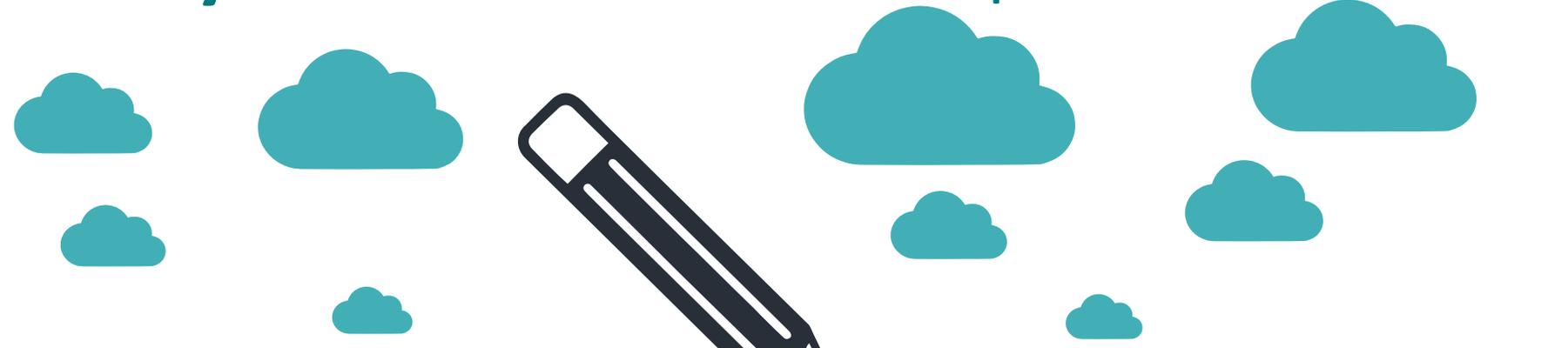


Combat Long-COVID-19 symptoms with lifestyle: Guide for healthcare professionals



Hand in hand with conventional medicine!

What needs to be addressed?

How do we get the virus out of the body?

1. What needs to be addressed to combat the patient's symptoms?

According to patient's status:

01 Mitochondria

02 Hormones

03 Adrenals

04 Thyroid

2. How do we get the virus out of the body?

Optimize detoxification through:

01 Diet

02 Lifestyle

1. What needs to be addressed to combat the patient's symptoms?



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According to patient's status & needs, we can approach the:

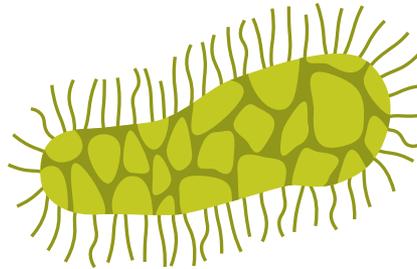
Mitochondria



1. What are mitochondria?
2. Guide for mitochondrial health.

What are mitochondria.

Much more than the “powerhouse of the cell”!



They also interact with free radicals, calibrating and adjusting **cellular respiration**. For good health, you want to keep the oxidative capacity of the mitochondria in both skeletal and heart muscle up and running.

Guide for mitochondrial health.

Breathing techniques
Grounding

Hormetic stressors:
High-Intensity Interval Training
Cold exposure
Sweat

Treat your microbiome
Fasting techniques
Burn fat as fuel

Sleep hygiene

AMPK activity:
Decrease inflammation (fuel on unprocessed-, mainly plant-food sources, reduce sitting time, ...)
Foods high in ALA: flax-, chia-, hempseeds, avocados, ...
Try hot-cold contrast techniques
Fasting strategies

Nitric Oxide:
Vegetables high in nitrate (celery, beetroot, spinach, ...)
Moderate to high intensity exercise
Nose breathing

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Hormones

1. Meet your hormones - stress, nutrition, movement and sleep.
2. Three-step guide for hormonal health.



Meet your hormones – Stress

Adrenaline

- Fight or flight hormone.
- Immediate reactions to stressors.
- Increases heart rate, gives a surge of energy, muscles tense, faster breathing, ...

Norepinephrine

- Similar to adrenaline, establishes arousal.
- Helps shift blood flow away from non crucial areas and toward more essential areas for that stressful situation.

Cortisol

- Stress hormone.
- Takes a few seconds to kick in.
- Helps to maintain fluid balance and blood pressure.
- Optimal amounts can be lifesaving. Though chronic elevated levels can lead to serious issues.

