
Surgical Management of Gliomas

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No Disclosures

Extent of Resection: Background

REMOVAL OF RIGHT CEREBRAL HEMI-
SPHERE FOR CERTAIN TUMORS
WITH HEMIPLEGIA

PRELIMINARY REPORT *

WALTER E. DANDY, M.D.

BALTIMORE

VOLUME 90
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CEREBRAL TUMOR—DANDY

823

Extent of Resection: Background

J Neurosurg 99:467–473, 2003

Survival following surgery and prognostic factors for recently diagnosed malignant glioma: data from the Glioma Outcomes Project

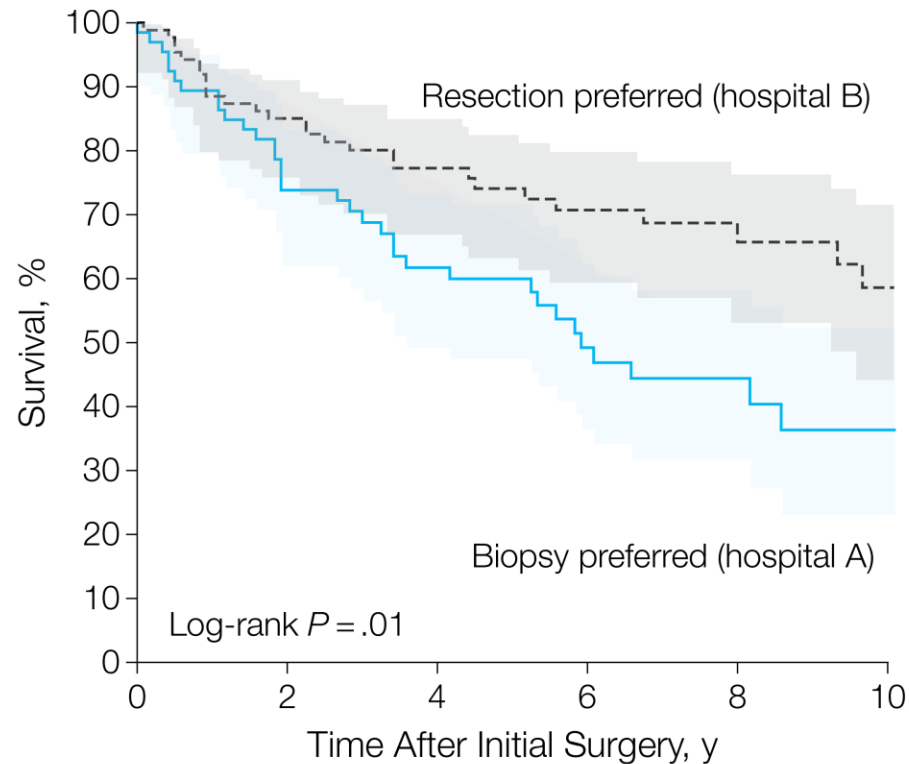
EDWARD R. LAWS, M.D., IAN F. PARNEY, M.D., PH.D., WEI HUANG, M.S., FRED ANDERSON, PH.D., ANGEL M. MORRIS, B.S.N., ANTHONY ASHER, M.D., KEVIN O. LILLEHEI, M.D., MARK BERNSTEIN, M.D., HENRY BREM, M.D., ANDREW SLOAN, M.D., MITCHEL S. BERGER, M.D., SUSAN CHANG, M.D., AND THE GLIOMA OUTCOMES INVESTIGATORS

Age

Karnofsky Performance Status (KPS)

Extent of Resection

EOR for LGGs



No. of patients at risk

Biopsy preferred	66	46	36	21	11	6
Resection preferred	87	71	50	40	23	13

From: **Comparison of a Strategy Favoring Early Surgical Resection vs a Strategy Favoring Watchful Waiting in Low-Grade Gliomas**

EOR for LGGs

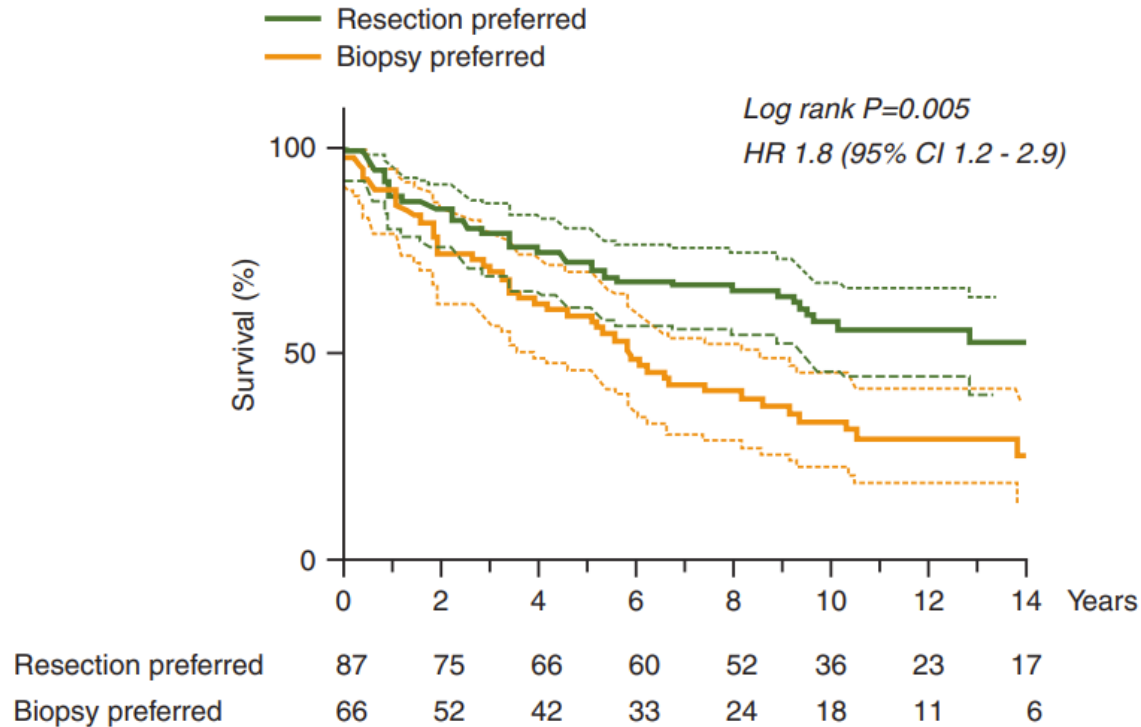


Figure 2. Survival analysis comparing cohorts, where *region A* preferred biopsy while *region B* preferred early resection. In *region A* the median survival was 5.8 years (95% CI 4.5–7.2) compared with 14.4 years (95% CI 10.4–18.5) in *region B*.

