



## ***Low grade inflammation***

### **What is low grade inflammation (LGI)**

#### *Inflammation and the immune system*

Low-grade inflammation (LGI) is a term used for persistent inflammation in the body. This is caused by persistent overactivity of the immune system. Low-grade inflammation is distinguished from an acute infection in which the immune system reacts violently to pathogens that enter the body en masse. The immune system responds with violent action to clear out the pathogens and make recovery possible. That's why you get fever and feeling real sick with energy loss and fatigue. As soon as the pathogens are eliminated, recovery comes quick.

With low-grade inflammation, the immune system is also overactive but at a level that does not immediately make you sick or induce fever. It is a chronically persistent silent state of overactivity.

The immune system needs a lot of energy, glucose, calcium, phosphorus, iron etc... It is stealing that energy from other systems like muscles, bones and brains. This creates problems on many levels.

#### *Microbiome and inflammation*

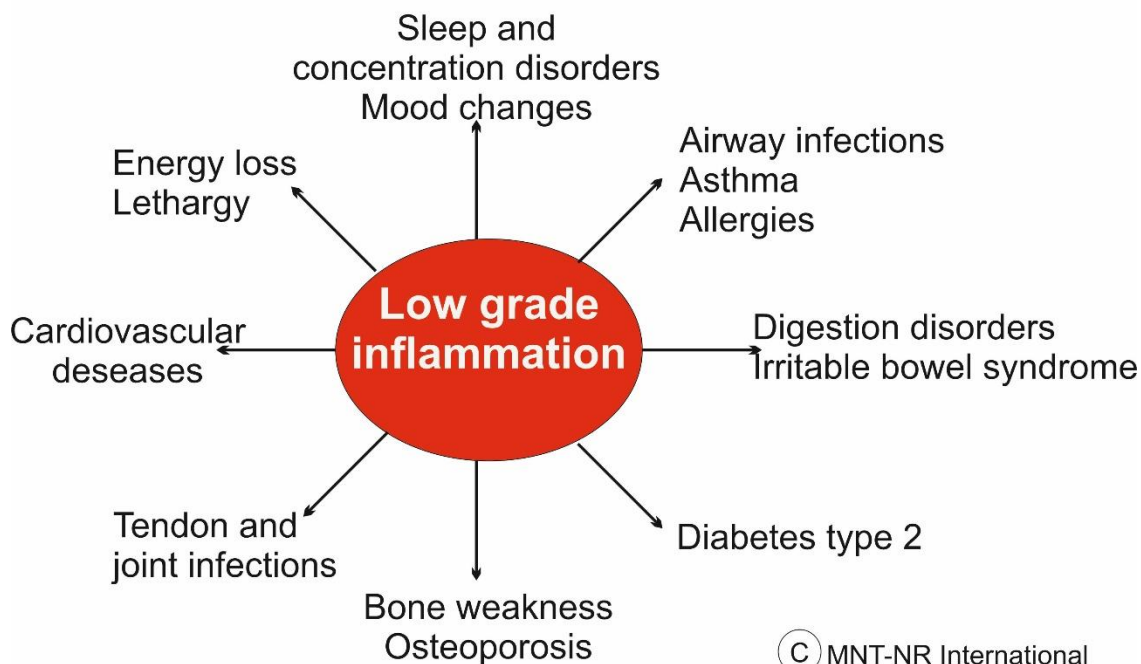
Your skin, mouth, lungs, and intestines contain the "microbiome," commonly known as intestinal flora. This is an immense collection of mainly benign bacteria that play a role in digestion, respiration and protecting from foreign bacteria. The microbiome produce minerals, vitamins and neurotransmitters. If you inhale harmful bacteria or eating the wrong food, hostile bacteria will install in your microbiome. In inflammatory processes, bacteria also detach themselves from the microbiome, such as in the mouth or intestines. They spread through the circulatory system and can settle in joints, tendons, intervertebral discs or nerves. This declares varying inflammations in muscles, joints, tendons and intervertebral discs.



## *Microbiome-nerves and brain*

A mass of nerve endings are in close contact with the microbiome. Inflammatory processes are picked up by those nerves and the signals are transmitted to the brain. Inflammation can also install there. That's called neuroinflammation. This inflammation in the brain also installs itself with strong emotions and emotional traumas. This in turn leads to sleep and concentration disorders, mood swings or depression.

## **Low grade inflammation: consequences**



It is becoming increasingly and abundantly clear that low-grade inflammation is the cause of numerous chronic conditions such as: type 2 diabetes, cardiovascular disease, disseminated and repeated inflammations in the musculoskeletal system (tendon and joint disorders), digestive complaints (irritable bowel syndrome, Crohn's disease), fibromyalgia, chronic fatigue syndrome and other...

Depression, lethargy, concentration and sleep disorders are also part of this.



