



Dr Eddie Mee

Neurosurgeon

Auckland City Hospital, Ascot Integrated Hospital,
MercyAscot Hospitals, Auckland

FULLY BOOKED

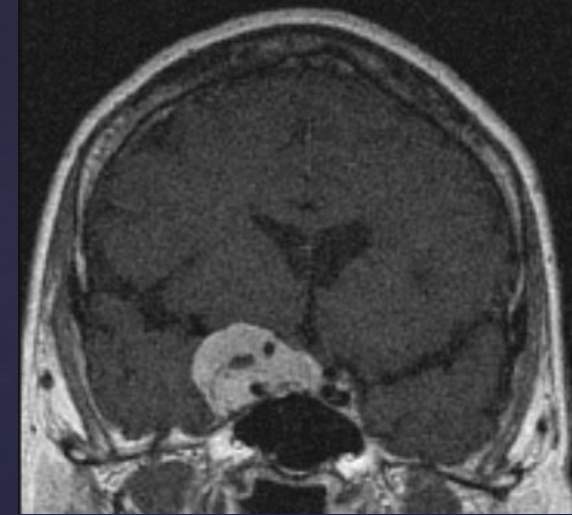
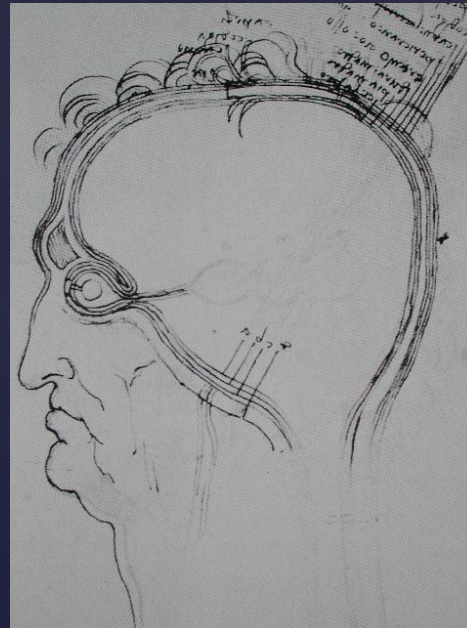
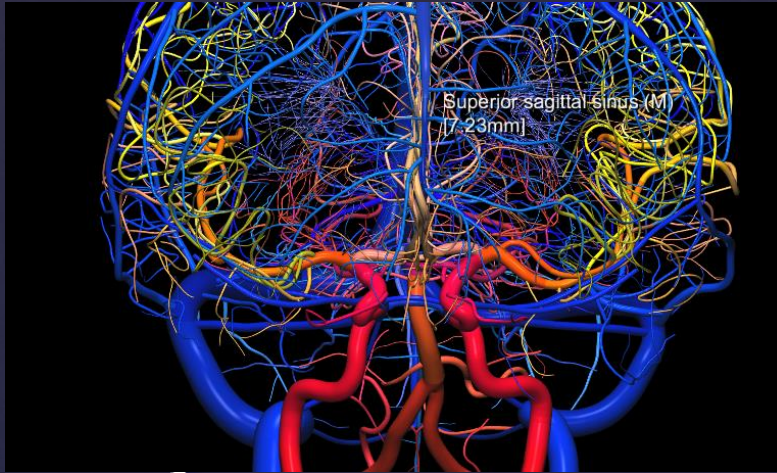
Friday, August 12, 2016

(Room 9)

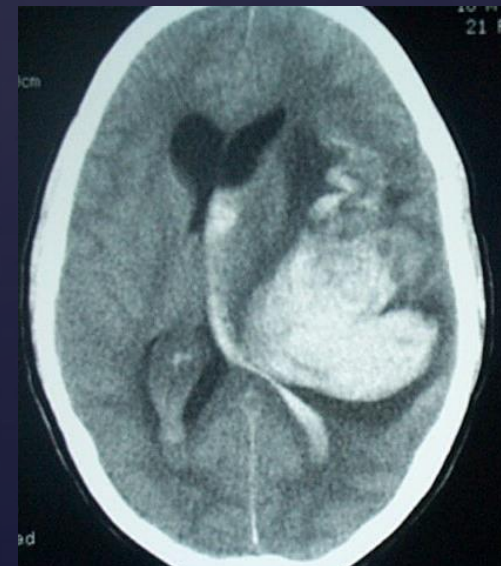
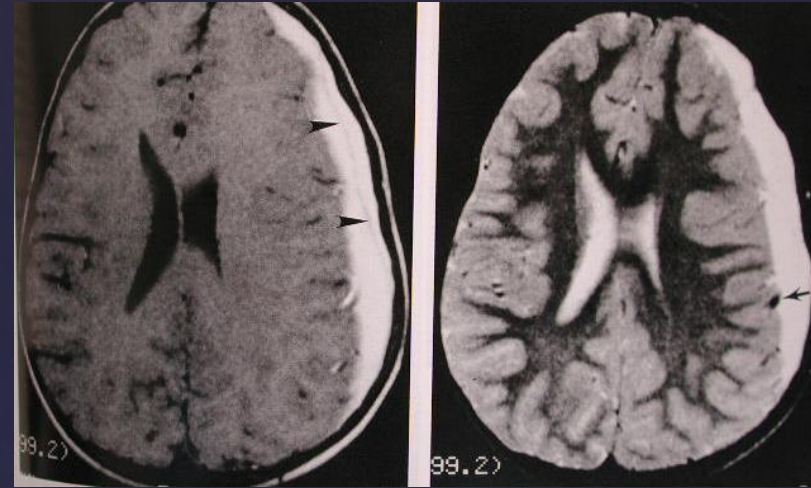
16:30 - 17:25 WS #48: Current Management of Brain Bleeds and Tumours

17:35 - 18:30 WS #58: Current Management of Brain Bleeds and Tumours (Repeated)

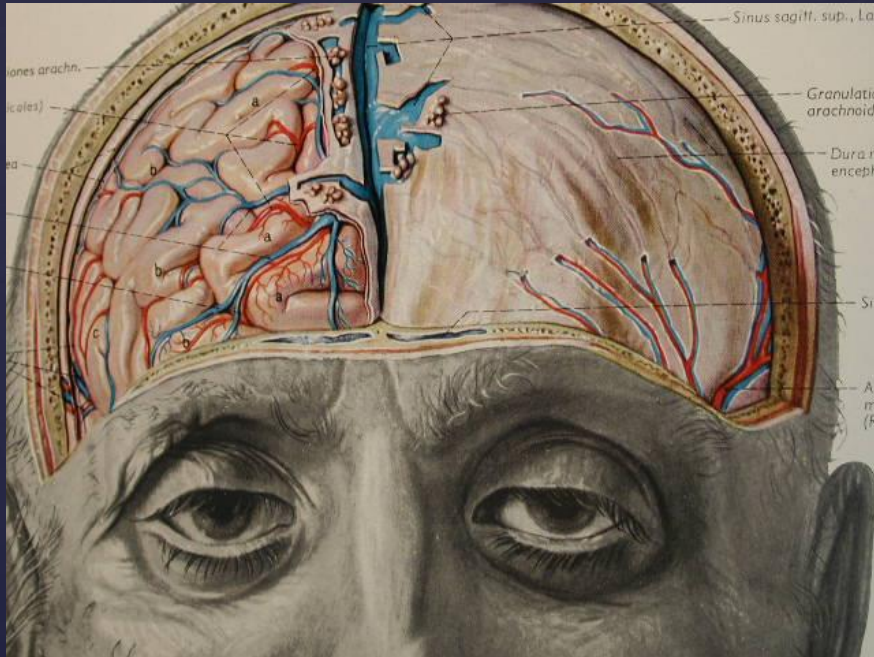
Current Management of Brain Bleeds and Tumours

