



Brain Tumour Australia Information

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Various Types of Tumours

Astrocytomas

- Are primary brain tumours comprising astrocytes cells
- Are graded I to IV (see the bottom of this page for an explanation of "grades")

Cerebellar Astrocytomas

- Found in the cerebellum (the lower back section of the brain that is responsible for balance)
- A high percentage of this type of tumour can be grade one [1]
- More commonly presents in children
- Surgery is the primary treatment
- Radiotherapy may be suggested for adults or adolescents as a follow-up.

Pilocytic astrocytoma

- Account for fewer than 5% of all glioma brain tumours
- Usually slow growing, grade I
- Usually benign
- Characteristically paediatric brain tumours (although persons over 20 years of age may account for 5%)
- Commonly are found in the cerebellum, optic pathways, Diencephalon & brainstem
- Surgery is the primary treatment
- Radiotherapy may be suggested for adults or adolescents as a follow-up.

Astrocytomas [Low grade or grade II]

- Usually slow growing but may infiltrate surrounding membrane
- Surgery is usually suggested as primary treatment
- Radiotherapy may be suggested for adults or adolescents as a follow-up
- Or if the tumour is inaccessible, then radiotherapy may be the primary treatment
- Account for 5 to 10% of all glioma brain tumours
- Present in the 30-50 age group.

Anaplastic astrocytomas [grade III]

- Anaplastic means malignant
- Difficult to completely surgically remove
- Surgery is usually suggested as a primary diagnostic tool (a biopsy)
- Surgery may be suggested as treatment (this depends on spread of tumour)
- Are not able to be totally removed surgically due to

tentacle nature of cells

- Radiotherapy usually follows surgery to treat any remaining tumour
- Chemotherapy may also be part of the treatment plan
- Account for 10 to 30% of all glioma brain tumours
- Present in the 35-55 age group

Astrocytomas [grade IV] Also known as Glioblastoma multiforme (GBM)

- Account for 20% of all primary brain tumours
- Account for 50% of all Astrocytomas
- Higher percentage found in men
- the most common and aggressive form of glioma
- Presents most frequent in the 45-65 age group
- Usually develop in the cerebral hemispheres of the brain (however can be found anywhere in the central nervous system "CNS" which includes the brain and spinal cord)
- Temporal & frontal lobes are the most common sites
- Infiltrate other areas in the brain
- Surgery is usually suggested as biopsy/ primary treatment
- Radiotherapy usually follows surgery
- Chemotherapy may also be part of the treatment plan, before, during or after radiotherapy.

Ependymoma

- Are less common
- Account for 2 to 5 % of all primary brain tumours
- Present in the 2-15 years age group where they represent about 33% of brain tumours diagnosed in the under 3 years category
- Frequently found in the posterior fossa (however can be found anywhere in the neuraxis)
- Usually present as a grade II tumour
- Surgery is usually suggested as primary treatment
- Radiotherapy only follows surgery in the case of older children or adults.

Gangliogliomas & gangliocytomas

- Rare
- Account for 0.25% of all primary brain tumours



Brain Tumour Australia Information

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Various Types of Tumours cont.

Gangliogliomas & gangliocytomas cont.

- Present in children & the under 30 years age group
- Usually benign & slow growing
- Most often present in the temporal lobes & the third Ventricle
- Surgery is usually suggested as primary treatment.

Germ cell Tumours

- Germinoma is the most common type (accounts for 40-60%) of all germ cell tumours
- Account for 0.4- 3.4 % of all intracranial brain tumours (Higher % in Japan)
- Present in the 10 to 13 years age group (70% present before age 21).

Germinoma

- Occurs in the pineal or suprasellar part of the brain
- It is the commonest type of pineal tumour (30% of this type of tumour)
- Presents in adolescents & found more in males
- Is usually responsive to radiation therapy treatment
- Surgery usually depends on the position of the tumour in the brain

Gliomas

- Are primary brain tumours comprising a mix of three types of glial cells; astrocytes, ependymal cells and oligodendrocytes
- Account for 67.6% of all primary brain tumours
- Surgery is the initial treatment for gliomas
- Radiotherapy is usually part of the post surgery treatment plan.