## The most frequent causes: nutrition and stress

### 1. Nutrition.

Our body mainly needs sugars, fats and proteins to build up sufficient energy and to properly maintain and renew our cells. An imbalance in that supply causes harmful substances that are still difficult to remove and are therefore attacked by the immune system.

➤ *Excessive supply of sugars.*

Sugar molecules are the first and most important source of energy production. However, too much sugar supply leads to harmful compounds in blood vessels and digestive tract. Those harmful compounds elicit inflammatory responses from the immune system. Too many sugar molecules are also converted into fat globules that accumulate close together under the skin. There, too, harmful compounds arise that will ignite inflammation.

➤ *Meat, milk and cheese products from four legged animals or mammals.*

Mammals or four-legged friends have a certain species "recognition molecule" on their cell walls, called: Neu5GC, which cause them to attract the bacteria that are friendly to their specific microbiome (intestinal flora).

In humans, the Neu5Ac is authentic and NEU5Gc of mammals are foreign to the body.

But mammals have both molecules and if you eat mammals' meat or cheese, it takes a while before the immune system discovers that in addition to Neu5Ac, Neu5Gc is also present. And bacteria are implanted that are specific to the mammalian microbiome but not to the human.

This in turn leads to inflammatory reactions.

➤ *Harmful fats.*

This is not so much about saturated versus unsaturated fatty acids but mainly about a correct balance between Omega-3, Omega-6 and omega-9 fatty acids. Too many omega-6 fatty acids form into arachidonic acid, which in turn produces inflammatory substances.



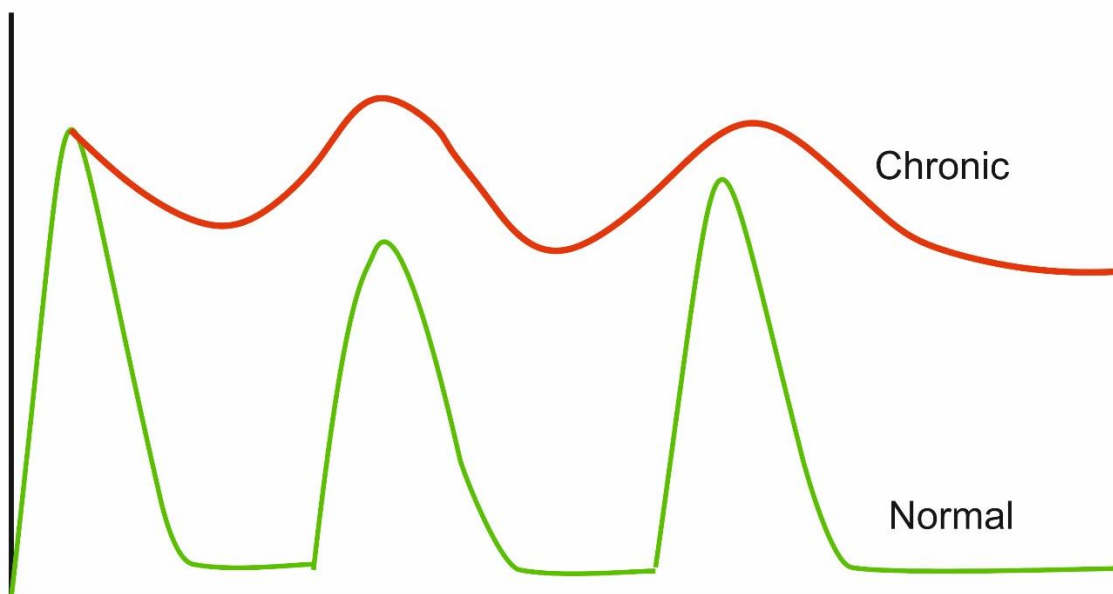
## 2. Stress.

*Stress is a joint response of the nervous, hormonal, and immune systems to a situation that threatens the physical and emotional state of the body. The stress response therefore arises both with physical threat (inflammation, overload, tissue damage...) and with emotional load (emotional trauma, work pressure, environmental pressure...) The reaction will be the same in all cases.*

The human stress response in all his development has practically not changed compared to the animal world and the former human hunter-gatherer. It serves to evoke a ***time-limited*** responses. Like the animals and the hunters have to hunt for food or have to defend themselves against attacks. After the action, animals and hunters retreat to their safe environment to recover and rest.

The stress response therefore burdens the body and the mind, but they must also be given time to recover. Normal stress reactions therefore have an undulating course with peaks and rest periods.