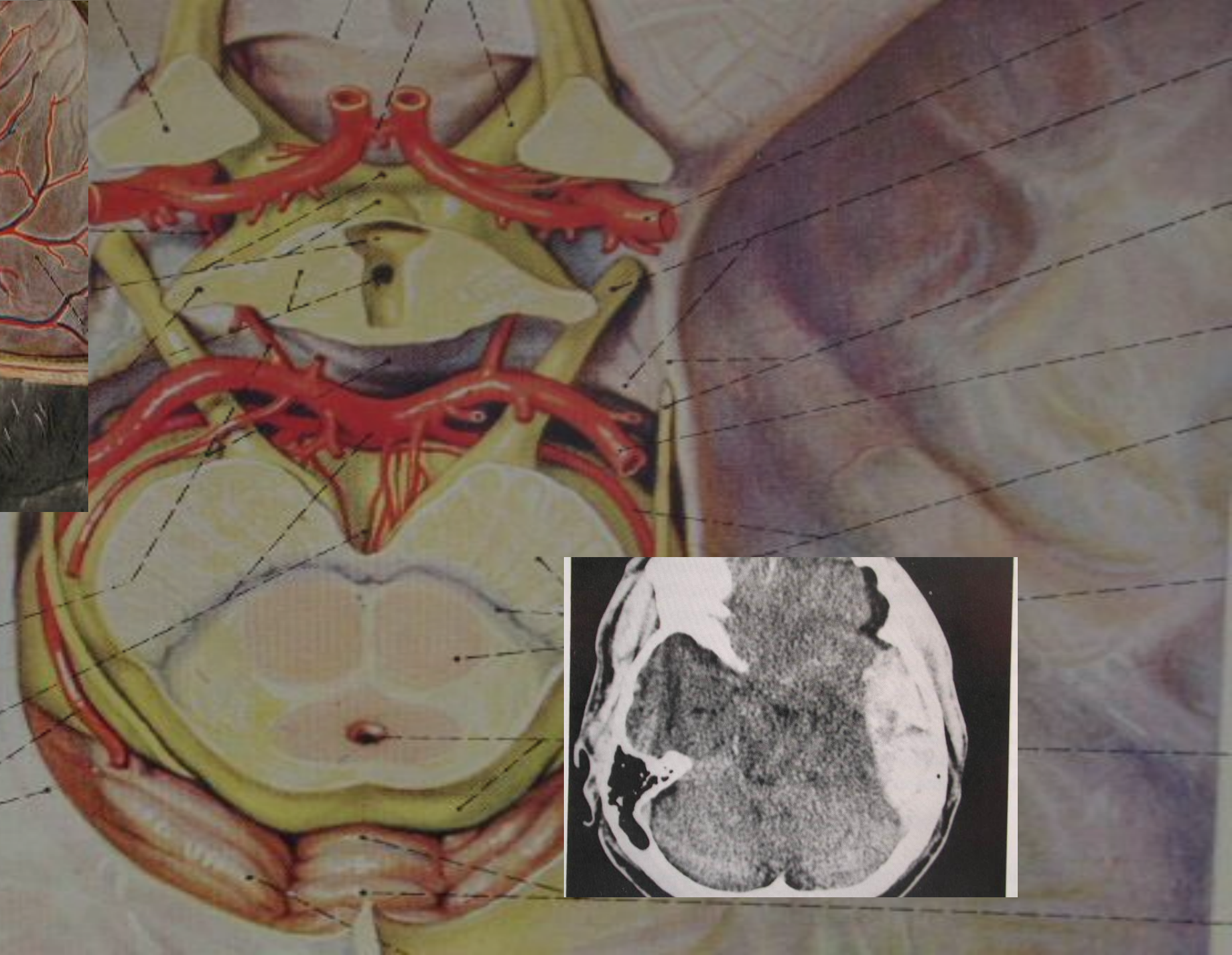


Edward Mee 2016

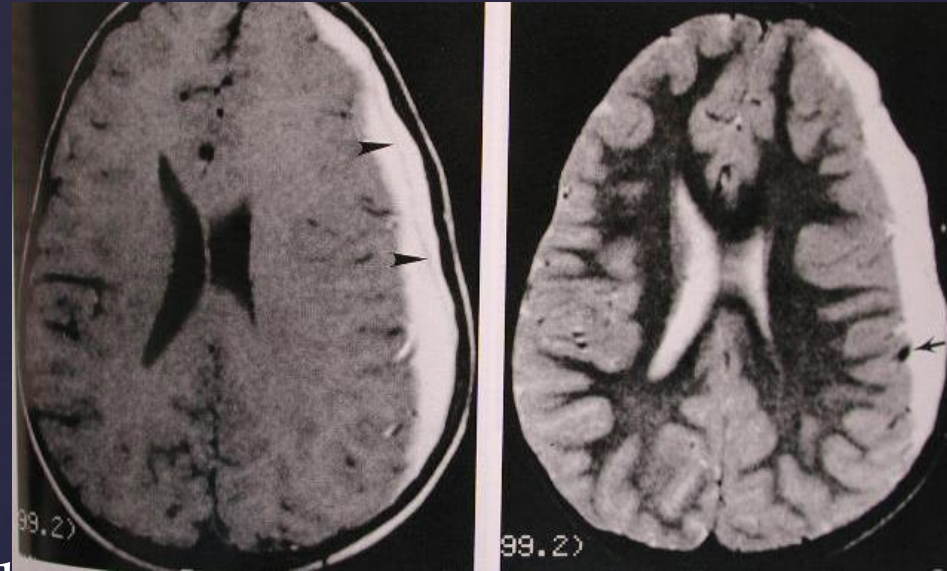


Traumatic Bleeds





Subdural haematoma



Venous laceration/brain contusion

Large surface area

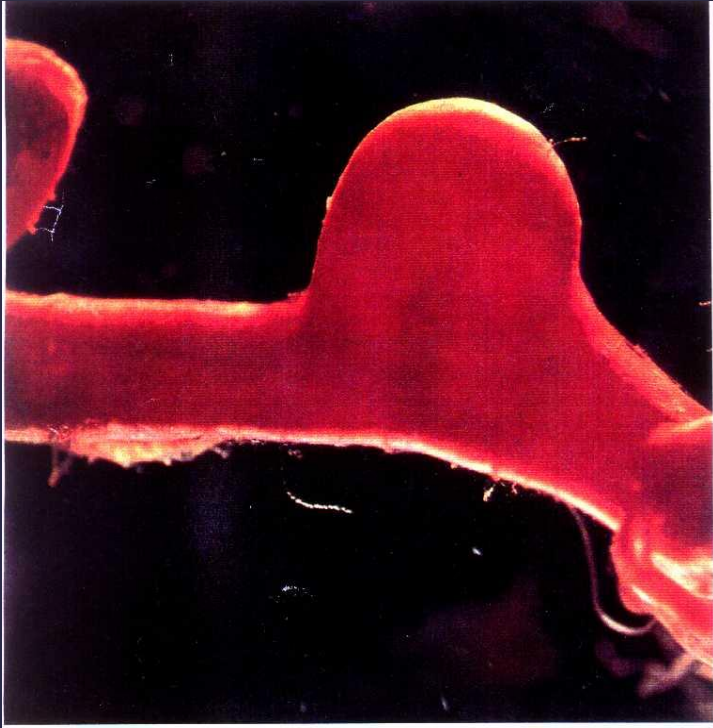
May be acute/chronic

Fluctuating level GCS

>5mm midline shift requires evacuation

Outcome depends on degree of brain injury





3 -5% Population has an aneurysm

Subarachnoid Haemorrhage

SAH is 5% of all strokes

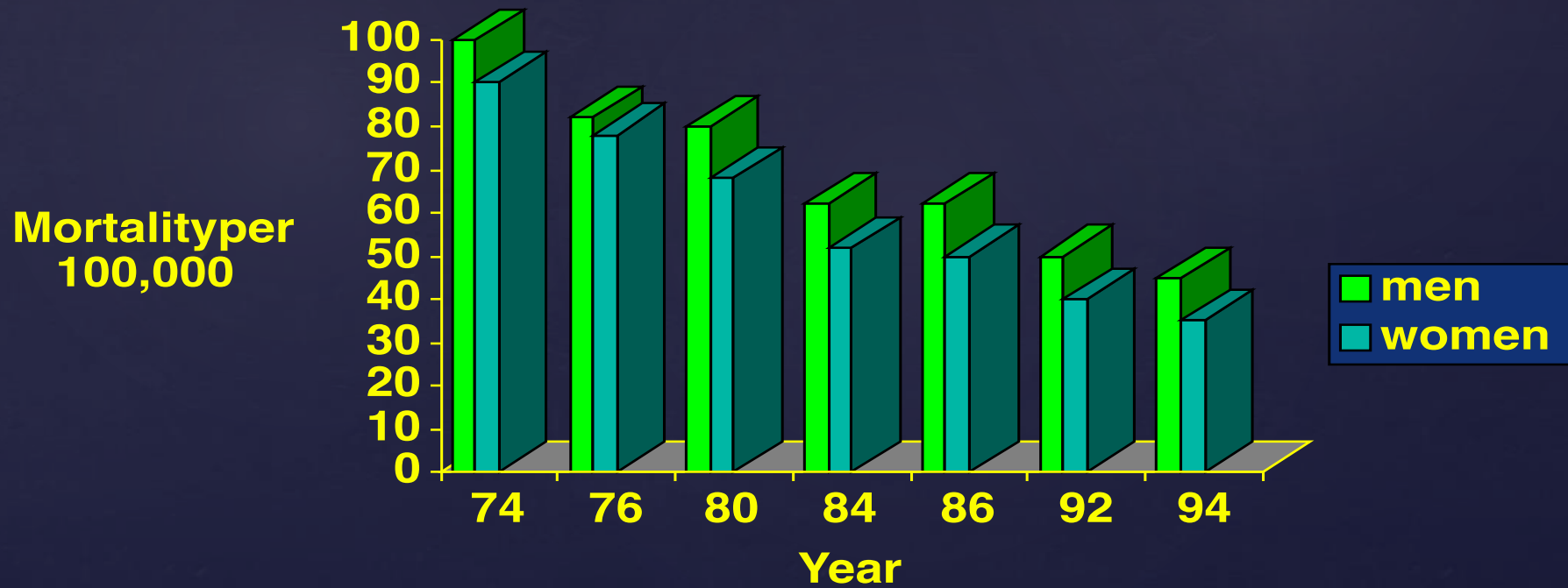
Prevalence of aneurysms 2%

Annual risk of rupture 0.7%

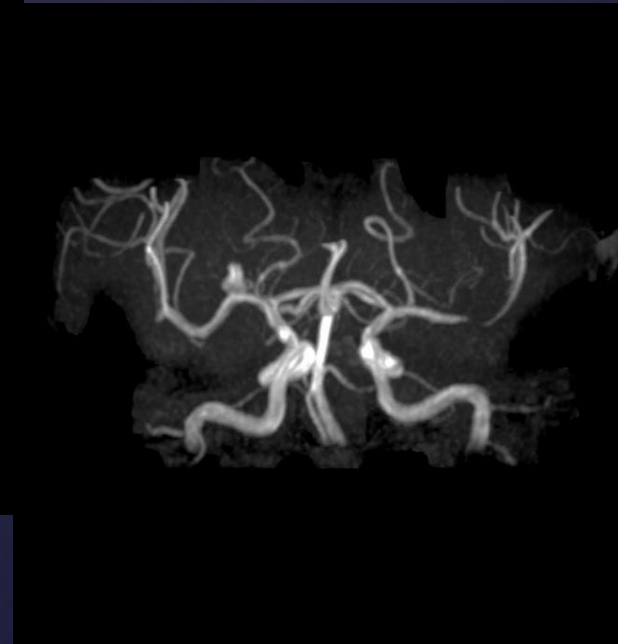
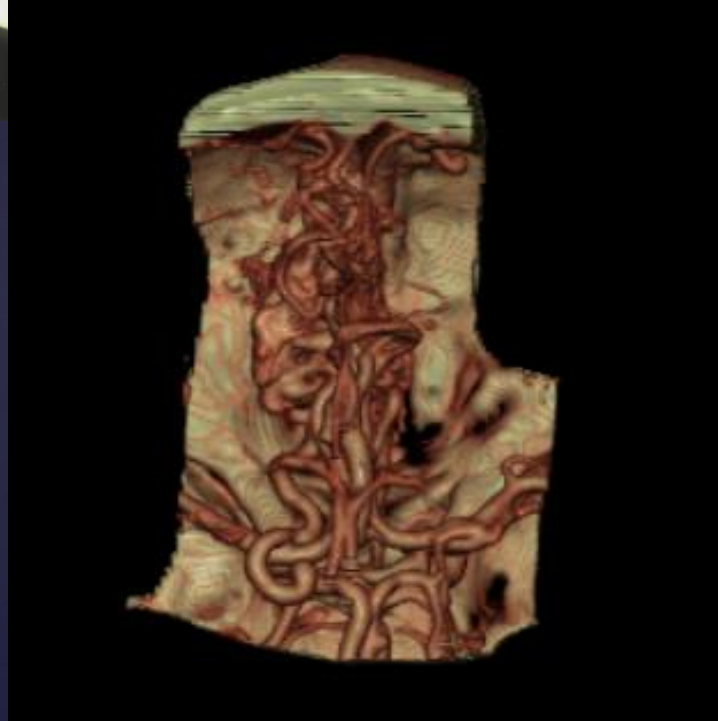
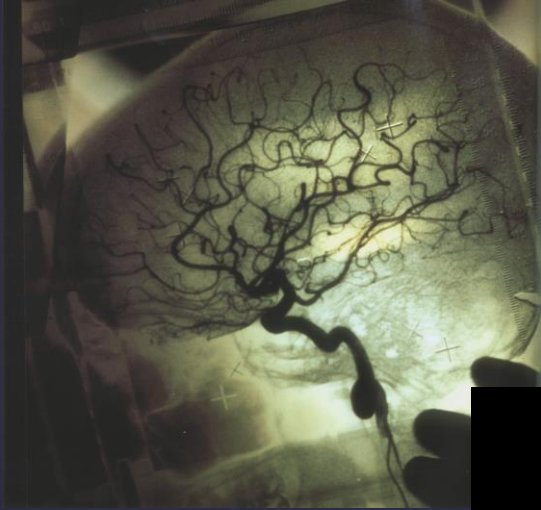
Incidence variation 6-30 cases per
100,000



Stroke mortality rate



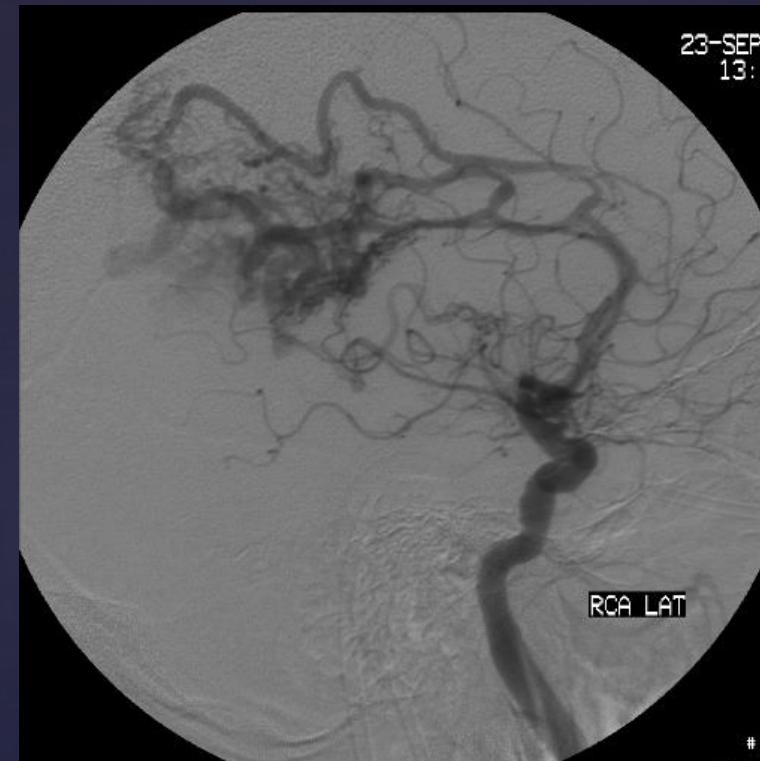
Angiography

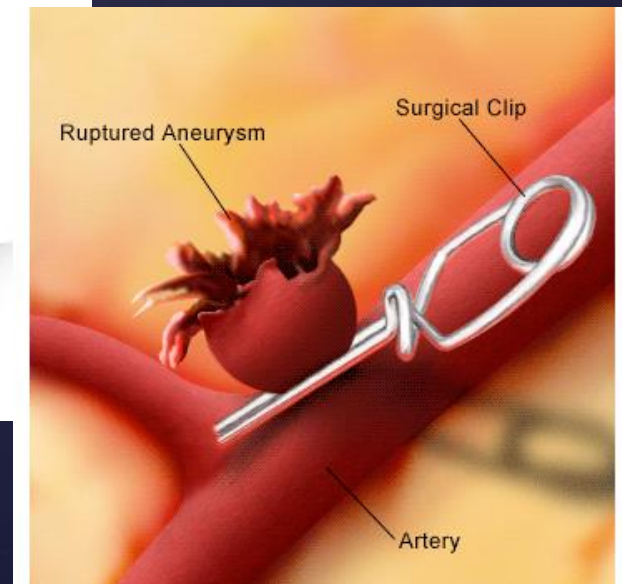
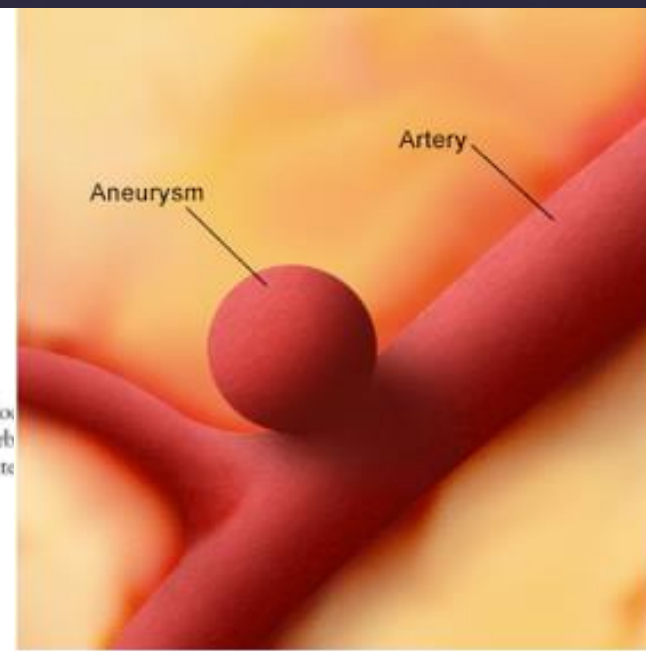
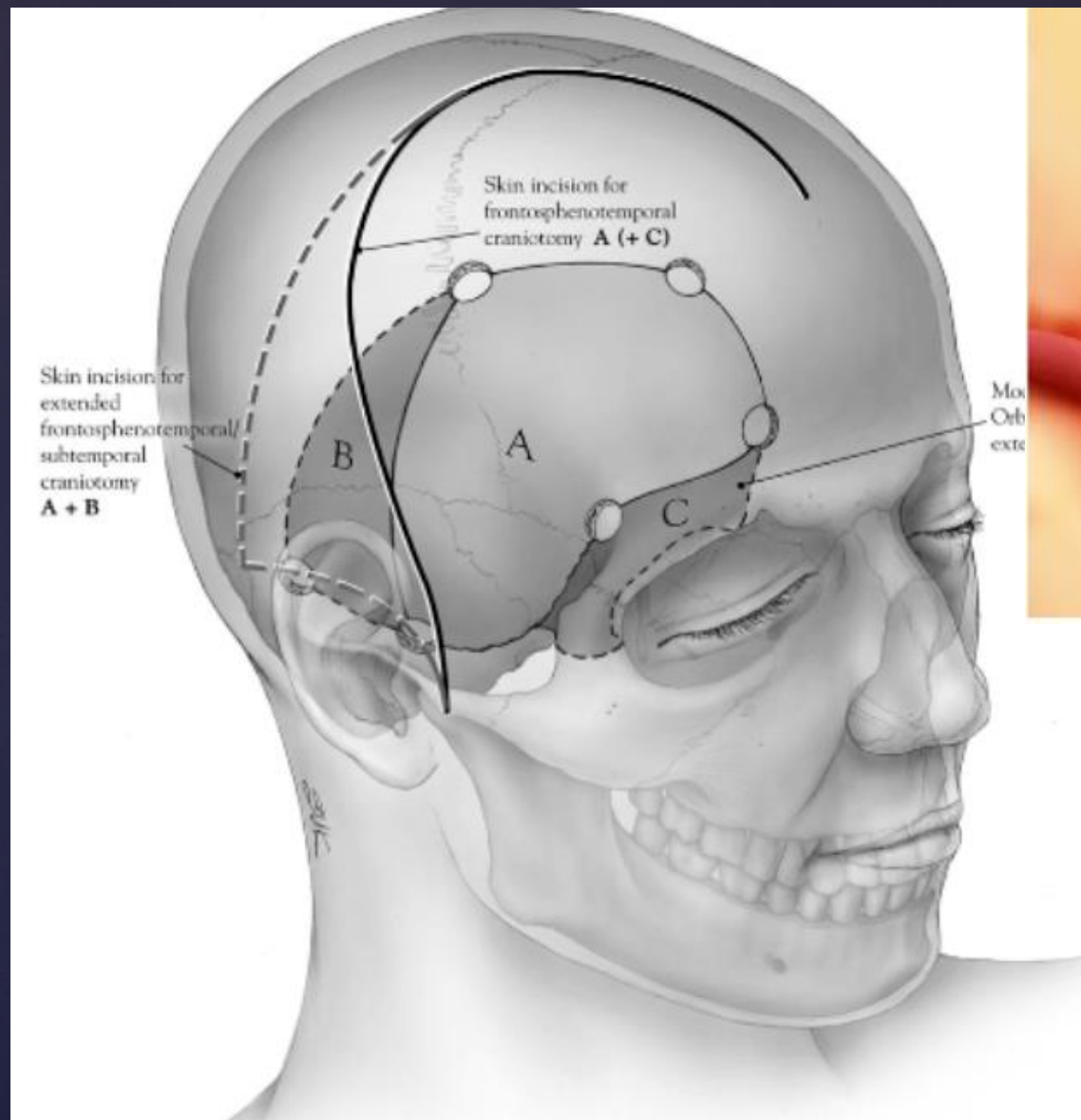


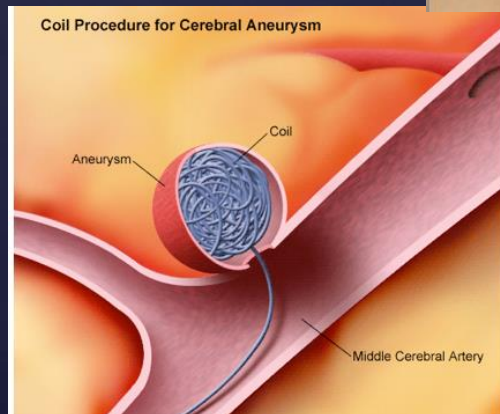
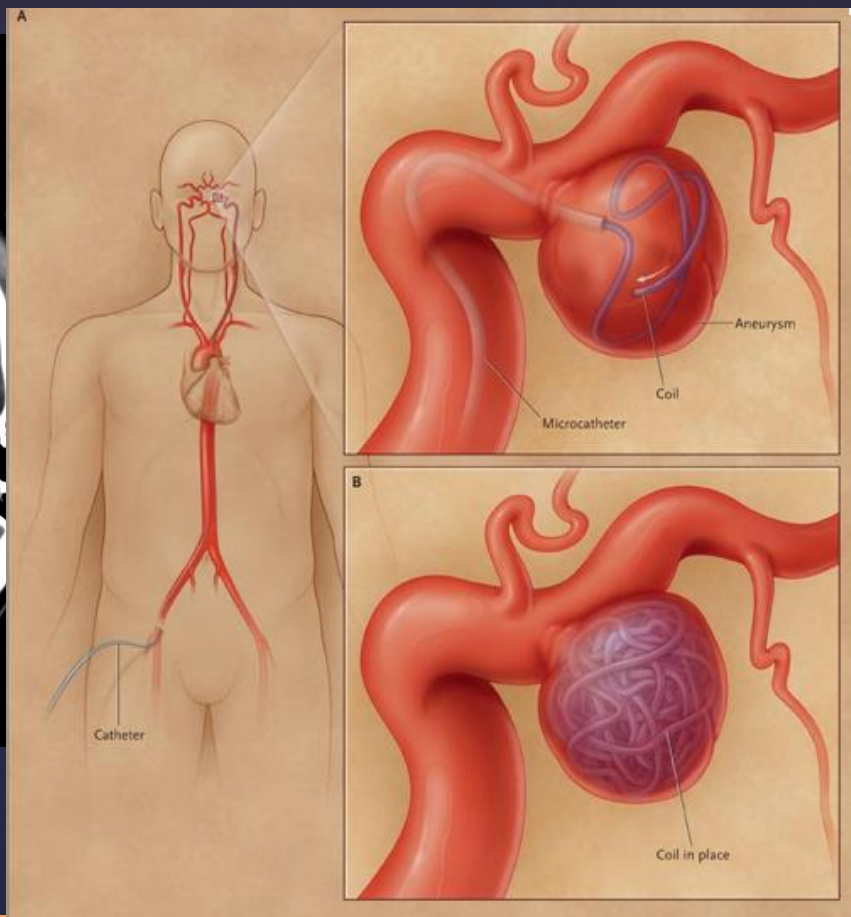
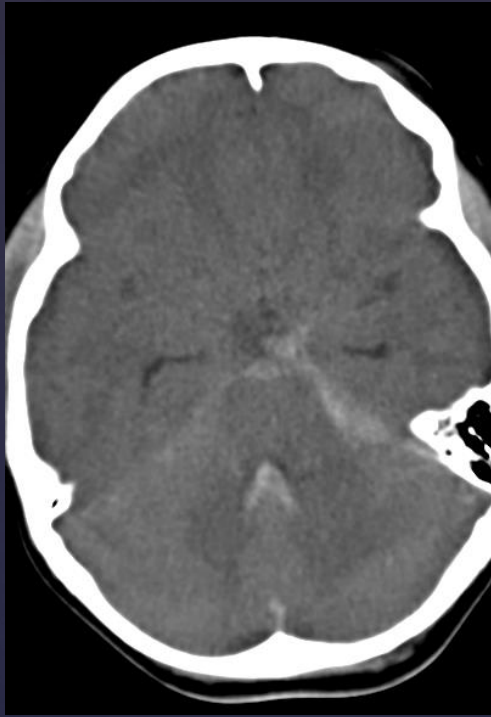
Pericallosal Aneurysm

