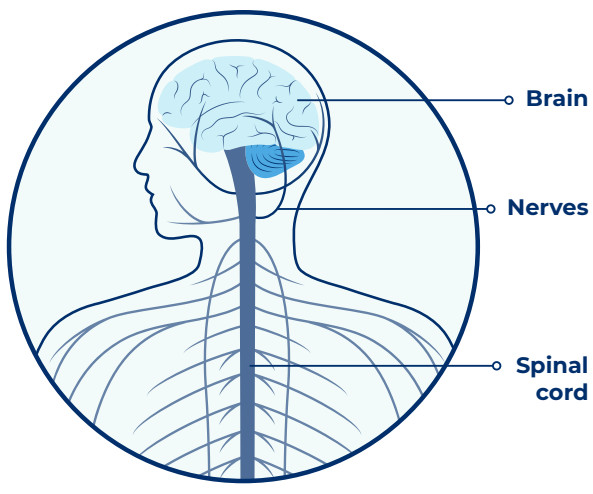
Neurofibromatosis Type 1 (NF1) Plexiform Neurofibromas (PN)

ALEXION
AstraZeneca Rare Disease

WHAT IS NEUROFIBROMATOSIS TYPE 1?

Neurofibromatosis (NF) is a rare, progressive, genetic condition, with the most common type being **neurofibromatosis type 1 (NF1)**. NF1 can impact every organ system and be involved in the development of non-malignant (non-cancerous) tumours that may affect the brain, spinal cord and nerves.[1,2]



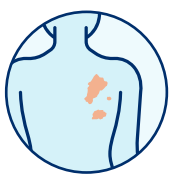
NF1 is also one of the most common inherited disorders and is caused by a mutation or flaw in the NF1 gene. **Half** of all people with NF1 are estimated to **inherit the mutation** from a parent while the other half **have no family history**.[1-3]

NF1 affects about
1 in 3,000
people worldwide.[2]

NF1 is **commonly recognised in early childhood** and is a lifelong, progressive condition that affects all types of people, **regardless of gender or ethnicity**.[4,5]

The severity of NF1 can vary significantly and people with the disease may not develop every symptom.[6]

Initial signs of NF1 may include:[6]



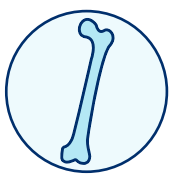
Flat, light brown spots on the skin
(called 'café au lait' spots)

Soft lumps on and under the skin
(neurofibromas)

Patients with NF1 may also experience:[6]

freckling in unusual places
(such as the armpits or groin area)

optic gliomas
(tumour that develops in the cells surrounding the optic nerve)



bone issues

increased head size

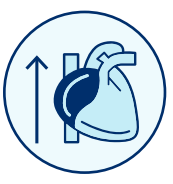
scoliosis
(back bone deformities)

small stature

tiny bumps on the iris of the eye
(called 'lisch nodules')

delayed or early puberty

developmental differences



hypertension
(high blood pressure)

WHAT IS NF1 PN?

Up to
50%
of children
with NF1 may develop **non-malignant tumours on the nerve sheaths called plexiform neurofibromas (PN).**[6]

PN can appear anywhere inside or outside of the body. They are often identified in infancy or childhood but may also appear later in a person's life. Some PN can grow fast and become large, which can progressively interfere with normal physical functions.[6,7,8]

PN can cause a range of problems depending on where they are in the body, including:[9,10,11]

- **Pain**
- **Disfigurement**
- **Muscle weakness**
- **Numbness**
- **Breathing problems**
- **Bladder or bowel problems**
- **Visual impairment**

Although PN may start as non-malignant, **a small proportion (~10%) will later become cancerous**.[12]

HOW IS NF1 PN DIAGNOSED AND MONITORED?

Initial diagnosis of NF1 can be complex and may involve visits to multiple specialists that can evaluate signs, symptoms and family history as well as perform genetic testing. Upon diagnosis, **a physical examination can be conducted to understand the involvement of PN**.[2,7]

An MRI (magnetic resonance imaging) of the affected body part can help determine the size and extent of the PN on the outside and inside of the body. **Other radiology procedures may be necessary** if there is concern for the presence or development of a malignancy surrounding the nerves, including a PET (positron emission tomography) scan.[2]

HOW HAS NF1 PN TREATMENT EVOLVED?

In certain cases, surgery may be done to remove some PN, but **PN are often considered inoperable**, meaning they cannot be totally removed by surgery, or the surgery poses a high risk. Previously, PN treatment options were limited to medication to help manage pain and/or physical therapy to address complications of PN, such as lack of mobility and reduced range of motion, but **research has led to more options**.[4,13,14]

Clinical studies have shown that key proteins (enzymes) are overactive in NF1 PN and can cause uncontrolled growth of tumour cells.[15]

Content created by Alexion, AstraZeneca Rare Disease

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