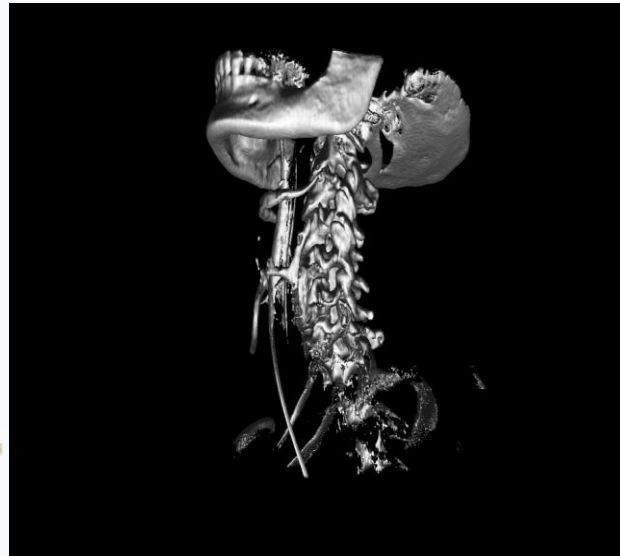


Technology in Neurosurgery and Spinal Surgery

Dr Frank Tomlinson



Pharmacology

- Dexamethasone
- Gliadel
- Temodal

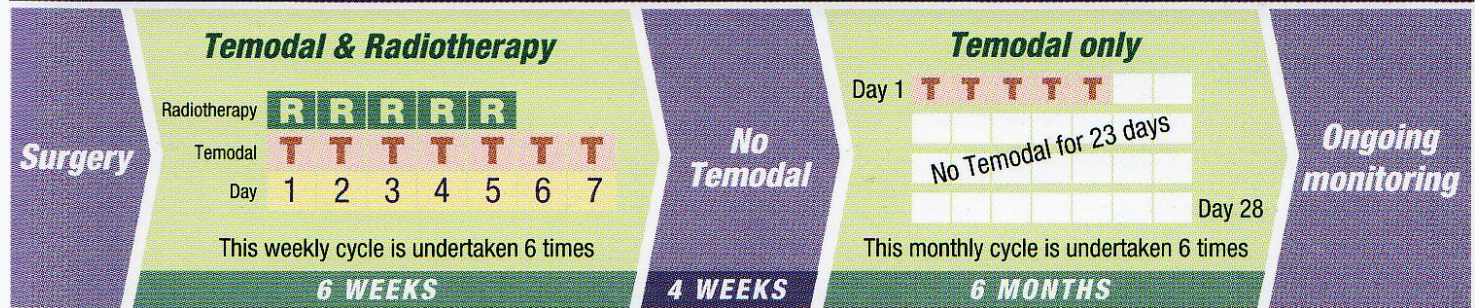
Gliadel

Chemo wafers (Gliadel Wafers)
Carmustine (BCNU)