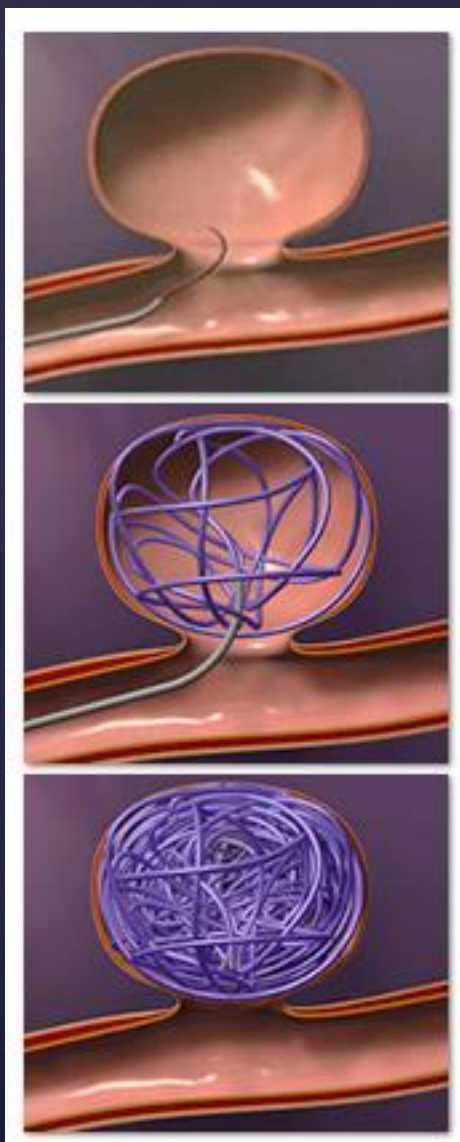


Arteriovenous Malformation









Endovascular Coiling v. Surgical Clipping

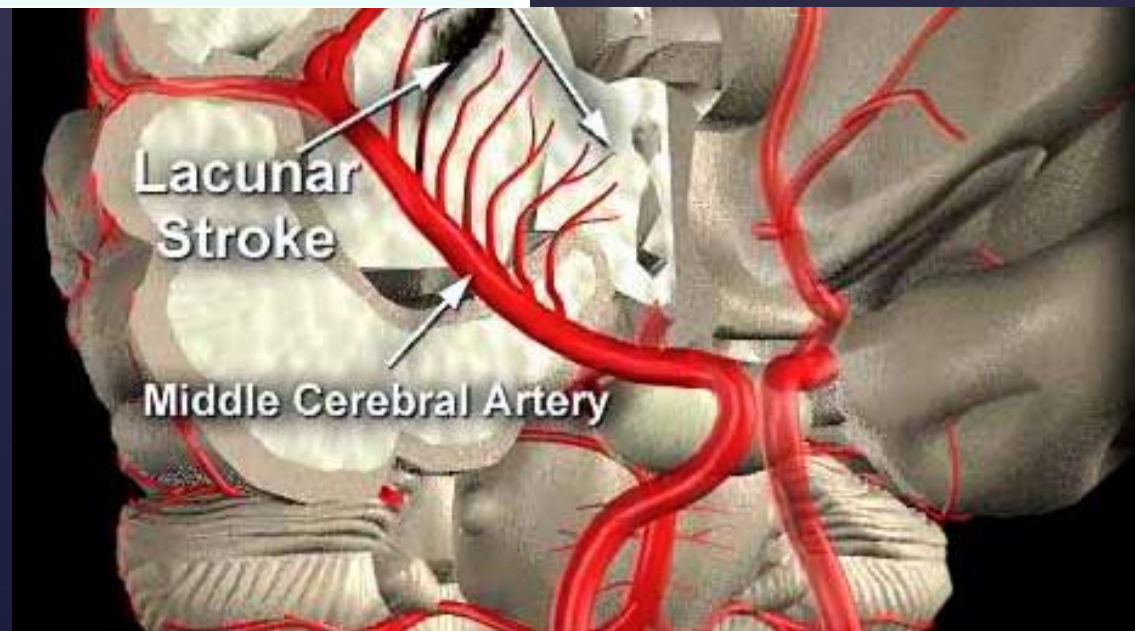
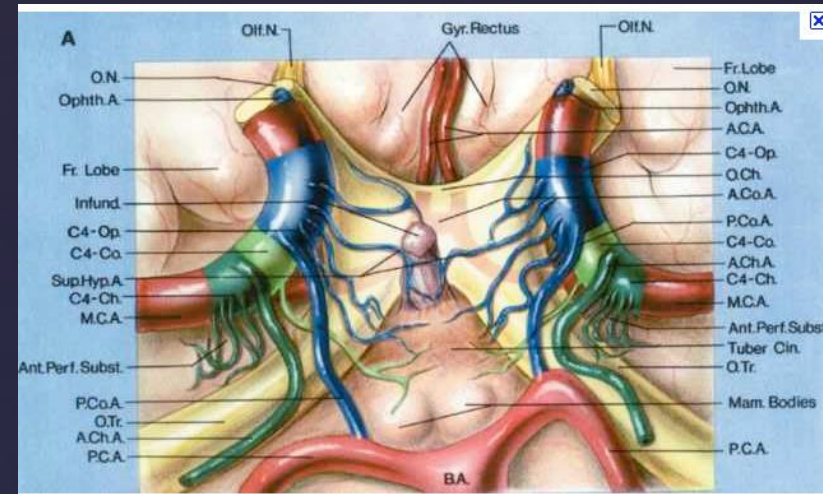
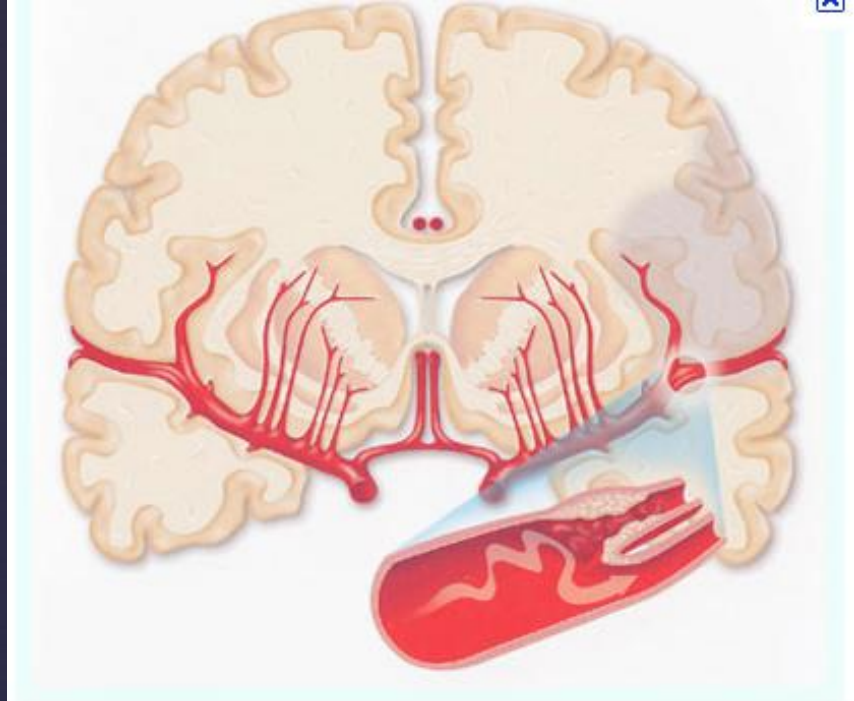
Treatment of Ruptured Aneurysms

Until recently, most studies on the surgical clipping and endovascular treatment of brain aneurysms were either small-scale studies or were retrospective studies that relied on analyzing historical case records. The only multi-center prospective randomized clinical trial - considered the gold-standard in study design - comparing surgical clipping and endovascular coiling of ruptured aneurysm is the International Subarachnoid Aneurysm Trial (ISAT)¹.

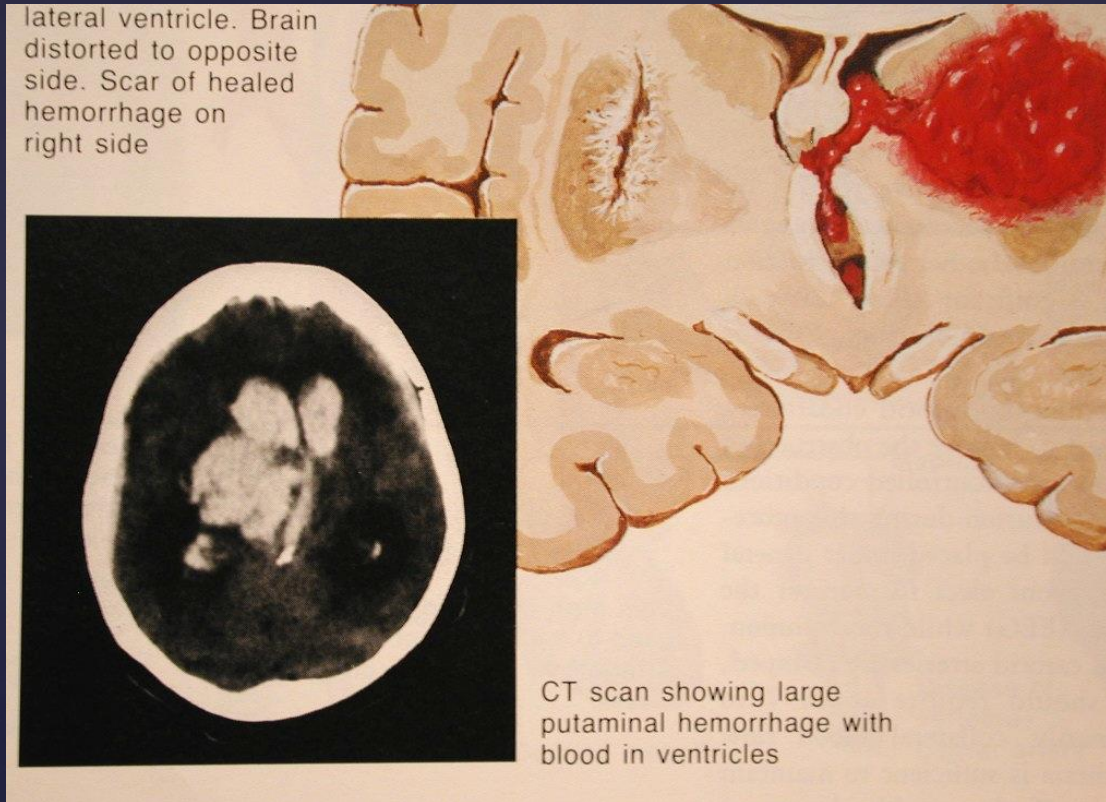
The study found that, in patients equally suited for both treatment options, endovascular coiling treatment produces substantially better patient outcomes than surgery in terms of survival free of disability at one year. The relative risk of death or significant disability at one year for patients treated with coils was 22.6 percent lower than in surgically-treated patients.

The study results were so compelling that the trial was halted early after enrolling 2,143 of the planned 2,500 patients because the trial steering committee determined it was no longer ethical to randomize patients to neurosurgical clipping. Long-term follow-up will be essential to assess the durability of the substantial early advantage of endovascular coiling over conventional neurosurgical clipping for the treatment of brain aneurysms.

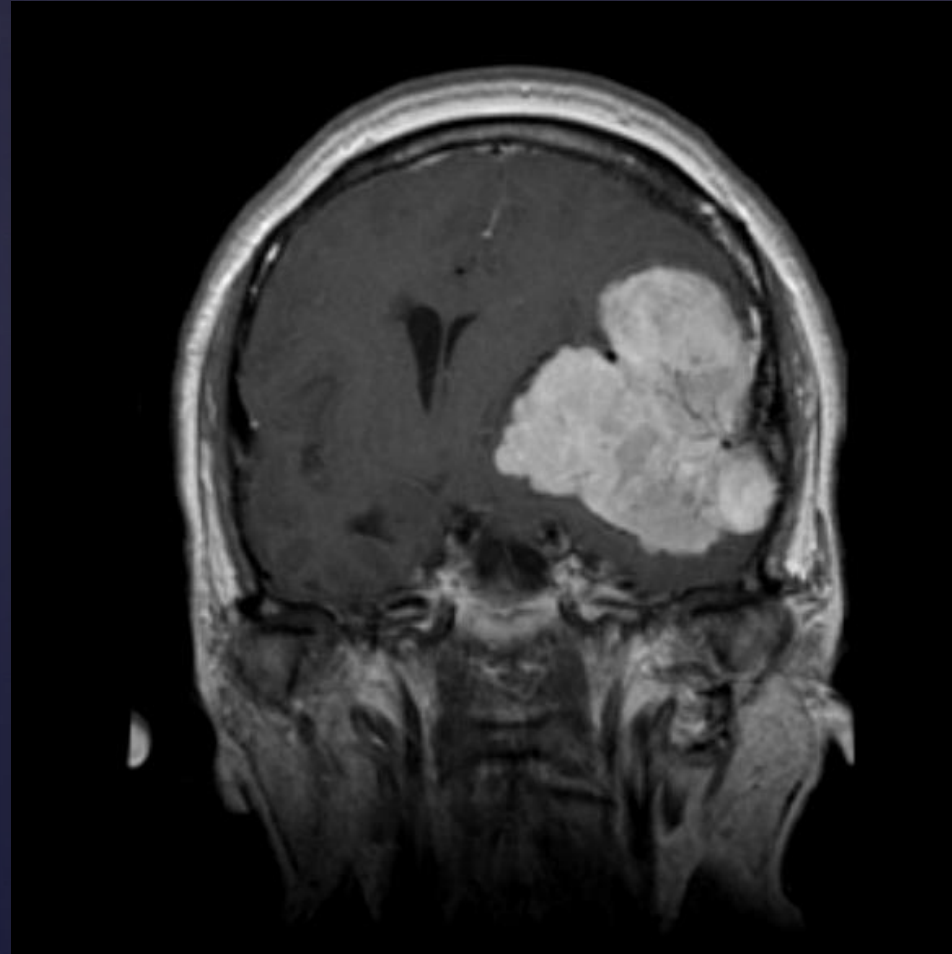
Molyneux A, Kerr R, Stratton I, Sandercock P, Clarke M, Shrimpton J, Holman R. International Subarachnoid Aneurysm Trial (ISAT) of neurosurgical clipping versus endovascular coiling in 2143 patients with ruptured intracranial aneurysms: a randomised trial. Lancet. 2002; 360: 1267-74.



Intracerebral Bleeds



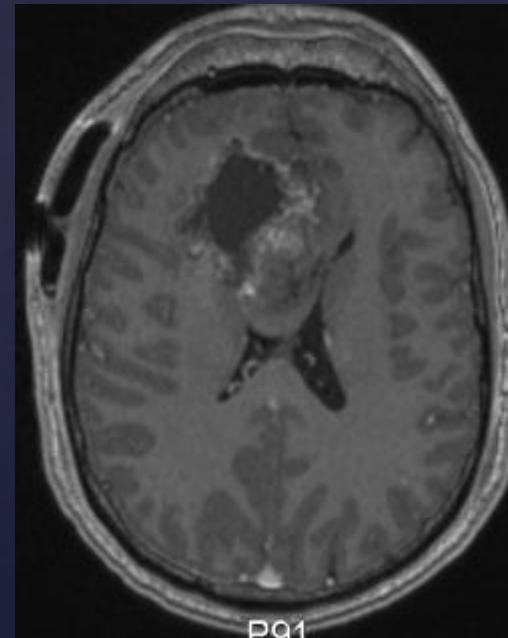
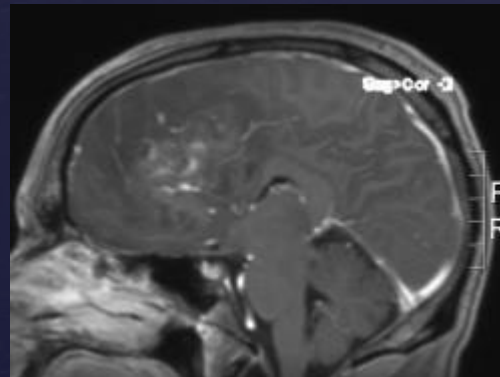
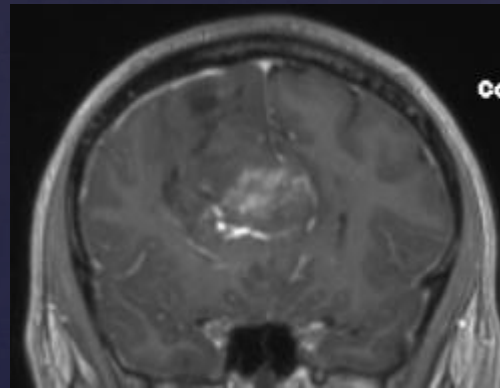
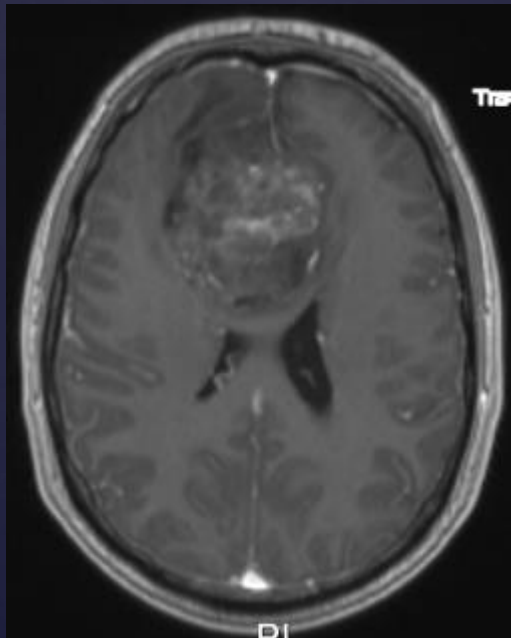
Brain Tumours