EOR for LGGs

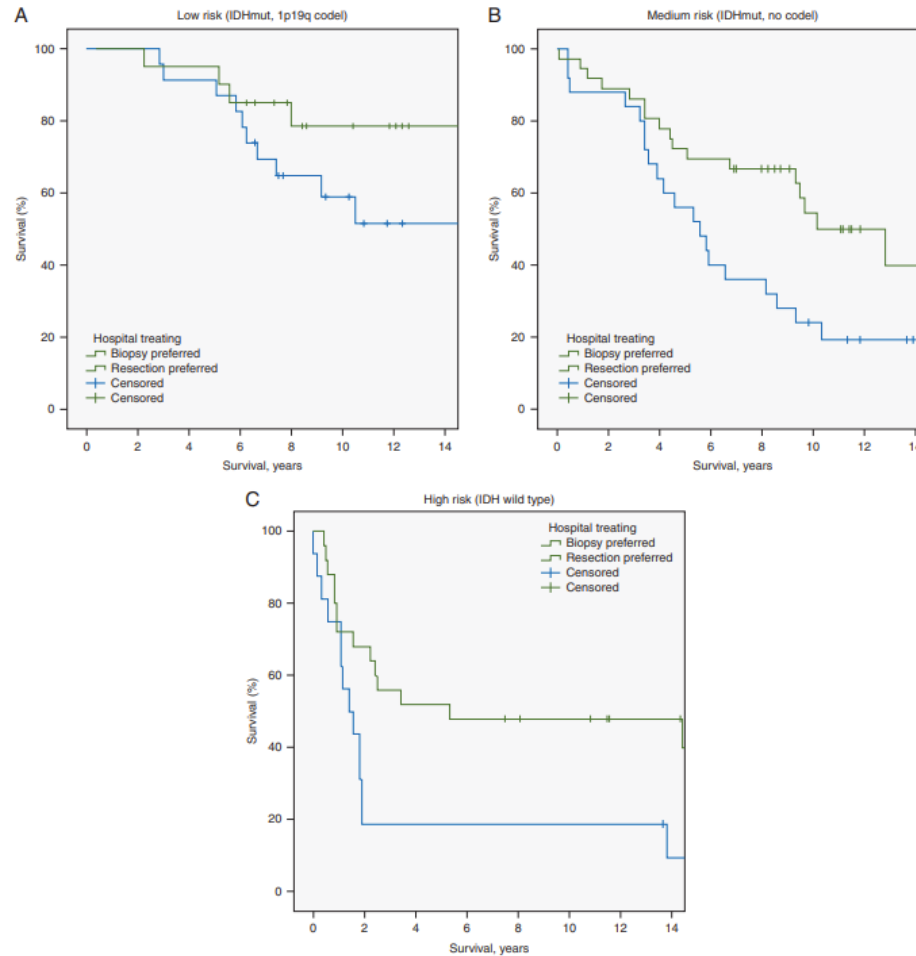
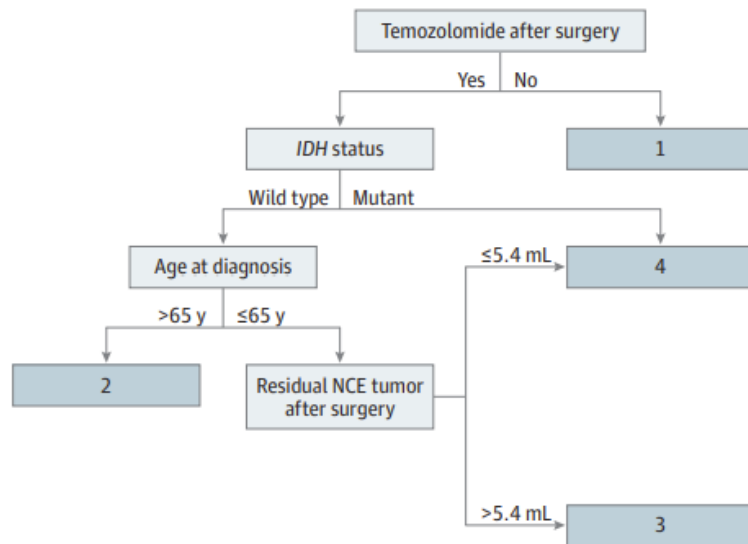


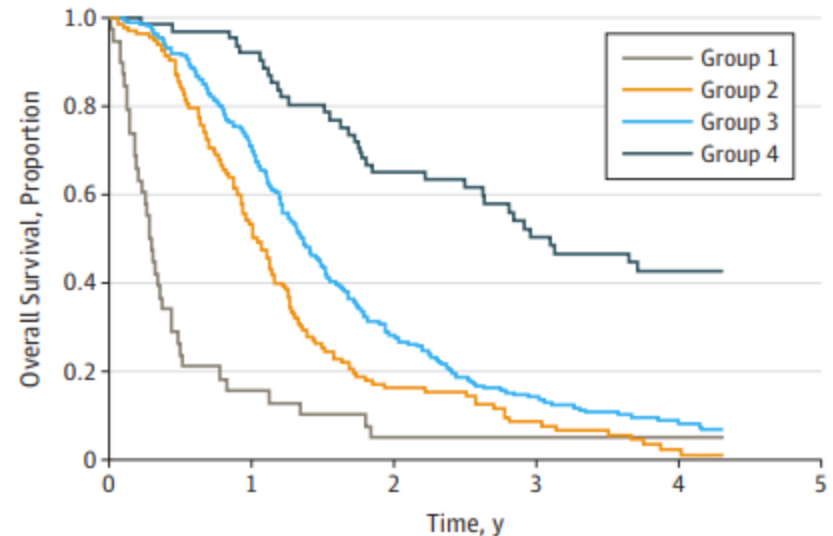
Figure 3. Survival in cohorts (A–C) with adjustment for molecular risk-group (log-rank test, $P = 0.001$). Results are presented stratified according to risk groups (A) low-risk (B) medium-risk and (C) high-risk group. (A) *IDH* mutated, 1p19 codeleted LGGs ($n = 43$). Median survival was not reached. (B) *IDH* mutated, non-codeleted LGGs ($n = 61$). Median survival in region A was 5.6 years (95% CI 3.5–7.6) compared with 10.2 year (95% CI 6.9–13.4) in region B. (C) *IDH* wild-type LGGs ($n = 41$). Median survival in region A was 1.4 year (95% CI 0.6–2.2) compared with 5.3 year (95% CI 0.0–20.0) in region B.

