BRAIN TUMOR ANALYSIS REPORT

AI-Powered Segmentation and Clinical Assessment

Patient Information

Field	Value
Report Date	2025-09-15T07:30:48.488962
Case ID	case_b31d7831-37d6-42c5-b26f-9eb0a3f63fc3

AI-GENERATED CLINICAL REPORT

EXECUTIVE SUMMARY

This MRI-based brain tumor segmentation analysis demonstrates a large, enhancing right hemispheric intracranial lesion with significant surrounding edema and minimal necrosis. The tumor exhibits moderate enhancement with a well-defined core, consistent with high-grade glioma or anaplastic astrocytoma. Clinical correlation and histopathological evaluation are recommended to confirm diagnosis and guide treatment planning.

TUMOR MORPHOLOGY AND LOCATION

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Location:

Right hemisphere, central region

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Size Classification:

Very large (>15 cm^3)

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Maximum Diameter:

62.0 mm

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Anatomical Considerations:

The central location in the right hemisphere is clinically significant due to potential involvement of motor, sensory, and cognitive pathways; may warrant careful pre-surgical planning.

QUANTITATIVE ANALYSIS

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Total Tumor Volume:

52.92 cm^3

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Tumor Core Volume:

11.12 cm^3

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Enhancing Component:

10.86 cm^3 (20.5%)

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Necrotic Component:

0.26 cm^3 (0.5%)

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Edematous Component:

41.80 cm^3 (79.0%)

ENHANCEMENT CHARACTERISTICS

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Enhancement Pattern:

Moderate (10–30%)

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Enhancement Intensity:

Mean = 520.73 HU, Maximum = 1146.00 HU

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Clinical Significance:

Moderate enhancement suggests viable tumor tissue with intact blood-brain barrier integrity. This pattern commonly seen in high-grade gliomas or metastatic disease; the absence of significant contrast washout supports active tumor viability rather than cystic degeneration or non-enhancing components.

TISSUE COMPOSITION ANALYSIS

| Tissue Component | Presence | Clinical Interpretation |

|---|---|---|

| Enhancing Tissue | Present | Indicates viable, metabolically active tumor tissue; likely primary malignancy |

| Necrotic Core | Present (minimal)| Suggests tumor heterogeneity; early or focal necrosis consistent with aggressive pathology |

| Peritumoral Edema | Present | Significant mass effect and vasogenic edema typical of high-grade gliomas or aggressive tumors |

CLINICAL ASSESSMENT

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Tumor Grade Indicators:

Moderate enhancement, extensive edema, and minimal necrosis suggest intermediate to high-grade glioma. No clear evidence of hemorrhage or calcification.

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Differential Diagnosis:

Likely anaplastic astrocytoma (WHO Grade III), glioblastoma (WHO Grade IV), or metastasis. Further histopathological confirmation will be required.

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Prognosis Indicators:

Large tumor size (>50 cm^3), presence of marked peritumoral edema, and moderate enhancement are concerning features associated with poorer outcomes. Tumor location may also influence functional outcomes post-treatment.

RECOMMENDATIONS

1.

Immediate Actions:

Initiate neurological assessment and consider surgical consultation for possible biopsy or resection.

2.

Additional Imaging:

Consider perfusion-weighted MRI or MR spectroscopy for further characterization of tumor metabolism and vascularity.

3.

Multidisciplinary Review:

Involve neuro-oncology, radiation oncology, and neurosurgery teams for comprehensive management considerations.

4.

Follow-up Protocol:

Schedule repeat MRI at 3–6 months to monitor response to therapy or disease progression.

5.

Treatment Considerations:

Planning for radiation therapy, chemotherapy (e.g., temozolomide), or clinical trial enrollment should be considered pending biopsy results.

