BRAIN TUMOR ANALYSIS REPORT

EXECUTIVE SUMMARY

Automated brain tumor segmentation analysis reveals a lesion with total volume of 52.92 cm³ 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 cmÂ³). Quantitative analysis provides objective measurements for treatment planning and monitoring.

QUANTITATIVE FINDINGS

• Total Tumor Volume: 52.92 cm³
• Maximum Diameter: 62.0 mm
• Tumor Core Volume: 11.12 cm³
• Enhancing Component: 10.86 cm³ (20.5% of total volume)
• Necrotic Component: 0.26 cm³ (0.5% of total volume)
• Edematous Component: 41.80 cm³ (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 cm³
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
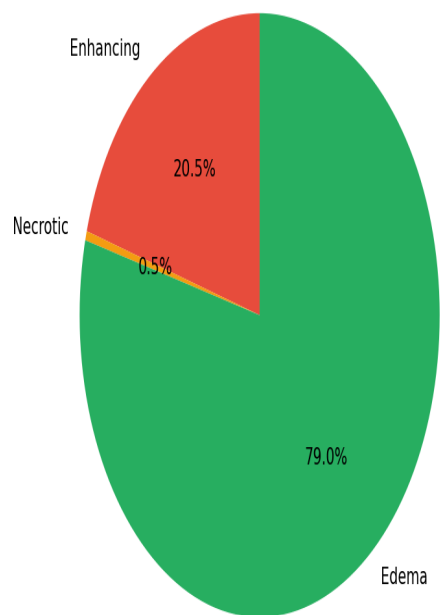
TECHNICAL SPECIFICATIONS

• 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 10:04 PM
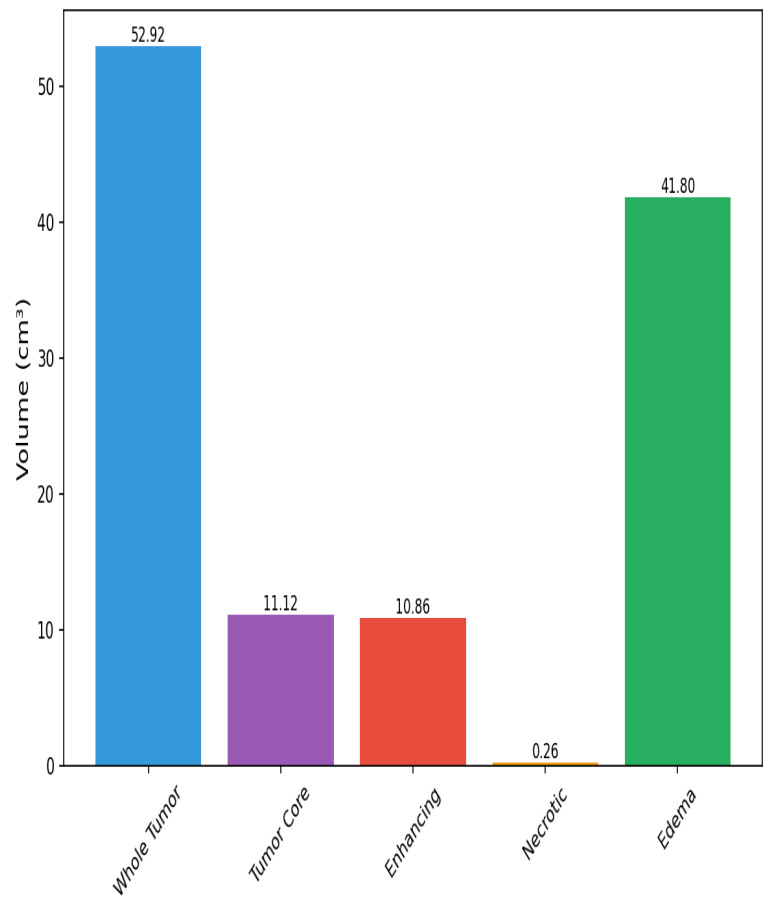
LIMITATIONS AND DISCLAIMERS

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.

QUANTITATIVE ANALYSIS

Tumor Component Distribution

Volume Measurements

Clinical Summary

Parameter	Value	Clinical Significance
Total Volume	52.92 cm³	very_large (>15 cmÂ³)
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