Glioblastoma

41yr Male

Seizures

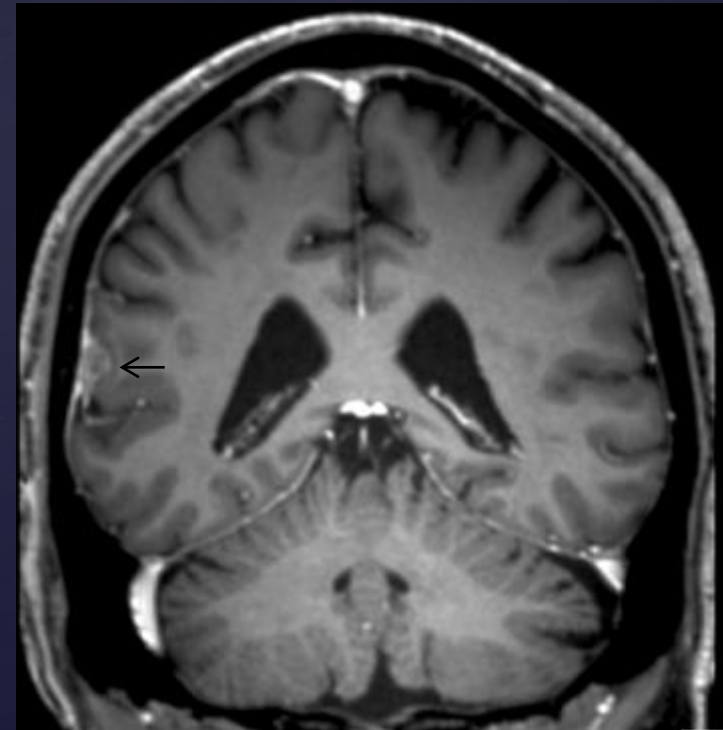
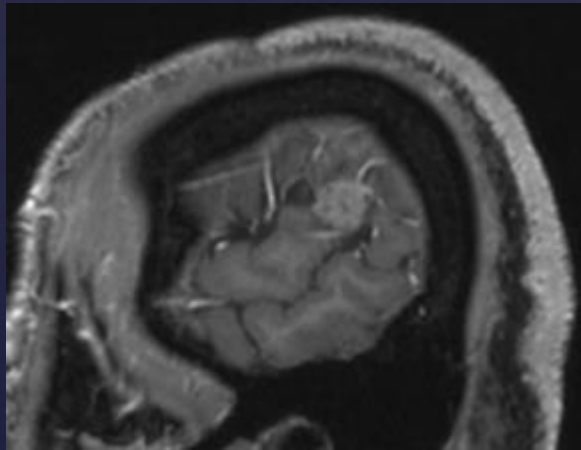
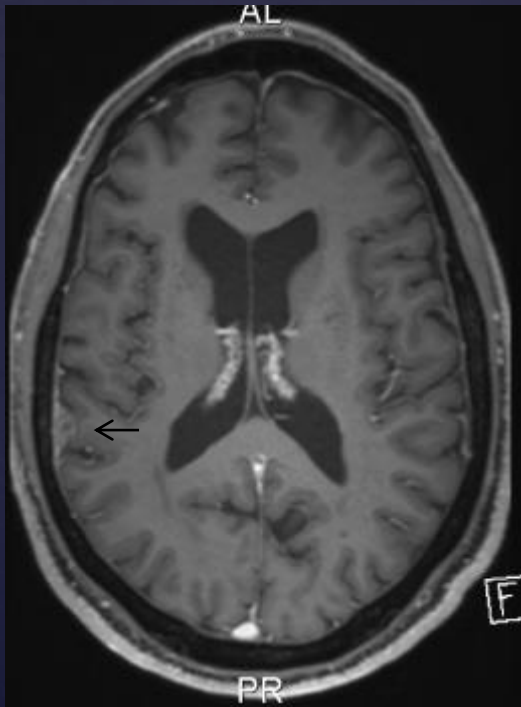


Post-op

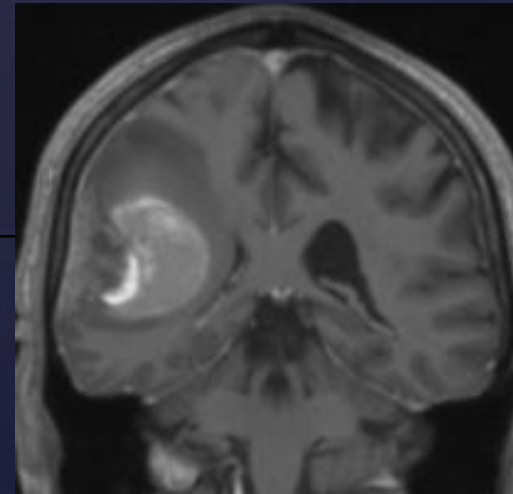
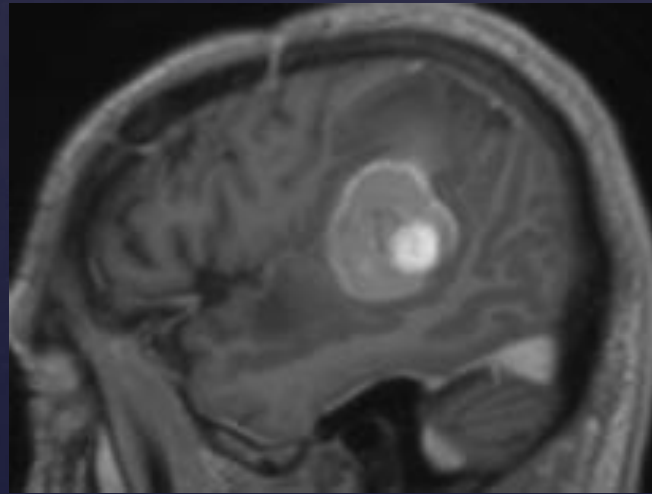
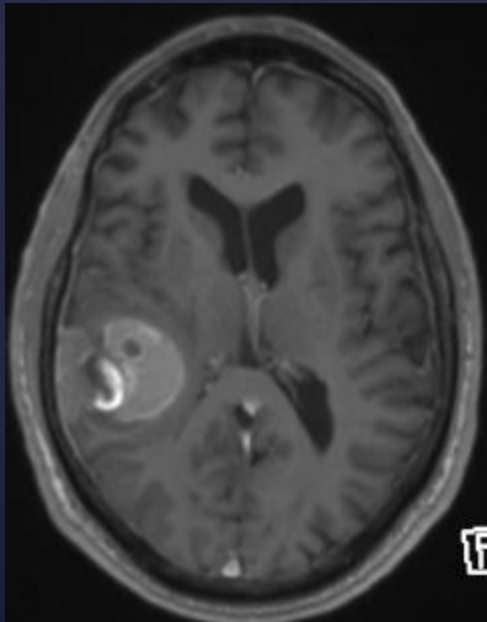
Metastatic Melanoma

62 yr

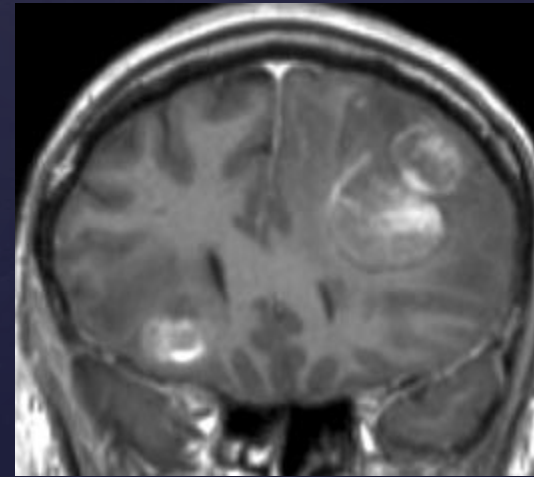
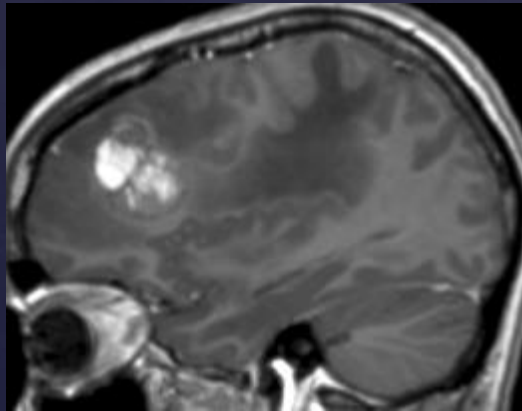
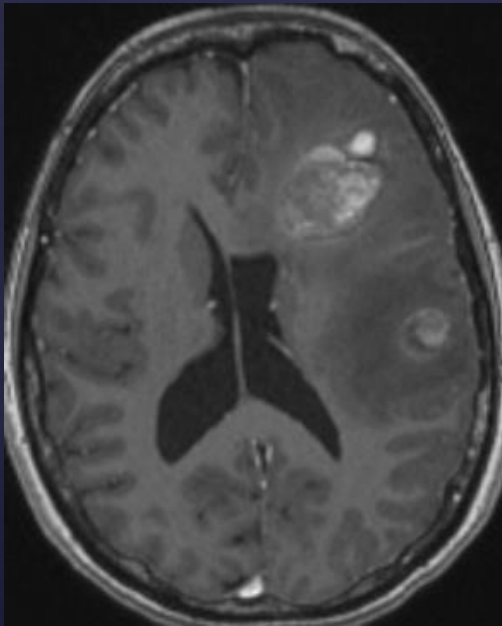
Screening



- ✧Headaches
- ✧50yr Male
- ✧Meningioma

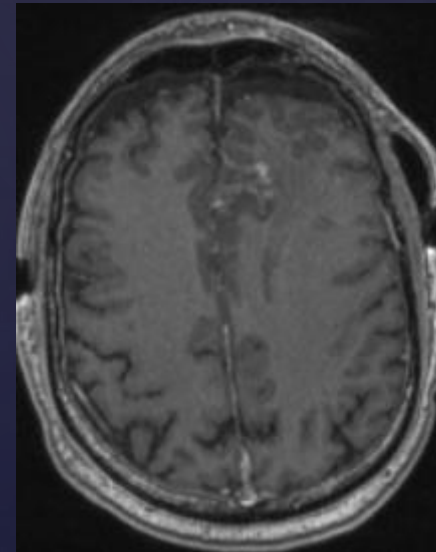
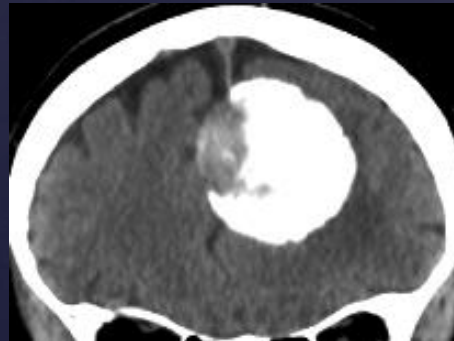
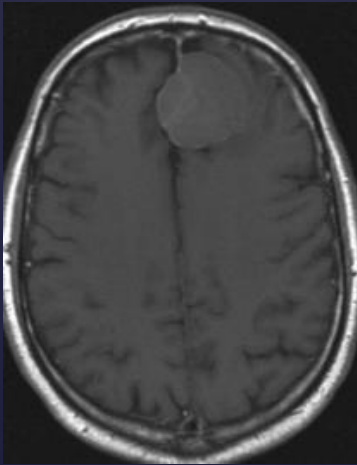


- ◆Dysphasia
- ◆Melanoma
- ◆53 Female



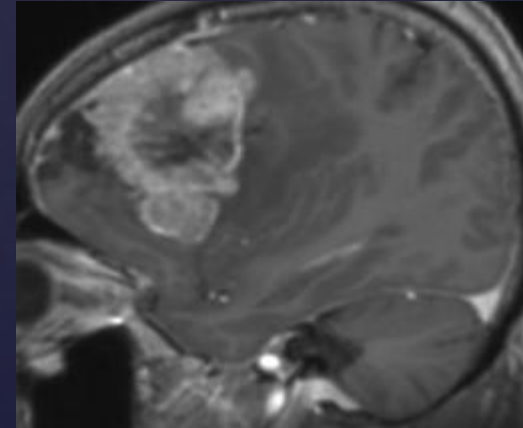
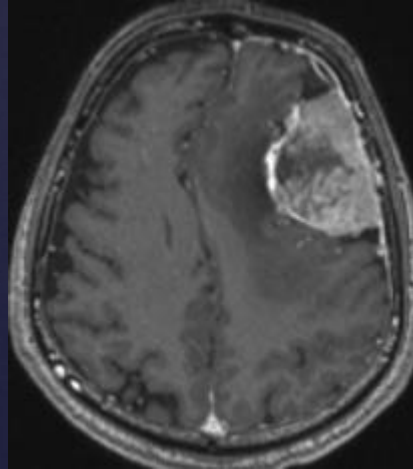
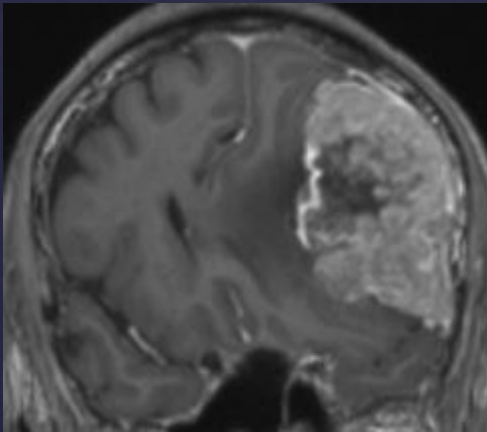
Post-op

- ◆ Headaches
- ◆ 69yr Male
- ◆ Meningioma

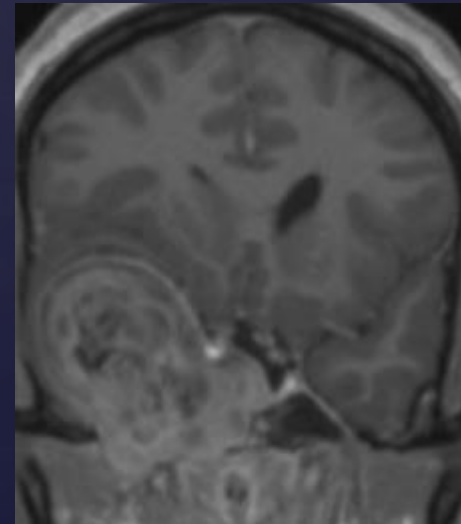
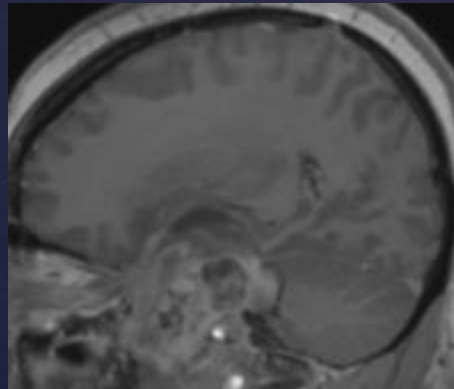
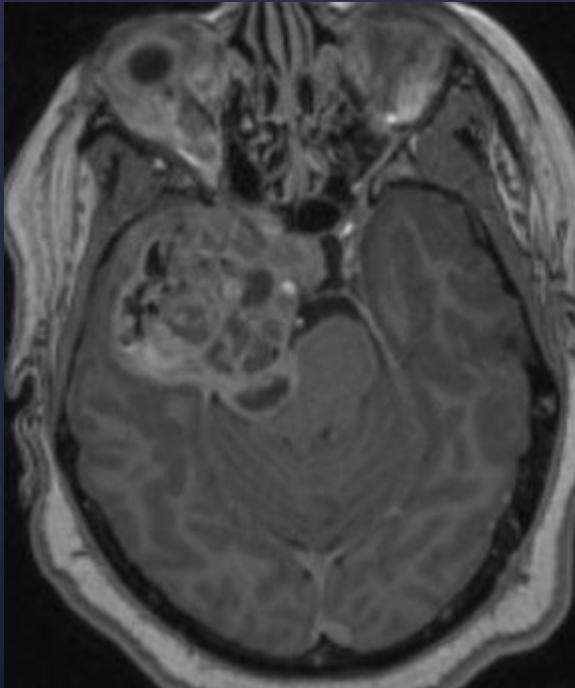


Post-op

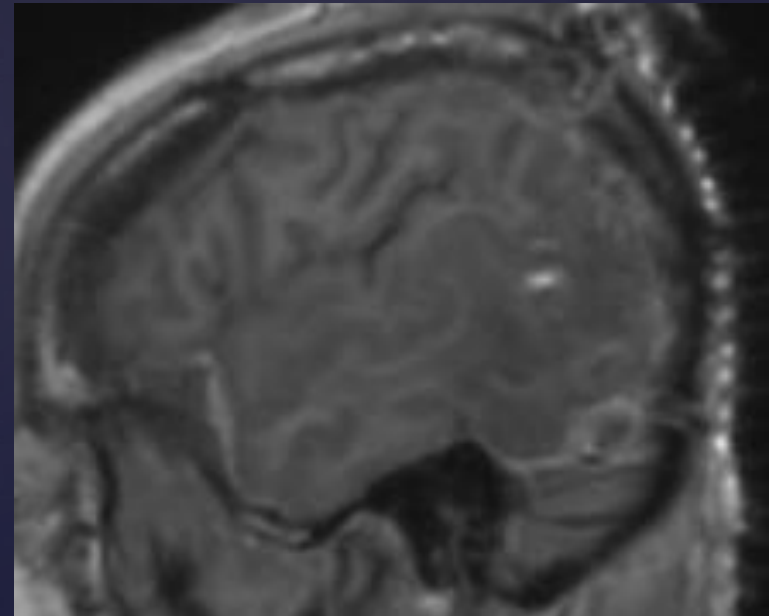
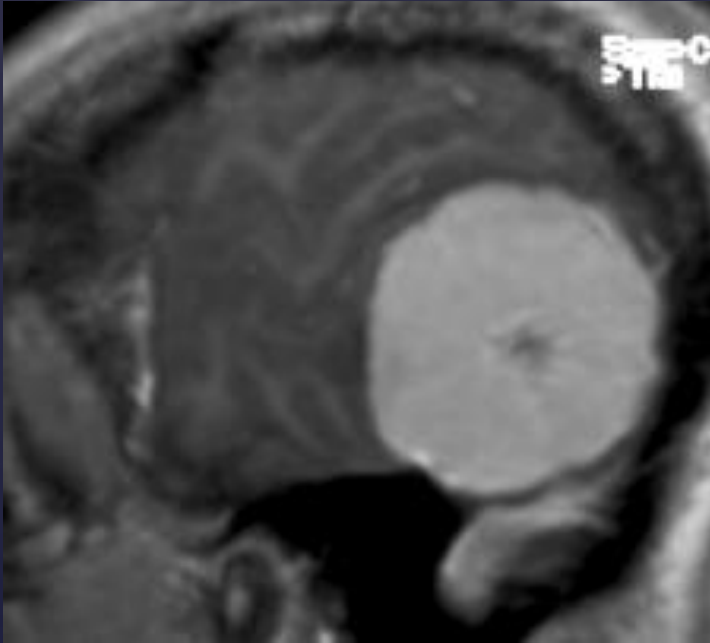
- ◆Headaches and R sided weakness
- ◆65 Male
- ◆Meningioma