EOR for HGGs

Figure 2. Recursive Partitioning Analysis (RPA) for Post-2005/*IDH*-Known Subset



Includes 434 patients. Four risk groups were determined by RPA based on adjuvant temozolomide treatment after surgery, isocitrate dehydrogenase gene 1 or 2 (*IDH*) status, age at diagnosis, and residual non-contrast-enhancing (NCE) tumor after surgery. Groups are denoted by numbers 1 through 4. Group 4 is the combination of 2 subgroups: temozolomide-treated patients with *IDH*-mutant tumors and temozolomide-treated patients aged 65 years or younger with *IDH*-wild-type tumors with no greater than 5.4 mL of NCE residual tumor.

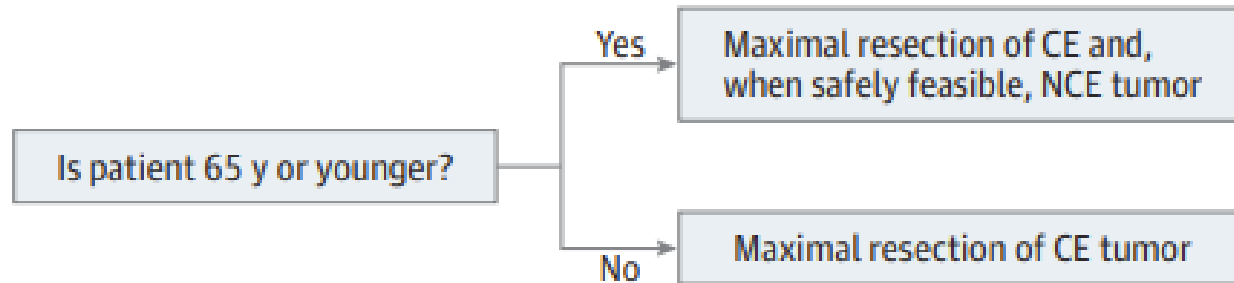


No. at risk			
Group 1	38	2	1
Group 2	122	19	2
Group 3	212	57	12
Group 4	62	38	20

From: **Association of Maximal Extent of Resection of Contrast-Enhanced and Non-Contrast-Enhanced Tumor With Survival Within Molecular Subgroups of Patients With Newly Diagnosed Glioblastoma**

EOR for HGGs

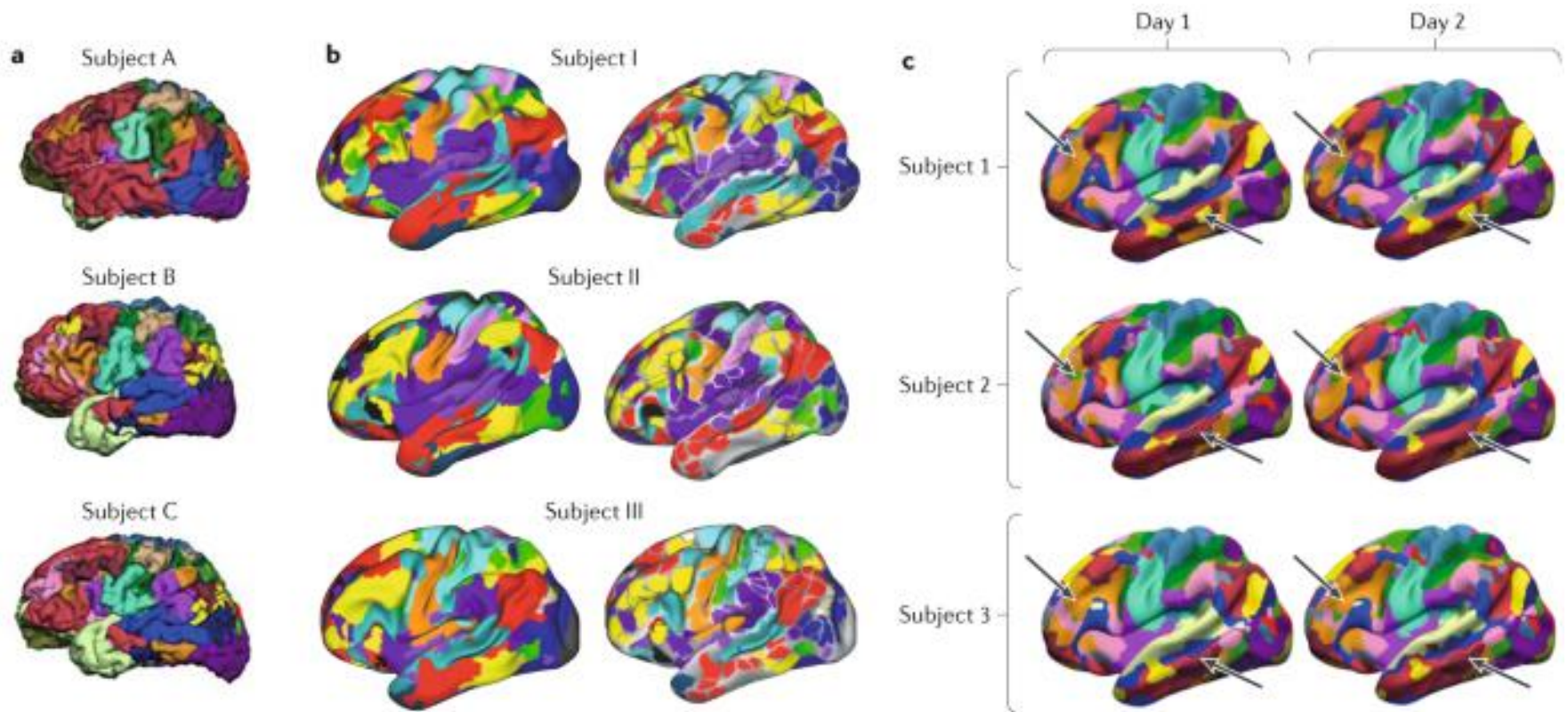
Figure 4. Proposed Surgical Strategy for Newly Diagnosed Glioblastoma



Strategy consists of maximal resection of the contrast-enhanced (CE) tumors for all patients with the additional maximum resection of the non-contrast-enhanced (NCE) tumors for patients younger than 65 years, when safely feasible.

