Leptomeningeal Metastases

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

### EVALUATION
- Physical exam with comprehensive neurologic evaluation
- MRI brain and MRI cervical/thoracic/lumbar spine with and without contrast
- Cerebrospinal fluid (CSF) exam
- Physical activity
- Signs and symptoms suggestive of leptomeningeal metastases

### DIAGNOSIS
- CSF positive for tumor cells
- Positive radiologic findings with supportive neurologic findings
- Suggestive CSF findings with supportive neurologic findings in a patient with a known malignancy

### RISK STATUS
- Poor Risk:
  - Low Karnofsky performance status (KPS)
  - Multiple, serious, major neurologic deficits
  - Extensive systemic disease with few treatment options
  - Encephalopathy

- Good Risk:
  - High Karnofsky performance status (KPS)
  - No major neurologic deficits
  - Minimal systemic disease
  - Reasonable treatment options available for systemic disease (if applicable)

### TREATMENT
- Consider: Fractionated external beam radiation therapy to symptomatic sites and/or
- Consider placing intraventricular catheter (Ommaya Reservoir) and/or
- Consider ventriculoperitoneal shunt with adjustable valve (including on/off or programmable) for intrathecal chemotherapy if symptoms and/or radiological findings suggestive of hydrocephalus
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PRIMARY TREATMENT

- Induction intra-CSF chemotherapy for 4-8 weeks, if systemic disease stable
  or
  - Consider high-dose methotrexate (if breast or lymphoma)
  or
  - Consider radiation (if breast or lymphoma)

Reassess CSF from site where positive CSF cytology was originally obtained; if CSF cytology was originally negative, reassess by obtaining CSF from a different site

Evidence of clinical or radiologic progression of leptomeningeal metastases?

CSF cytology negative

CSF cytology positive

POST-INDUCTION THERAPY

Consider increasing the interval of treatments between intra-CSF chemotherapy

- Consider increasing the interval of treatments between intra-CSF chemotherapy
  or
  - Consider switching intra-CSF medications and treat for 4 weeks before re-testing CSF

Repeat CSF cytology

Flow abnormalities

Normal flow

Perform Nuclear Medicine CSF Shunt Evaluation

Repeat Nuclear Medicine CSF Shunt Evaluation

Fractionated external beam radiation to sites of involvement

Repeat CSF cytology

Radiation to symptomatic sites or
- Systemic chemotherapy or
- Best supportive care

Consider imaging review by neurosurgery team to confirm there is no placement/anatomical issues with the inserted ventricular catheter

Consider radiation therapy to previously un-irradiated symptomatic sites:
  - Fractionated external beam radiation or
  - Stereotactic radiosurgery and/or
  - Best supportive care

Cytology continually positive and/or evidence of clinical or radiologic progression of leptomeningeal metastases

CSF cytology negative

Yes

CSF cytology positive

No

Maintenance intrathecal chemotherapy and monitor CSF cytology every month for 1 year then reassess

Negative cytology

Flow abnormalities

Normal flow

Note:
1. Induction intra-CSF chemotherapy can start after radiation
2. Depending upon the extent of the disease, consider appropriate radiation therapy
3. Consider switching intra-CSF medications and treat for 4 weeks before re-testing CSF
4. Usually WBRT and/or partial spine field recommended

Department of Clinical Effectiveness V6
Approved by the Executive Committee of the Medical Staff on 11/16/2021
APPENDIX A: Karnofsky Performance Status Scale Definitions

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
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<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>
SUGGESTED READINGS


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DEVELOPMENT CREDITS

This practice algorithm is based on majority expert opinion of the Leptomeningeal Metastases workgroup 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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