Primary Brain Lesion-Diffuse Glioma – Adult

This practice algorithm has been specifically developed for MD Anderson using a multidisciplinary approach and taking into consideration circumstances particular to MD Anderson, including the following: MD Anderson’s specific patient population; MD Anderson’s services and structure; and MD Anderson’s clinical information. Moreover, this algorithm is not intended to replace the independent medical or professional judgment of physicians or other health care providers. This algorithm should not be used to treat pregnant women.

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

RADIOLOGICAL PRESENTATION

- Imaging study suggestive of glioma
- Left hemisphere speech/motor
- Right hemisphere
- Patient has speech symptoms?
- Yes
- No
- Other brain involvement

PRESURGICAL PLANNING

- Strongly consider neuropsychological evaluation before functional imaging study
- Strongly consider functional imaging study
- MRI Stealth/Brain Lab
- Is gross total resection feasible?
- Yes
- Gross total resection with or without:
  - Awake craniotomy
  - Intraoperative imaging study
  - Intraoperative monitoring (IOM)
  - Imaging study within 72 hours
  - Glioblastoma, see Page 2
  - Anaplastic Glioma, see Page 3
- No
  - Sub-total resection or Biopsy

TREATMENT

1 Biopsy first if MRI suggestive of CNS lymphoma or non-tumor diagnosis
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**PATHOLOGY**

- **Glioblastoma**
  - Good performance status (KPS ≥ 60)
  - Radiation therapy to start 2 to 6 weeks after surgery: 3D approach required – fractionated external beam radiation (EBRT) 60 Gy/30 fractions AND Temozolomide 75 mg/m² for 6 weeks
  - For patients with a preoperative neuropsychological evaluation, consider post-operative neuropsychological evaluation
  - Consider clinical trial

- **Poor performance status (KPS < 60)**
  - Radiation therapy to start 2 to 6 weeks after surgery: 3D approach required – fractionated external beam radiation (EBRT) 60 Gy/30 fractions
  - Consider temozolomide 75 mg/m² for duration of radiation therapy if clinically appropriate
  - Consider shorter course of radiation therapy alone 40-50 Gy in 3 to 4 weeks
  - For patients with a preoperative neuropsychological evaluation, consider post-op neuropsychological evaluation

- **End Stage Disease**
  - Consider Hospice/Supportive Care

**TREATMENT**

- Chemo-radiation treatment to start 2 to 6 weeks after surgery:
  - 3D approach required – fractionated external beam radiation (EBRT) 60 Gy/30 fractions
  - Temozolomide 75 mg/m² for 6 weeks
  - For patients with a preoperative neuropsychological evaluation, consider post-operative neuropsychological evaluation
  - Consider clinical trial

**SURVEILLANCE**

- Imaging study every 3 to 4 weeks postradiation
- Adjuvant temozolomide 150 mg/m²/day once daily for 5 consecutive days of a 28 day cycle for 12 cycles; dose escalate to 200 mg/m²/day if patient tolerates

**RECURRENCE**

- Imaging study every 2 to 3 months for first 2 years then as clinically indicated
- Consider neuropsychological evaluation every 3 to 6 months, or as clinically indicated

Progressive disease?

- Yes
  - 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
  - Consider clinical trials

- No
  - Continue surveillance

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1 Refer to Karnofsky Performance Status Scale (Appendix A)

2 Conduct baseline neuropsychological evaluation prior to radiation treatment

3 3D approach = Intensity Modulated Radiation Therapy (IMRT) or 3D conformal radiation therapy

4 Monitoring while on therapy:

- Constipation
- Pneumocystis pneumonia prophylaxis
- Labs: CBC weekly and metabolic panel every 4 weeks
- Neurologic evaluation
- Intracranial Pressure (ICP)
- Intracranial Pressure (ICP)

5 Reflected as new baseline; pseudoprogression may be noted.

6 Recommended for patients who are being treated for metastatic disease to brain per the neuro-oncology team.

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**End Stage Disease**

- Consider Hospice/Supportive Care

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Approved by the Executive Committee of the Medical Staff on 11/28/2017
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### PATHOLOGY
- Anaplastic Oligodendroglioma (AO)
- Anaplastic Glioma
- Anaplastic Astrocytoma (AA)
- Anaplastic Oligoastrocytoma (AOA)

### TREATMENT
- Start 2 to 6 weeks after surgery 3D approach required:
  - Fractionated external beam radiation (EBRT) 57 Gy/30 fractions with or without temozolomide concurrently and/or adjuvant temozolomide based on the molecular profile and physician’s discretion.
  - For patients with a pre-operative neuropsychological evaluation, consider post-operative neuropsychological evaluation.

### SURVEILLANCE
- MRI every 2 to 3 months for first 2 years then as clinically indicated based on the following factors:
  - Performance status
  - Extent of residual disease
  - Imaging
  - Proliferation rate
  - Patient personal preferences

### RECURRENCE
- Karnofsky performance status greater than or equal to 60?
  - Yes: Consider clinical trial
  - No: Consider re-irradiation
- Prior history of radiation therapy?
  - Yes: Consider radiation therapy
  - No: Individualize care as clinically indicated

### ADJUVANT THERAPY
- Imaging study 3 to 4 weeks postradiation
- Consider adjuvant therapy based on the following factors:
  - Performance status
  - Extent of residual disease
  - Imaging
  - Proliferation rate
  - Patient personal preferences

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 PCV- procarbazine, lomustine, and vincristine
3 Reflected as new baseline; pseudoprogression may be noted.
# 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


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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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