From: **Association of Maximal Extent of Resection of Contrast-Enhanced and Non-Contrast-Enhanced Tumor With Survival Within Molecular Subgroups of Patients With Newly Diagnosed Glioblastoma**

Onco-functional Balance

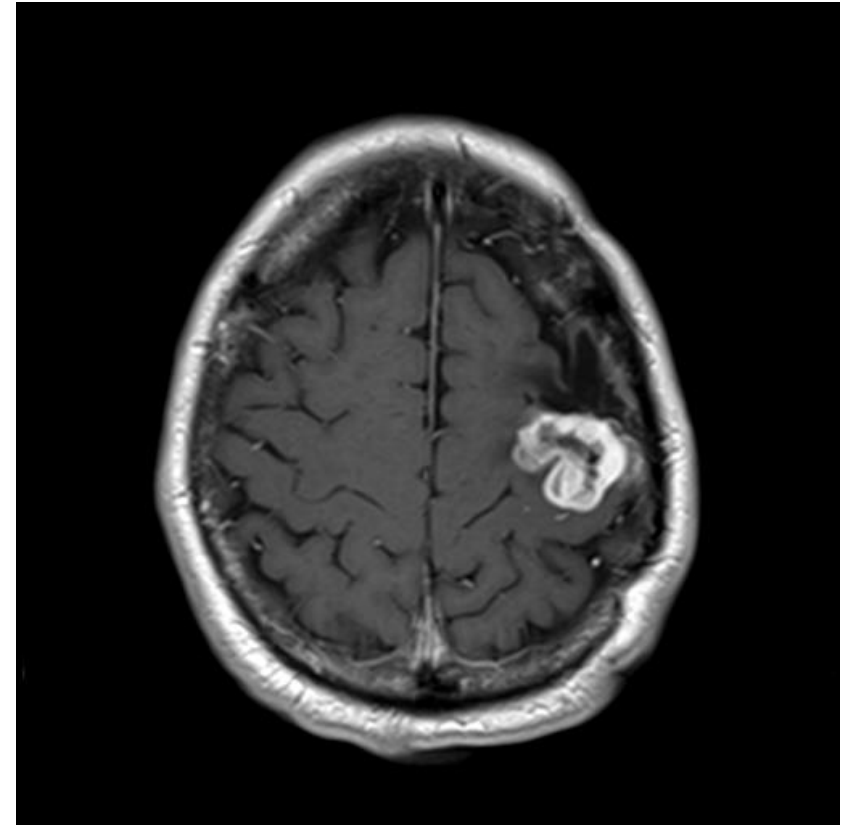
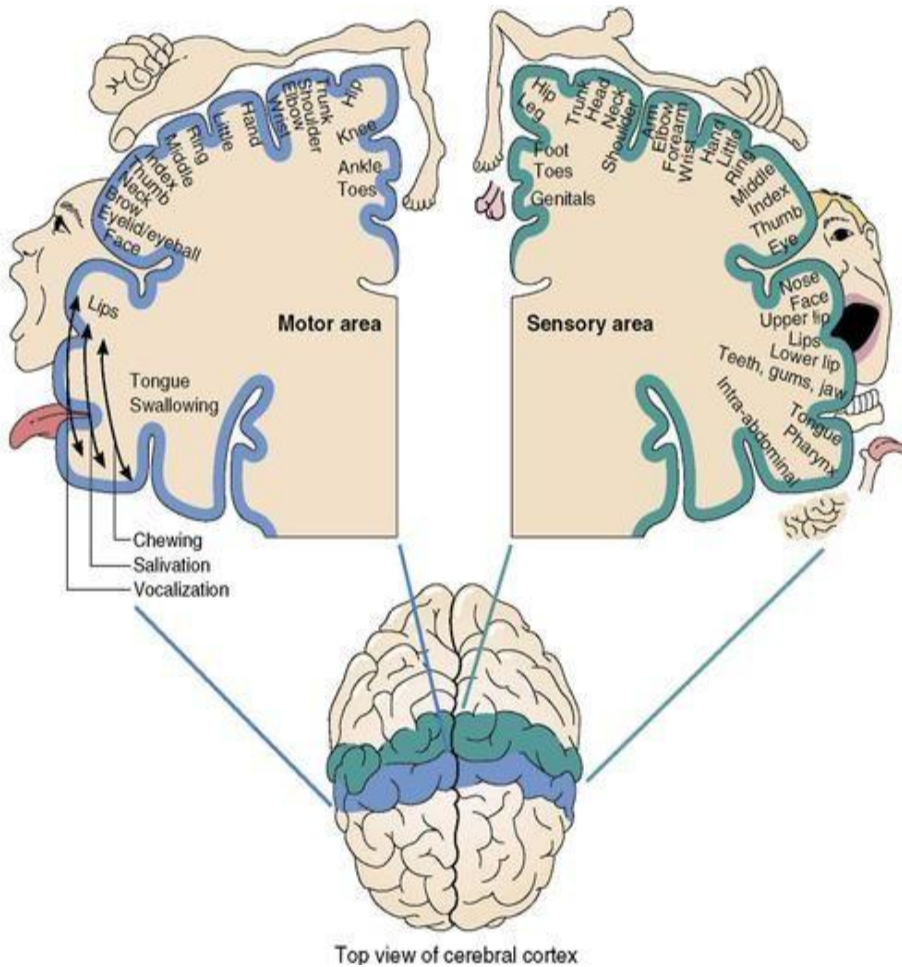