- ◆Diplopia
- ◆Trigeminal Schwannoma
- ◆45 yr Female

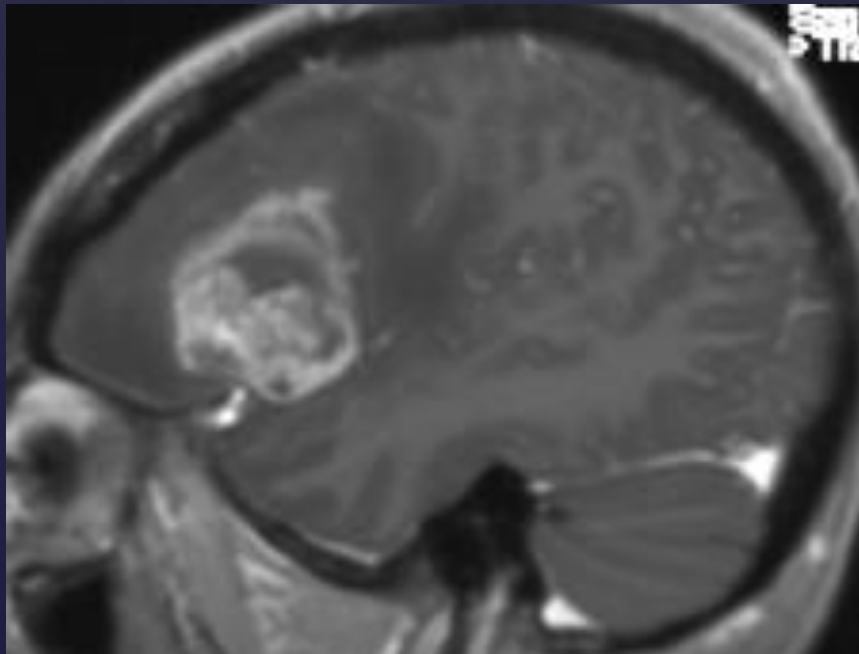


- ◆ Episodic confusion for 6 months
- ◆ 55 Female
- ◆ Meningioma



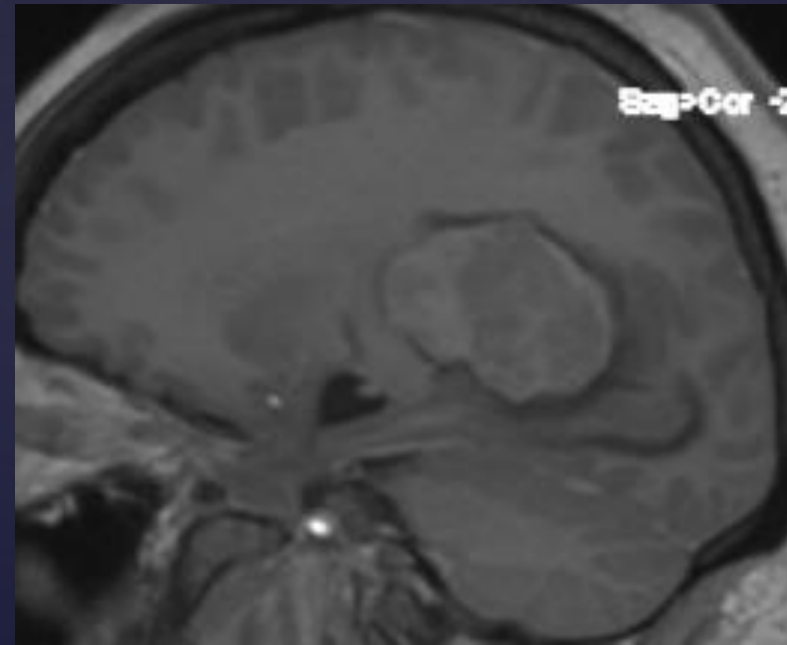
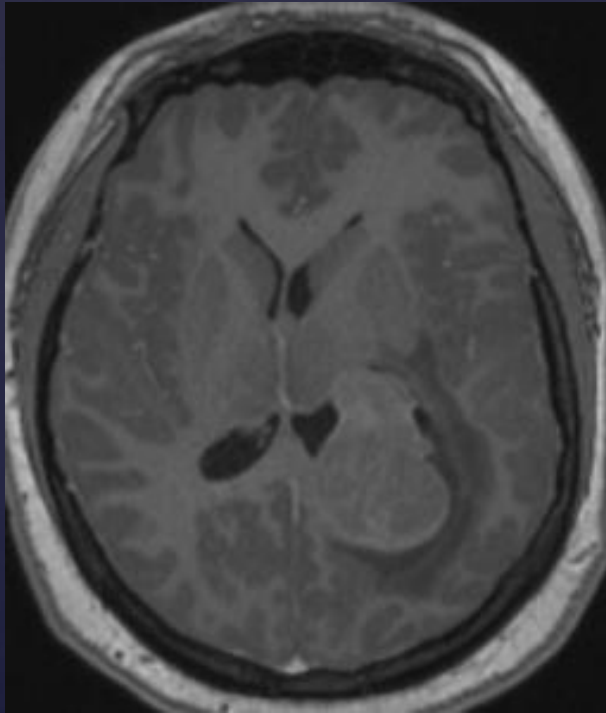
Post-op

- ◆Dysphasia
- ◆53 Female
- ◆Melanoma

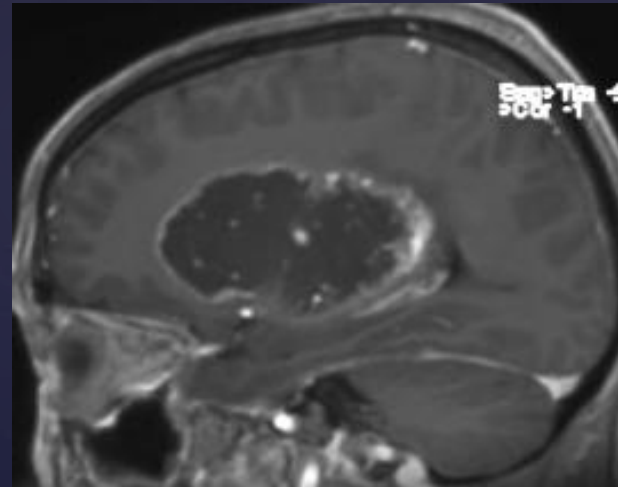
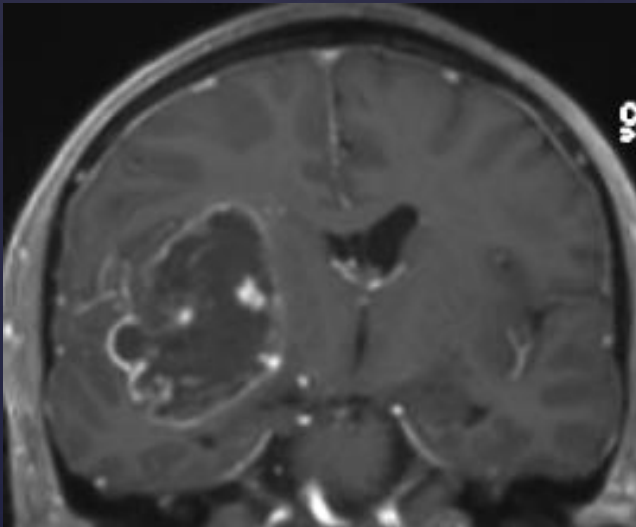


Post-op

- Headaches for 6 months
- 20 Female
- Meningioma

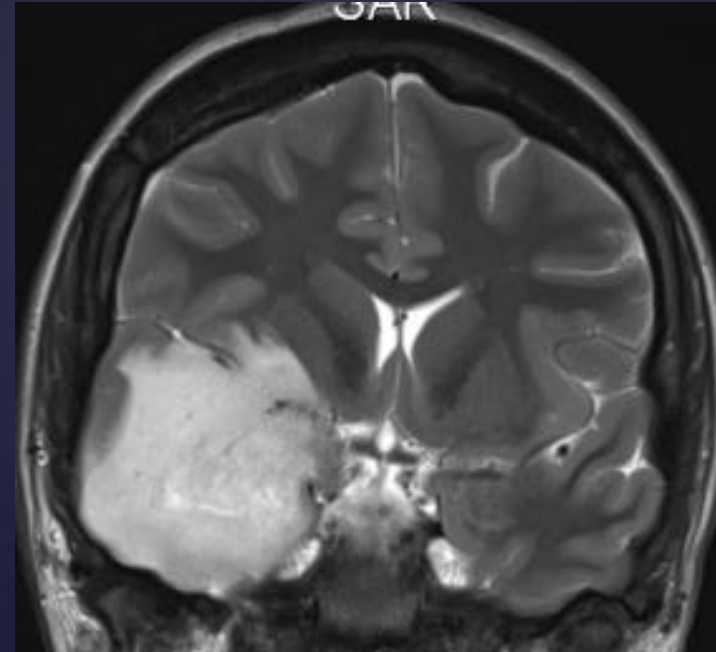
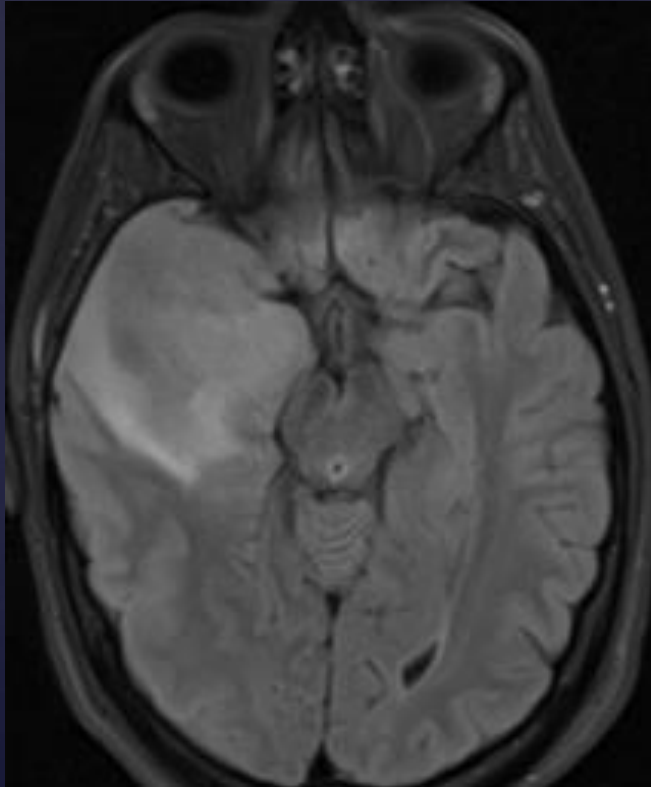


Confusion
65 yr Male
Glioblastoma



Post-op

- Seizures
- 29 Female
- Low grade Astrocytoma



Brain Cancer-Glioma

CNS cancer 7/100,000 cf with colon cancer 60/100,000

More common in males median 55-59 yrs

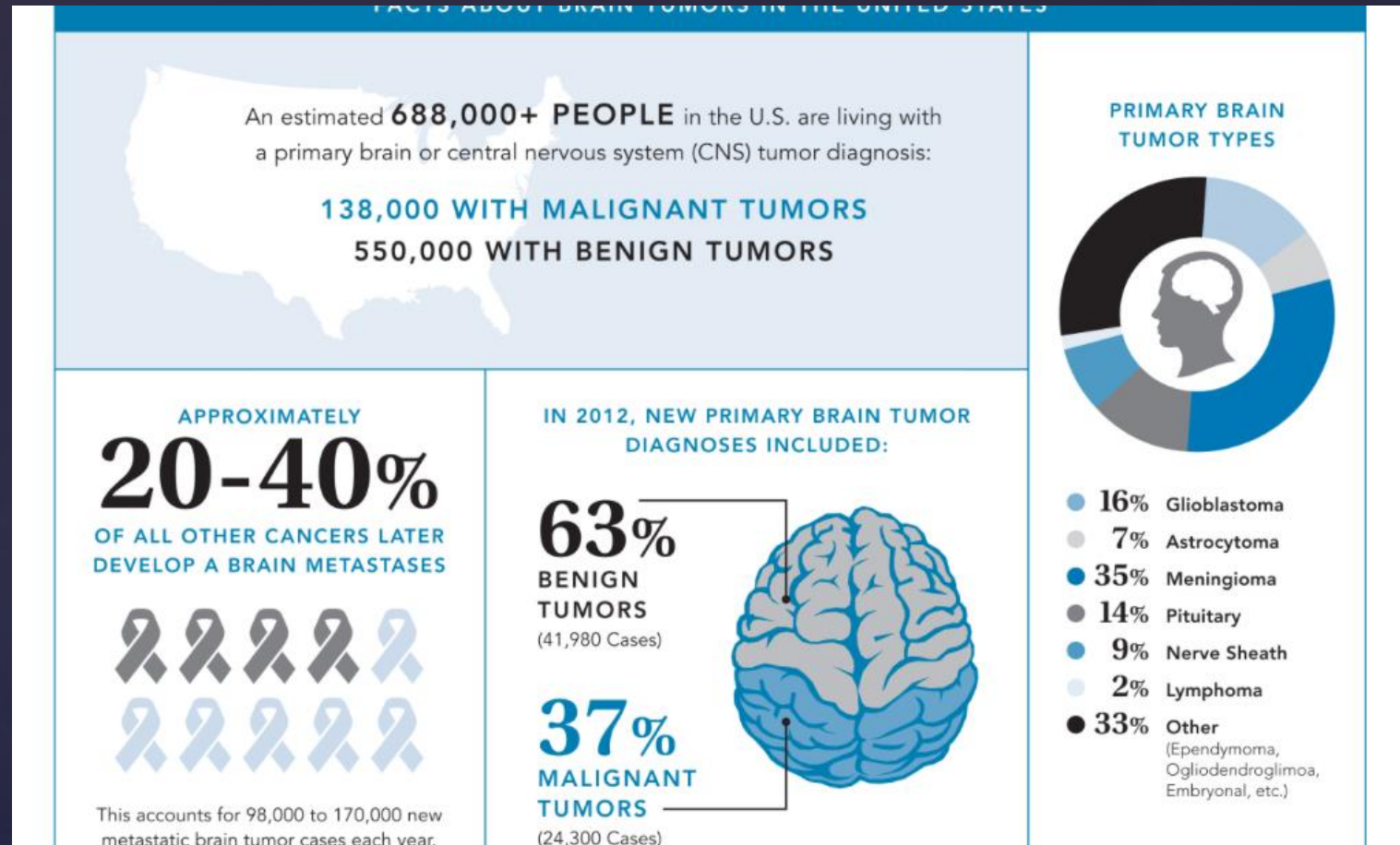
Females 60-64 yrs

Better imaging and more investigation

Arise randomly

Surgery

Radiation and chemo

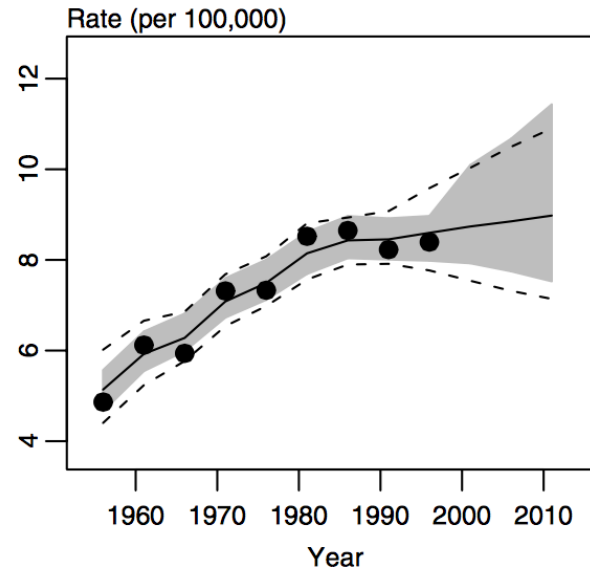


Brain Tumours USA

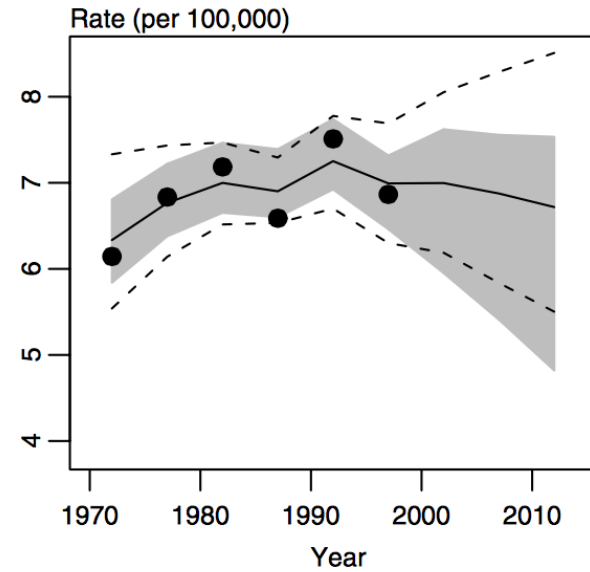
New Zealand Brain Cancer Registry

Figure 11.6 Trends and projections of age standardised rates, brain cancer

(a) Male incidence rates



(b) Male mortality rates



ACH 70 new cases Glioma annually/ 200 cases NZ
100 metastases surgically treated

How Well Do We Do?

