

Brain tumour

What is a brain tumour?

Brain tumours can be categorised into primary and secondary tumours.

Primary tumours are tumours that **originate** in the brain while **secondary** are tumours that have **spread** to the brain. In this poster, we mainly focus on primary.

There are over **100 different types** of primary brain tumours depending on where the tumour has developed in the brain. For instance, **glioma** is usually located in the **frontal lobe** while **ependymoma** is in the **central canal of the spinal cord**.

Primary brain tumours can be either **benign** or **malignant**:

- **benign** (grade **1 & 2**) - non-cancerous cells that grow slowly
- **malignant** (grade **3 & 4**) - cancerous cells, which in grade 4 can spread outside the brain to the spinal cord.

While brain tumour comprises only **3%** of all cancers, it is **deadlier** than prostate cancer in men under 45 and breast cancer in women. In the UK, brain tumour **incidence** and **mortality** rate are:



What are the current treatments?

Surgery



- **Surgery** is one of the **main** treatments for brain and spinal cord tumours.
- It **removes** either the **whole** or **part of** the tumour.

Chemotherapy

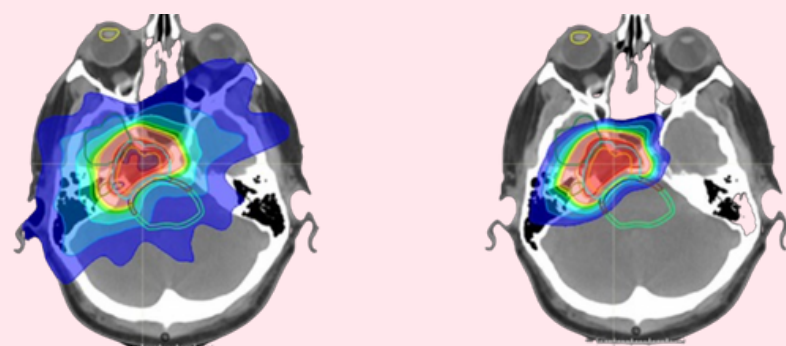


- **Chemotherapy** uses anti-cancer **drugs** to destroy cancer cells.
- The drugs can be delivered into your body by **tablets, pumps** or **injections**.

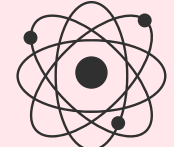
Radiotherapy



- Employs **X-rays**, a high-energy radiation, to **kill cancer cells**.
- Radiotherapy can **worsen** brain tumour symptoms before they get better because of **brain swelling**.
- The radiation can be delivered by **implants, injections** or **beam** of X-rays.



Proton beam therapy



- A type of **radiotherapy**
- Uses a beam of **high-energy protons**, which are small parts of atoms, rather than X-rays to treat specific types of cancer.
- The proton beam is more **precisely targeted** at a tumour, **reducing the damage** to surrounding healthy tissues.

The **brain scans** show the brain tumour (red) and the target regions (blue). **Radiotherapy** (left) shows **more damage** compared to **proton beam therapy** (right).

Image taken from: <https://www.hopkinsmedicine.org>

Successful and ongoing clinical trials

A successful win

1. **Vaccine** Trial - DCVax-L
 - Treatment that helps the **immune system** to attack cancer cells
 - Heading to the final phases before licensing it
 - Along with **chemotherapy**
2. Results:
 - Average **additional 3 months** life span
 - Increase survival rate