Temodal - Temozolomide

Temodal treatment for newly diagnosed GBMs



Chemistry

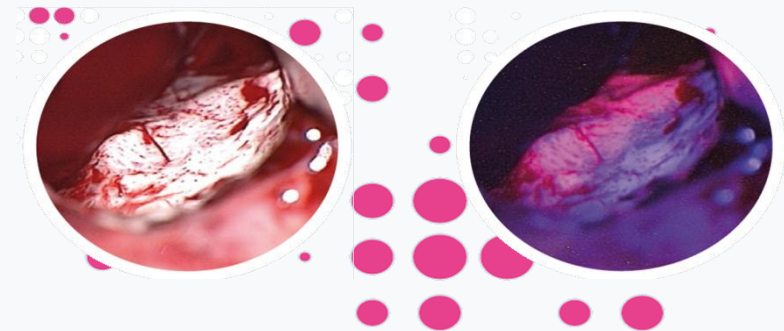
Fluorochemistry

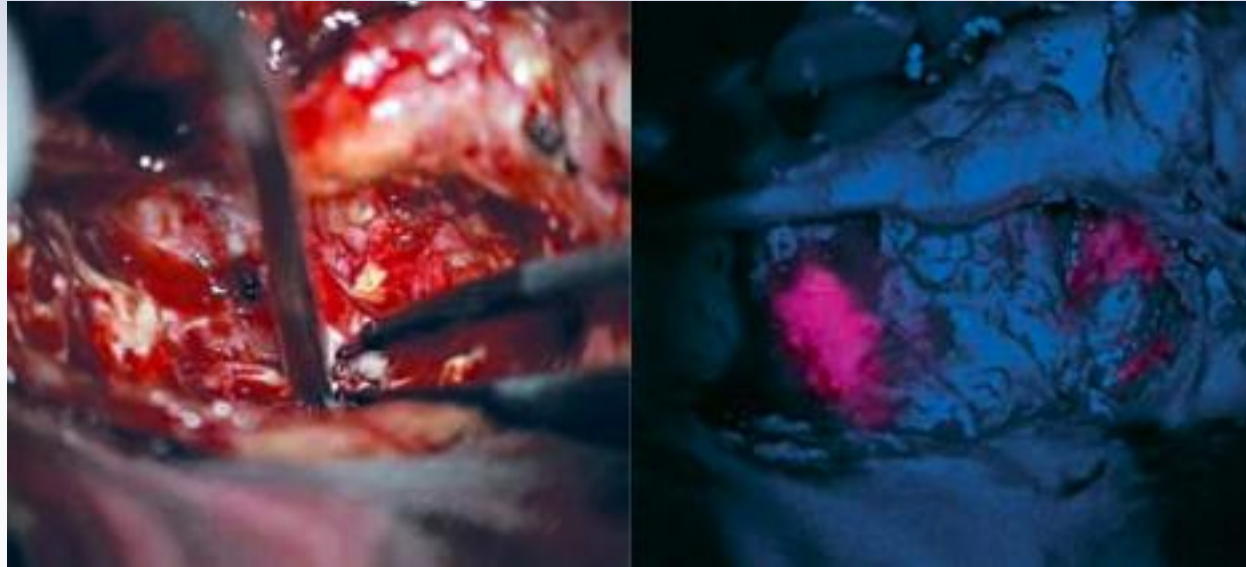
gliolan (5 aminolevulinic acid)

- an orally administered drug for enhancing high grade glioma visualisation during surgery to improve resection of malignant tissue
- natural biochemical precursor of haemoglobin that elicits accumulation of fluorescent porphyrins within malignant glioma tissue
- Fluorescence can be visualised by use of a modified neurosurgical microscope

A clear contrast

- The method of fluorescence-guided resection makes use of the capacity of malignant glioma cells to selectively accumulate a fluorescent dye (protoporphyrin IX) derived from gliolan.
- Under a special blue excitation light ($\lambda=375-420$ nm) the tumour tissue appears red, while normal tissue shows no fluorescence.





- ➔ intense red fluorescence is corresponding to solid tumour tissue
- ➔ vague pink fluorescence is corresponding to infiltrating tumour cells
- ➔ normal tissue shows no fluorescence (blue)

Molecular Biology

Cytogenetics

- Chromosome analysis
 - 1p/19q loss
 - Oligodendrogliomas
- Gene expression – MGMT 06-methylquanine-DNA methyltransferase