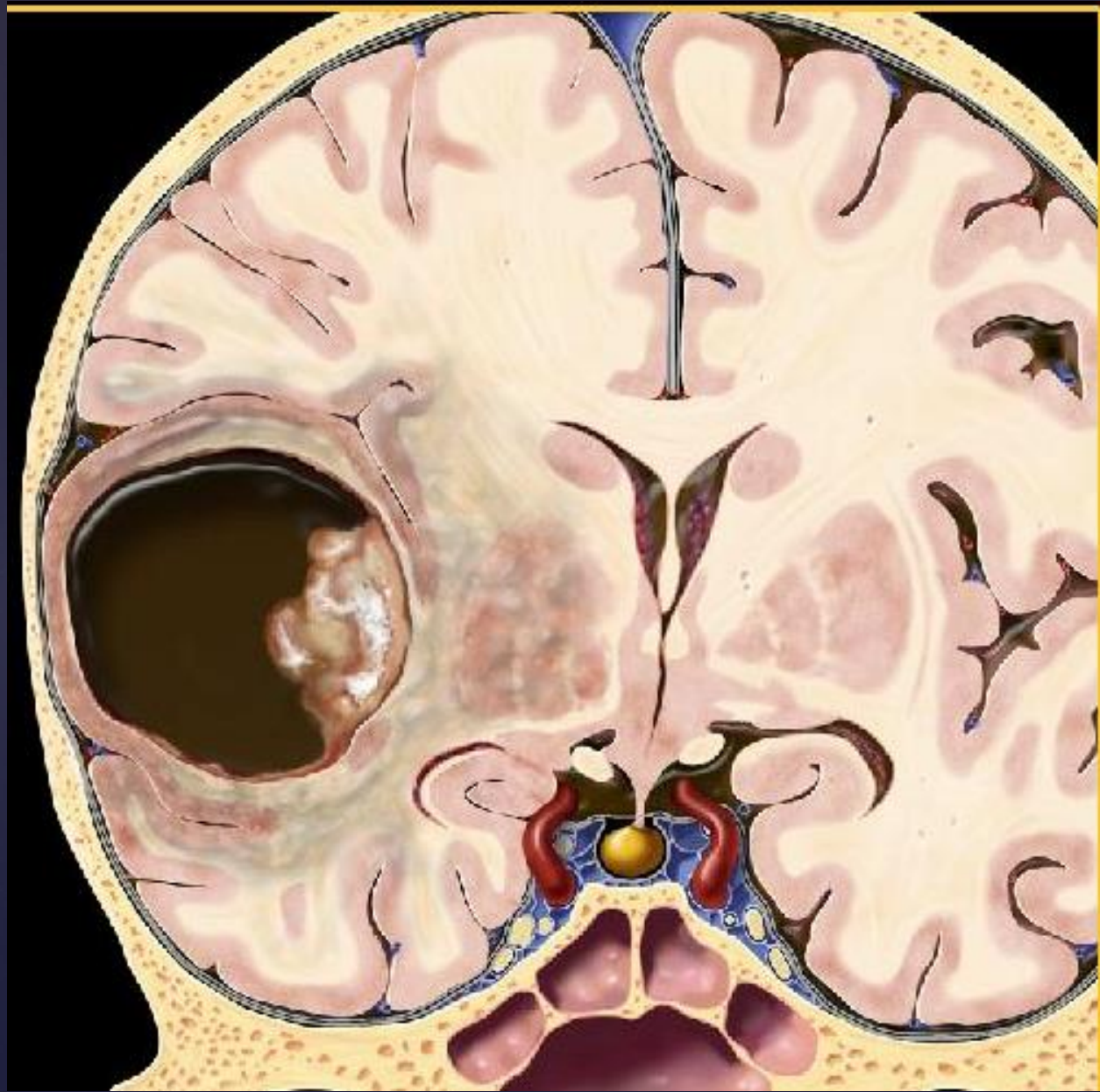
“Just ask Judi”

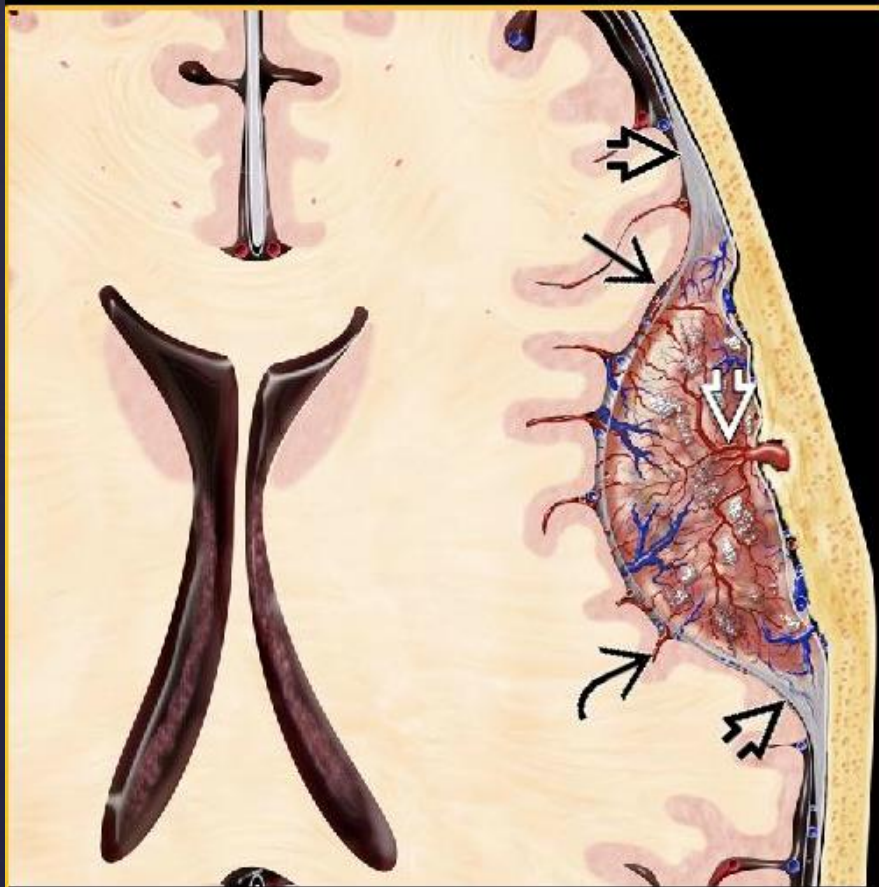
A patient’s story of care at the end of life

Ron Paterson, 18 May 2015

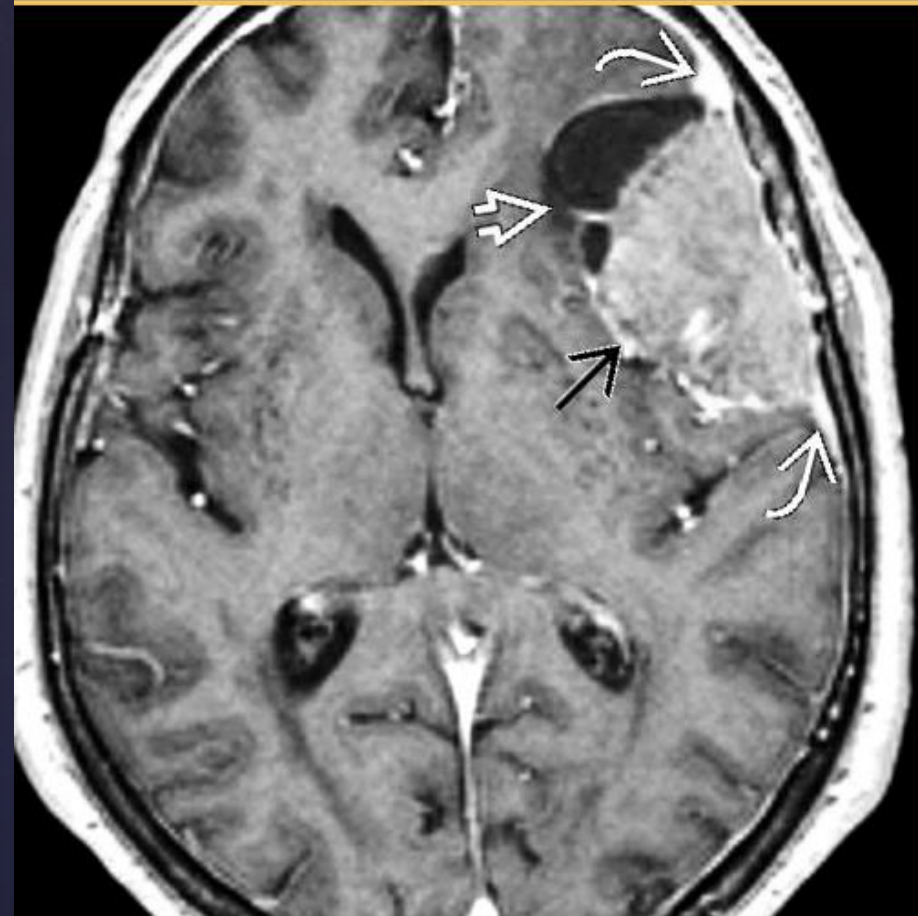
I’ve been asked to tell you a story of the care for a patient at the end of life. The patient is my friend, Judi Strid, who died on February 26th this year.

www.hqsc.govt.nz/assets/General-PR-files-images/atul-gawande-forum/ron-paterson-Jun-2015.pdf





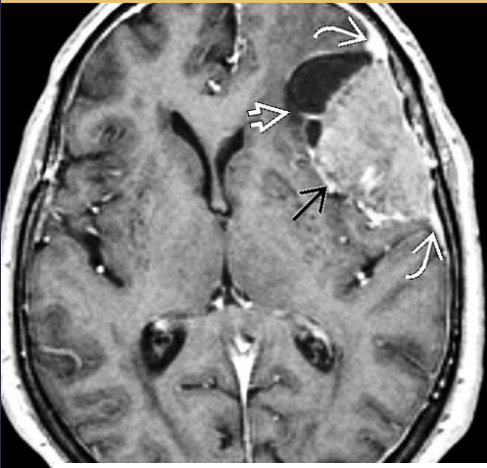
Axial graphic shows a dural-based mass with Ca^{++} (white foci), inward cortical buckling, CSF/vascular "cleft" (black arrow), and dural "tail" (black open). Note the "sunburst" of dural vascular supply (white open). Intracranial arteries are becoming parasitized (black curved), supplying the periphery.



Axial T1WI C+ MR shows a dural-based extraaxial mass (black arrow) in the left frontal lobe with intense enhancement and dural "tail" (white curved). Note the trapped pools of CSF around the tumor (white open).

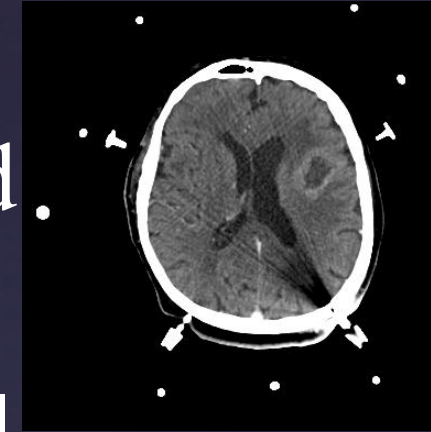


Axial graphic shows a heterogeneous frontal cortical and subcortical mass with areas of necrosis and hemorrhage. Note the mass effect and infiltrative margins, typical of anaplastic grade III oligodendroglioma.



Axial T1W
with inten
around th

Med School revisited.



A brain tumor is an abnormal growth of tissue in the brain or central spine that can disrupt proper brain function. Doctors refer to a tumor based on where the tumor cells originated, and whether they are cancerous (malignant) or not (benign).

- **Benign:** The least aggressive type of brain tumor is often called a benign brain tumor. They originate from cells within or surrounding the brain, do not contain cancer cells, grow slowly, and typically have clear borders that do not spread into other tissue.
- **Malignant:** Malignant brain tumors contain cancer cells and often do not have clear borders. They are considered to be life threatening because they grow rapidly and invade surrounding brain tissue.
- **Primary:** Tumors that start in cells of the brain are called primary brain tumors. Primary brain tumors may spread to other parts of the brain or to the spine, but rarely to other organs.
- **Metastatic:** Metastatic or secondary brain tumors begin in another part of the body and then spread to the brain. These tumors are more common than primary brain



GP Beware

SYMPTOMS AND DIAGNOSIS

Brain tumor symptoms can vary according to tumor type and location. There are times a person may have no symptoms when their brain tumor is discovered

- Recurrent headaches
- Issues with vision
- Seizures
- Changes in personality
- Short-term memory loss
- Poor coordination
- Difficulty speaking or comprehending

Raised ICP

- ⌘ **Headache**
- ⌘ **Papilloedema**
- ⌘ **Vomiting**
- ⌘ ***Impaired consciousness***
- ⌘ ***Visual obscuration***
- ⌘ ***Cushing's Response***
- ⌘ ***Neck stiffness***



Presenting Symptoms

Focal signs-site specific

Memory/Personality

Hemiparesis

Speech deficit

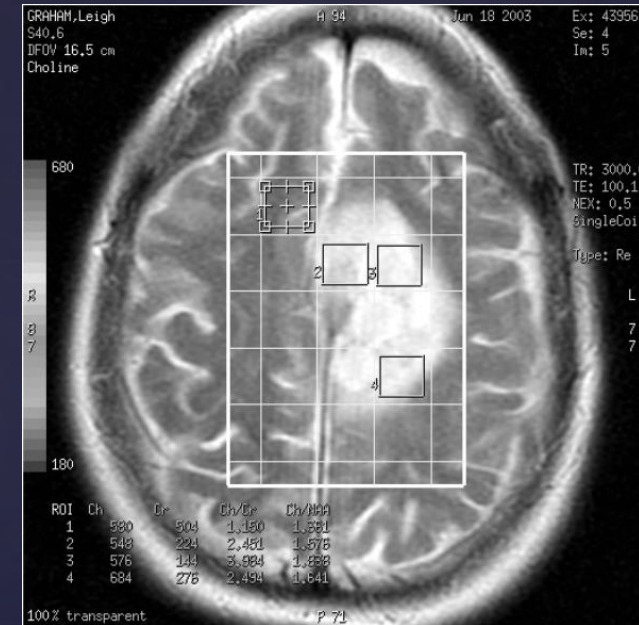
Visual field cut

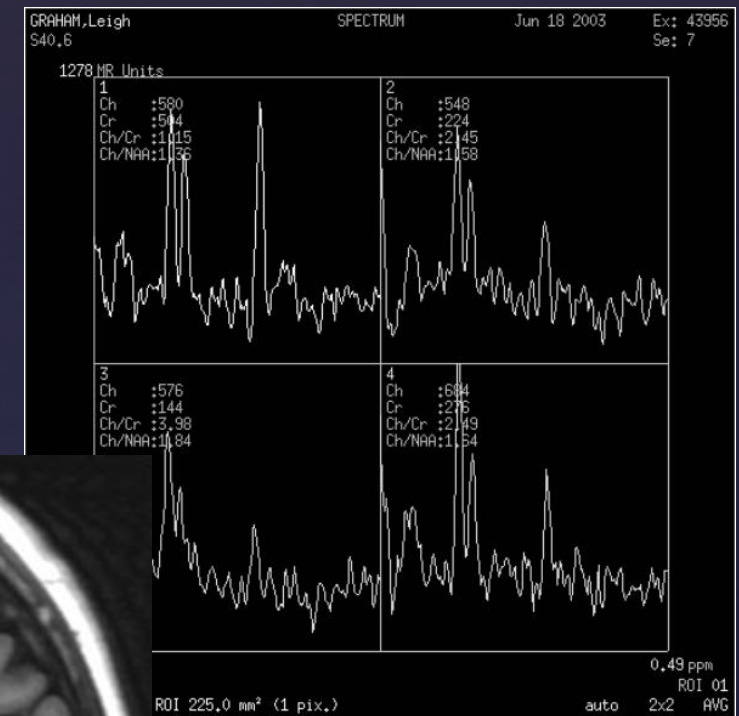
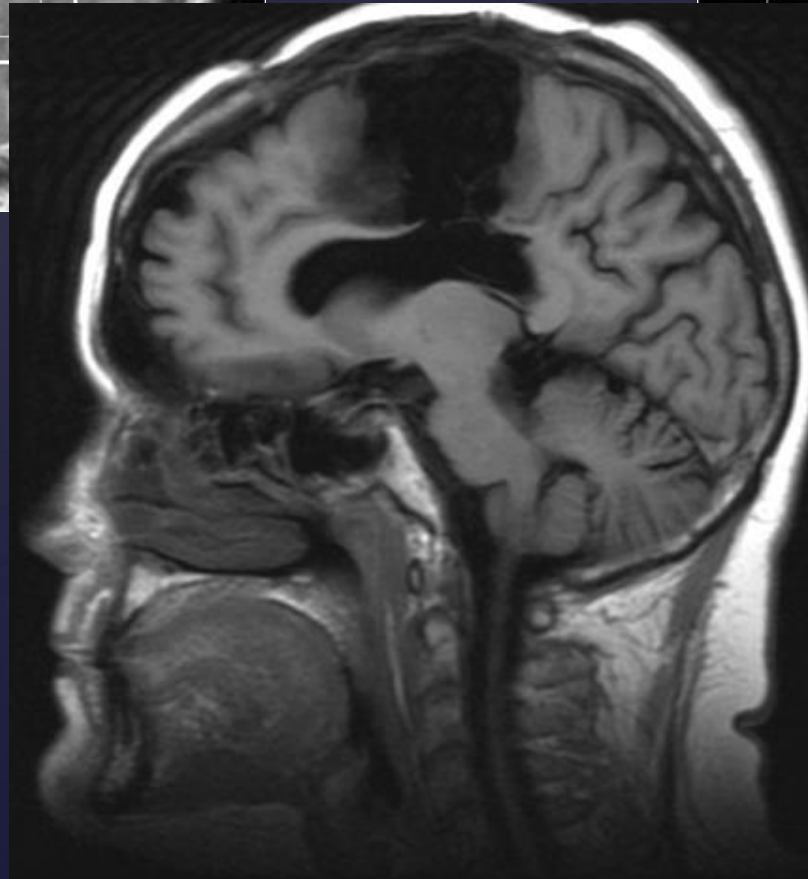
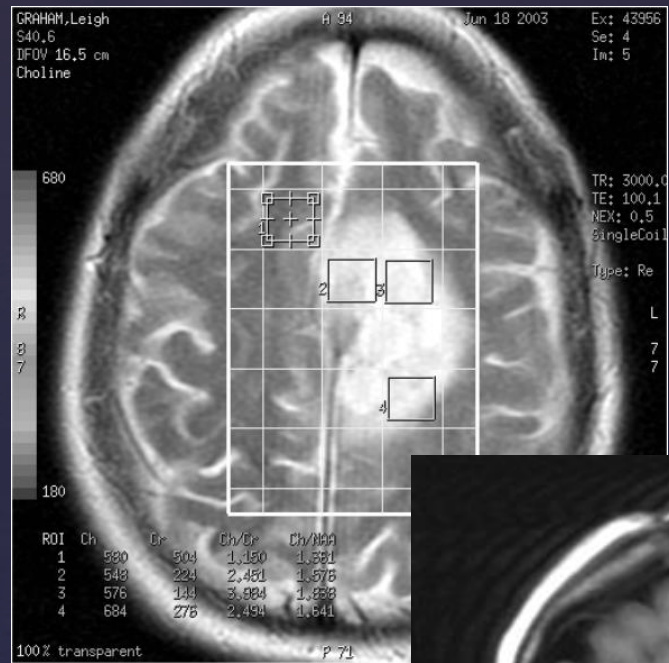
Focal seizures

