**Primary Brain Lesion-Diffuse Glioma – Adult**

(Greater than or equal to 18 years old)

Disclaimer: This algorithm has been developed for MD Anderson using a multidisciplinary approach considering circumstances particular to MD Anderson’s specific patient population, services and structure, and clinical information. This is not intended to replace the independent medical or professional judgment of physicians or other health care providers in the context of individual clinical circumstances to determine a patient’s care. This algorithm should not be used to treat pregnant women.

Note: Consider Clinical Trials as treatment options for eligible patients.

---

**RADIOLOGICAL PRESENTATION**

- Left hemisphere speech/motor
- Right hemisphere
- Other brain involvement

**Imaging study suggestive of glioma**

- Patient has speech symptoms?
  - Yes
  - No

**PRESURGICAL PLANNING**

- Pre-op or Navigation MRI brain
- Is gross total resection feasible?
  - Yes
  - No

- Gross total resection with or without:
  - Awake craniotomy
  - Intraoperative imaging study
  - Intraoperative monitoring (IOM)

**TREATMENT**

- Imaging study within 72 hours
- Post-operative neuropsychological evaluation

- Gross total resection with or without:
  - Awake craniotomy
  - Intraoperative imaging study
  - Intraoperative monitoring (IOM)

- Sub-total resection or Biopsy

---

- Glioblastoma, see Page 2
- Anaplastic glioma, see Page 3
- Low Grade glioma, see Page 4

---

1 Biopsy first if MRI suggestive of CNS lymphoma or non-tumor diagnosis
2 Consider for patients with a pre-operative neuropsychological evaluation
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**Note:** Consider Clinical Trials as treatment options for eligible patients.

**PATHOLOGY**

- Glioblastoma
  - Good performance status (KPS\(^1\) ≥ 60)
  - Poor performance status (KPS\(^1\) < 60)
- End stage disease
  - Consider hospice/Supportive Care

**TREATMENT**

- Chemoradiation treatment preferred to start 2 to 6 weeks after surgery:
  - IMRT/VMAT preferred – fractionated external beam radiation (EBRT) 60 Gy/30 fractions
  - Temozolomide\(^2\) 75 mg/m\(^2\) once daily for 6 weeks
  - Consider clinical trial

- Radiation therapy preferred to start 2 to 6 weeks after surgery:
  - IMRT/VMAT preferred
  - Can consider shorter course of radiation therapy alone (40-50 Gy in 3 to 4 weeks) or 60 Gy in 6 weeks at the physician’s discretion
  - Consider temozolomide\(^2\) 75 mg/m\(^2\) once daily for duration of radiation therapy, if clinically appropriate

**SURVEILLANCE**

- MRI brain\(^3,4\) every 3 to 4 weeks post-radiation
- Adjuvant temozolomide\(^2\) 150 mg/m\(^2\) once daily for 5 consecutive days of a 28-day cycle for 12 cycles; dose escalates to 200 mg/m\(^2\) once daily if patient tolerates

**RECURRENCE**

- MRI brain\(^4\) every 2 to 3 months for the first 2 years, then as clinically indicated
- Consider bevacizumab 10 mg/kg IV every 2 weeks as clinically appropriate
- Consider temozolomide re-challenge
- Consider re-irradiation
- Consider lomustine with or without bevacizumab as clinically indicated

**TREATMENT**

- Consider clinical trials

**SURVEILLANCE**

- Monitoring while on therapy:
  - Constipation
  - Pneumocystis pneumonia prophylaxis
  - Labs: CBC twice a month and CMP once a month
  - Intracranial pressure (ICP)
  - Neurologic evaluation

**END STAGE DISEASE**

- Consider hospice/Supportive Care

**DISCLAIMER:**

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1 Refer to Karnofsky Performance Status Scale (Appendix A)
2 Monitoring while on therapy:
3 Reflecting a new baseline; pseudoprogression may be noted
4 MRI Brain without and with contrast strongly preferred

IMRT = intensity-modulated radiation therapy
VMAT = volumetric-modulated arc therapy

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Department of Clinical Effectiveness V5

Approved by the Executive Committee of the Medical Staff on 03/23/2021
Primary Brain Lesion-Diffuse Glioma – Adult  

(Greater than or equal to 18 years old)

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Note: Consider Clinical Trials as treatment options for eligible patients.

