

Identifying between “fight or flight” and “rest and relaxation” modes

The parasympathetic nervous system (PNS) and sympathetic nervous system (SNS) are both apart of the Autonomic nervous system. The parasympathetic nervous system, sometimes called the rest and digest system, conserves energy as it slows the heart rate, increases intestinal and gland activity, and relaxes sphincter muscles in the gastrointestinal tract. The sympathetic nervous system, is often termed the fight or flight response, is a response to threat or danger that comes upon you. The parasympathetic and the sympathetic nervous systems work together to help you cope with and respond to daily life. For many people, daily life brings a myriad of stresses that activate the sympathetic nervous system. Loud noises, flashing lights, frustrating thoughts and advertisements for delicious frozen coffee all activate the sympathetic, or “fight or flight” mechanisms in your body.

Many yoga practices including gentle breath-based vinyasa and slow diaphragmatic breathing activate the parasympathetic system, or the “rest and digest” mechanisms of the body. Parasympathetic activation is the base state of the body, brain and mind. PNS activation reduces blood pressure and slows the heart and breathing rates after a stressful event. Additionally, blood flow is redirected to the digestive and reproductive organs, and the endocrine and lymphatic system, those parts of your body that aren’t needed in order to survive. A yoga practice encourages you to pay attention to the sensations in your body and your reactions to those sensations. People who practice yoga thus learn to be aware of and respond differently to stress-including thoughts and experiences so that the baseline of the PNS can be maintained. The PNS is a much slower system that moves along longer pathways. The parasympathetic response is responsible for controlling homeostasis, or the balance and maintenance of the body’s systems. It restores the body to a state of calm and counterbalance, and allows it to relax and repair. The body undergoes several specific responses when the parasympathetic system is activated: your saliva is increased, digestive enzymes are released, your heart rate drops, the bronchial tubes in your lungs constrict, your muscles relax, the pupils in your eyes constrict, and your urinary output increases. All of these changes are designed to maintain long-term health, improve digestion, conserve energy, and maintain a healthy balance in your body’s systems.

The sympathetic nervous system, or “fight or flight” response, is the body’s response to perceived threat or danger. During this reaction, certain hormones like adrenaline and cortisol are released, speeding the heart rate, slowing digestion, shutting blood flow to major muscle groups, and changing various other autonomic nervous functions, giving the body a burst of energy and strength. Originally named for its ability to enable us to physically fight or run away when faced with danger, such as being face to face with a lion, it’s now activated in situations where neither response is appropriate, like in traffic or during a stressful day at work. When the perceived threat is gone, systems are designed to return to normal function via the relaxation response, but in our times of chronic stress, this often doesn’t happen enough, causing damage to the body.

Cortisol (along with its partner epinephrine) is best known for its involvement in the “fight-or-flight” response and temporary increase in energy production, at the expense of processes that are not required for immediate survival. The resulting biochemical and hormonal imbalances resolve due to a hormonally driven negative feedback loop. The following is a typical example of how the stress response operates as its intended survival mechanism:

1. An individual is faced with a stressor.
2. A complex hormonal cascade ensues, and the adrenals secrete cortisol.
3. Cortisol prepares the body for a fight-or-flight response by flooding it with glucose, supplying an immediate energy source to large muscles.
4. Cortisol inhibits insulin production in an attempt to prevent glucose from being stored, favoring its immediate use.
5. Cortisol narrows the arteries while the epinephrine increases heart rate, both of which force blood to pump harder and faster.
6. The individual addresses and resolves the situation.
7. Hormone levels return to normal.



KiriLi Tiemeyer
Saugatuck High School
January 22, 2016

<http://healthyliving.azcentral.com/benefits-yoga-parasympathetic-nervous-system-1519.html>

<http://www.slideshare.net/LisaRSchmidt/the-autonomic-nervous-system-and-yoga>

<http://www.todaysdietitian.com/newarchives/111609p38.shtml>