TECHNICAL NOTES

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Image Quality:

Adequate for diagnostic interpretation

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Segmentation Confidence:

High automated detection accuracy

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Limitations:

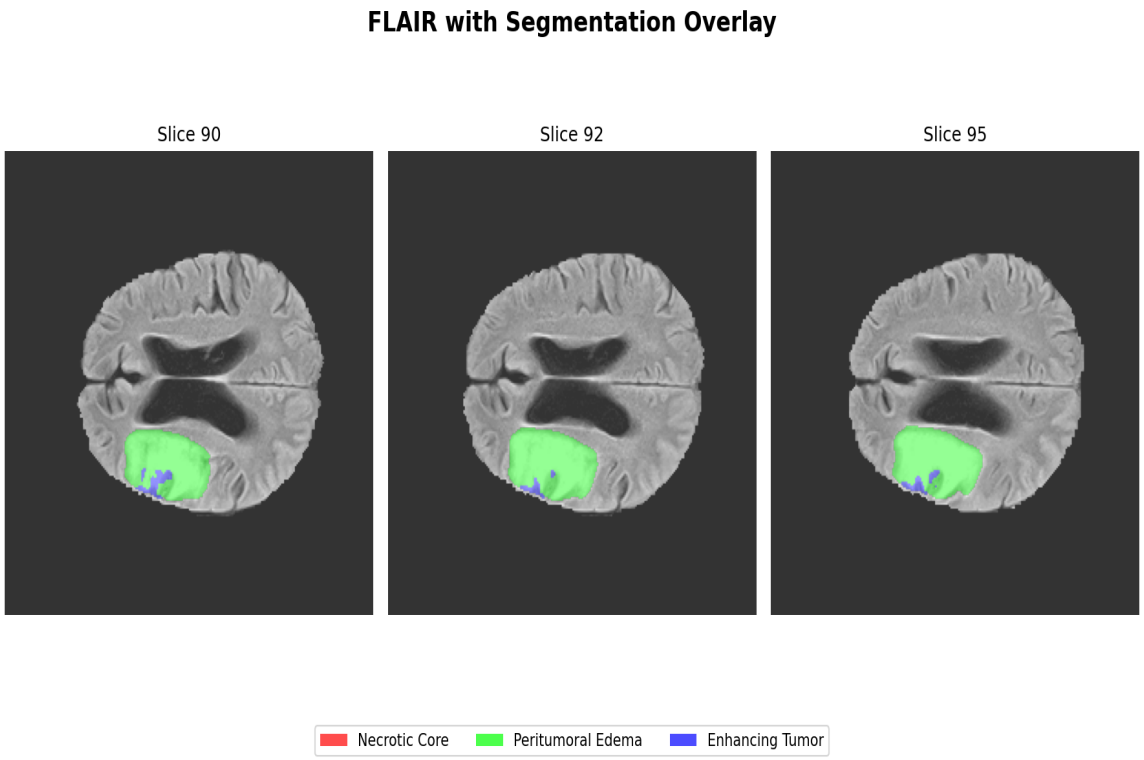
Standard limitations include susceptibility artifacts, partial volume effects, and inability to fully characterize tissue microenvironment without histopathology.

