

# **Neurocardiogenic NCS or Vasovagal Syncope**

Modified by Dr. LeGras from the website information on syncope at dinet.org  
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## **What is neurocardiogenic syncope?**

Neurocardiogenic syncope is caused by a drop in blood pressure, quickly followed by faster then slower heart rate resulting in poor blood and oxygen flow to the brain which results in temporary loss of consciousness.

Neurocardiogenic syncope (NCS) is also referred to as vasovagal syncope or neurally mediated syncope. It is also called fainting.

## **What are the symptoms and triggers of NCS?**

Syncope or fainting usually occurs while standing but can occur while seated. Triggers include emotional stress or stressful conditions and pain especially among the young. Other situations or triggers can include prolonged standing, motionless standing, physical illness, abdominal pain or vomiting, inadequate food and fluids, dehydration, sleep deprivation, suddenly standing motionless following vigorous exercise, hot weather conditions or overheating, prolonged breath holds (choirs, wind instruments, hyperventilation, breath holding spells), hair grooming, micturition (urinating), choking or rapidly standing up from a sitting or lying position.

The onset may be abrupt or gradual and is often associated with warning symptoms such as lightheadedness, dizziness, weakness, feeling hot or cold, fatigue, nausea, abdominal pain, sweating, pallor, visual disturbances or confusion. People may also describe a fast heart rate. Presyncopal (near fainting) patients may also complain of vomiting, disorientation, and difficulty speaking or seeing. Other symptoms that may occur before fainting include feeling either warm or cold, tremors, yawning and having a bluish/purple or red coloring to the skin, or looking very pale or grey.

During fainting, "seizure-like" activity may occur. This shaking or stiffening is thought to be distinct from a true seizure and is due to the brain being briefly deprived of oxygen and blood flow.

Patients often feel unwell after fainting. They may complain of symptoms including nausea, abdominal pain, clamminess, tremors, lightheadedness, headache, malaise, exhaustion and confusion.

## **Mechanisms and causes of NCS**

When a person stands up, the pull of gravity causes blood to pool in the lower extremities. This can result in inadequate blood supply to the upper body, including the heart and brain. Normally, the body automatically adjusts to the lower blood supply by increasing vascular tone, heart rate and cardiac output. Blood vessels contract, heart rate increases and the blood pressure remains about the same or drops slightly.

In those with neurocardiogenic syncope this mechanism does not always work correctly: with a sudden drop in blood pressure the heart tries to compensate with harder faster contractions- this stimulates receptors in the heart wall which send a message to the brain that the heart is pumping too hard and too fast. In response, the sympathetic portion of the cardiovascular center reduces its impulses to the heart and blood vessels, while the parasympathetic division or "vagal nerve" increases its impulses. This nervous system reflex causes the heart to slow dramatically or even stop and the blood vessels to vasodilate (open up) so the blood pressure drops and the brain is no longer receiving adequate blood flow, which then causes fainting.

### **How is NCS diagnosed?**

A careful history and physical exam is usually diagnostic. Cardiac testing such as an electrocardiogram and echocardiogram are often performed to exclude certain cardiac conditions. Other cardiac testing such as an exercise stress test, Holter monitor or event monitor recording is occasionally performed. Bloodwork is generally not needed. As a rule Tilt table testing is not necessary to make the diagnosis. Your cardiologist is evaluating for seizures, structural heart disease, arrhythmias, pulmonary hypertension, autonomic dysfunction (abnormal blood pressure regulation by the brain) and other conditions such as Long QT syndrome.

### **How is NCS treated?**

**A heightened awareness** of high risk or trigger situations is crucial for prevention. For example increasing salt, fluid and food intake and avoiding skipping meals. Dress in layers and take cooler showers to avoid overheating. Lay down during blood tests or vaccines. Avoid prolonged standing.

**Immediate actions** to take when feeling symptoms: The best action is lying down on the ground immediately. An alternative is sitting down with your head between your knees to increase blood flow to the brain. Do not go outside for fresh air or attempt to let others know you are feeling unwell- they will notice you lying down or bending over and will ask what is wrong.

**Medications** or pacemakers are rarely used.