found that exercise early in life can alter the microbial community and set the person up for healthier brain and metabolic function over a lifetime

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Exercise – The Bad

- Intense exercise is not good for the gut
- Endurance athletes are known to have gut issues especially after an endurance event
- In one study of triathletes – found higher levels of LPS and inflammatory cytokines
- More inflammation occurs in the gut and the gut tends to be more leaky – the immune system function decreases
- In another study of men subjected to 90 minutes of intense exercise daily, found that those taking probiotics had less inflammation and less leaky gut than the controls

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Exercise

- Exercise also increases free-radical damage in the body
- In one study two groups of 12 athletes were looked at for oxidative stress with one group taking probiotics L. rhamnosusIMC 501 and L. paracasei IMC 502
- The results showed that intense physical activity induced oxidative stress and free radical damage
- Also showed that probiotic supplementation increased antioxidants in the blood

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Cortisol and Exercise

- Exercise does not raise cortisol levels
- If fact – it lowers high cortisol levels
- Except one study found people who consumed caffeine prior to exercise had higher cortisol levels after exercise
- High cortisol levels also contribute to lower muscle development
- Since excess cortisol is linked to lowering good gut bacteria and increasing bad bacteria – exercise should be part of a gut health program

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Walking and Cortisol

- Low-intensity aerobics is best (will depend on the fitness level of client)
- One study of 12 people walking, measured heart rate, blood pressure, pulse rate, salivary cortisol, and secretory IgA six times each day
- Half the group walked for 15 minutes in the woods and the rest did 15 minutes in the city
- The woods group had lower blood pressure and cortisol than the group who walked in the city – also reported feeling calmer and relaxed – looking at scenery on TV had a similar effect

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Exercise and Cortisol

Other exercise like tai chai, yoga also help lower cortisol levels

One study of people with depression found that those who did yoga had lowers levels of cortisol (felt less depressed) than those taking drugs only (for depression)

A meta analysis study of 40 studies (total 3817 people) found that the studies showed that tai chi provided improvements in psychological well-being including reduced stress, anxiety, depression and mood disturbance, and increased self-esteem

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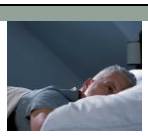
Lifestyle Relationship



- It is impossible to separate the relation with stress, exercise and sleep from the health of the microbiome
- Sometimes we are looking at a direct relationship of sleep and exercise on the gut
- Sometimes we are considering the relationship of exercise and sleep and their relationship with the adrenals and cortisol and its affect on the gut
- We also need to understand that sleep and exercise help each other

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In Conclusion…

- We want to help clients understand the relationship of sleep with the gut and exercise with the gut
- By explaining this – we can help them make better choices.
- The key is finding the right balance to help them have the best quality sleep
- We also need to help them make the best choice for their exercise routine
- Both sleep and exercise can have a positive relationship in improving gut health