**PATHOLOGY**

- Consider conducting baseline neuropsychological evaluation prior to radiation treatment
- Sequential radiation and chemotherapy with PCV or temozolomide based on the molecular profile and physician’s discretion
- Reflected as new baseline; pseudoprogression may be noted
- *PCV = procarbazine, lomustine, and vincristine*
- *IDH-1 mutation status*
- *Reflects as new baseline; pseudoprogression may be noted*
- *MRI Brain without and with contrast strongly preferred*

**TREATMENT**

- MRI brain: 3-4 weeks post-radiation
- Adjuvant therapy: PCV for 6 cycles or Temozolomide for 12 cycles
- MRI brain: 3-4 weeks post-radiation
- Adjuvant therapy: Temozolomide for 12 cycles

**SURVEILLANCE**

- MRI brain every 2 to 3 months for the first 2 years, then as clinically indicated
- Consider neuropsychological evaluation every 6 to 12 months, or as clinically indicated
- MRI brain every 2 to 3 months for the first 2 years, then as clinically indicated
- Consider neuropsychological evaluation every 6 to 12 months, or as clinically indicated

**RECURRENCE**

- KPS performance status ≥ 60?
- Consider clinical trial
- Consider re-irradiation

- Prior history of radiation therapy?
- Consider re-irradiation
- Stable or improving disease?
- Continue surveillance
- Stable or improving disease?
- Continue surveillance
- KPS performance Status ≥ 60?
- Consider clinical trial
- Consider re-irradiation

- Consider hospice
- Consider hospice

**Note:**
- Patient personal preferences
- *MD Anderson’s specific patient population, services and structure*
- *Multidisciplinary approach*
- *Indicate clinical circumstances to determine a patient’s care*

---

PCV = procarbazine, lomustine, and vincristine

1 Prognostic factors (any of the following present or positive):
- Age less than 40 years
- 1p/19q deletion status
- IDH-1 mutation status

2 Reflected as new baseline; pseudoprogression may be noted

MRI Brain without and with contrast strongly preferred

4 Monitoring while on therapy:
- Constipation
- Pneumocystis pneumonia prophylaxis
- Neurologic evaluation
- Intracranial pressure (ICP)
- Labs: CBC twice a month and CMP once a month

5 Based on following factors: KPS performance status, extent of residual disease, imaging, patient personal preferences

6 Refer to Karnofsky Performance Status Scale (Appendix A)
Primary Brain Lesion-Diffuse Glioma – Adult

(Greater than or equal to 18 years old)

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Note: Consider Clinical Trials as treatment options for eligible patients.

PATHOLOGY

Grade 2 (low grade) oligodendroglioma

Grade 2 (low grade) astrocytoma

Low Grade Glioma

TREATMENT

GTR, age ≤40 and good KPS?

Yes

Consider observation

MRI brain 2,3 every 2–3 months for the first 2 years, then as clinically indicated

Adjuvant therapy: PCV for 6 cycles or Temozolomide for 12 cycles

No

Consider observation based on the molecular profile and physician’s discretion

MRI brain 2,3 3–4 weeks post-radiation

Adjuvant therapy: Temozolomide for 12 cycles

SURVEILLANCE

MRI brain 2,3 3–4 weeks post-radiation

Adjuvant therapy: Temozolomide for 12 cycles

No

Consider observation based on the molecular profile and physician’s discretion

MRI brain 2,3 every 2–3 months for the first 2 years, then as clinically indicated

Adjuvant therapy: PCV for 6 cycles or Temozolomide for 12 cycles

Yes

RECURRENT

MRI brain and without contrast every 2–3 months for first 2 years, then as clinically indicated

Adjuvant therapy: Temozolomide for 12 cycles

No

KPS performance status ≥ 60?

