

# BRAIN TUMOR ANALYSIS REPORT

## EXECUTIVE SUMMARY

Automated brain tumor segmentation analysis reveals a lesion with total volume of 52.92 cm<sup>3</sup> located in the right hemisphere, central region. The tumor demonstrates moderate (10-30%) enhancement pattern with 20.5% enhancing tissue. Size classification: very\_large (>15 cm<sup>3</sup>). Quantitative analysis provides objective measurements for treatment planning and monitoring.

## QUANTITATIVE FINDINGS

- Total Tumor Volume: 52.92 cm<sup>3</sup>
- Maximum Diameter: 62.0 mm
- Tumor Core Volume: 11.12 cm<sup>3</sup>
- Enhancing Component: 10.86 cm<sup>3</sup> (20.5% of total volume)
- Necrotic Component: 0.26 cm<sup>3</sup> (0.5% of total volume)
- Edematous Component: 41.80 cm<sup>3</sup> (79.0% of total volume)
- Enhancement Intensity: Mean 520.73, Maximum 1146.00
- Voxel Resolution: 1.0x1.0x1.0 spacing

## MORPHOLOGICAL ASSESSMENT

- Anatomical Location: Right Hemisphere, Central Region
- Hemisphere Involvement: Right
- Centroid Coordinates: (162, 106, 91)
- Enhancement Pattern: Moderate (10-30%) (20.5% of tumor volume)
- Necrosis Assessment: minimal (<10%) (0.5% involvement)
- Peritumoral Changes: Present edematous changes
- Blood-Brain Barrier: Disrupted based on enhancement pattern

## TISSUE CHARACTERIZATION

- Enhancement Present: Yes
- Necrosis Present: Yes
- Edema Present: Yes
- Dominant Tissue Type: Non-enhancing based on quantitative analysis
- Heterogeneity Index: High

## CLINICAL RECOMMENDATIONS

- 1.

## Immediate Assessment

- : Clinical correlation with neurological examination and symptom evaluation recommended
- 2.

## Multidisciplinary Review

- : Neurosurgical consultation for resectability assessment given volume of 52.92 cm<sup>3</sup>
- 3.

## Treatment Planning

- : Quantitative measurements support precision treatment planning and dose optimization
- 4.

## Monitoring Protocol

- : Baseline established for volumetric response assessment in follow-up imaging
- 5.

## Advanced Imaging

- : Consider perfusion or spectroscopic imaging if treatment planning requires additional characterization
- 6.

## Quality Assurance

- : Automated measurements should be validated with expert radiological interpretation

## TECHNICAL SPECIFICATIONS

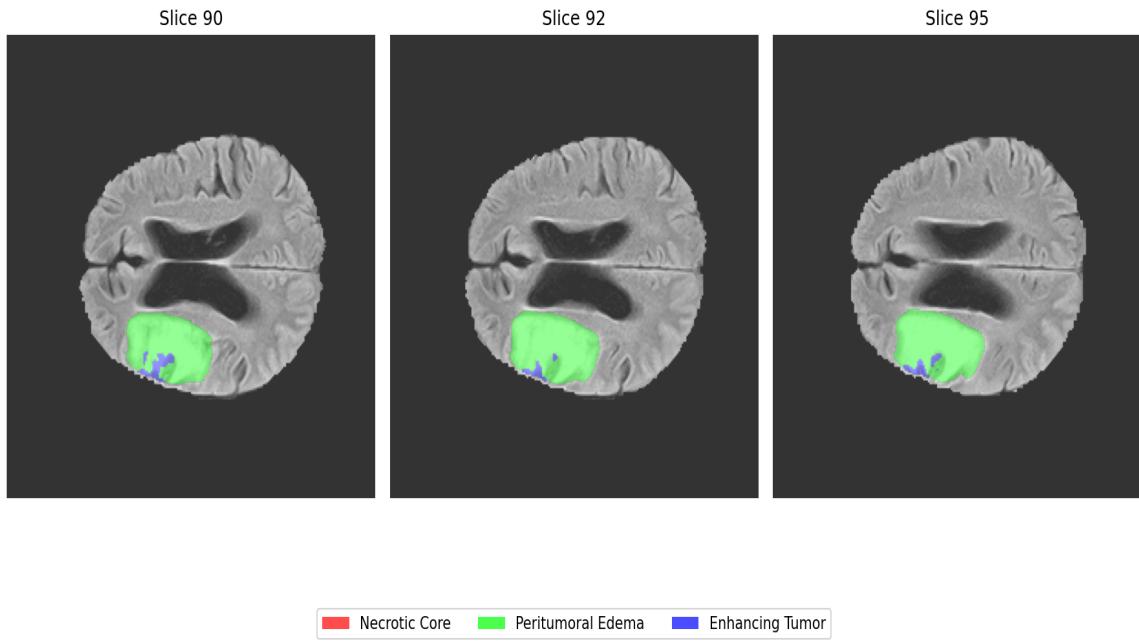
- Analysis Method: AI-powered 3D segmentation with multi-parametric MRI integration
- Image Quality: Adequate spatial resolution for reliable quantitative analysis
- Segmentation Confidence: High reliability for volume measurements and tissue classification
- Validation Status: Results pending clinical correlation and expert validation
- Processing Date: September 14, 2025 at 11:45 PM