Imaging-based parcellations of the human brain

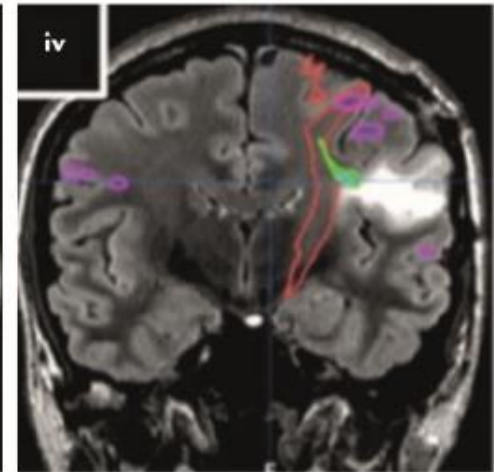
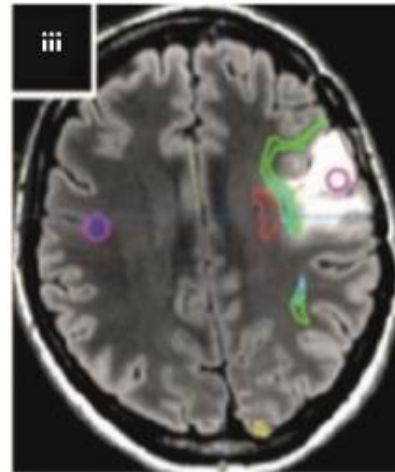
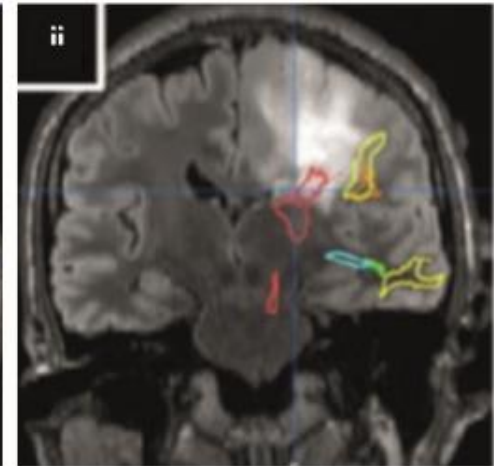
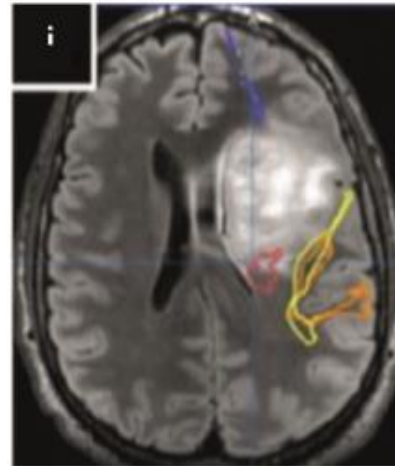
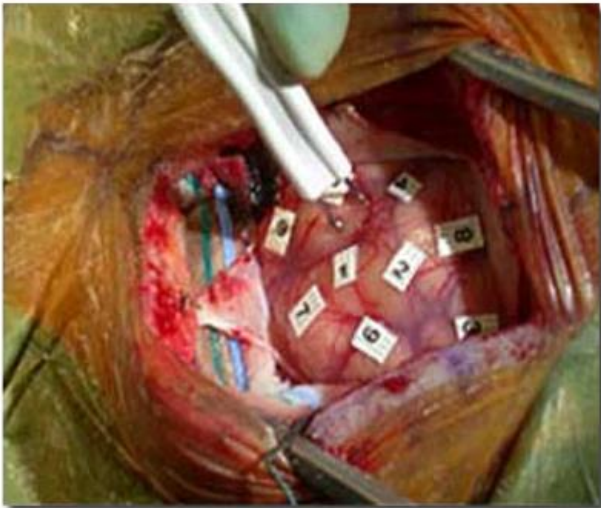
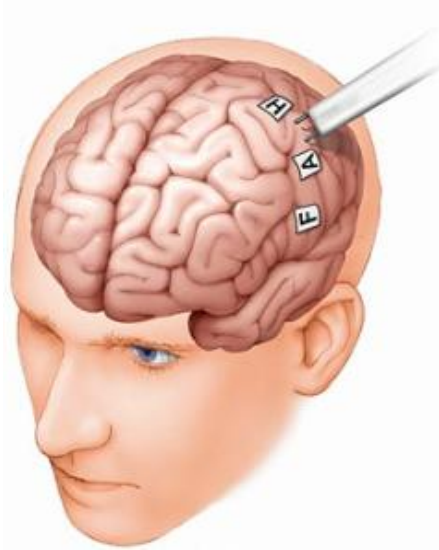
Simon B. Eickhoff , B. T. Thomas Yeo & Sarah Genon

Nature Reviews Neuroscience **19**, 672–686 (2018) | [Cite this article](#)

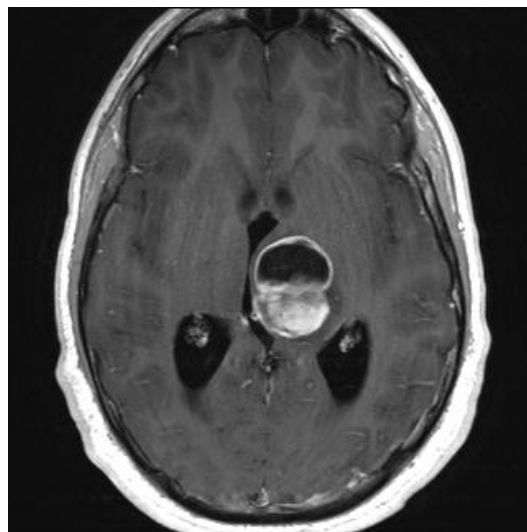
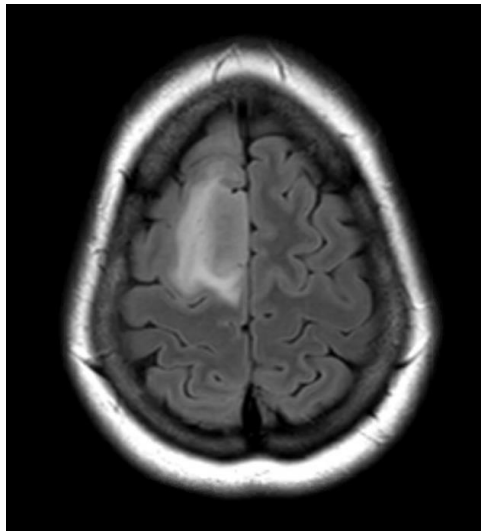
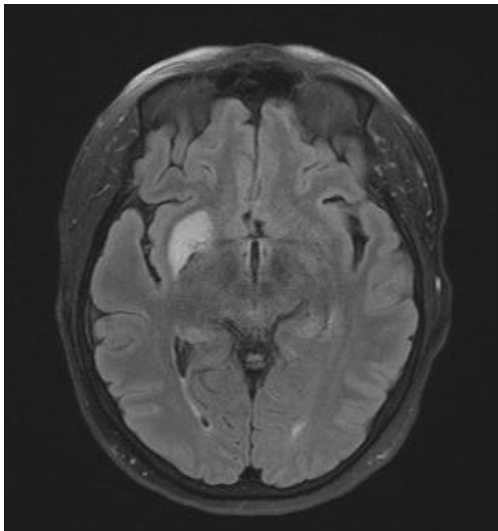
Maximizing EOR can be Difficult