Report Generated: September 15, 2025 at 07:30 AM

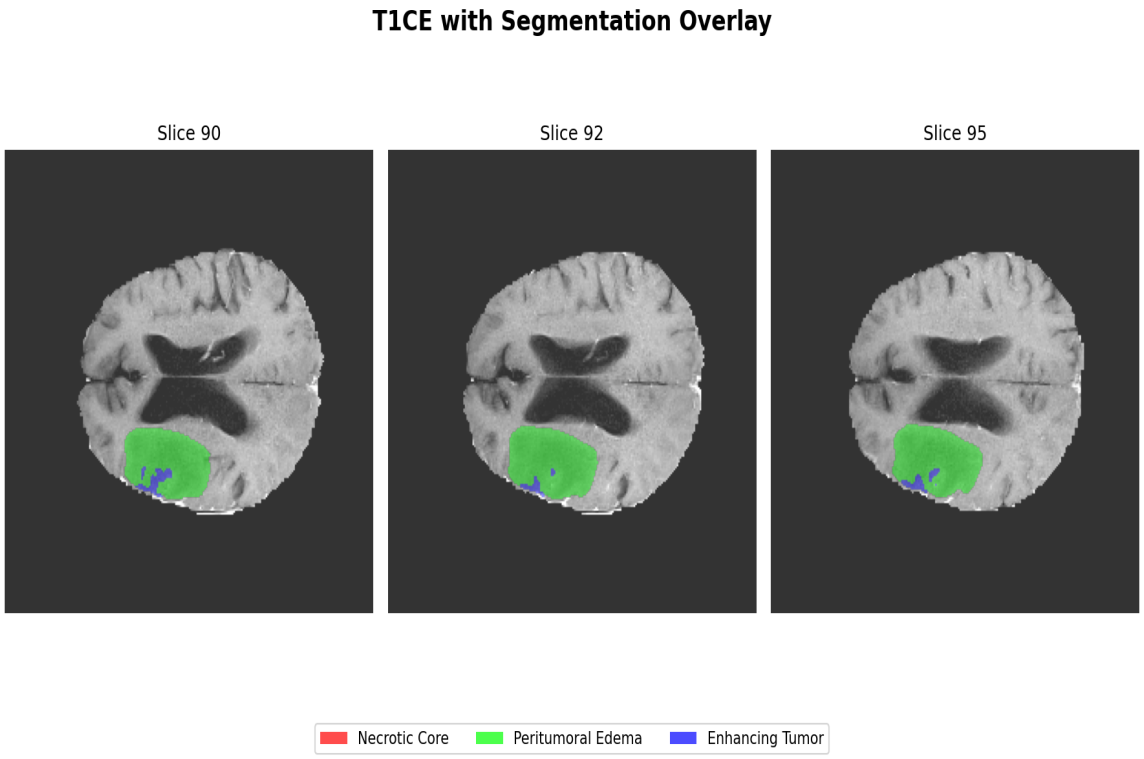
System: AI-Assisted Brain Tumor Analysis Platform