Glioblastoma multiforme (GBM) *see previous page* Astrocytomas [grade IV]

Brain Stem Glioma

- Present in the 5-10 years age group
- However can present in 30-40 year old adults
- When presentation occurs in children, (astrocytomas) it is usually grade I
- However grade II or grade III can present in adults
- Unfortunately if occurrence occurs in the pons region of the brain, it is not able to be surgically removed
- Surgery may be suggested to determine grade and tumour type

- If a blockage of cerebrospinal fluid occurs, then a shunt may be implanted
- Radiation therapy & Chemotherapy may be offered.

Glioma Mixed

- Contain mixed cells [ie astrocytes & oligodendrocytes]
- Surgery may be suggested
- Radiation therapy & Chemotherapy may be offered.

Metastatic Brain Tumours

- Are tumours found in the brain that have started somewhere else in the body as another type of cancer and spread (metastasized) to the brain. These are called metastatic brain tumours.
- Brain metastases outnumber primary neoplasms by at least 10 to 1, and they occur in 20% to 40% of cancer patients
- Because no national cancer registry documents brain metastases, the exact incidence is unknown,
- It has been estimated that 98,000 to 170,000 new cases are diagnosed in the United States each year.
- This number may be increasing because of the capacity of MRI to detect small metastases and because of prolonged survival resulting from improved systemic therapy.
- Eighty percent of brain metastases occur in the cerebral hemispheres
- 15% occur in the cerebellum
- 5% occur in the brain stem
- Metastases to the brain are multiple in more than 70% of cases, but solitary metastases also occur.

Metastatic Brain Tumours cont.

- The most common primary cancers metastasizing to the brain are:
 - lung cancer (50%)
 - breast cancer (15%-20%)
 - unknown primary cancer (10%-15%)
 - melanoma (10%)
 - colon cancer (5%)

NOTE: Primary brain tumours rarely spread to other areas of the body, but they can spread to other parts of the brain and to the spinal axis.



Brain Tumour Australia Information

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Various Types of Tumours cont.

Central neurocytoma

- Rare
- Presents in the lateral ventricles of the brain
- Usually present between hemispheres
- Account for 1.4% of all primary brain tumours
- Present in the 20 to 40 years age group
- More common in young males
- Surgery is usually suggested as a primary treatment.

Neuronal tumours

- Rare
- Affect children & adolescents

Oligodendroglioma

- Arise from oligodendrocytes
- Account for 5 to 25% of all primary brain tumours
- Present in the 20 to 40 years age group
- Can occur in children
- Present in the cerebral hemisphere & frequently located in the frontal lobe of the brain
- Can present as low [grade II] or high [grade III] tumours
- High grade are called Anaplastic oligodendroglioma
- Anaplastic oligodendroglioma is sensitive to chemo therapy
- Can be graded A-D according to the cell reproduction speed (after pathology tests)
- Surgery is usually suggested as a primary treatment.

Pineal region tumours

- Located at the back of the third ventricle
- Represent less than 1% of all primary brain tumours
- However a small percentage of this category present in paediatric tumours
- Includes germ cell tumours, pineal parenchymal tumours, gliomas, meningiomas
- Present similar to tumours occurring in ovaries, testes

Pituitary Tumours

- Are benign & slow growing
- Account for less than 10-15% of all intracranial brain tumours (Adenomas)
- Present in the 20 to 60 years age group
- Occur more frequently in women
- Can be either a microadenoma (tumour up to 1cm in diameter) or a macroadenoma (tumours greater 1cm in

diameter)

- Treatment may involve a multi-medical specialty team eg. Endocrinologist, ear-nose-throat consultants
- Surgery may not be the first option.

Prolactinomas

- Most common of the Pituitary Adenomas
- Account for 30% of all Pituitary Adenomas.