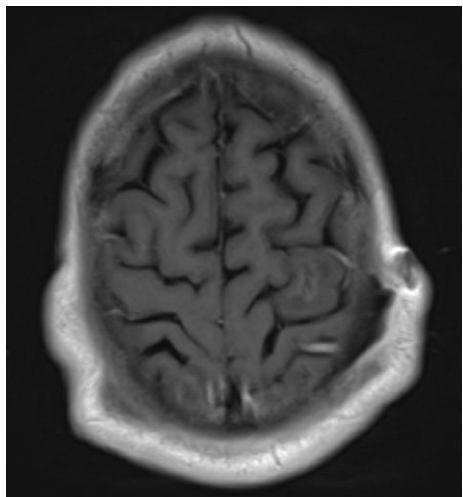
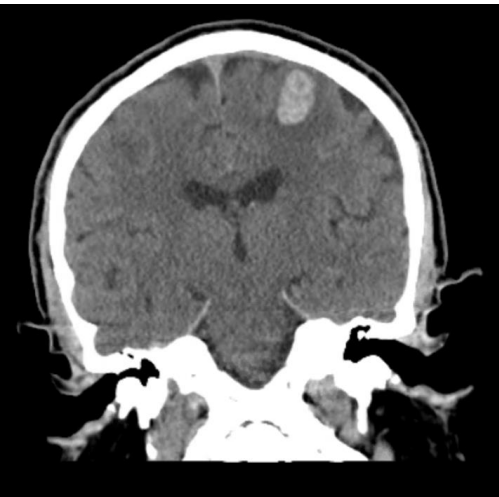
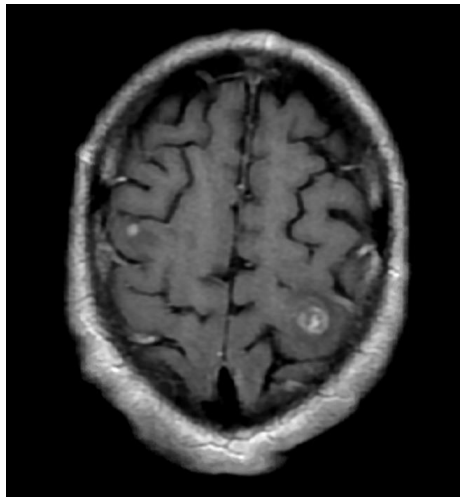
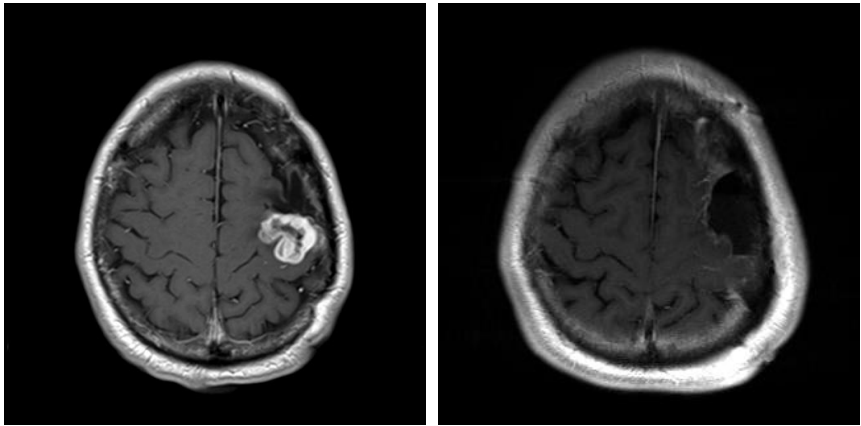
Brain Mapping



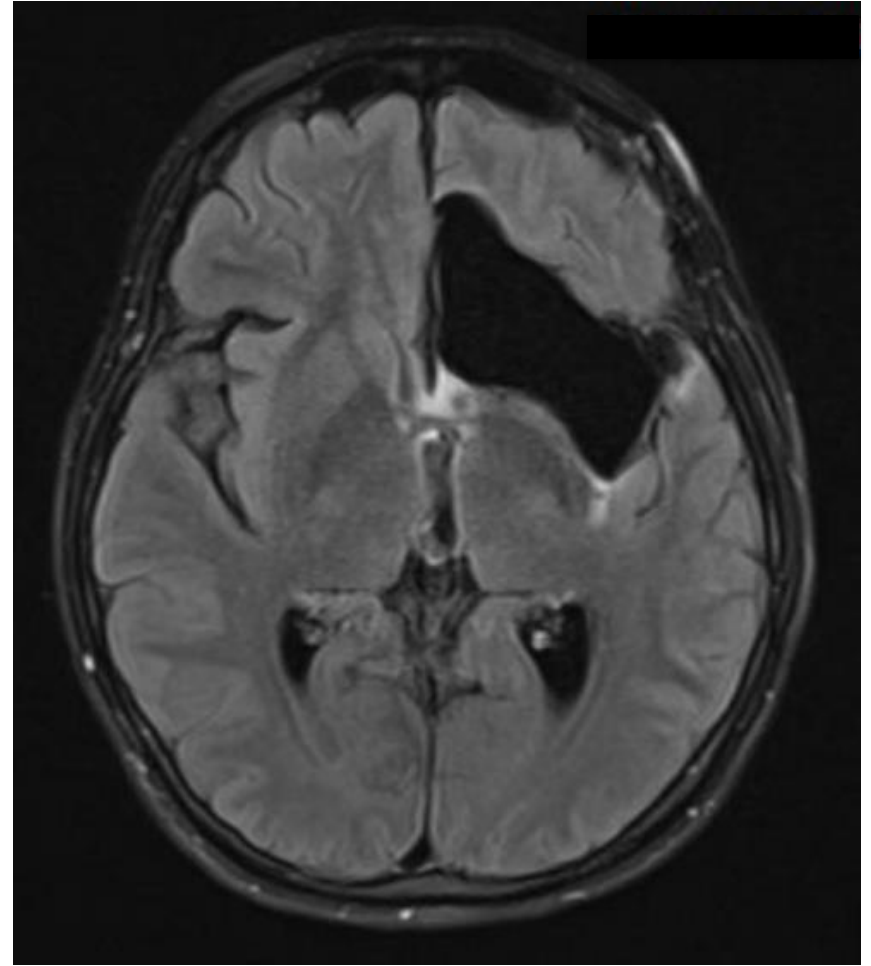
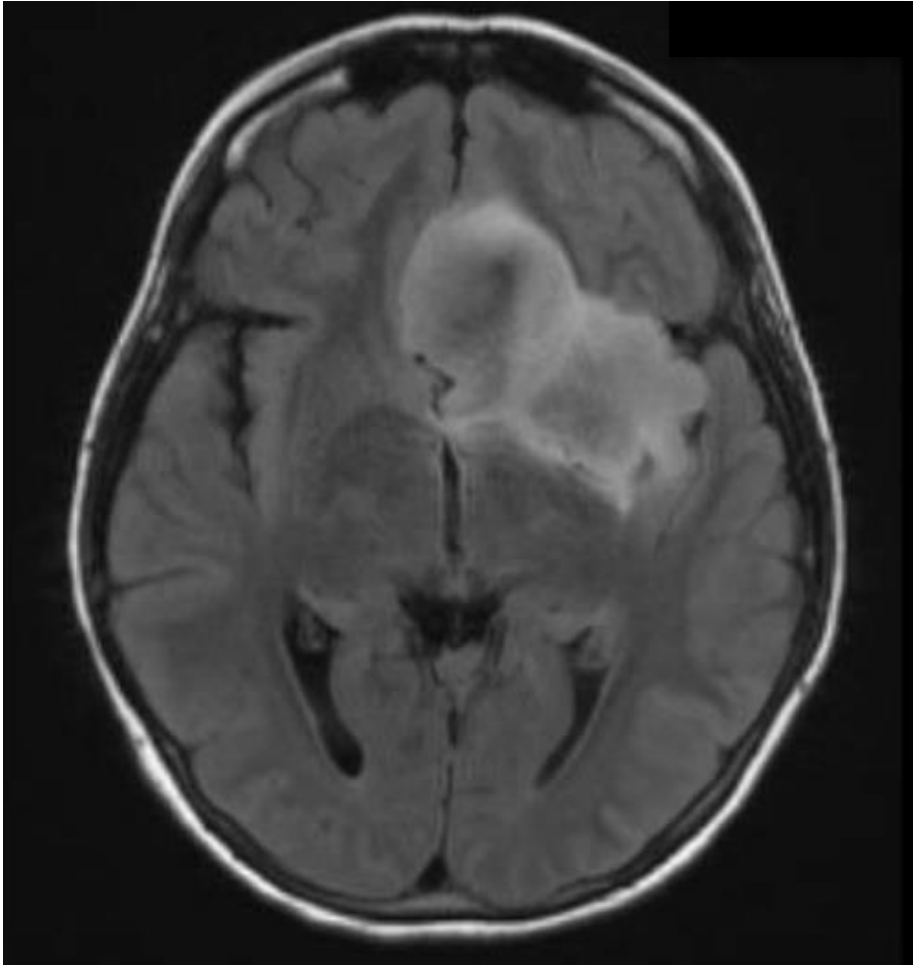
Asleep Motor Mapping: Case Examples



