

EANS-EANO Glioma Resection Guidelines 2025

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Key findings of: Goldbrunner R, Foroglou N, Signorelli F, Schucht P, Jakola AS, Minniti G, Rola R, Renovanz M, Preusser M, Furtner J, Grossman R, Mawrin C, Demetriades A, Weller M, Simon M. EANS-EANO Guidelines on the extent of resection in gliomas. Neuro Oncol. 2025 Sep 17;noaf217. doi: 10.1093/neuonc/noaf217. PMID: 40973061.

Hmm, the user is asking for key findings from a specific medical guideline paper on glioma resection. This is a highly specialized topic in neuro-oncology, so the response needs to be precise and structured for clarity. The user likely wants a concise yet comprehensive summary of the guidelines' main recommendations.

I should organize this by first establishing the guideline's authority and scope, then break down the core principles supported by evidence levels. The response should cover the definitions of resection extent, its impact on survival, the role of new surgical techniques, and specific recommendations for different glioma types. Since this is clinical guidance, emphasizing the balance between maximal resection and functional preservation will be crucial.

The summary should conclude with practical takeaways for clinical practice, showing how these guidelines translate to real-world decision-making. Avoiding excessive jargon while maintaining technical accuracy will make this useful for both clinicians and informed non-specialists.

Here is a detailed summary of the key findings and recommendations from the influential **EANS-EANO Guidelines on the extent of resection in gliomas** by Goldbrunner et al. (2025).

Overview and Significance

These guidelines represent a comprehensive, evidence-based consensus from leading European neurosurgical and neuro-oncological societies (EANS and EANO). Their primary goal is to standardize surgical decision-making for gliomas by synthesizing the highest quality available evidence on the impact of the extent of resection (EOR).

Key Findings and Recommendations

1. The Central Principle: Maximal Safe Resection

The cornerstone of the guidelines is the strong, consistent evidence supporting **maximal safe resection** as the primary surgical objective. The benefits of maximizing EOR must always be balanced against the risk of causing new or worsened neurological deficits.

2. Impact on Survival and Progression

- **High-Grade Gliomas (HGGs - Glioblastomas & Grade 3):**
 - **Strong Recommendation:** A maximal safe resection is recommended over a biopsy or subtotal resection.
 - **Evidence:** Greater EOR is associated with significantly improved overall survival (OS) and progression-free survival (PFS). The goal should be to achieve a **supra-total resection** (see below) where anatomically feasible without causing deficit.
 - There is **no minimum threshold** of residual tumor that must be left behind; the aim is to remove as much as safely possible.
- **Low-Grade Gliomas (LGGs - Grade 2):**
 - **Strong Recommendation:** Maximal safe resection is recommended as the initial treatment for suitable patients.
 - **Evidence:** Greater EOR is strongly associated with improved OS and PFS. A more extensive resection can delay malignant transformation to a higher-grade tumor.
 - **Biopsy vs. Resection:** Primary surgical resection is favored over biopsy for patients with lesions in non-eloquent areas, even if the patient is asymptomatic.

3. Defining the "Extent of Resection"

The guidelines provide clear, quantitative definitions, moving beyond vague terms:

- **Gross Total Resection (GTR):** Removal of **100%** of the contrast-enhancing tumor (for HGGs) or FLAIR-hyperintense tumor (for LGGs).
- **Subtotal Resection (STR):** Removal of **90-99%** of the tumor volume.
- **Partial Resection (PR):** Removal of **<90%** of the tumor volume.
- **Supra-total Resection (SupTR):** Removal of the tumor **plus a margin of the surrounding abnormal FLAIR signal** (in non-eloquent areas). This is highlighted as a goal when safely achievable, as it is associated with superior outcomes, particularly in LGGs and some HGGs.

4. Critical Role of Advanced Surgical Technologies

The guidelines strongly emphasize that "maximal safe resection" is achievable and definable primarily through the use of intraoperative technologies. These are not just optional tools but are considered standard of care for achieving the guidelines' goals.

- **Intraoperative Mapping & Monitoring:** **Strong recommendation** for use in tumors within or near eloquent brain areas. Direct electrical stimulation (DES) is the gold standard for identifying and preserving motor and language function.
- **Intraoperative Imaging (5-ALA & iMRI):**
 - **5-ALA Fluorescence (Gliolan):** **Strong recommendation** for use in malignant gliomas (Grade 3/4) to improve the rate of complete resection of contrast-enhancing tissue.
 - **Intraoperative MRI (iMRI):** Recommended where available to provide updated images during surgery, helping to assess and maximize EOR.
- **Intraoperative Ultrasound (ioUS):** Recommended as a valuable and more widely available tool for real-time tumor visualization and navigation.

5. Specific Recommendations by Molecular Subtype

The guidelines reflect the modern era of neuro-oncology by tailoring recommendations to molecular markers.

- **IDH-Mutant Gliomas (both LGG and HGG):** Maximal safe resection is strongly recommended, with a particularly pronounced benefit on survival observed in this subgroup.
- **IDH-Wildtype Glioblastomas:** Maximal safe resection remains a primary goal, as it is one of the most significant modifiable factors for improving outcome.
- **Diffuse Midline Glioma (DMG), H3 K27-altered:** The role of surgery is limited due to the critical location. **Biopsy is recommended** for molecular diagnosis, but radical resection is **not recommended** due to high morbidity and lack of proven benefit.

6. The Importance of Measurable Residual Disease (MRD)

The guidelines introduce the concept of **Measurable Residual Disease (MRD)**, defined as any quantitatively measurable tumor volume post-resection. The key takeaway is:

Any amount of MRD has a negative impact on survival. Therefore, the surgical goal should be to achieve **MRD-zero** (i.e., no measurable tumor left behind) whenever it can be done safely.

7. Managing Recurrent Gliomas

- The guidelines support **repeat surgery** for recurrent gliomas in selected patients.
- The decision should be based on the patient's performance status, the time since previous therapy, the feasibility of a meaningful resection, and the potential for additional treatments (e.g., local therapies).

Summary for Clinical Practice

In essence, the 2025 EANS-EANO guidelines solidify the following principles:

1. **Surgery is Therapeutic:** The primary goal is maximal safe resection, not just diagnosis.
2. **More is Better:** A greater EOR, aiming for GTR or even SupTR, leads to better survival outcomes across all glioma grades and subtypes.
3. **Safety is Paramount:** The use of advanced intraoperative technologies (mapping, 5-ALA, iMRI) is essential to maximize resection while minimizing neurological morbidity.
4. **Measure Precisely:** EOR should be quantitatively measured using volumetric analysis, and the goal should be to eliminate all Measurable Residual Disease (MRD-zero).
5. **Tailor the Approach:** Surgical strategy must be adapted based on tumor location, molecular subtype, and the patient's individual condition.

These guidelines provide a robust framework for neurosurgeons and neuro-oncology teams to optimize patient outcomes through state-of-the-art surgical management of gliomas.

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