



## The Nervous System

---

Lupus is an autoimmune disease that can affect almost any part of your body, including your joints, skin, kidneys, heart, lungs, or blood. Lupus can also affect the nervous system and brain. There are several terms doctors use to describe this: neuropsychiatric lupus (NP-SLE), neurocognitive dysfunction, or central nervous system lupus (CNS lupus). Your nervous system has three parts, any of which may be affected by lupus.

- The central nervous system (CNS) consists of the brain and the spinal cord.
- The peripheral nervous system (PNS) is a network of nerves that connects the brain and spinal cord to the rest of the body, and gives skin and muscles the signals needed for sensation and movement.
- The autonomic nervous system (ANS) allows communication between spinal and peripheral nerves and the brain and internal organs, and controls functions like breathing, blood flow, and heart rate.

People with lupus can experience a number of complications when their nervous system is affected. The symptoms may come on suddenly or may come and go, but they will vary depending upon the location and extent of the tissue injury. These symptoms also can be present in other diseases, so diagnosing lupus-related nervous system disorders is often difficult.

Neurologists are the physicians who specialize in the nervous system. They may rely on a number of diagnostic tools to determine whether lupus is involved in your cognitive problems:

- x-rays
- brain scans (magnetic resonance imaging (MRI) and computed tomography (CT))
- electroencephalograms (to capture the electrical pattern of brain activity)
- spinal tap (to examine fluid in the spinal column)

Behavioral and cognitive tests may also be done to find out if your memory or other mental abilities have been affected.

Depending on the symptoms, a variety of medications are available to treat lupus-related nervous system disorders, including non-steroidal anti-inflammatory drugs, antimalarials, and steroids. Your response to treatment may be rapid or gradual over several months. For many people with lupus, nervous system involvement is completely reversible.

### Central Nervous System (CNS)

When lupus affects your central nervous system, many symptoms may occur, including:

- headaches
- confusion
- fatigue
- depression
- seizures
- strokes
- vision problems

- mood swings
- difficulty concentrating

Drugs used to treat lupus can cause side effects that are similar to the symptoms of CNS lupus. If you have symptoms of CNS lupus you should consult a neurologist who can determine which symptoms are side effects of medication and which are due to lupus. The drugs most known for causing symptoms like those of CNS lupus are:

- Non-steroidal anti-inflammatory drugs (NSAIDs) – may cause headache, dizziness, confusion, and in rare instances, meningitis-like symptoms
- Antimalarials – in very high doses (not usually given for lupus) may cause manic behavior, seizures, psychosis
- Corticosteroids – may cause agitation, confusion, mood swings, psychosis, depression
- Anti-hypertensive medications – may cause depression or loss of sex drive

A serious form of lupus called CNS vasculitis may occur when there is inflammation of the blood vessels of the brain. Characterized by high fevers, seizures, psychosis, and meningitis-like stiffness of the neck, CNS vasculitis is the most dangerous form of lupus involving the nervous system and usually requires hospitalization and high doses of corticosteroids to suppress the inflammation.

## **Peripheral Nervous System (PNS)**

The nerves of your peripheral nervous system control your motor responses and sensation, so symptoms of numbness or tingling, or inability to move a part of your body, may be the result of lupus affecting these nerves. Known as peripheral neuropathies, symptoms of PNS nerve damage are caused by inflammation of the nerves or by compression of the nerves due to swelling in the tissue around them. The types of symptoms you might experience include:

- vision problems
- facial pain
- ringing in the ears
- dizziness
- drooping of an eyelid
- carpal tunnel syndrome

## **Autonomic Nervous System (ANS)**

The autonomic nervous system regulates many of your body's functions that happen almost automatically: heart rate, blood pressure, feeling hot or cold, bladder and bowel functions, release of adrenalin, breathing, sweating, and muscle movement. Lupus can cause these nerve signals to be overactive, which can lead to a wide range of symptoms:

- numbness
- burning
- tingling
- mental confusion
- headaches
- gastrointestinal problems such as nausea, vomiting, constipation, or diarrhea

## **Raynaud's phenomenon**

Raynaud's phenomenon is a condition of ANS involvement caused by inflammation of nerves or blood vessels. Blood vessels in your hands and feet go into spasm and restrict blood flow, usually as a reaction to cold

temperatures, with the tips of the fingers or toes turning red, white, or blue. Raynaud's can also cause pain, numbness, or tingling in fingers and/or toes. People who have Raynaud's phenomenon are advised to avoid cold conditions when possible, and may have to wear gloves or mittens when in air-conditioned surroundings.

Livedo reticularis and palmar erythema are two other skin disorders that may affect you if you have autonomic nerve damage. Both of these conditions can cause a bluish, lacelike mottling under your skin, especially on your legs, giving your skin a "fishnet" look.

### **Cognitive Dysfunction**

As many as half of all people with lupus describe feelings of confusion, fatigue, memory loss, and difficulty expressing their thoughts. This collection of symptoms is termed cognitive dysfunction, although many people call it "lupus fog."

Cognitive dysfunction most often affects people with mild to moderately active lupus. The causes of these symptoms, and the reasons that the symptoms tend to come and go, are not known. Living with cognitive dysfunction can be very frustrating. However, you can learn to improve your concentration and lessen confusion and memory loss with a variety of coping skills, including puzzles, games, biofeedback, using a daily appointment calendar, and balancing daily activities to reduce stress.

### **Lupus Headache**

Compared with the general population, people with lupus may be twice as likely to experience migraine-like lupus headaches, commonly known as lupus headaches. The features of lupus headaches are similar to migraines and may be seen more often in people who also have Raynaud's phenomenon. However, headaches can also be caused by vasculitis, a symptom of active lupus due to inflammation of the blood vessels. If you are experiencing headaches that are not improved by an over-the-counter headache medication, be sure to tell your doctor.

### **Related Information**

#### [Nervous System Issues](#)

15 Questions with Dr. Michael Luggen

#### [Central Nervous System and Lupus](#)

June 2011 Podcast with Dr. Betty Diamond

#### [Neurology / CNS & Lupus](#)

May 2009 webchat transcript with Dr. Robin Brey

#### [Lupus and the Central Nervous System](#)

March 2007 webchat transcript with Dr. Robin Brey

### **Frequently Asked Question**

#### **My MRI from 3 years ago showed plaques. Is there anything on the MRI of people with lupus of the nervous system that is diagnostic for CNS lupus?**

Diagnosis of CNS lupus is difficult as there is not one specific diagnostic test to detect nervous system involvement in lupus. The abnormalities seen on the MRI scans are not specific for systemic lupus. In other words, they could be due to a number of things. The findings on these specialized tests and sometimes other tests such as a brain wave test (electroencephalogram, EEG) and a spinal tap have to be considered along with clinical and laboratory findings in establishing a diagnosis of CNS lupus.

*<http://www.lupus.org/>*