

The nervous system: Autonomic

Health information after cancer treatment as a child or teenager

The purpose of this factsheet is to tell you about long-term side effects (called 'late effects') that can happen after having cancer treatment. They can happen soon after treatment has finished or later in life. The medical team at the hospital where you received your treatment or are attending follow-up checks will be able to help you with specific information about which late effects are relevant to you.

What is the nervous system?

Your nervous system is divided into two parts:

- Central nervous system: the brain and spinal cord
- Peripheral nervous system: the nerves that take information backwards and forwards from our brain to our body

The **central nervous system** receives, processes and coordinates information from the peripheral nerves and sends out messages telling your body how to respond.

The **peripheral nervous system** includes nerves for different sensations: pain, touch, vibration, temperature, and position. These are called sensory nerves. Motor nerves are those that tell our muscles to contract to help parts of our body move.

The **autonomic nervous system** is a distinct set of peripheral nerves that link the brain to the body, and messages within this system happen without thought, triggered by the hormone adrenaline. This system regulates sweating, heart rate, digestion and other processes we do not think about, including the function of our internal organs.

This factsheet focuses on autonomic neuropathy which is a rare side effect after cancer treatment. This is where the nerves to these body functions are damaged.

What do I look out for?

Symptoms of autonomic neuropathy can include difficulty with:

- regulating your blood pressure and heart rate – this may cause a feeling of light headedness on standing up

- feeling hot or cold, and sweating
- digestion and bowel function such as diarrhoea, loss of appetite, constipation, heartburn
- your bladder and having a wee
- being able to have sex

Who is at risk?

If you have had the following, you have a greater risk of developing autonomic neuropathy:

- a tumour which has squashed or invaded a nerve
- damage to nerves during surgery which may have been necessary to be able to fully remove the tumour. Surgery for neuroblastoma is most often linked with autonomic nervous system problems.
- specific chemotherapy drugs such as:
 - vinca alkaloids: vincristine, vinblastine, vinorelbine
 - platinum-based drugs: cisplatin or carboplatin
 - taxane-based drugs: docetaxal or paclitaxal
 - etoposide
 - cytarabine: in high doses
 - ifosfamide: in high doses
 - methotrexate – in high doses

This list is not exhaustive as newer treatments, such as immunotherapies, may be nerve-damaging, as they use the body's own immune system to treat the cancer.

- diabetes and thyroid disease
- radiotherapy

Continued →

Rarely, cancers can make the body develop antibodies to nerve cells which then damage the nerve function. An example of this is a rare condition known as opsoclonus myoclonus or dancing eye syndrome that can be seen with childhood neuroblastoma.

Specific problems

Horner's syndrome

This is a combination of symptoms caused by damage to the nerves in the autonomic nervous system from a tumour or surgical damage in the neck or chest. This leads to a sinking of the eye into the bony socket, drooping of the upper eyelid (ptosis), small (constricted) pupil in the eye, and reduced sweating on the side of the damage. It is usually not reversible.

Raynaud's phenomenon

Raynaud's phenomenon is a common condition that affects your blood circulation. Your hands and feet can become more sensitive to cold so they change colour. The skin on your fingers and toes turns white as the blood flow is restricted, then turns blue as blood vessels react and then becomes swollen and red when blood supply returns. There is also throbbing pain and tingling. The whole process may last for seconds or hours.

Raynaud's phenomenon is a lifelong condition. We recommend following this simple advice:

- **keep your home warm**
- **wear warm clothes** during cold weather, especially on your hands and feet

- **exercise regularly** to help your blood circulation
- **wear well-fitting protective shoes**
- **take care when using hot water** – you may not be able to feel how hot the water is and could burn yourself
- **use oven gloves** when cooking and protective gloves when gardening
- **keep your skin moisturised and soft**
- **take care when cutting your nails**

Some people may require additional treatment for Raynaud's.

Complex regional pain syndrome

This is a poorly understood condition where an individual suffers persistent severe and disabling pain, usually after injury. Sometimes the 'injury' can be cancer surgery or treatment. If you have this, your team will have given you relevant specialist information.

Where can I find more information?

The NHS has a range of information about the nervous system
www.nhs.uk/conditions/peripheral-neuropathy/symptoms

www.nhs.uk/conditions/raynauds

www.nhs.uk/conditions/complex-regional-pain-syndrome



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Written by CCLG Late Effects Group, a national network of experts who specialise in looking after young cancer survivors, in conjunction with the CCLG Information Advisory Group, comprising multiprofessional experts in the field of children's cancer. If you have any comments on this factsheet, please contact us. CCLG publications on a variety of topics related to children's cancer are available to order or download free of charge from our website.

Children's Cancer and Leukaemia Group (CCLG) is a leading national charity and expert voice for all childhood cancers.

Each week in the UK and Ireland, more than 30 children are diagnosed with cancer. Our network of dedicated professional members work together in treatment, care and research to help shape a future where all children with cancer survive and live happy, healthy and independent lives.

We fund and support innovative world-class research and collaborate, both nationally and internationally, to drive forward improvements in childhood cancer. Our award-winning information resources help lessen the anxiety, stress and loneliness commonly felt by families, giving support throughout the cancer journey.

Our work is funded by donations. If you would like to help, text 'CCLG' to 70300 to donate £3. You may be charged for one text message at your network's standard or charity rate. CCLG (registered charity numbers 1182637 and SC049948) will receive 100% of your donation.