Low Grade Benign Tumours

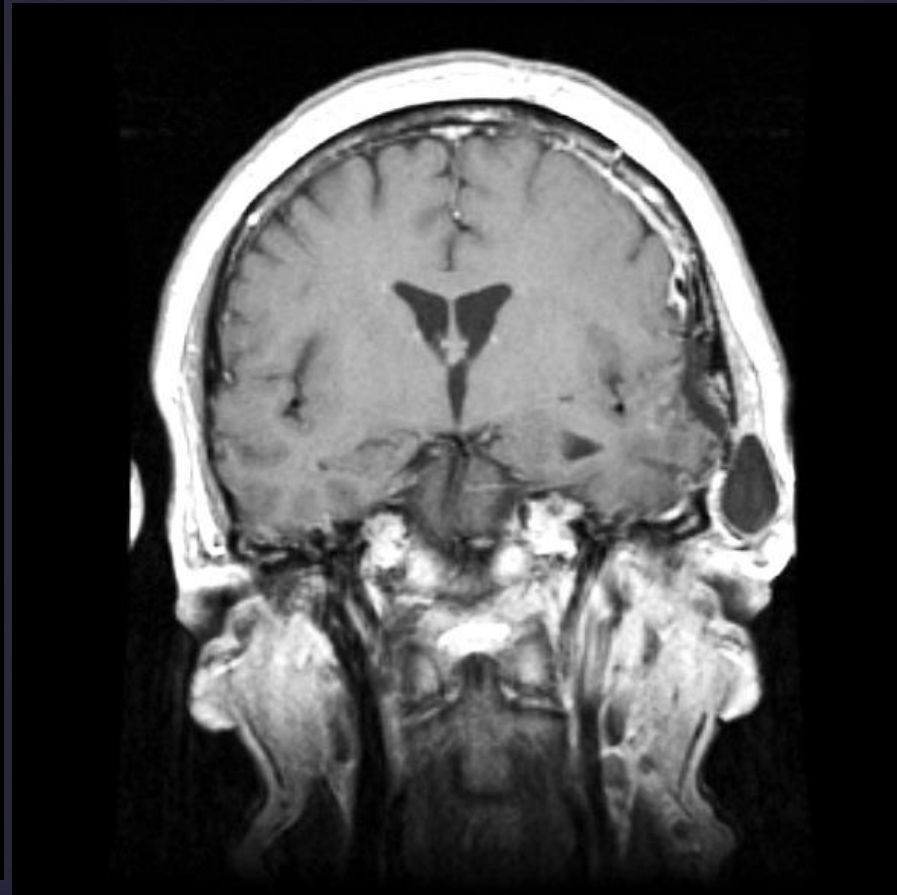
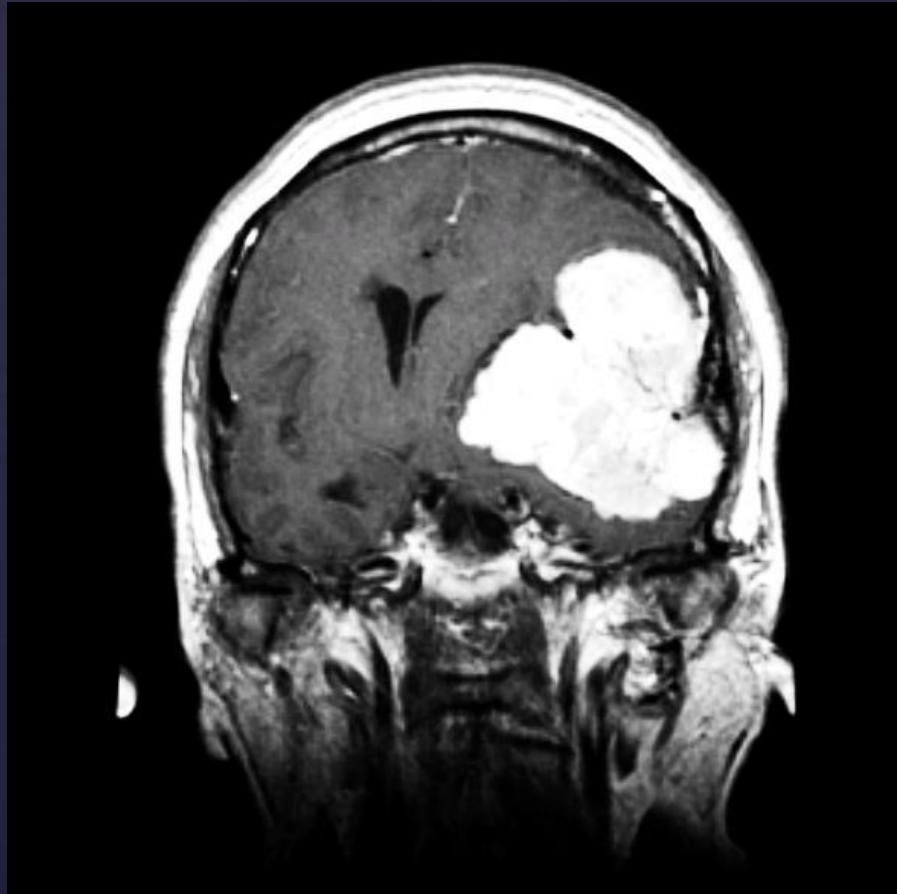
astrocytoma
oligodendroglioma
ependymoma

Clinical features
slow growing tumours
focal epilepsy



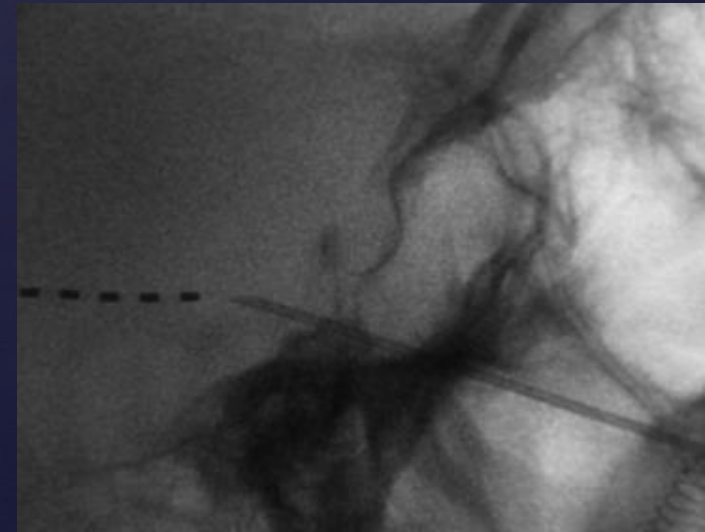


Meningioma



Pituitary adenoma

- ◆ ***10-15% of brain tumours***
- ◆ ***Cushing's: ACTH: CRF:***
- ◆ ***Thyroid Disease TRH:TSH:***
- ◆ ***Growth Hormone -giants and dwarfs***
- ◆ ***Infertility FSH:LH:Testosterone***
- ◆ ***Prolactin***
- ◆ ***Antidiuretic hormone***

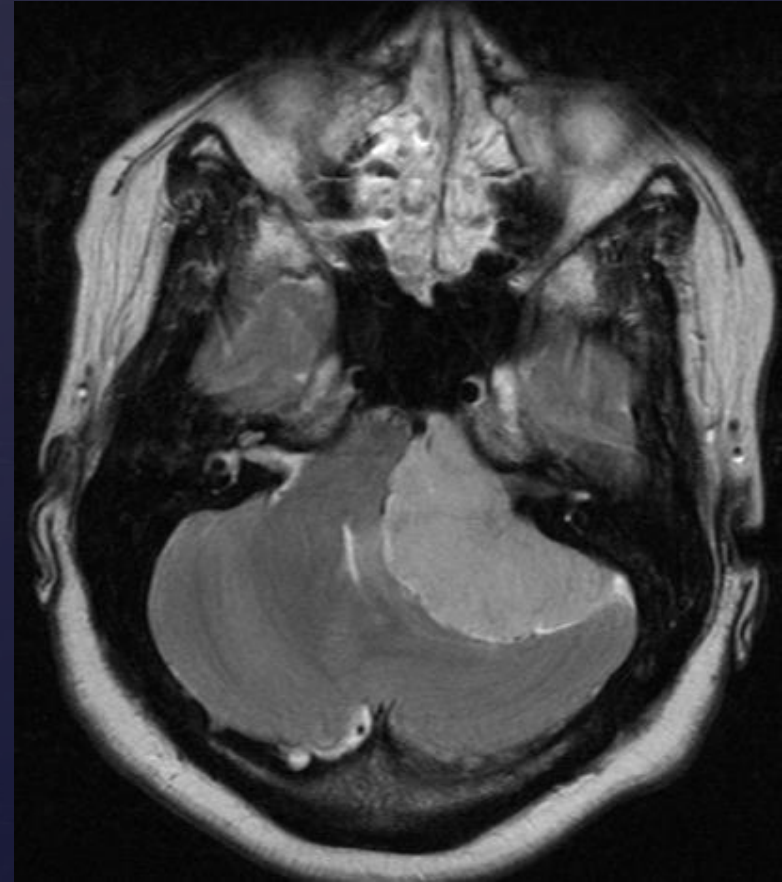


Acoustic neuroma

*c-p angle tumour
schwannoma*

produce hearing loss and enlargement of IAM

unilateral hearing loss
tinnitus
vestibular symptoms



Secondary (Metastatic)

10 times more common than
primary tumours.

median survival 18 months

Treatment ? none

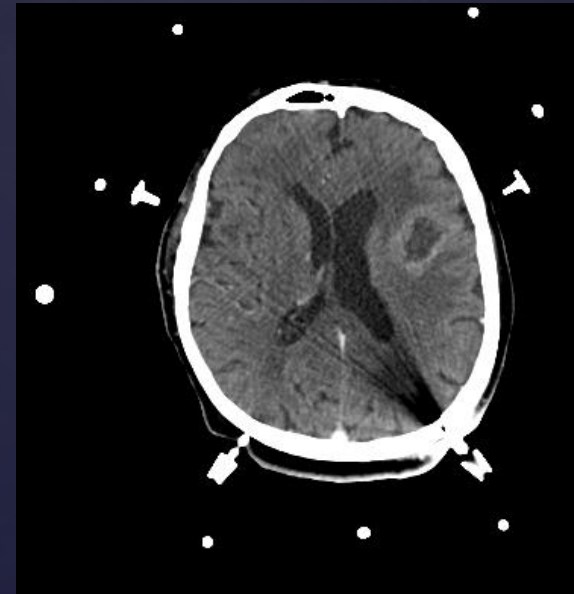
biopsy /excision

steroids

chemotherapy

primary screen

seen in 12-35 % of autopsy series.



Brain Metastases

Epidemiology

- ⊗ The true incidence of brain metastases is unknown, but recent estimates are as high as 200,000 cases per year in the United States alone ¹.
- ⊗ 80% of brain metastases can be accounted for by five primary tumours ² :
- ⊗ lung cancer
- ⊗ breast cancer
- ⊗ melanoma
- ⊗ renal cell carcinoma
- ⊗ gastrointestinal tract adenocarcinomas (the majority colorectal carcinoma)

Brain Metastases

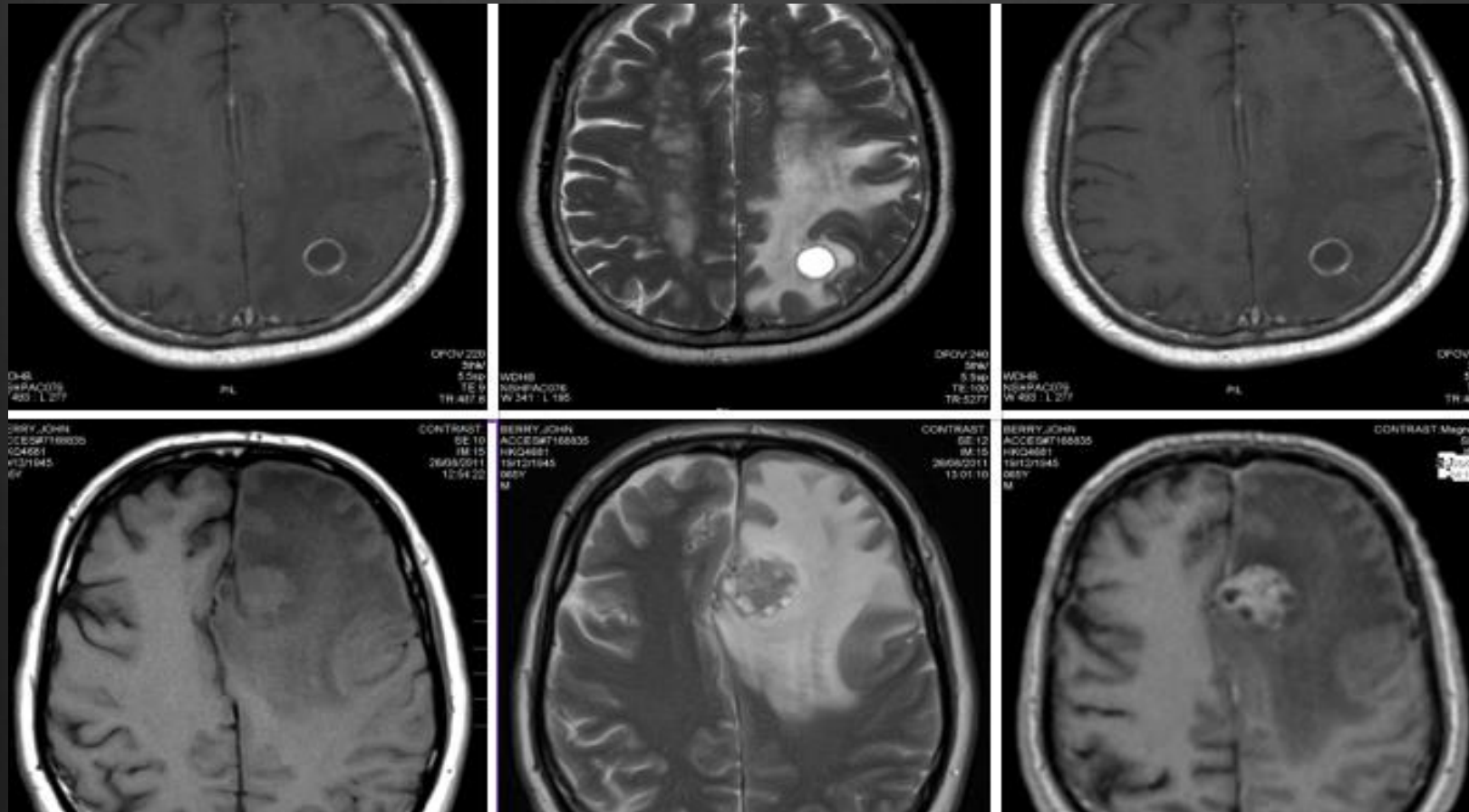
Population Study Detroit 2004

- ⊗ 19.9% of lung cancers,
- ⊗ 6.9% of melanomas,
- ⊗ 6.5% of renal cancers,
- ⊗ 5.1% of breast cancers
- ⊗ 1.8% of colorectal cancers metastasized to the brain

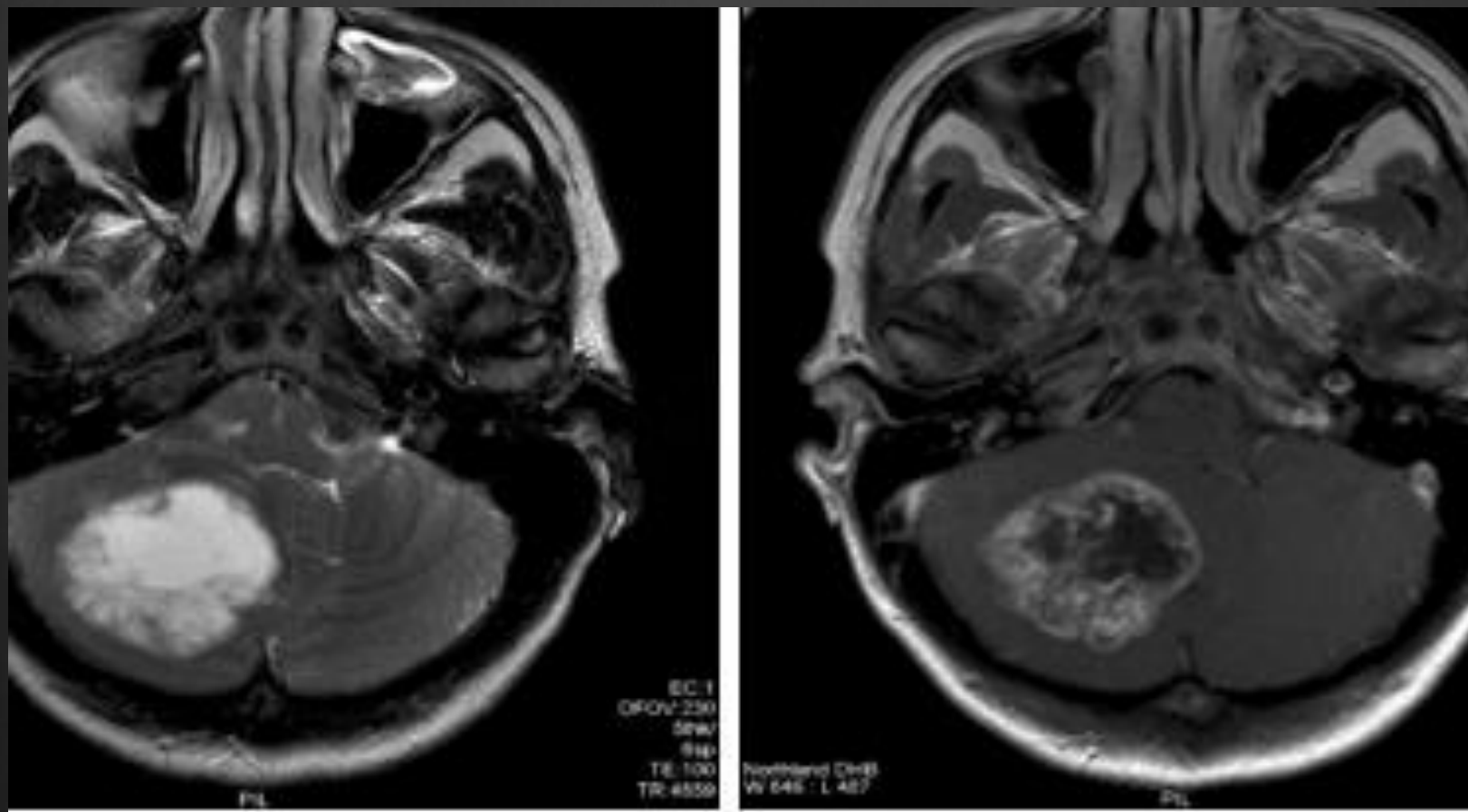
Barnholtz-Sloan JS, Sloan AE, Davis FG et-al. Incidence proportions of brain metastases in patients diagnosed (1973 to 2001) in the Metropolitan Detroit Cancer Surveillance System.

