

## Effects of stress

on the autonomic nervous system

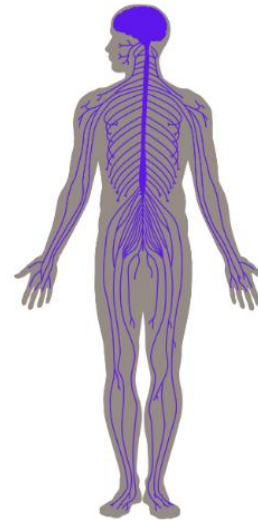


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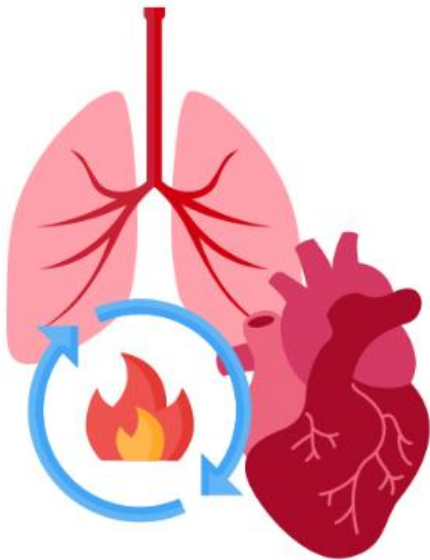
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## The autonomic nervous system <sup>(1)</sup>

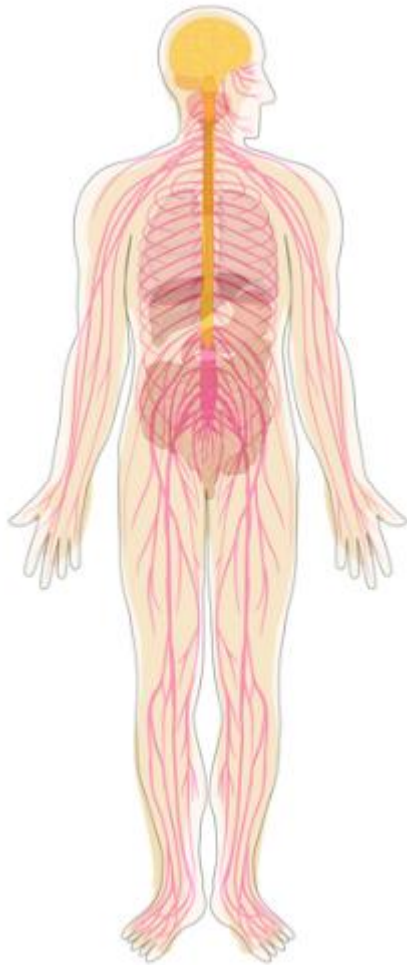
sympathetic and parasympathetic nervous system



The autonomic nervous system is part of the **central nervous system** (CNS = brain and spinal cord) and the **peripheral nervous system** (PNS = nerves that run from the brain and spinal cord into the body).



It is responsible for involuntary processes in the body (e.g. breathing, heartbeat and metabolism).



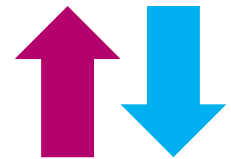
The autonomic nervous system ensures that physical processes automatically adapt to the situation you are in (e.g. shivering when it gets cold, sweating when it gets hot, etc.)

Therefore, it is also called the **autonomic nervous system (ANS)**.

It consists of two subsystems:

The **sympathetic** and the **parasympathetic** nervous system.

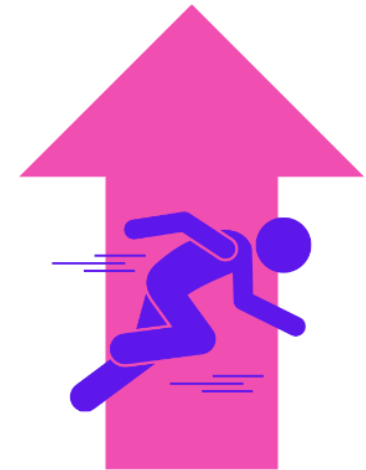
The sympathetic nervous system has an activity-enhancing and energy-enhancing effect, while the parasympathetic nervous system has a calming and energy-storing effect.



