Clinical Context

This mr brain tumor review is based on FLAIR, T1, T1ce, T2. The study date is unavailable in the current metadata. A clinical note is available for contextual correlation. No prior comparison material accompanies the current package.

PATIENT DEMOGRAPHICS & SCAN METADATA

- **Patient ID:** BraTS20_Validation_001
- **Study ID:** BraTS20_Validation_001
- Study Date: Unknown
- **Modality:** MR (FLAIR, T1, T1ce, T2 sequences)
- **Available imaging inputs:** 0 DICOM series directories and 4 NIfTI files.
- **Clinical note present:** yes; prior reports present: no.
- **Report detail mode:** balanced.
- **Purpose:** case-level brain tumor imaging assessment with automated segmentation review.

Findings

The dominant pattern localizes to Left Frontal lobe (Left Frontal Pole), subcortical, middle level. The segmented appearance is best described as multiple lesion groups with fragmented internal segmentation components. The qualitative burden pattern is predominantly non-enhancing/infiltrative with substantial edema burden. Approximate regional overlap is concentrated in Left Frontal Pole, Left Cerebral White Matter, Left Middle Frontal Gyrus. Any mass effect or midline shift

language in this draft should be read as heuristic rather than directly measured.

DETAILED VOLUMETRIC ANALYSIS

- **Total segmented tumor burden:** **118.05 cm**3 (**118048.00 mm**3). Confidence: Moderate (measurement uncertainty: +/-**17.0 %**). **95 %** CI for total volume: 97.98-**138.12 cm**3. Maximum segmented diameter: **89.93 mm**.
- **Lesion architecture after class merge:** 3 lesion groups across 8 segmented components.
- **Component composition:** enhancing **19.95 cm**3 (**16.9 %**), non-enhancing **0.32 cm**3 (**0.3 %**), edema **97.78 cm**3 (**82.8 %**).
- **Dominant segmented component:** edema burden at **97.78 cm**3 (**82.8 %** of total).
- **Imaging phenotype:** predominantly non-enhancing/infiltrative with substantial edema burden.
- **Lesion #7 (dominant component):** edema component measuring **91933.00 mm**3 (**77.9 %** of total burden) with max diameter **89.93 mm**, centered in Left Frontal lobe (Left Frontal Pole), subcortical, middle level.

SPATIAL LOCALIZATION & CRITICAL STRUCTURES

- Approximate atlas-supported regional burden is concentrated in Left Frontal Pole, Left Cerebral White Matter, Left Middle Frontal Gyrus.
- Approximate frontal-region involvement may place the lesion burden near executive or premotor cortical territory; direct eloquent-cortex distance is not measured.
- Subcortical white-matter overlap is present, but tract-level proximity is not directly quantified.

- Direct proximity measurements to eloquent cortex, white-matter tracts, ventricles, or vascular structures are not available in the current structured package.

CONFIDENCE METRICS & AUTOMATED SEGMENTATION VALIDATION

- **Confidence:** Moderate (measurement uncertainty: +/-**17.0 %**). **95 %** CI for total volume: 97.98-**138.12 cm**3.
- **Atlas localization confidence:** Low.
- **Registration quality:** Moderate (score 0.62).
- **Audit gate volume consistency delta:** **0.00 mm**3.
- Quantitative metrics remain deterministic and the narrative layer is constrained not to alter audited numeric truth.

VR-READINESS ASSESSMENT

- **Mesh readiness status:** Conditionally ready with fragmentation review.
- **Candidate segmented mesh components:** 8; largest component diameter for mesh planning context: **89.93 mm**.
- Segmentation-derived closed surfaces can be generated for VR review, but mesh quality must be checked for fragmentation and atlas misregistration before planning use.

LOCALIZATION

- **Anatomic location:** Left Frontal lobe (Left Frontal Pole), subcortical, middle level.
- **Laterality:** Left.

- **Atlas localization confidence:** Low.
- **Registration quality:** Moderate (score 0.62).