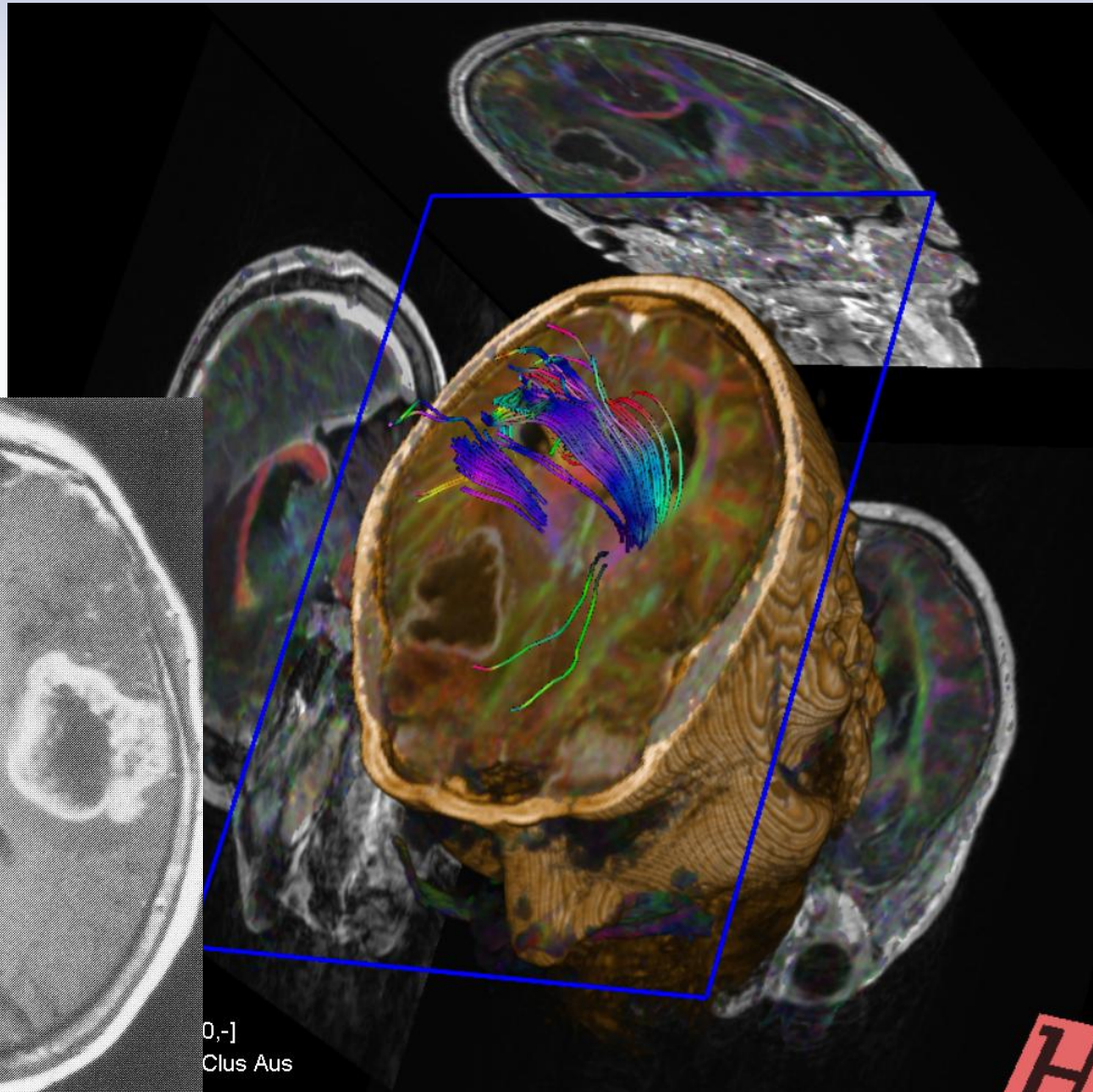
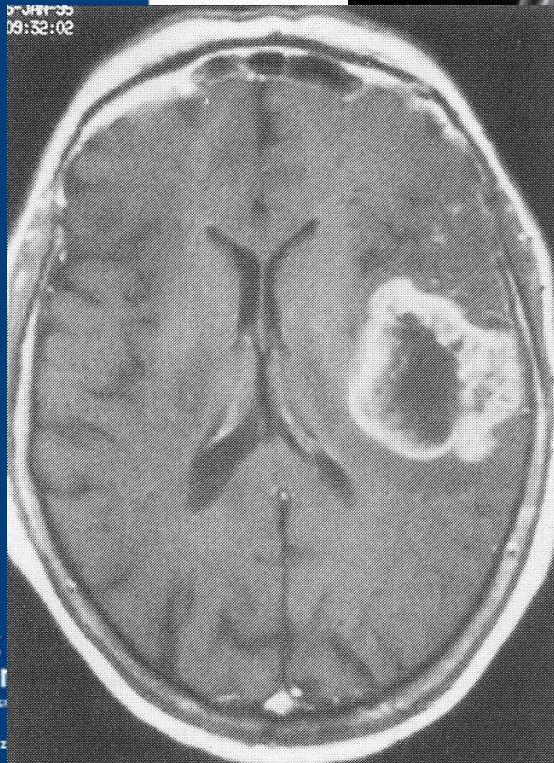
Immunotherapy