Yes

Consider radiation therapy

Individualize care as clinically indicated

No

Consider re-irradiation

Yes

Consider hospice

KPS performance status < 60?

No

Consider observation based on the molecular profile and physician’s discretion

MRI brain 2,3 every 2–3 months for the first 2 years, then as clinically indicated

Adjuvant therapy: PCV for 6 cycles or Temozolomide for 12 cycles

Yes

Consider re-irradiation

No

Consider hospice

No

Consider radiation therapy

Individualize care as clinically indicated

KPS performance status 6 ≥ 60?

Yes

Consider hospice

No

Consider radiation therapy

Individualize care as clinically indicated

KPS performance status < 60?

Note: Monitoring while on therapy:
- Constipation
- Neurologic evaluation
- Pneumocystis pneumonia prophylaxis
- Labs: CBC twice a month and CMP once a month
- Intracranial pressure (ICP)

4 Monitoring while on therapy:
- Constipation
- Neurologic evaluation
- Pneumocystis pneumonia prophylaxis
- Labs: CBC twice a month and CMP once a month
- Intracranial pressure (ICP)

5 Based on following factors: KPS performance status, extent of residual disease, imaging, patient personal preferences

6 Refer to Karnofsky Performance Status Scale (Appendix A)

GTR = gross total resection  
PCV = procarbazine, lomustine, and vincristine

1 Prognostic factors (any of the following present or positive):
- Age less than 40 years old  
- 1p/19q deletion status
- IDH-1 mutation status

2 Reflected as new baseline; pseudoprogression may be noted

3 MRI Brain without and with contrast strongly preferred

4 Monitoring while on therapy:
- Constipation
- Neurologic evaluation
- Pneumocystis pneumonia prophylaxis
- Labs: CBC twice a month and CMP once a month
- Intracranial pressure (ICP)

5 Based on following factors: KPS performance status, extent of residual disease, imaging, patient personal preferences

6 Refer to Karnofsky Performance Status Scale (Appendix A)
## APPENDIX A: Karnofsky Performance Status Scale Definitions

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>Normal; no complaints; no evidence of disease</td>
</tr>
<tr>
<td>90</td>
<td>Able to carry on normal activity; minor signs or symptoms of disease</td>
</tr>
<tr>
<td>80</td>
<td>Normal activity with effort; some signs of disease</td>
</tr>
<tr>
<td>70</td>
<td>Cares for self; unable to carry on normal activity or to do active work</td>
</tr>
<tr>
<td>60</td>
<td>Requires occasional assistance, but is able to care for most of his personal needs</td>
</tr>
<tr>
<td>50</td>
<td>Requires considerable assistance and frequent medical care</td>
</tr>
<tr>
<td>40</td>
<td>Disabled; requires special care and assistance</td>
</tr>
<tr>
<td>30</td>
<td>Severely disabled; hospital admission is indicated although death not imminent</td>
</tr>
<tr>
<td>20</td>
<td>Very sick; hospital admission necessary; active supportive treatment necessary</td>
</tr>
<tr>
<td>10</td>
<td>Moribund; fatal processes progressing rapidly</td>
</tr>
<tr>
<td>0</td>
<td>Dead</td>
</tr>
</tbody>
</table>
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SUGGESTED READINGS


Approved by the Executive Committee of the Medical Staff on 03/23/2021
Primary Brain Lesion-Diffuse Glioma – Adult (Greater than or equal to 18 years old)

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DEVELOPMENT CREDITS

This practice algorithm is based on majority expert opinion of the Primary Brain Lesion Work Group Faculty at the University of Texas MD Anderson Cancer Center. It was developed using a multidisciplinary approach that included input from the following:

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