REGIONAL DISTRIBUTION

- **Approximate atlas-supported overlap in Left Frontal Pole:** **18.1 %** of the total segmented burden (cortical atlas support).
- Approximate atlas-supported overlap in Left Cerebral White Matter: **16.1 %** of the total segmented burden (subcortical atlas support).
- Approximate atlas-supported overlap in Left Middle Frontal Gyrus: **10.6 %** of the total segmented burden (cortical atlas support).
- Approximate atlas-supported overlap in Left Superior Frontal Gyrus: **7.2 %** of the total segmented burden (cortical atlas support).
- **Approximate atlas-supported overlap in Left Temporal Pole:** **1.4 %** of the total segmented burden (cortical atlas support).

MASS EFFECT

- **Secondary automated flag:** Severe.
- **Comment:** Heuristic estimate from lesion burden (**118.0 cm**3) suggests clinically relevant regional mass effect risk.

MIDLINE SHIFT

- **Secondary automated flag:** High.
- **Comment:** Heuristic burden-based estimate suggests **elevated** risk of midline displacement from the left

hemisphere.

ENHANCEMENT PATTERN

- **Dominant:** Edema.
- **Percentage:** **82.8 %**.
- **Description:** Predominantly infiltrative non-enhancing pattern with fragmented satellite components.

MULTIFOCALITY

- **Type:** Dominant+satellites.
- **Lesion group count:** 3.
- **Segmented component count:** 8.
- **Description:** Dominant component accounts for **82.8 %** of total segmented burden.

Impression

The overall imaging pattern centers in Left Frontal lobe (Left Frontal Pole), subcortical, middle level. Overall, the segmented appearance is predominantly non-enhancing/infiltrative with substantial edema burden and is most compatible with a dominant lesion with additional satellite groups. Localization is atlas-backed but remains approximate. Approximate regional distribution is concentrated in Left Frontal Pole, Left Cerebral White Matter. These findings remain suggestive rather than diagnostic, and definitive characterization still requires histopathological confirmation with clinical correlation.

Quantitative support: total segmented burden is **118.0 cm**3 with maximum diameter **90 mm**. Composition is predominantly non-enhancing/infiltrative, with non-enhancing burden **0.3 %** and edema burden **82.8 %**. Lesion architecture is best

> described as dominant+satellites. Secondary automated flags suggest severe mass effect risk and high midline shift risk, but these were not directly measured.

> **Differential considerations:**

1. > Infiltrative high-grade glial process is most compatible with the mixed volumetric pattern.
2. > Lower-grade glial or treatment-altered infiltrative process is less typical due to the component burden profile.
3. > Alternative aggressive pathology with marked vasogenic response cannot be excluded because edema burden is substantial.

> These findings are suggestive, not diagnostic. Definitive diagnosis requires histopathological confirmation and clinical correlation.

Limitations

- Definitive diagnosis cannot be made from imaging-only automated analysis.
- > **Clinical history availability:** present.
- > **Prior imaging/report comparison:** not available in current package.
- > Neuroanatomic localization is derived from MNI152 registration with Harvard-Oxford atlas lookup; current registration quality is moderate and atlas assignment remains approximate.
- > Segmentation is automated and remains subject to thresholding, labeling, and fragmentation artifacts.
- Study date is unknown, so longitudinal progression timing cannot be assessed reliably.

Suggested Clinical Correlation

1. Obtain tissue diagnosis when clinically feasible for definitive characterization.
2. Integrate histopathology and molecular marker testing (for example IDH and MGMT) with imaging findings.
3. Review the case in multidisciplinary tumor board / neuro-oncology conference.
4. Correlate with neurologic examination, symptoms, and full clinical history.
5. Add longitudinal comparison imaging when prior studies become available.

Disclaimer

> This is an automated decision-support draft. All findings require verification by a qualified radiologist/clinician. It does NOT provide a medical diagnosis. Definitive diagnosis requires histopathological examination and clinical correlation. This report does not constitute a medical diagnosis or treatment recommendation.