- Dendritic Cell Therapy

Engineering

- MRI Scanning
- Carbon Fiber Technology
- Implants
- Deep Brain Stimulation
- Stereotactic Radiosurgery
- Optics
- O-Arm

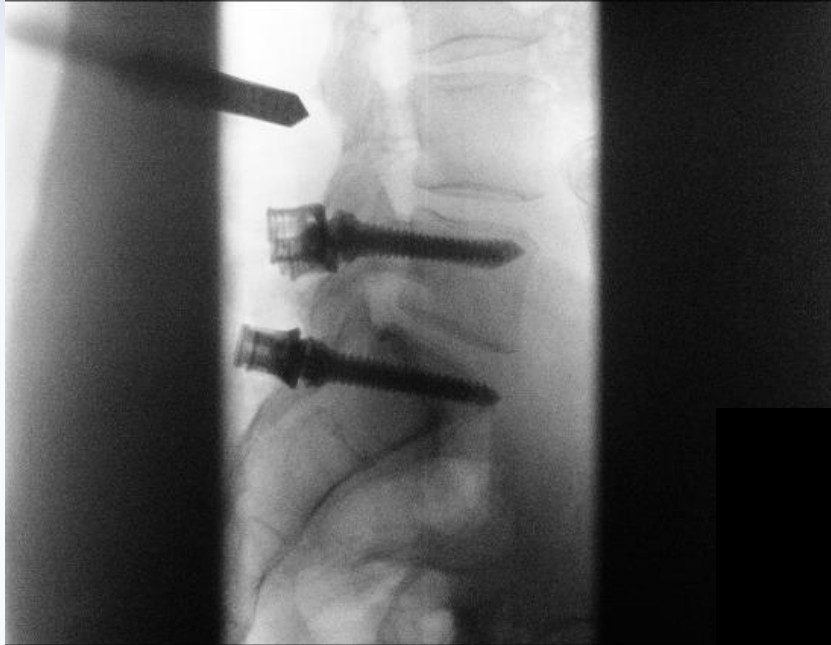
MRI Scanning



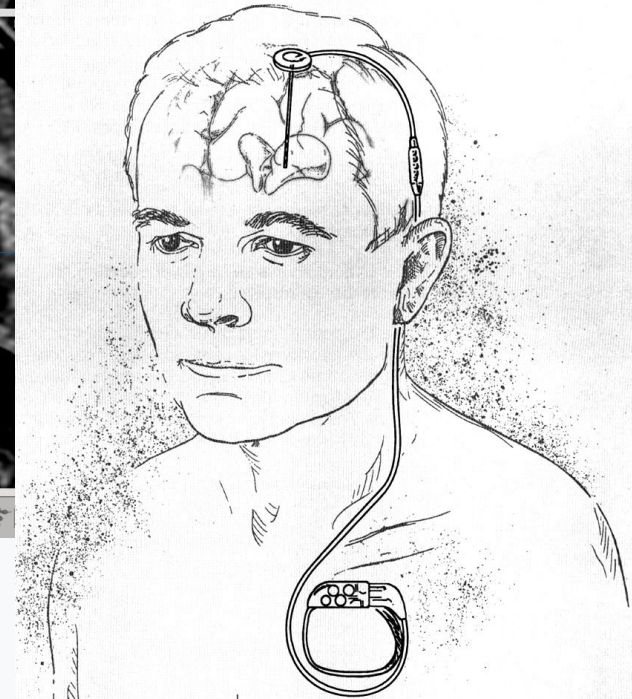
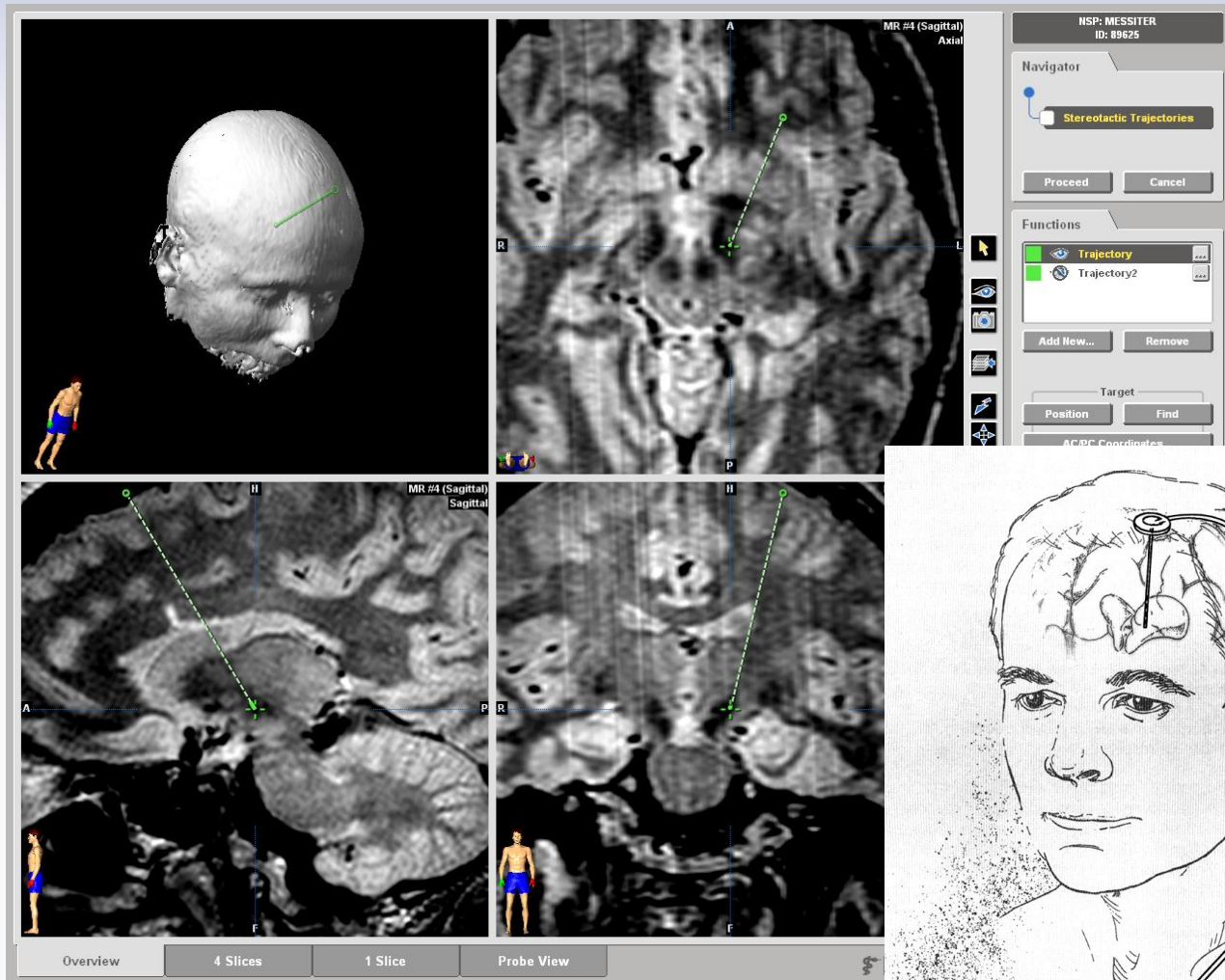
Carbon Fiber Technology