-
- Estrogen and testosterone are also hormones that affect how we react to stress, as are the neurotransmitters dopamine and serotonin.
 - Good relationships, body- or breathwork and behaviors promoting a better mindset can influence these hormones for better physiology.

Meet your hormones – Nutrition

Leptin & grehlin

- Leptin regulates appetite, metabolism and calorie burning.
- Leptin tells your brain when you're full, grehlin does the opposite.
- Disregulation will cause cravings and difficulties in weight management.

Insulin

- Maintains normal blood glucose levels by facilitating cellular glucose uptake.
- Regulates carbohydrate-, lipid- and protein metabolism.
- Insulin resistance is a contributing factor to a broad range of our Western diseases.

Cortisol

- Increases appetite and ramps up the motivation to eat.
- Distress increases the intake of foods high in fat, sugar or both. High cortisol & high insulin levels may be responsible for this reaction.

-
- Eating a predominantly plant-rich diet, with a variety of unprocessed foods (loaded with fiber and low in fat or artificial sweeteners), eating in a 8-10h window, (high intensity) exercise and good quality sleep beneficially influences leptin, grehlin, insulin & cortisol levels.

Meet your hormones – Movement

Dopamine, serotonin, endorphins & oxytocin

- These hormones are responsible for good mood.
- Dopamine motivates you to take action toward your goals.
- Serotonin flows when you feel important.
- Endorphins alleviate anxiety
- Oxytocin strengthens relationships

Testosterone & estrogen

- Testosterone is responsible for muscle protein resynthesis and repair, and has a role in helping grow skeletal muscle.
- Estrogen is the primary female sex hormone. Together with progesterone it assists metabolism, acts as an antidepressant, and promotes sleep.

Human growth hormone & BDNF

- HGH spurs or maintains growth, regulates body composition, body fluids, muscle and bone growth, sugar and fat metabolism and possible heart function.
- BDNF helps stimulate the production of new brain cells and plays a role in mood disorders.

-
- Keeping on the move is deeply rooted in our evolution, so it's no surprise the right amount & load is undisputedly one of the best ways to keep our body in a healthy state of equilibrium.
 - The right balance is often difficult to find. Exercise must be tailored to your own needs and goals, taking into account your circadian- or infradian rhythms, stress or other lifestyle factors.

Meet your hormones – Sleep

Cortisol and melatonin

- Cortisol peaks in the early morning & wakes us up, while melatonin is released in the dark and prepares our bodies to go to sleep.
- For sleep and health, these two should be synchronised to form outbalanced diurnal- and nightly slopes.

Thyroid hormones

- Responsible for growth as well as body development.
- Wrong ratios can cause a broad spectrum of health issues, having consequences on physical and psychological wellbeing.

Human growth hormone & BDNF

- Both hormones have a huge impact on health and performance.
- An overall healthy lifestyle with special emphasis on a good sleep hygiene, will naturally increase their levels.

-
- **All of the previous mentioned hormones are greatly impacted by our circadian rhythm and our sleep quality. Also, our immune system and inflammatory markers in our blood depend on a good nights' sleep.**
 - **Sleep is thus an unnegotiable necessity.**

Three-step guide for hormonal health

1 Balance

Improve your metabolism, digestion & lose weight with **blood sugar balance**.

2 Replenish

Lower stress levels and increase your energy with adrenal support (see chapter adrenals).

3 Detox

Clear excess hormones with liver support (see chapter detoxification).

Blood sugar balance

1 Stress management

- Chronic high cortisol makes our body less sensitive to insulin
- Be mindful of emotional unhealthy food cravings

2 Dietary choices

- Eat a fiber-rich unprocessed rainbow predominantly plant-based foods.
- Avoid snacking

3 Movement

- Daily exercise is better than having high bursts of exercise only twice a week.
- Implement resistance training.

3 High quality sleep

- Your body's ability to balance bloodglucose levels is far better after a good night's sleep

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Adrenals



1. Stress relief tools, backed up by science.
2. Embracing life's stressors.

Stress relief tools, backed up by science.

- 1 Don't go N.U.T.S with stress (by Dr. Lupien):**
Defining the problem might be the beginning of solving the problem.
- 2 Alleviate stress with light:**
Go outside for good mood.
- 3 Alleviate stress with vision:**
Give the panoramic view a try.
- 3 Alleviate stress with breath:**
Slow down your respiration, or use sigh to relieve.

Don't go N.U.T.S with stress.