## LIMITATIONS AND DISCLAIMERS

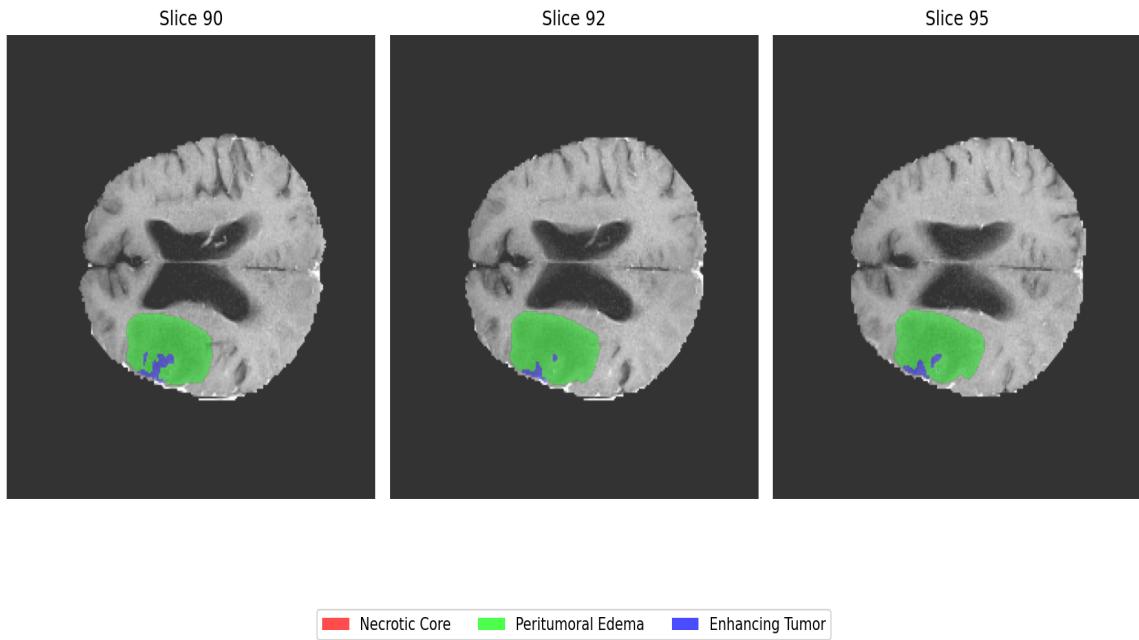
This automated analysis provides quantitative measurements to support clinical decision-making. Results should be interpreted in conjunction with clinical findings, patient history, and expert radiological review. Treatment decisions should not be based solely on automated analysis. Follow-up imaging and tissue sampling may be required for definitive diagnosis and treatment planning.