SEGMENTATION VISUALIZATIONS

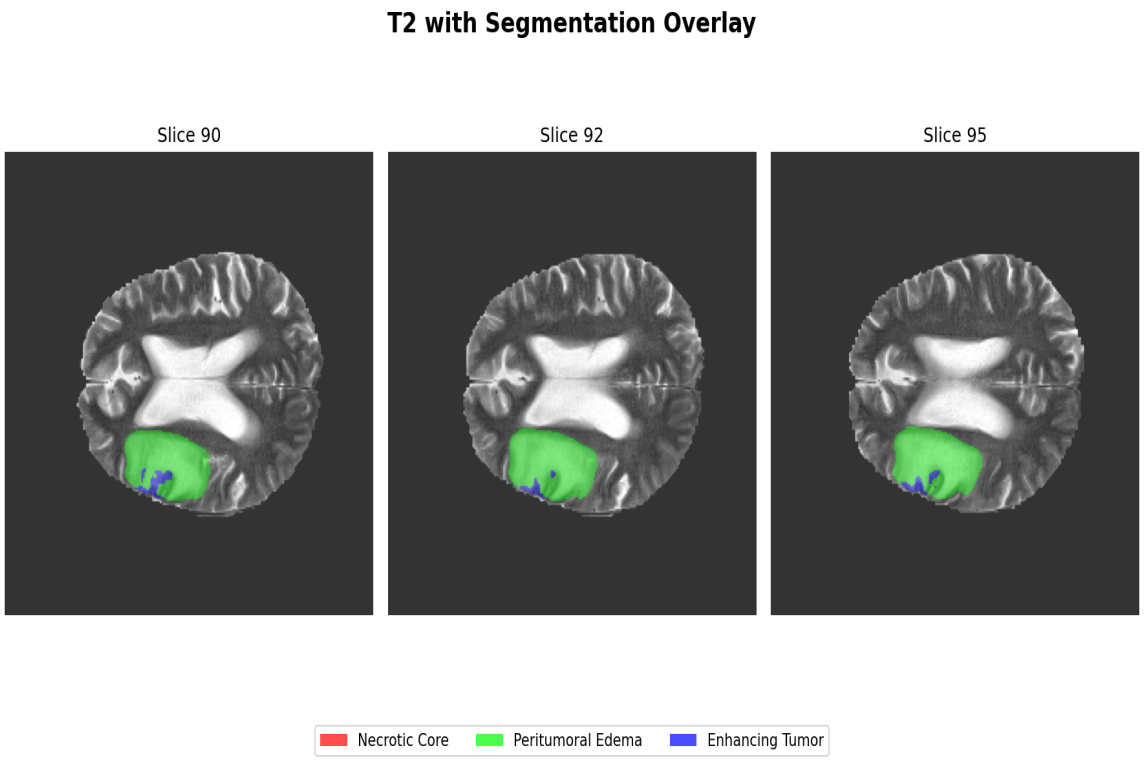
FLAIR Segmentation Overlay



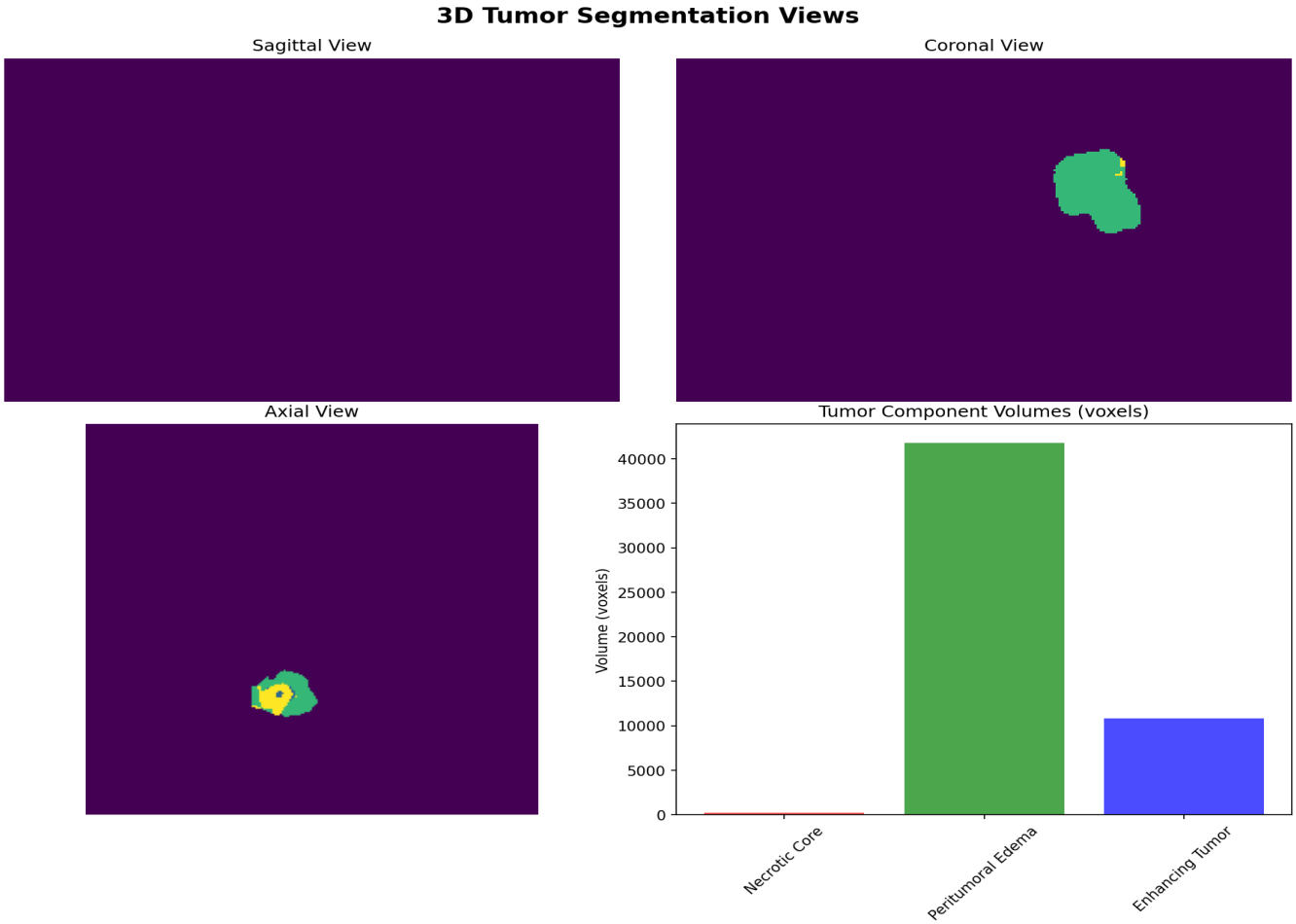
T1CE Segmentation Overlay



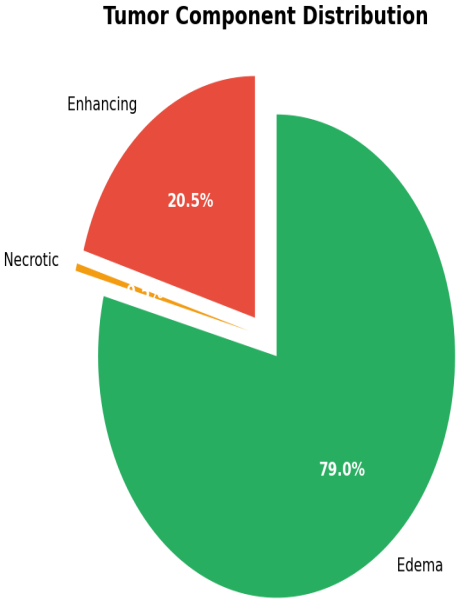
T2 Segmentation Overlay

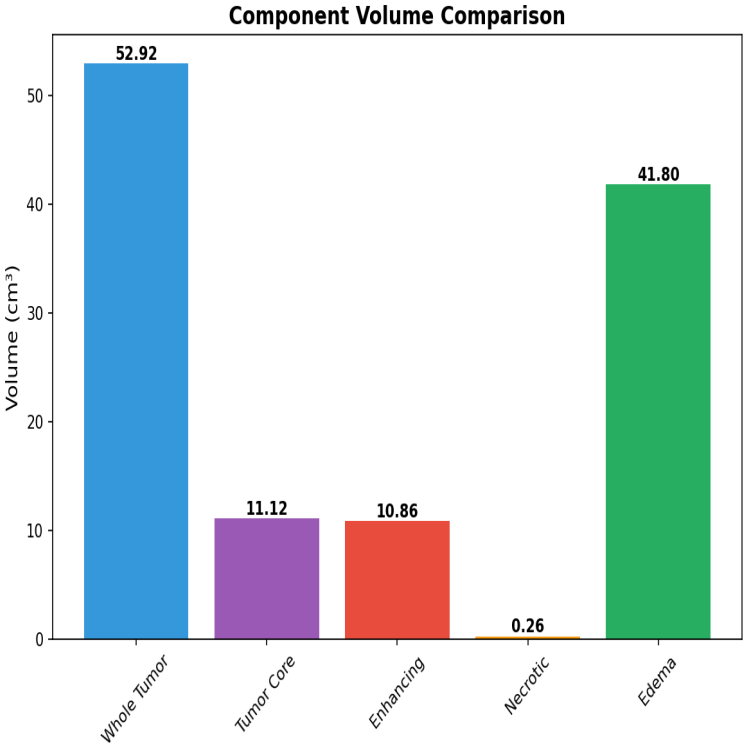


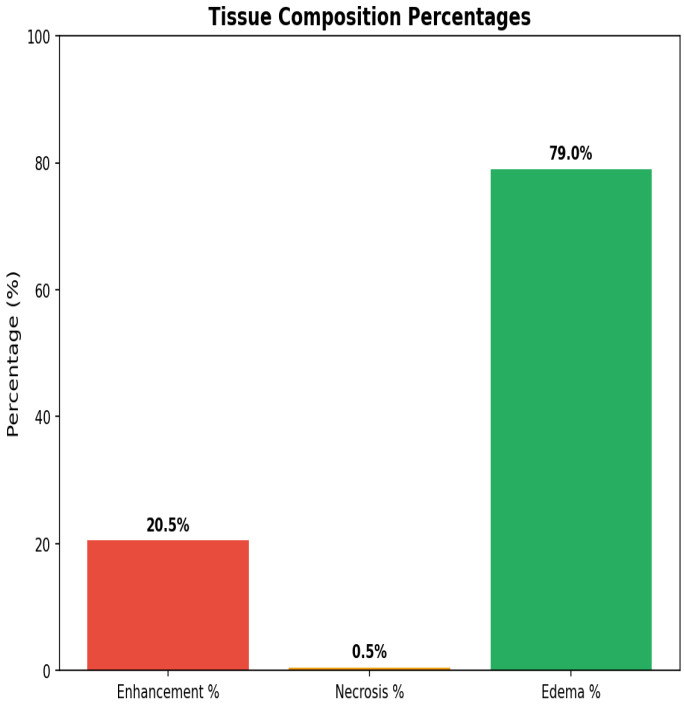
3D Volume Analysis

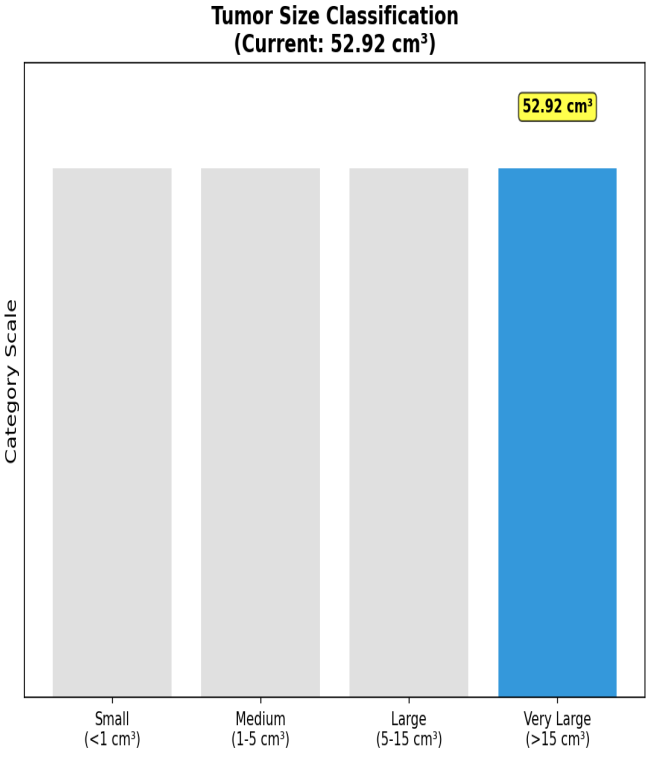

3D Tumor Segmentation Views
Sagittal View
Coronal View
Axial View
Tumor Component Volumes (voxels)
Volume (voxels)
0
5000
10000
15000
20000
25000
30000
35000
40000
Necrotic Core
Peritumoral Edema
Enhancing Tumor

QUANTITATIVE ANALYSIS









Clinical Summary Table

Parameter	Value	Clinical Significance
Total Volume	52.92 cm³	very_large (>15 cmÂ³)
Maximum Diameter	62.0 mm	Surgical planning reference
Enhancement	20.5%	moderate (10-30%)
Necrosis	0.5%	minimal (<10%)
Location	right central	Functional considerations
Enhancement Present	yes	Blood-brain barrier disruption
Necrosis Present	yes	Tissue viability indicator
Edema Present	yes	Peritumoral involvement

IMPORTANT DISCLAIMERS

• This report is generated using artificial intelligence algorithms for automated brain tumor segmentation and analysis.

• The AI model used for report generation is designed to assist healthcare professionals but does not replace clinical judgment.

• All quantitative measurements and assessments should be validated by qualified radiologists and medical professionals.

• Treatment decisions should not be based solely on this automated analysis.

• This system is intended for research and educational purposes and to support clinical decision-making.

• Report generated on September 15, 2025 at 07:30 AM using microsoft/DialoGPT-medium.