N - novelty
Something new

U - unpredictability
No way of knowing it could occur

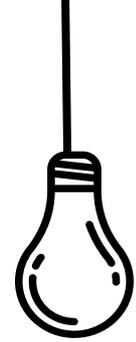
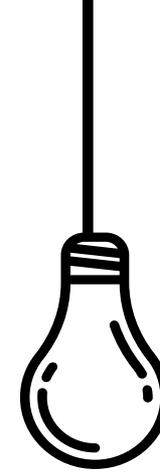
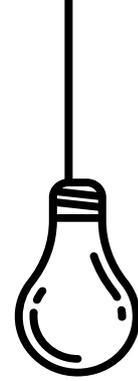
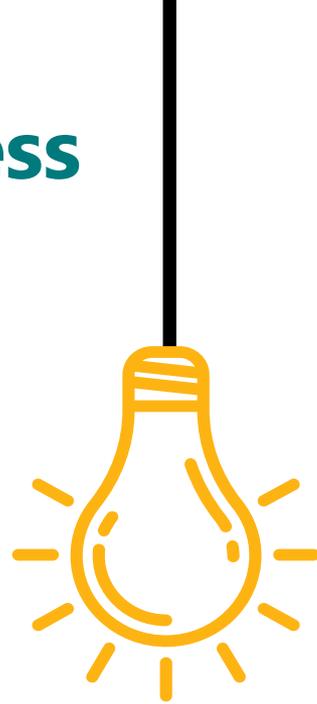
T - threat to the ego
Feeling your competence is questioned

S - sense of control
Feeling you have little or no control in a situation

While what stresses you is very personal, the **recipe for stress is universal**. So are the ingredients. For a situation to be stressful, **it must contain one or more of the N.U.T.S. elements.**

Defining the problem might be the beginning of **solving** the problem.

Alleviate stress with light.



Melanopsin are **light sensitive** proteins in your eyes. They trigger centers in your brain, **influencing mood, metabolism and overall health.**

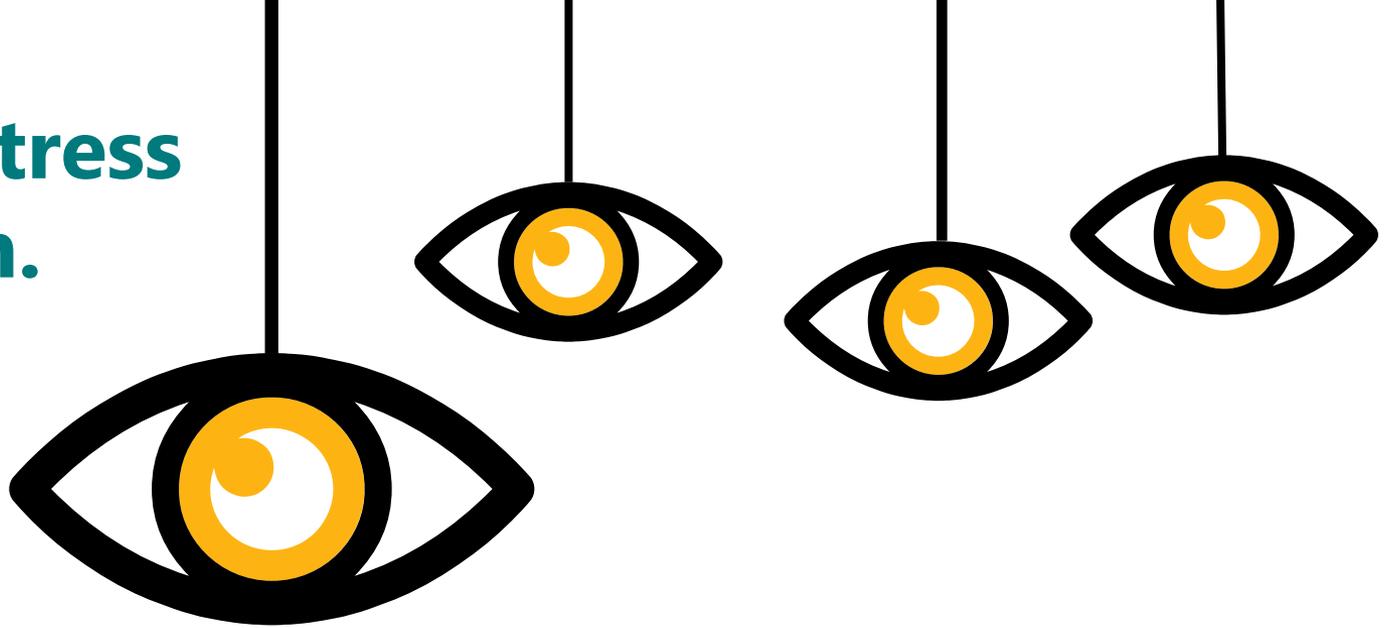
Long-term night light exposure has harmful effects on your health, but natural daylight can offset these effects. **Go outside for good mood!**

Bright morning light regulates circadian rhythms & balances stress hormones.