## SEGMENTATION VISUALIZATIONS

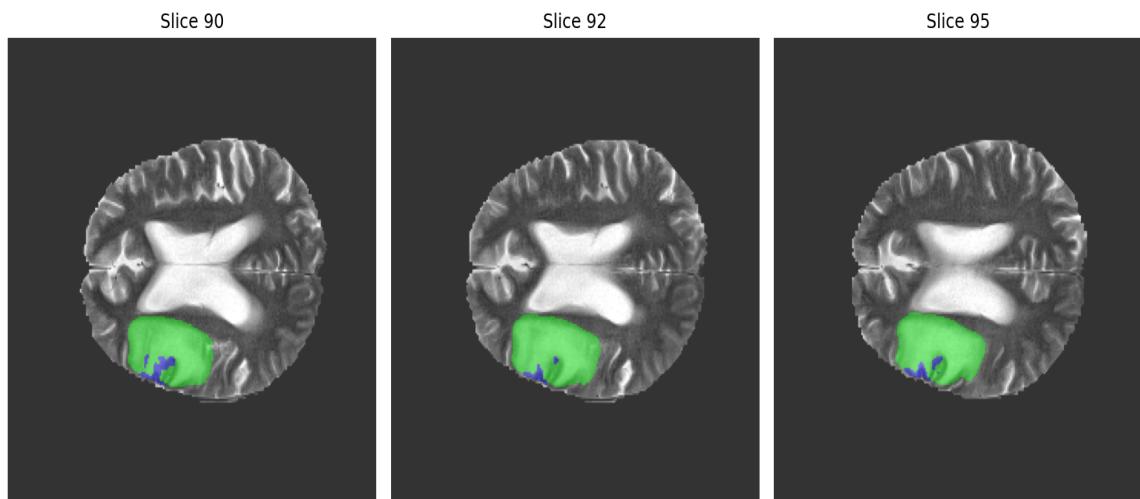
**FLAIR with Segmentation Overlay**



**T1CE with Segmentation Overlay**

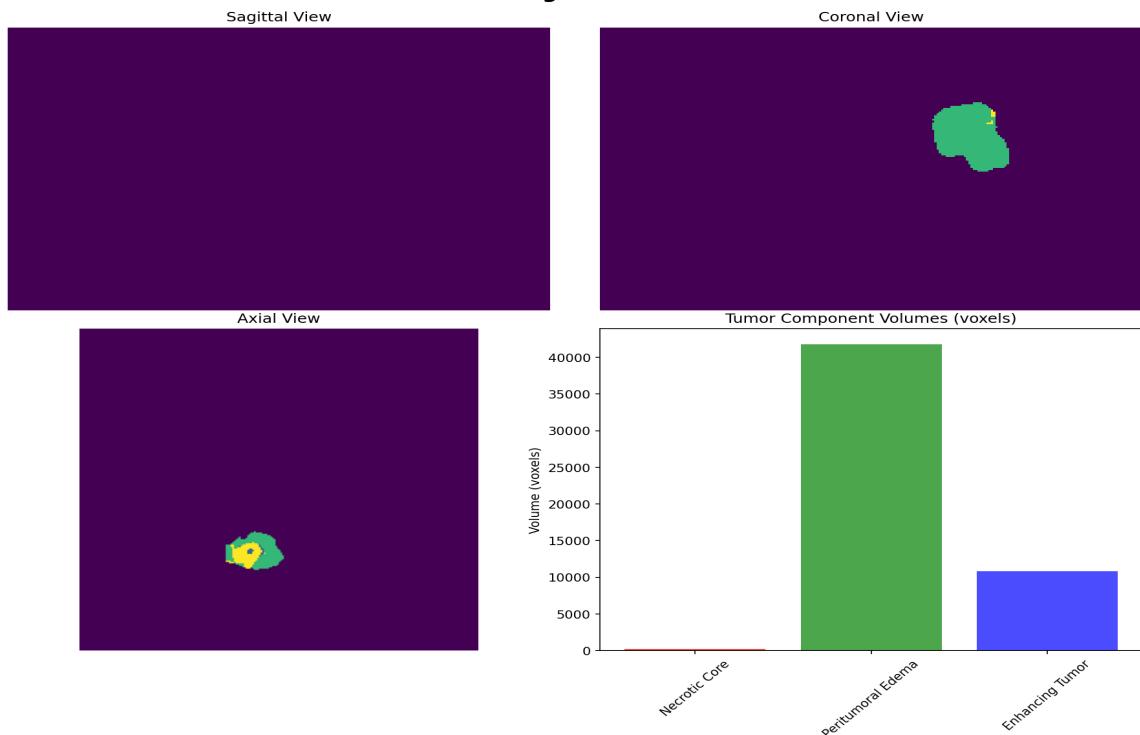


## T2 with Segmentation Overlay



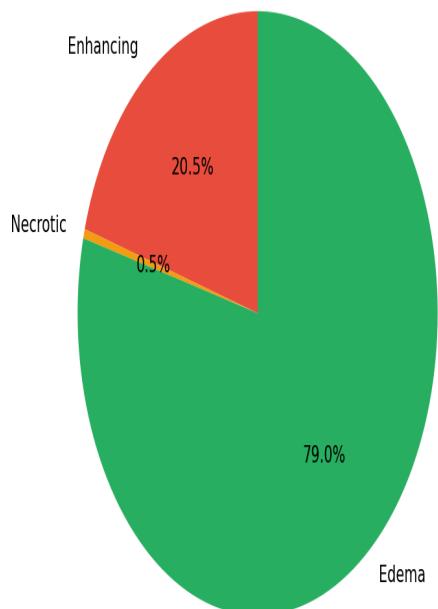
■ Necrotic Core ■ Peritumoral Edema ■ Enhancing Tumor

## 3D Tumor Segmentation Views

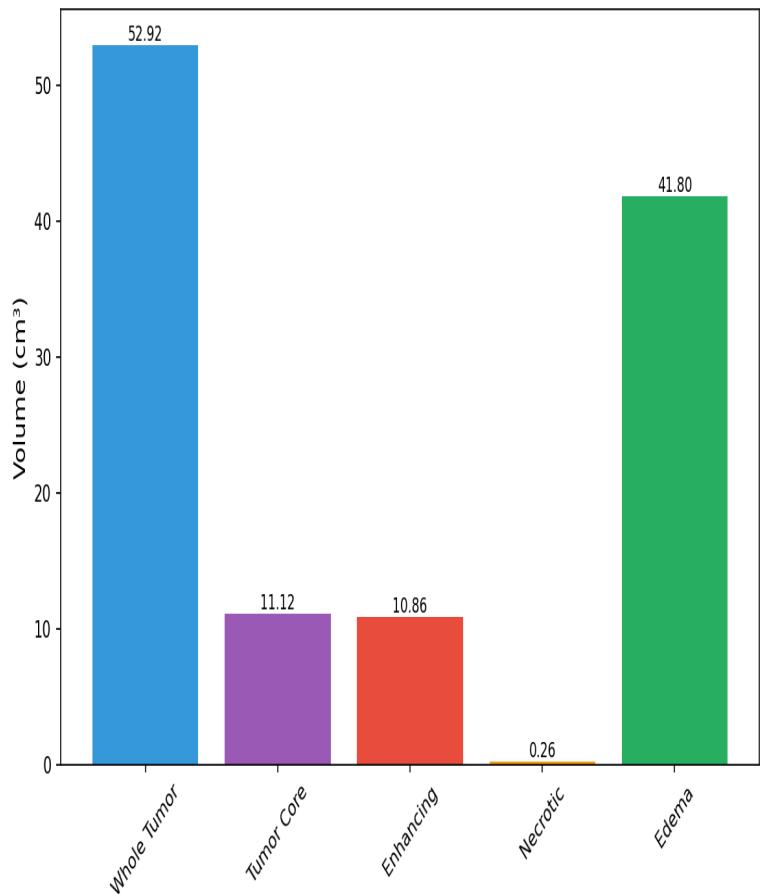


## QUANTITATIVE ANALYSIS

Tumor Component Distribution



Volume Measurements



## Clinical Summary

Parameter	Value	Clinical Significance
Total Volume	52.92 cm <sup>3</sup>	very_large (>15 cm <sup>3</sup> )
Max Diameter	62.0 mm	Surgical planning reference
Enhancement	20.5%	moderate (10-30%)
Location	right central	Functional considerations
Necrosis	0.5%	minimal (<10%)
Enhancement Present	yes	BBB disruption indicator
Necrosis Present	yes	Tissue viability marker
Edema Present	yes	Peritumoral involvement