

In spinal cord injury (SCI) and in Multiple Sclerosis, abnormalities in the function of the autonomic nervous system (ANS) may be a feature and in Reflex Sympathetic Dystrophy (RSD, or CRPS Type I) are the predominant feature.

Other conditions which can cause autonomic dysfunction include

- diabetes,
- lupus,
- rheumatoid arthritis,
- scleroderma,
- Guillain-Barre Syndrome.
- Alcohol abuse may also be a causative factor.
- Vitamin B12 deficiency may present with orthostatic hypotension (postural drop in blood pressure).

Symptoms of autonomic dysfunction are quite common in arachnoiditis patients.

Basically, the ANS is the part of the nervous system that connects the central nervous system (brain and spinal cord) to the various organs of the body: the heart, gut, skin(which counts as an organ) etc.

The ANS regulates blood pressure, heart rate, gut activity, sweating and size of the pupil.

The ANS consists of 2 opposing, normally balanced systems: the Sympathetic Nervous System,

which prepares the body for emergency ('fight or flight') and the Parasympathetic nervous system, which deal with bodily functions at other times.

These 2 systems are connections between the hypothalamus in the brain, the pituitary gland (known collectively as the hypothalamic-pituitary axis) and the viscera.

The sympathetic nervous system affects hormones such as adrenaline, insulin and cortisone, which are increased when the body is under stress.

Persistently high levels of these hormones due to chronic stress may put pressure on the adrenal gland and in some cases cause 'adrenal exhaustion', a term used by 'alternative' practitioners to describe episodes of adrenal insufficiency, which might account for the fatigue that chronically ill people often suffer.

Usually, the abnormalities in SCI or MS involve hyperactivity of the sympathetic nervous system: sweating, fluctuations of blood pressure, diarrhoea etc.

However, more recent research has found that the parasympathetic activity may also be affected: for instance, reduced parasympathetic activity has been reported in MS patients whilst they are asleep. ([1](#))

Up to 49% of MS patients report postural dizziness, (lightheadedness when standing up). There have been studies to show sympathetic nervous system abnormalities which affect cardiovascular reflexes.

Symptoms:

- Postural dizziness
- Reflux oesophagitis and delayed gastric emptying (latter may cause vomiting in the morning)
- Nocturnal diarrhoea

- Post-gustatory sweating (after meals)
- Bladder dysfunction/urinary retention: (note: these are dealt with fully in other articles)
- Impotence
- Pupil abnormalities
- Thermal irregularities : difficulties with temperature regulation: a common problem
- Skin colour abnormalities (mottled)
- Peripheral circulation abnormalities: Raynaud type syndrome: vasoconstriction of blood vessels in hands and feet: poor circulation. Changes in temperature cause a 3-phase colour sequence: white>blue>red. Can also affect nose, ears and tongue. Repetitive movements such as typing may worsen the symptoms. Overheating the affected part may also make matters worse

### Tests:

1. Heart rate response to a Valsalva manoeuvre: blood pressure is measured and the change noted when breathing out forcibly for 5 seconds. (lost in autonomic dysfunction)
2. Heart rate variation during quiet breathing in and out. (lost in autonomic dysfunction)
3. Blood pressure on lying and standing
4. Blood pressure response to sustained handgrip (dynamometer).

### Treatment:

1. Postural dizziness: elastic stockings, fludrocortisone 0.1-0.3mg daily, ephedrine, midodrine.
2. Reflux/delayed gastric emptying: metoclopramide 10mg before meals
3. Nocturnal diarrhoea: metoclopramide 10mg 8 hourly
4. Post-gustatory sweating: propantheline hydrobromide before meals
5. Bladder dysfunction/urinary retention: specialist assessment and treatment (see appropriate article\*)
6. Impotence: specialist assessment and treatment (see appropriate article\*)
7. Raynaud's: Avoidance of caffeine and nicotine can be helpful as they both act as vasoconstrictors. Medication: nifedipine, prazosin, topically-applied nitric oxide gel, (a study in 1999 showed it tripled the blood flow to patients' fingers, to the extent that it approached that found in untreated healthy volunteers) fish oil, Evening primrose oil (EPO), Gingko biloba (but note: increased risk of bleeding abnormalities, especially if taken with anti-inflammatory medication including aspirin).

Invasive treatments such as a sympathectomy (usually a toxic chemical such as phenol is injected into a sympathetic ganglion to destroy the nerve), are not advised by ASG

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[\[1\]](#) Ferini-Strambi L, Rovaris M, Oldani A, Martinelli V, Filippi M, Smirne S, Zucconi M, Comi G  
*J Neurol*  
1995 Oct; 242(10):639-43 Cardia Autonomic Function During Sleep and Wakefulness in Multiple Sclerosis.