Orangish evening light gets the sleep orchestra going.

Bright light at night (11pm-4am) negatively affects dopamine release and also results in memory & learning deficits.

Alleviate stress with vision.



Your eyes are closely related to the brain. If you feel you're stressed, **give the panoramic view a try.**

Recent research now suggests the **stress relieving effects of outside walking** are also impacted via an eye-brain connection.

Panoramic view ("dreaming" with your eyes) readily releases stress through neurophysiological ways.

Your eyes horizontally screen everything around you while walking. These eye movements positively affect stress relieving centers in the brain.

Alleviate stress with breath.



Slowing your respiration down to 6-7x/min, has thorough effects on your autonomic nervous system.

Sighing is a type of long, deep breath. It begins with a normal breath, then you take a second breath before you exhale. This is **shown to relieve stress and reduce anxiety**.

In a stressful situation, try sighing for 5-10 times for stress relief.

Pranayama or yogic breathing practices result in a better parasympathetic control.

Ujjayi breath (ocean's breath) brings the attention to the now.

Breathe in for 3s – hold for 4s – breathe out for 5s (or 4-4-8).

Try alternate nostril breathing.

Embracing life's stressors

A balanced autonomic nervous system is key for good health.

All processes of your healing and health maintenance are turned on when your body is in a parasympathetic state.

It is shown that stress resilience is critical for health.

Resiliency is not just something you get born with. It is achieved through overcoming life's difficulties, and what you experience over time. Moreover, it can be fine-tuned through mind-body practices and lifestyle.

Patients should not be guarded from stressors, but should learn how to manage life's challenges.

By embracing the dynamic push-pull of the different autonomic states, one can create a buffer from the deleterious effects of chronic stress, as it does not have such a bad impact when there is resilience.

Embracing life's stressors

Positive social interactions, purpose in life or gratitude practices greatly impact your ability to cope with life's stressors.

Exposure to **bodily stressors** could potentially make your mind more resilient to emotional stressors (such as cold showers or exercise)

Anti-inflammatory- & unprocessed plant-foods create beautiful xenohormetic ripple effects in your body, balancing good & bad stressors, making you more resilient.

Breath work can influence your physiology. Thus balancing the autonomic nervous system. Giving you **deeper sleep**. So your body and brain can rest and replenish your energy.

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Thyroid



1. What is the thyroid system?
2. Underlying causes for thyroid dysfunction.
3. Strategies to promote thyroid health.

What is the thyroid system?

It plays a critical role in your **metabolism** and so much more.



Thyroid hormone **“cross-talks”** with all the other **hormones** in your body, including insulin, cortisol, and your sex hormones. If you don't produce the right amounts, your whole system goes haywire.

Underlying causes for thyroid dysfunction.

Stress
Smoking
Toxin exposure
Hormonal imbalance

Infections
Pain

Gut problems & food intolerances
Artificial sweeteners
Nutrient deficiencies
Iodine levels & low vit A, selenium or copper

Strategies to promote thyroid health.

1 **Regular exercise or saunas:** sweat!

2 **Eat foods that offer nutritional support for your thyroid:**

- **Include:** Fish for iodine, omega-3 fatty acids & vit D. Dark leafy greens for vit A. Herring and Brazil nuts for selenium. Seeds, lentils & cashews for zinc & copper.
- **Avoid:** gluten (if you've tested sensitive) and processed soy products

3 **Have your thyroid tested, use the right supplements to support your thyroid, choose the right thyroid hormones replacement.**

2. How do we get the virus out of the body?



**Optimize detoxification
through:**

01 Diet

02 Lifestyle

2. How do we get the virus out of the body?

Optimize detoxification through:



Diet

1. Foods for general (microbiome) health.
2. Diet strategies to focus on.

Foods for general (microbiome) health.

Fiber is key: Eat a rainbow of beans, greens, grains & nuts!
Avoid snacking, try fasting.