Skull base tumours

- Can be benign or malignant

Parangliomas

- Can arise at any age
- More common in females

Schwannomas

- Account for 6-8 % of all intracranial brain tumours
- Usually benign, slow growing
- Located between the pons and the cerebellum
- More frequently present in females
- Are managed surgically

Chondromas

- Rare
- Presents at base of skull
- Benign & Slow growing
- Present on outer layer of the meninges
- Are managed surgically

Chondrosarcomas

- Malignant form of Chondromas
- Usually present in male patients
- Are managed surgically

Chordomas

- Rare
- Account for less than 1% of all intracranial primary brain tumours
- Presents at base of skull or end of spine
- Benign & Slow growing
- Present in the 20 to 40 years age group
- Are managed surgically & with radiotherapy



Brain Tumour Australia Information

© FACT SHEET 9

Various Types of Tumours cont.

Craniopharyngiomas

- Benign
- Low grade tumours
- Account for 2-3% of all primary brain tumours and 5-13% of childhood brain tumours
- Present in the suprasellar region
- Present 50% in adults and children
- Present in the sellar region near the pituitary gland
- Are managed surgically
- Radiotherapy may be part of the adult treatment plan.

Haemangioblastoma

- Account for 2% of all primary brain tumours
- Can present in the 40 years age group (however may present at any age)
- Benign, slow growing
- Arise from cells in the lining of blood vessels
- Do not usually infiltrate surrounding normal tissue
- Surgery is the usual treatment offered
- Usually found in the cerebellum & the brain stem (the posterior fossa)
- However can present in the spinal cord or the cerebral hemispheres as well

Lymphoma (CNS Lymphoma) Primary Central Nervous system

- A rare form of non-Hodgkin's lymphoma confined to the CNS
- Account for 0.5 & 2% of all primary brain tumours
- Usually occurs in the cerebral hemisphere
- Can involve the cerebrospinal fluid or spinal fluid
- Surgery may only be offered if there is a significant pressure built up in the brain
- Steroids may be prescribed
- Present in the 55 to 70 years age group
- Radiation therapy treatment usually offered
- Whole brain irradiation may be the mode of treatment offered
- Chemotherapy treatment may also be offered.

Medulloblastoma (PNET)

- Account for 15 to 20% of all paediatric brain tumours
- However a small percentage may also present in some adults
- Presents in the cerebellum
- Is fast growing
- Surgery is usually suggested as a primary treatment.

Meningiomas

- Account for 20% of all brain tumours
- Present in the 50-80 years age group
- Affect women 2-3 times as often as men
- Arise from the covering (the lining) of the brain and the spinal cord (the meninges).
- About 90% are usually benign (grade I, & are slow growing). However, they can be progressive, or recur or it may not be possible to completely surgically remove them..
- Usually located in the cerebral hemispheres, at the base of the skull & in the posterior fossa (the lower part of the brain).
- Usually present as a single tumour, but can occur multiple times.
- Surgery is usually suggested as a primary treatment.
- Radiation therapy may be suggested (especially if residual tumour may remains).
- However in some cases a 'watch & wait' policy may be suggested as the treatment plan (especially if it is not causing major symptoms).
- Grade II type tumours may recur (due to faster growing behaviour).
- Anaplastic [malignant, grade III] tumours represent about 3-5% of the meningioma diagnoses

Information, Books & Factsheets

NSW NSW Cancer Council booklet Understanding Brain Tumours <http://www.cancercouncil.com.au/editorial.asp?pageid=2612>

VIC Vic Cancer Council - Information on Brain & Spinal Tumours http://www.cancervic.org.au/about-cancer/cancer_types/brain_tumour/

USA American Brain Tumour Association - an invaluable brain tumor resource A Primer of Brain Tumours - http://www.abta.org/Tumor_&_Treatment_Info/A_Primer_of_Brain_Tumors/170

USA Clinical Trials and Noteworthy Treatments for Brain Tumours (USA) - 48 pages Brain Tumour Guide <http://virtualtrials.com/faq/>

USA Information on Adult brain tumours <http://www.cancer.gov/cancertopics/pdq/treatment/adultbrain/patient>

USA The Society for Neuroscience - 52-page primer on the brain and nervous system http://www.sfn.org/skins/main/pdf/brainfacts/2008/brain_facts.pdf