Implants



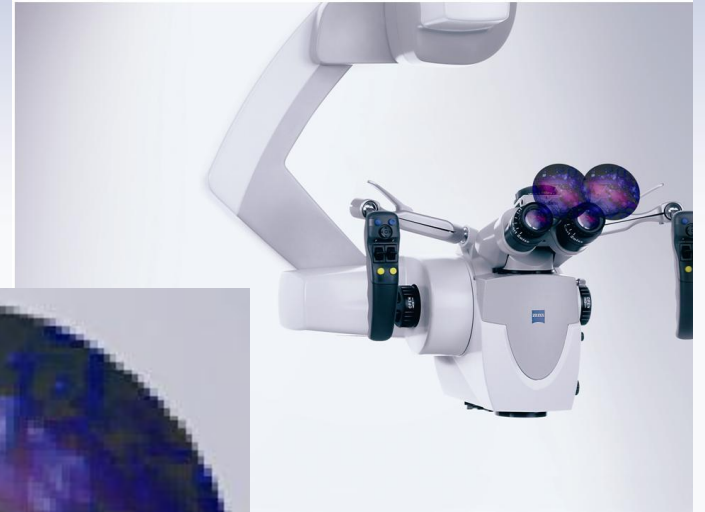
Deep Brain Stimulation



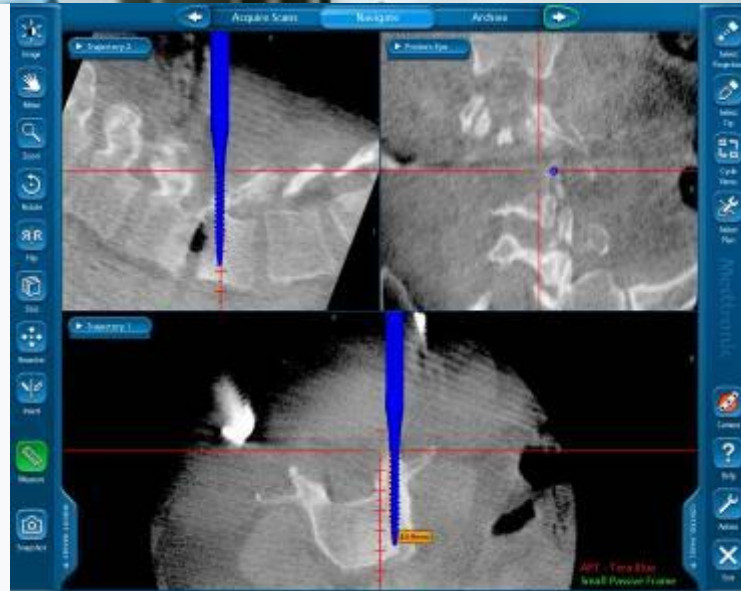
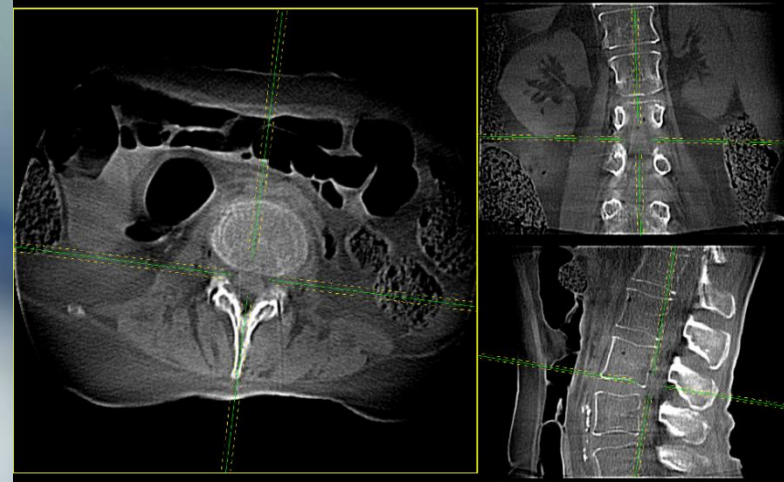
Stereotactic Radiosurgery