Ongoing - Treatment

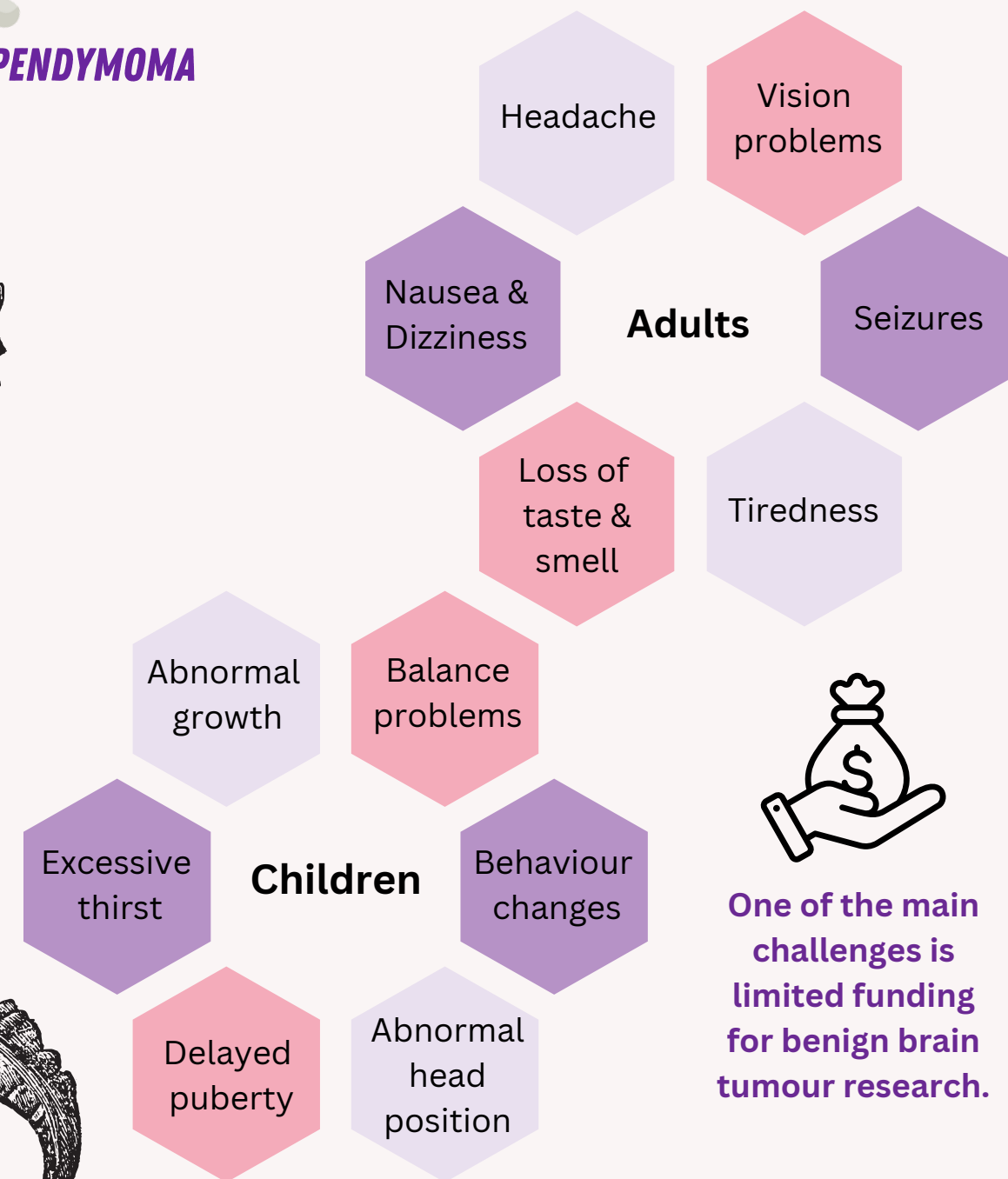
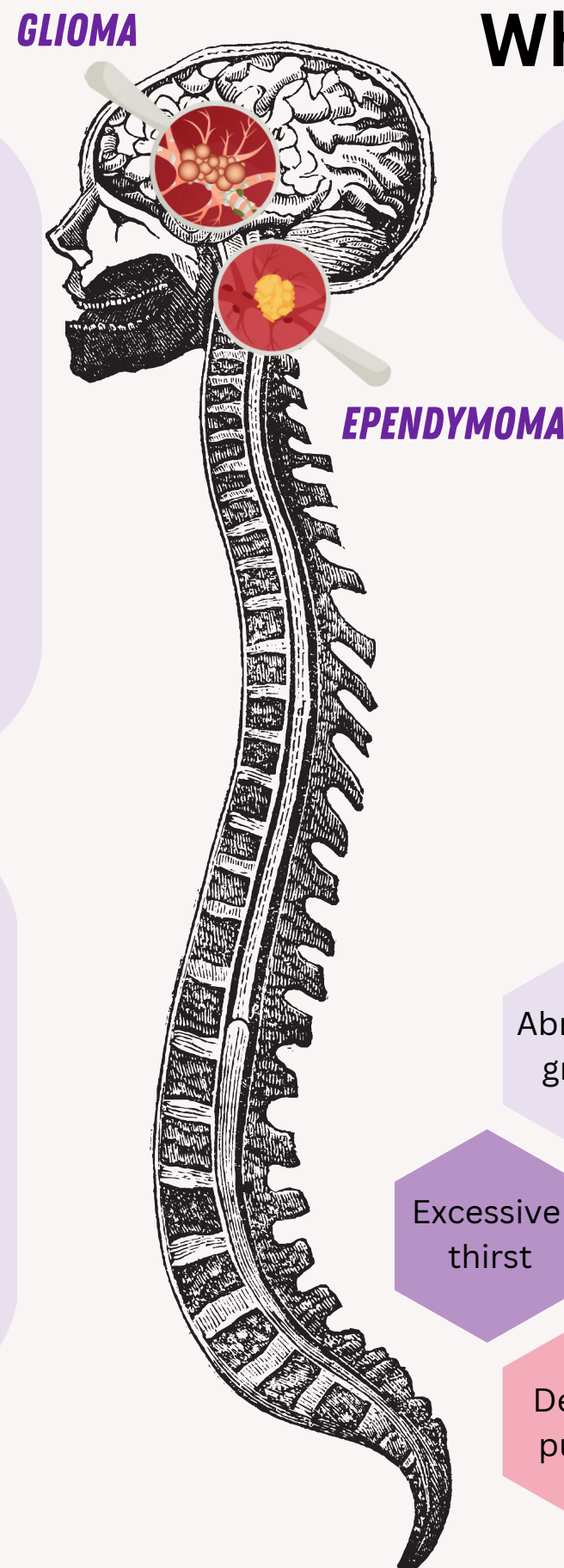
1. **Ependymoma** trial in children and young adults
 - Testing **new combinations between chemotherapy drugs**: vincristine, etoposide, cyclophosphamide, valproic acid
 - Testing the **safety** and the **side effects** of the combinations
2. **Glioblastoma** (a type of glioma) trial
 - Testing a **drug** that **blocks** cancer growth - Olaparib
 - Testing the **best dose** of olaparib with **radiotherapy** and potential **side effects**

Ongoing - Diagnosis

1. Testing a novel **computer program** to analyse brain scans
 - Patients could **still suffer from symptoms after treatments**
 - Symptoms are from either **brain swelling or tumour regrowth**
 - The computer is designed to **differentiate** between the two
2. **Genetic testing** of glioma patients
 - Different patients might have **different genetic** brain tumour **composition**
 - Analysis of patients' blood and tissue samples can help create a genetic profile for an **accurate diagnosis**

What are the symptoms?

Serious symptoms like seizures can **negatively** impact the **everyday life** of patients. **Children** can experience a **wider range** of symptoms, including those observed in adults.



One of the main challenges is limited funding for benign brain tumour research.

References:

1. <https://www.cancerresearchuk.org>
2. <https://www.nhs.uk>
3. <https://www.thebraintumourcharity.org>



Northern Care Alliance
NHS Foundation Trust

