

# Neuro-oncology: Adult Brain Tumors

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## DISEASE/SKILL OVERVIEW

- Primary brain tumors: originate in the brain and rarely metastasize outside of the CNS
  - Mostly supratentorial (cerebrum), with most of those being in frontal lobe
  - Gliomas (arising from neural glioma cells) most common
  - Cause mostly unknown but exposure to ionized radiation can contribute
- Metastatic brain tumors: originate outside the brain
  - Most common originating sites: lung, breast, melanomas
- Brain tumors classified by histopathology/ neuroembryonic origins. WHO grading system most commonly used and classifies tumors by histology and degree of anaplasia (change from the normal). Grading goes from grade 1 (low grade) to grade 4 (high grade) with grade 4 having the most degree of anaplasia as well as signs of necrosis. It is possible for a low-grade tumor to progress into a higher-grade tumor
  - Brain tumors do not follow typical cancer staging classifications as they do not typically disseminate or metastasize
  - Malignant vs benign can be misleading as only takes histology into account; a benign tumor in an eloquent (vital) location, especially if unresectable, can have devastating impacts
- Prognosis varies depending on tumor type with high-grade tumors seeing a median survival rate of less than 12 months; there is no cure and treatment focuses on prolonging survival while preserving as much quality of life
  - Factors affecting prognosis: age, tumor size (extent of resection/residual tumor), Karnofsky Performance Status (looks at ability to perform ADLs, the higher the score the better), presence/absence of certain genetic markers
- Standard of Care treatment guided by National Comprehensive Cancer Network (NCCN) guidelines – can include surgical resection, radiation, chemotherapy

## MANAGEMENT STRATEGIES/ NURSING IMPLICATIONS

- Symptoms dependent on anatomic location – consider tumor location and presenting symptoms at diagnosis during assessments
- Safety precautions as appropriate – seizure precautions, cerebral edema precautions, neutropenic and/or bleeding precautions if receiving chemotherapy treatment
- Will need brain MRIs for tumor evaluation (gold standard) – consider MRI safety and assess for need of any anxiolytic medications
  - May undergo head CT for acute changes (eval for edema or hemorrhage)
- Diagnosis can be distressing – evaluate support systems, encourage use of available resources (palliative care, SW, brain tumor support groups)
- Cognitive abilities may be affected – important to work with family/caregivers, especially when on active treatment

## NEURO EXAM PEARLS

- Serial neuro exams at least every 4 hrs in inpatient setting (more frequent if post op following resection or experiencing acute changes) – monitor for any new or worsening symptoms
  - Standard neurosurgery post-op assessment/ management following biopsy or resection, including for seizures, brain bleeds (SAH), hyponatremia (SIADH/DI)
- Assess for headaches (if headaches common/normal, monitor for any change in typical headache), N/V, changes in LOC, seizures, and cognitive-behavioral dysfunction including memory deficits. Assess for any cranial nerve deficits
- Assess for focal deficits brought on by tumor (dependent on tumor location) – hemiparesis, aphasias, sensory changes, balance/coordination issues, etc
- Assess for signs of increased ICP
- Assess for any side effects of any current therapies (i.e. chemotherapy, radiation)

- Oncology patients are at an increased risk for blood clots – assess for DVTs and PEs and take preventative measures

## MEDICATION/SPECIALIZED LABS

- Tylenol and ibuprofen can be used for basic headache management. If not effective, may need to address possible swelling as cause with course of corticosteroids (see below)
- Commonly used chemotherapies: temozolomide (Temodar), lomustine (Gleostine/CCNU), methotrexate; monoclonal antibody rituximab (Rituxan)
  - Supportive medications during chemotherapy: nausea medications, stool softeners
  - May be prescribed prophylactic antibiotic for Pneumocystis pneumonia – commonly used: trimethoprim/sulfamethoxazole (Bactrim)
  - Assess standard labs including blood counts and kidney/liver function (CBC w/ Diff, CMP)
- Worsening in symptoms/deficits (including headaches and weakness) could be due to increased swelling around tumor – treated with course of corticosteroids. Preferred steroid is dexamethasone (Decadron)
  - May need PPI to protect stomach, also monitor for hyperglycemia and steroid-induced psychosis
  - Goal is to use as little as necessary for as short a time period as possible to manage symptoms
  - May utilize bevacizumab (Avastin) infusions – a steroid-sparing targeted therapy to control swelling caused by the tumor
- At risk for seizures – Keppra most common ASM (anti-seizure medication) but may be on others
  - May need therapeutic drug monitoring labs
- Gene trials commonly ran on tumor samples obtained during biopsy/surgery that help provide insight for prognosis and treatment options

## TEAM QUESTIONS/COMMUNICATION

- Collaborative interdisciplinary approach best – neurology, oncology, neurosurgery, radiation oncology, PT, OT, ST, palliative care, social work, home health; hospice care near end of life
- Communicate any change from baseline or significant side effects from treatment
- Discuss any safe complementary and alternative therapies desired by patient; communicate any alternative medicines patient may be or planning on using (i.e. herbs, vitamins, complementary medicine)

- Upon discharge from hospital: ensure patient and family/caregivers have all that they need in order to safely transition to home setting (i.e. cane/walker/wheelchair, bedside commode, shower chair, etc.), which care team(s) to follow up with, also consider continuing PT/OT/ST therapies as appropriate

## PATIENT/FAMILY/CAREGIVER TEACHING SUPPORT

- Patient can have chronic deficits – cognitive, physical, or a combination
  - Encourage to alert team if they notice new or worsening symptoms – may be treatment-related but a return/worsening of original presenting symptom(s) could also be a sign of tumor progression
  - Important to work closely with family/caregivers for patients with cognitive deficits
- Discuss strategies for managing common symptoms such as fatigue, headache, weakness
- Treatment-specific (i.e. chemotherapy) teaching for patient and family as appropriate
  - May include: medication(s) and their side effects, symptom management (nausea, constipation, etc.), signs of thrombocytopenia, neutropenic precautions, safe chemotherapy handling in the home, and safe handling of excreta (urine, feces, emesis) for family caregivers
- Encourage enrolling in any clinical trials they may be eligible
- Important to have good understanding of what quality of life means to them and for patient to communicate this and their wishes with family and care team
  - As disease progresses, patient may lose mental capacity to make medical and end-of-life decisions; may need to set up a surrogate decision maker

## TOOLS/SUPPLIES

- Assessment tools: vital sign machine including thermometer, pen light, common/easy to identify objects (pen, badge, cup, etc.) for cognitive/speech assessments
- Seizure precautions (padded side rails, pulse ox, suction set up and ready for use)
- As patient moves to outpatient setting, important to establish reliable means of communication between care teams and patient/family/caregivers via phone or messaging via electronic healthcare application such as MyChart

***All Neuroscience Nursing Primer references listed on special reference page.***