Optics



O-Arm

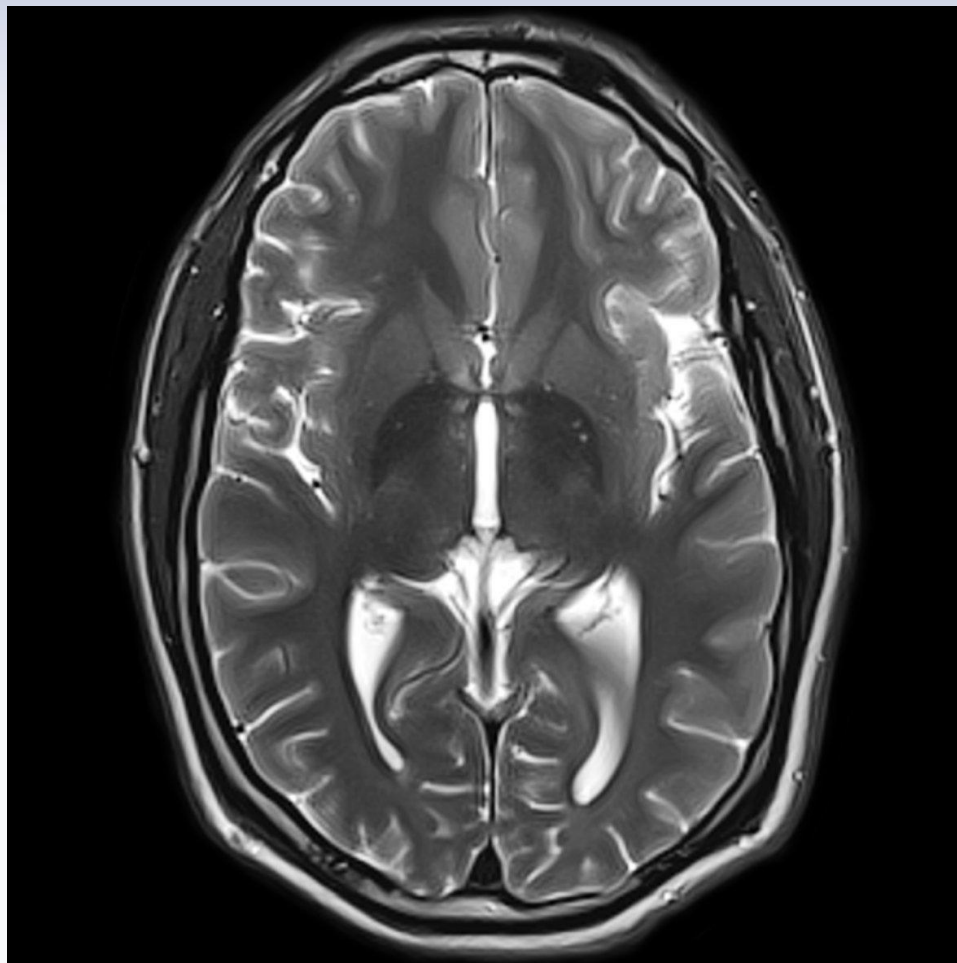


Information Technology

Imaging Systems

Stereotactic Localisation

Imaging Systems



Stereotactic Localisation