These two systems work antagonistically, i.e. in opposition to each other, and there is a finely tuned interaction between them.

The nerve cells of the **sympathetic nervous system** originate in the spinal cord and become active, for example, when there is stress, fear, excitement, threat, danger or physical exertion.

The sympathetic nervous system thus releases energy in preparation for rapid reactions.



The nerve cells of the **parasympathetic nervous system** originate in the brainstem and the lower spinal cord. They shut down the system after physical activity and ensure energy-saving behavior.



The parasympathetic nervous system thus reduces energy expenditure and brings the body into a resting mode.



## Negative stress <sup>(2, 3)</sup>

What leads to it and what effects it has



There are various stress triggers or “stressors” for **negative stress** (also called “distress”, i.e. the kind of stress that can make us ill in the long term).

These can be roughly divided into four categories:

- **External stressors**

- Everyday situations that we perceive as unpleasant or threatening (e.g. noise, climate, traffic jams, waiting times, worries, debts, illness, pain, boredom, criticism)

- **Internal stressors**

- They have to do with our upbringing and inner view of ourselves and the world. They further the perception of a situation or person as a stress trigger (e.g. high demands or expectations, unfulfilled desires, low resilience, perfectionism, low self-esteem)

- **Psycho-mental stressors**

- Stressors perceived as mental stress (e.g. excessive or insufficient demands, unclear targets, pressure to perform, time pressure, competitive pressure)

- **Social stressors**

- E.g. bullying, isolation and loneliness, negative working atmosphere, etc.

If we get stressed, the sympathetic nervous system kicks in and activates the body to **perform at its best** .

It has the following effects:

- Rapid heartbeat and increased blood pressure
- Constriction of blood vessels in the skin (skin gets cold)
- Dilation of blood vessels of the working muscles
- Dilatation of bronchi
- Increase in the blood's ability to clot
- Increase in metabolism
- Dilation of pupils
- Increased attention
- Inhibited salivation and loss of appetite
- Dormant digestive process
- Slightly sticky sweat
- Urinary urgency
- Decreased blood flow to the genitals

**If negative stress lasts too long** and your system is not restored into a resting state or not often enough, this can have serious health implications:

- Cardiovascular diseases
- Diabetes
- Elevated liver enzymes
- Skin rashes
- Gastrointestinal diseases
- Burnout or depression
- Sleep disorders



## Self-regulation

How to activate the parasympathetic nervous system



Even if the autonomic nervous system cannot be controlled directly, it can still be influenced indirectly.



Relaxation techniques (such as breathing exercises or autogenic training) inhibit the sympathetic nervous system and support the activity of the parasympathetic nervous system.

Methods such as biofeedback and neurofeedback also contribute to the regulation of unconscious physical processes.



When the parasympathetic nervous system is activated, the body goes into rest mode.

It has the following effects:

- Slow heartbeat and decreased blood pressure
- Dilation of blood vessels in the skin (Skin gets warm)
- Constriction of blood vessels of the working muscles
- Constriction of bronchi
- Decrease in the blood's ability to clot
- Lowering of metabolism
- Constriction of pupils
- Decreased attention and opening of the mind to daydreaming
- Increased salivation and appetite stimulation
- Activation of the digestive process
- Increased blood flow to the genitals



If you have difficulties coping with stress and at the latest when the first symptoms of illness appear, do not hesitate to seek medical advice.



### Sources:

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3. AOK – Die Gesundheitskasse, 01.07.2020 – updated at 14.03.2022, Krankheiten durch Stress: So sehr kann die Belastung dem Körper schaden, AOK Gesundheitsmagazin, <https://www.aok.de/pk/magazin/wohlbefinden/stress/stress-so-krank-kann-er-machen/>



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