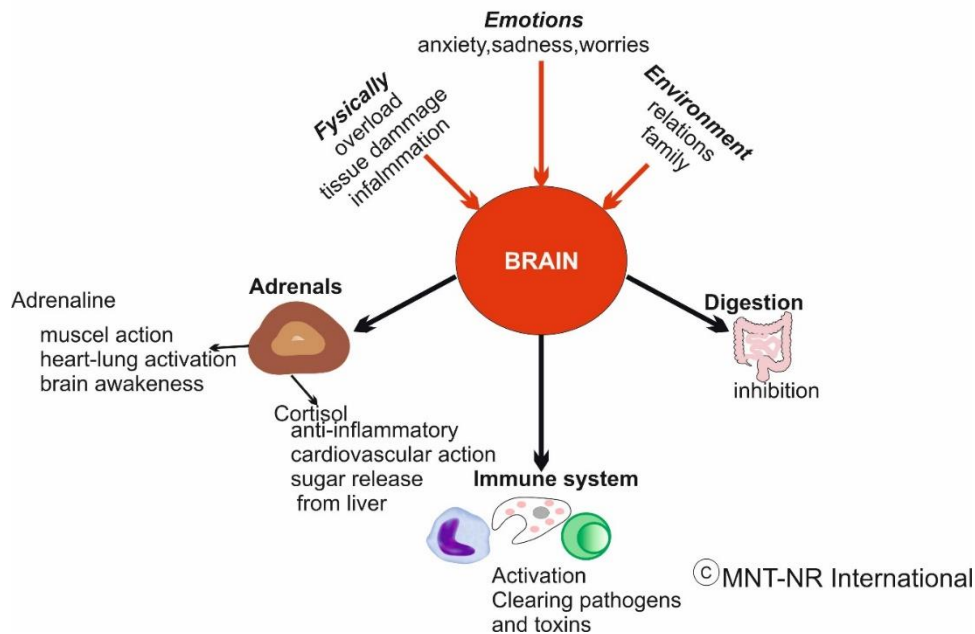
## Normal versus chronic stress load



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## Stress reactions



### *2.1. Normal stress reaction*

In stressful situations, impulses come from the brain that stimulate the hormonal system, the immune system, nervous system, movement system and the heart-lung system. Everything is at the service of vigilance, action, defence and learning.

- a. The sympathetic nervous system or our action nervous system stimulates:
  - adrenaline production in adrenal glands,
  - heart and respiratory rhythm,
  - muscle
  - vigilance.
- b. The hormonal system stimulates:
  - cortisol production in adrenal glands
  - Cortisol has an anti-inflammatory effect to protect the movement system from damage.
  - And along with adrenaline increase in wakefulness, heart and respiratory rhythm.
- c. The immune system must ensure that harmful substances and bacteria released during action are neutralized.
- d. Digestion is suppressed because all energy must go to the brain, movement, heart-lung function and immune system.



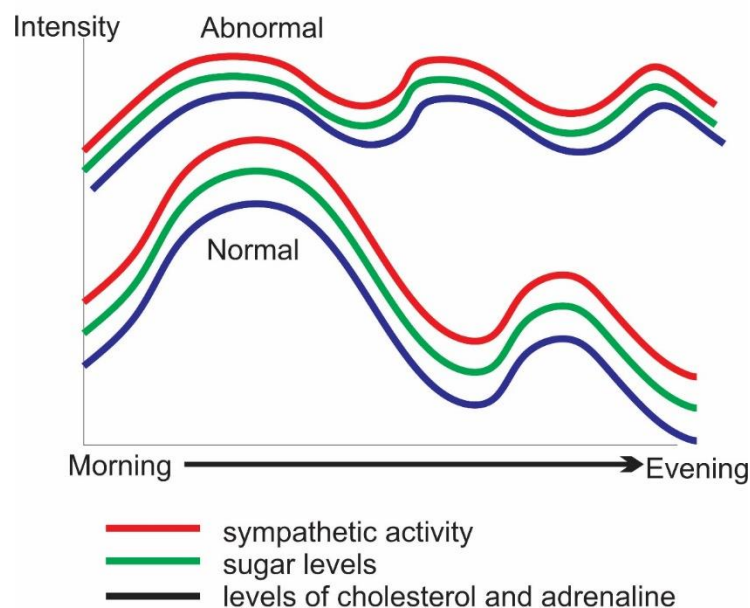
## 2.2. *The chronic stress load*

If you constantly put your stress under pressure from morning to evening, the immune system and the hormonal system and the nervous system will go into overdrive continuously.

These are the consequences.

1. Continuous high cortisol and adrenaline production against the natural biorhythm.
1. Continuously high sugar levels in the blood.
2. Continuous suppression of digestion.
3. Continuous load on heart and breathing.
4. Continuous load on brain activity.

### Levels of cortisol-adrenaline-glucose Normal vs anormal



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Oviously, all of that leads to a continuous degree of inflammation in the body.

Joint muscle and tendonitis are part of this. High sugar levels lead to type 2 diabetes.

High cortisol and adrenaline levels lead to sleep disorders, burnout and depression because the brain no longer comes to rest.

Poor digestion leads to overproduction of waste products and toxins.

Fat balance is disturbed.

Low-grade inflammation is a typical Western condition due to society's high stress levels and consuming sugary food products.