J. Clin. Oncol. 2004;22 (14): 2865-72

Lung 20%



Breast 5%



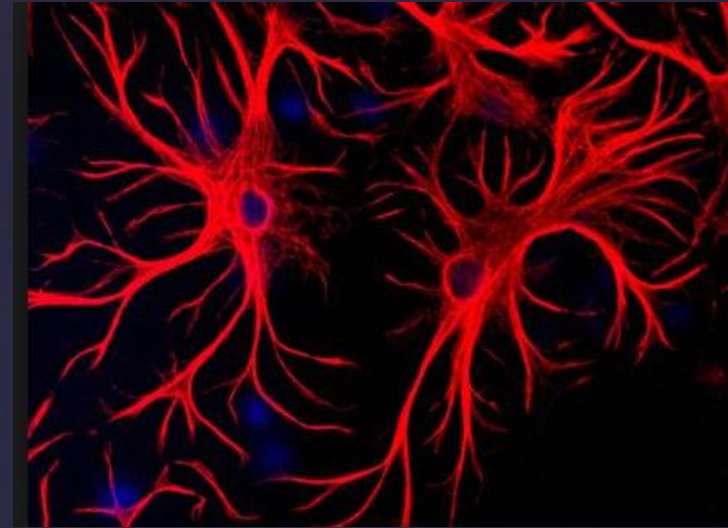
Single brain metastasis, surgery versus radiosurgery^{-limited evidence}

- ⊗ In good prognosis patients with single brain metastasis (less than 3 to 4 cm in maximum dimension and amenable to gross total resection), either surgery or radiosurgery may be considered.
- ⊗ Surgery may be favored in patients with **unknown primary**, or in patients with single brain metastasis causing significant **mass effect**.
- ⊗ In good prognosis patients with single brain metastasis less than 3 to 4 cm in maximum dimension (**in eloquent brain areas not amenable to safe total resection or in patients who are unfit for surgery**), radiosurgery may be considered.

Conclusion

- ⦿ Treatment options for brain metastases more than 30 years ago were limited to **steroids and whole brain radiotherapy** and **rarely surgery**.
- ⦿ Management options today have expanded to **include comfort measures (including the use of steroids)**,
- ⦿ **WBRT** and, in selected patients,
- ⦿ **surgery or radiosurgery**.
- ⦿ Optimal management depends on **patient factors** (such as age, performance status),
- ⦿ **tumor factors** (such as extra cranial cancer activity, as well as number, size, location, and histopathology of brain metastases)
- ⦿ **available treatment options** (such as experienced radiosurgery services and neurosurgeons).

Astrocytomas



Grade 1-4 or low and high grade

Arise from the glial(glue cells) which support the neurons

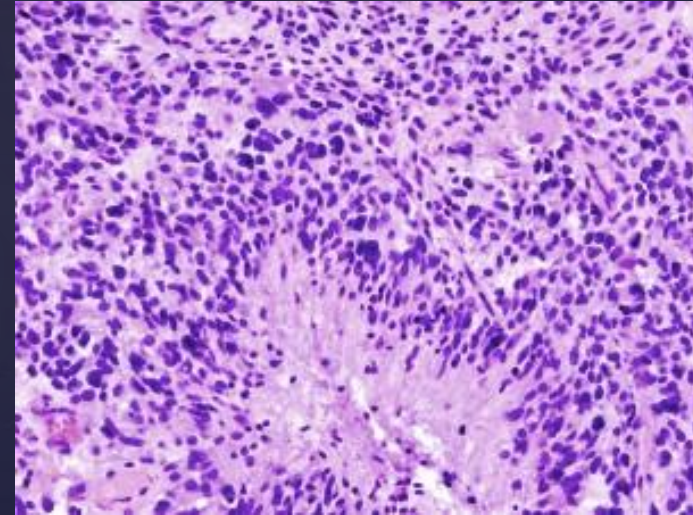
Astrocytes are star shaped

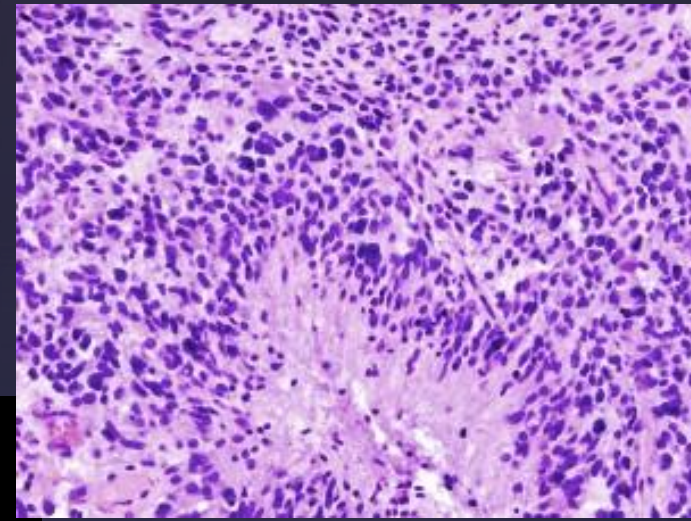
Outcome depends on grade, size, and location

Glioblastoma multiforme

Grade 4

- ⌘ Surgery plus radiation/chemo
9-24 months
- ⌘ 2 year survival 15-25%
- ⌘ Aggressive malignant tumours
- ⌘ Cystic and solid components
- ⌘ Cysts filled with clear yellow fluid
- ⌘ Typical appearance on CT and MRI





Effects of radiotherapy with concomitant and adjuvant temozolomide versus radiotherapy alone on survival in glioblastoma in a randomised phase III study: 5-year analysis of the EORTC-NCIC trial

Roger Stupp, Monika E Hegi, Warren P Mason, Martin J van den Bent, Martin J B Taphoorn, Robert C Janzer, Samuel K Ludwin, Anouk Allgeier, Barbara Fisher, Karl Belanger, Peter Hau, Alba A Brandes, Johanna Gijtenbeek, Christine Marosi, Charles J Vecht, Karima Mokhtari, Pieter Wesseling, Salvador Villa, Elizabeth Eisenhauer, Thierry Gorlia, Michael Weller, Denis Lacombe, J Gregory Cairncross, René-Olivier Mirimanoff; on behalf of the European Organisation for Research and Treatment of Cancer Brain Tumour and Radiation Oncology Groups and the National Cancer Institute of Canada Clinical Trials Group

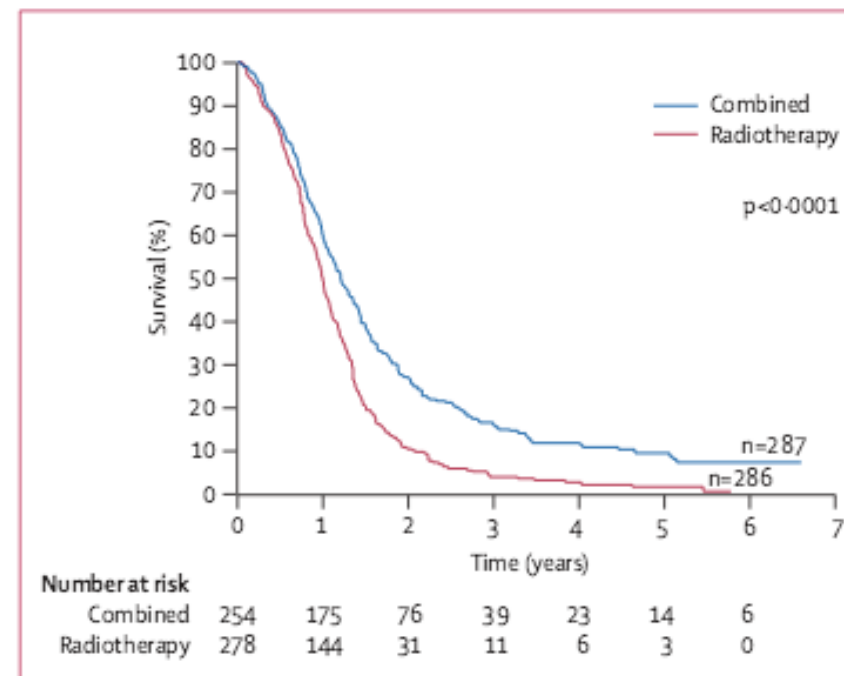


Figure 2: Kaplan-Meier estimates of overall survival by treatment group

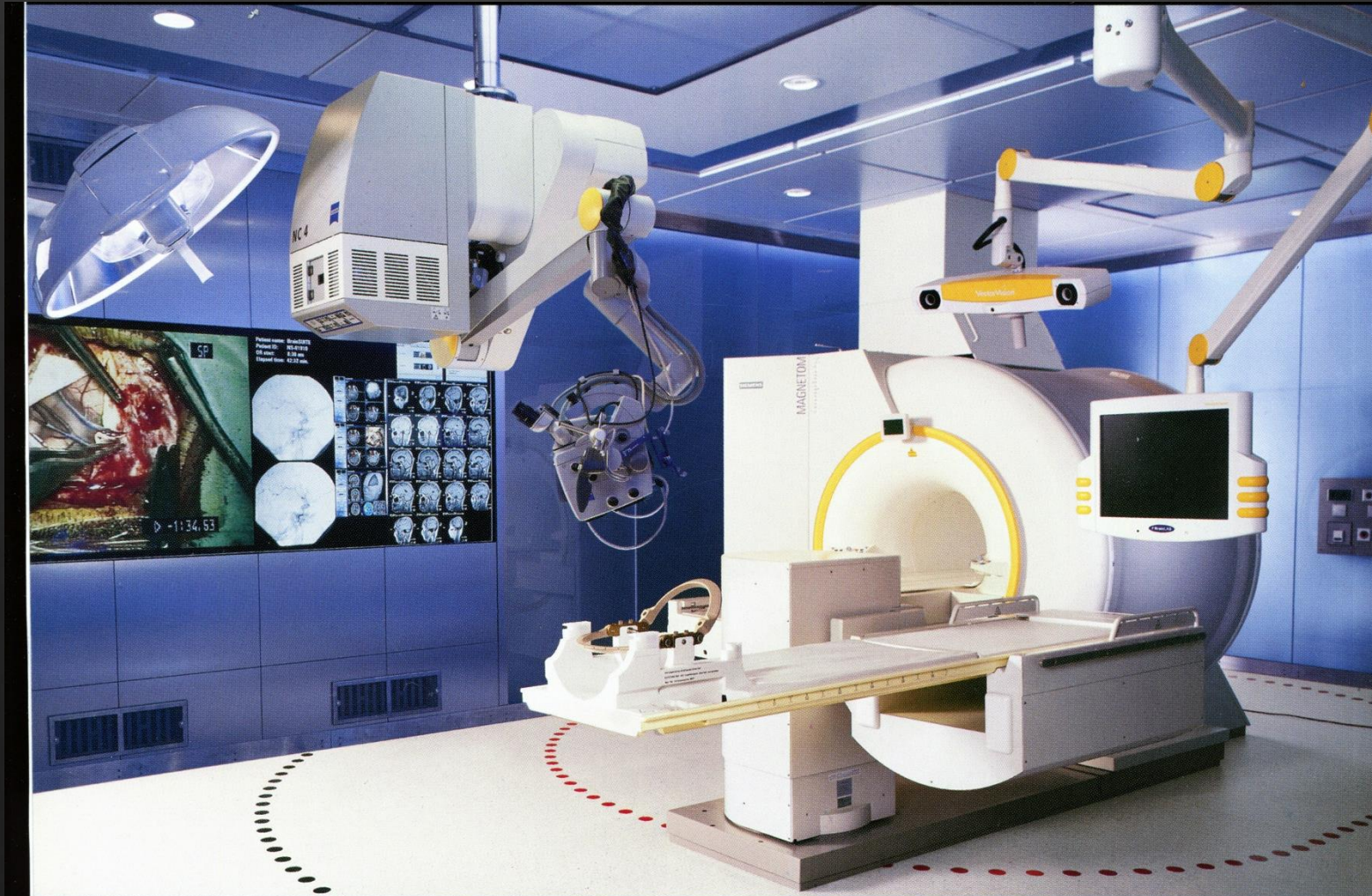
Costs and Pharmac

After the tumour was diagnosed in January last year, the 36-year-old spent much of his time looking for a cure for his illness. He found a drug called Temozolomide which was being successfully used in Toronto but was shocked to learn it was available in New Zealand - at a cost of up to \$6500 a month. Mr Bowman and his family paid for the drug through fundraising but also worked tirelessly to promote the need for the drug to be subsidised through Pharmac.

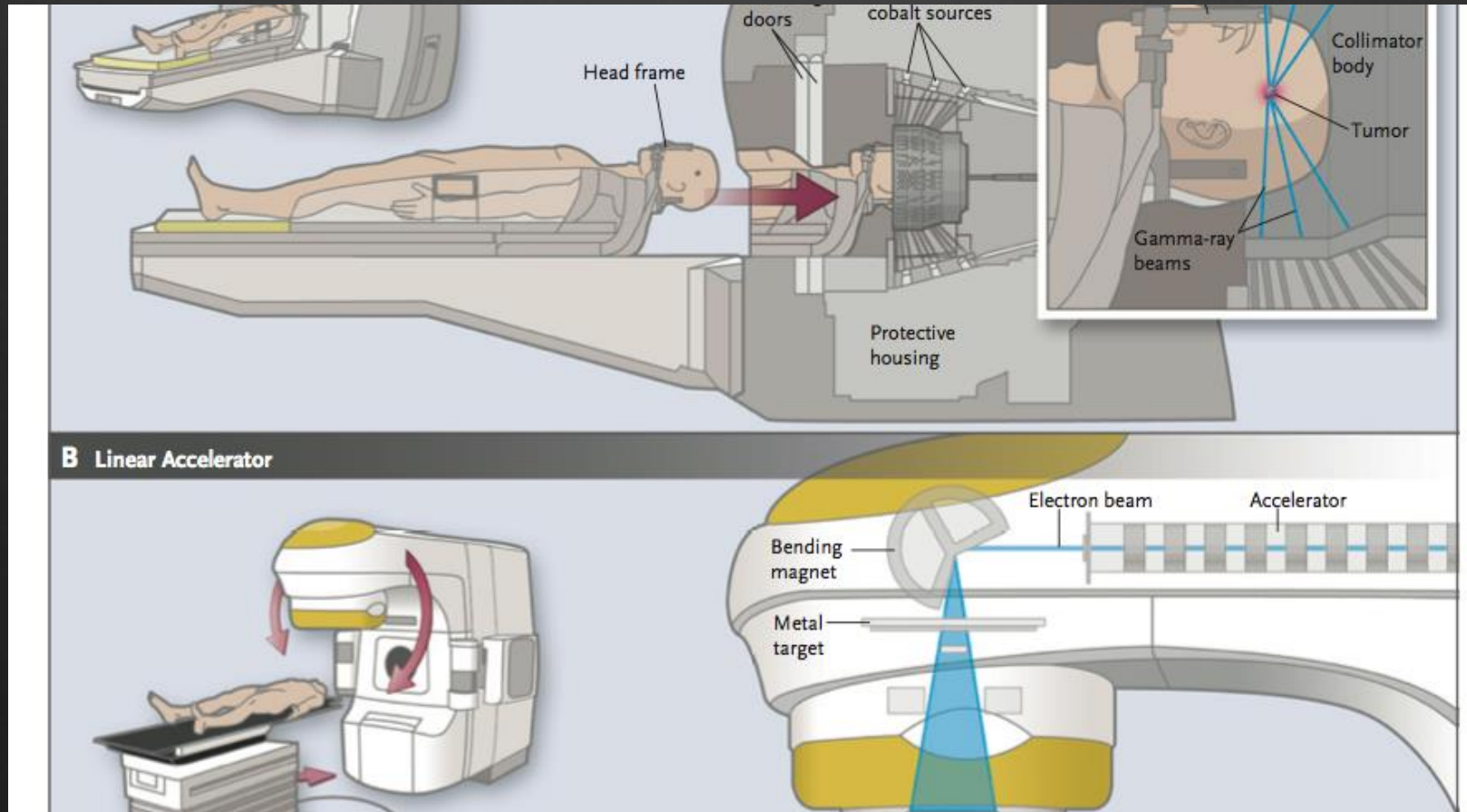
2006

Now Funded

Neurosurgical Operating Suite 2020



Stereotactic Radiosurgery for the Management of Brain Metastases



Median Survival for Astrocytomas

Grade	Median Survival
I	8-10 years
II	7-8 Years
III	2-3 years
IV	12-18 months

Multidisciplinary Approach

- ⌘ Memory
- ⌘ Judgment and personality
- ⌘ Mobility/driving
- ⌘ Dysphasia
- ⌘ Visual problem
- ⌘ Seizures
- ⌘ Financial/legal issues



- ⌘ Steroid toxicity/diabetes
- ⌘ Insomnia
- ⌘ High mood
- ⌘ Myopathy
- ⌘ Anticonvulsant issues
- ⌘ Oral Chemo side effects
- ⌘ DVT/PE

GP Neurosurgeon Oncologist Nurse specialist Neuroradiologist
Social Worker Occupational therapist Care Giver Hospice Neurologist