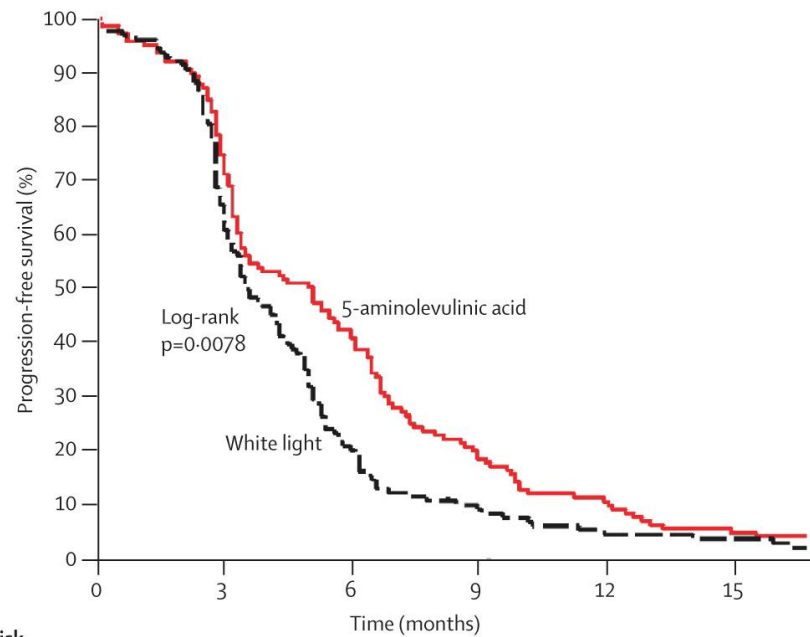
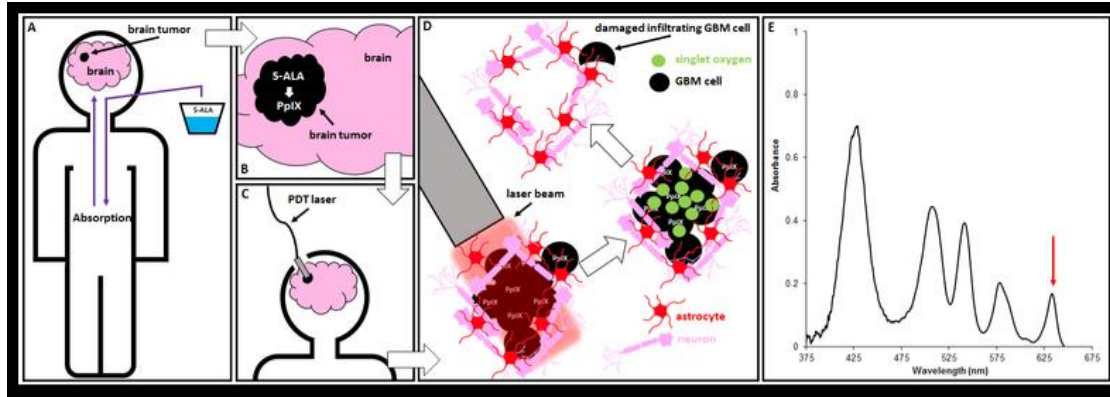
Asleep Motor Mapping: Case Examples