Whole foods, resistant starch foods, (cruciferous) vegetables & fruits, whole grains, beans & legumes
Don't forget: SMASH fish/seafood, avocado, turmeric, ginger, garlic, berries, nuts & seeds, extra virgin olive oil, green tea and fermented foods.
Optional: eggs, poultry, low-fat or nonfat dairy products, tofu and tempeh



Include, but don't overdo: starchy foods (potatoes & pasta), alcohol, real maple syrup or raw honey, coffee or black tea



Avoid antibiotics
Limit: Artificial sweeteners, refined grains, processed meat, processed food, trans fats, fried foods, full-fat dairy products, additives



Diet strategies to focus on.

- 1 **Eat clean and organic foods:** leafy greens, cruciferous vegetables (broccoli, cauliflower, cabbage, Brussels sprouts, ...), sulfur foods, and other brightly coloured vegetables and fruits. Thus eating a **fiber-rich rainbow** of health.
- 2 **Sulfur containing foods** such as eggs, onions, broccoli, and garlic enhance excretion of heavy metals and support glutathione.
- 3 **Limit alcohol, hydrate with water or (green) tea.**
- 4 **Go easy when implementing fasting strategies.** If you want to implement such a strategy, make sure you don't limit your calorie intake. Your body needs energy & stress-free time to detoxify properly. A easy manageable approach of Satchin Panda (eating in a window of 8-12h/ day, with a last meal around 7PM, without too much snacking) might be a good place to start.

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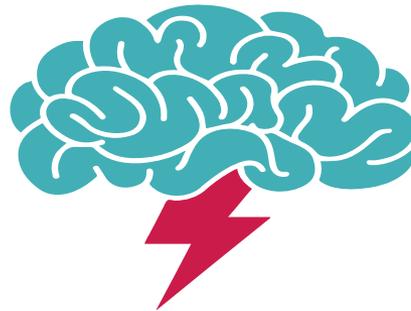


Lifestyle

1. Focus on sleep
2. Get active

Focus on sleep.

The glymphatic system



This is an important **waste clearance system** for your body. Each night, **during deep sleep**, the brain shrinks and gets washed with cerebrospinal fluid, and this waste is carried through the glymphatic system and gets moved into the peripheral lymph.

Focus on sleep.

Sleep hygiene guide

Regularity (in wake-up timing), also in the weekends.

Use caffeine as a performance boost in the morning or at noon, not in the afternoon.

Powernaps before 4PM, no longer than 30 minutes.

Eat during a time-window of 10 hours/day, limit late-night diners

Wind down before bed-time, creating bed-time routines can help.

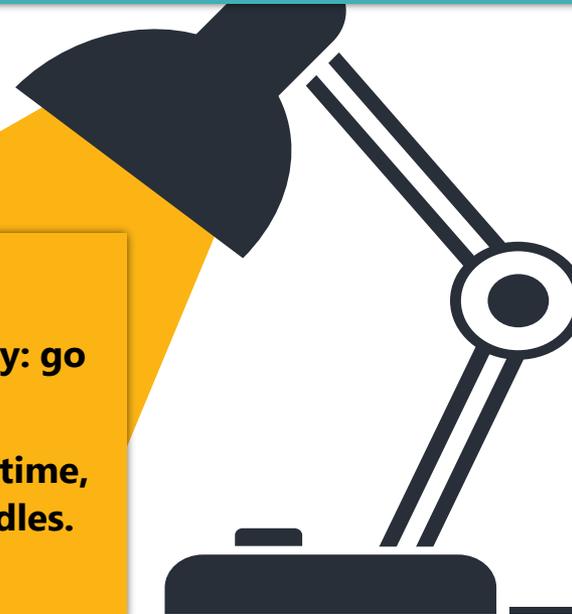
Sleep in a quiet, dark, cool bedroom

Light guide for sleep

Natural light in the morning & during the day: go for a morning walk.

Dim the lights in the hours leading up to bedtime, choose amber colored, warmer lights or candles.

Dark nights.



Get active

- 1 **Movement and exercise** are good for general health, specifically influencing metabolic health and lymphatic structures.
- 2 **By reducing inflammation**, exercise can help your body's systems – including its detoxification system – function properly and protect against disease.
- 3 **Sweat** from time to time!

3. How to approach Long-COVID-19 symptoms



Promote healthy behaviours & focus on health.



Treat underlying causes of symptoms.



Manage other chronic conditions.



This approach should go hand in hand with conventional care.