Awake Mapping: Case Example



5-ALA



Numbers at risk

5-aminolevulinic acid

White light

139

104

59

28

16

8

131

85

28

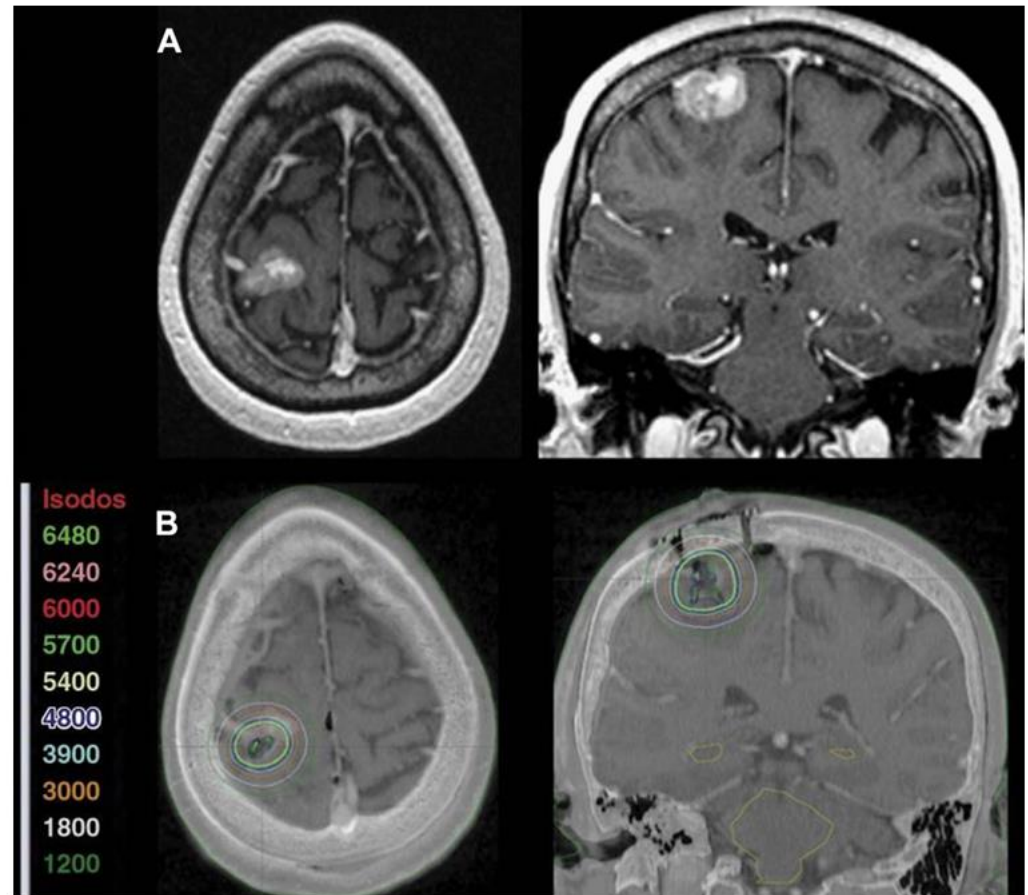
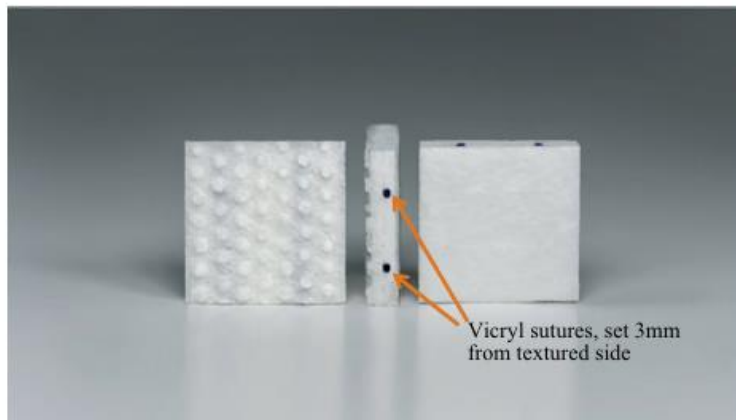
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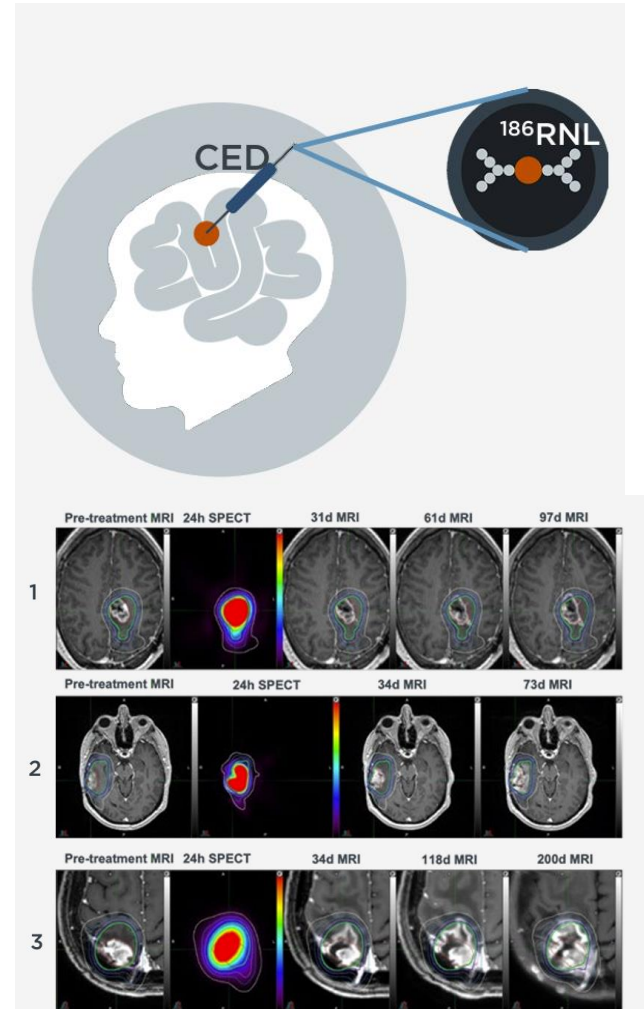
Gamma Tile

- Brachytherapy
- Cesium-131
- Collagen squares
- Bioresorbable
- Physical dose of ~60 Gy at a depth of 5 mm in the brain



ReSPECT-GBM Trial

- **NCT01906385:** Maximum Tolerated Dose, Safety, and Efficacy of Rhenium Nanoliposomes in Recurrent Glioma (ReSPECT).
- Rhenium-186 loaded nanoparticles are infused into recurrent GBMs, via surgically implanted convection-enhanced delivery (CED) catheters.



SONOBIRD Trial (SonoCloud-9)

- **NCT05902169:** A Randomized, Open-label, Multicentric, Two-arm Pivotal Trial of SonoCloud-9 Combined With Carboplatin (CBDCA) vs Standard of Care Lomustine (CCNU) or Temozolomide (TMZ) in Patients Undergoing Planned Resection for First Recurrence Glioblastoma.
- Study to evaluate the use of the surgically-implanted SonoCloud-9 focused ultrasound device to transiently open the blood-brain barrier and improve chemotherapy delivery to GBM patients.

