

Monitoring compliance with evidence-based guidelines of brain and spinal tumors

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In 1922, the American College of Surgeons established the Commission on Cancer (CoC) dedicated to improving both patient survival and quality of life by establishing guidelines that ensure patient-focused care through standard setting, prevention, research, education and monitoring. As part of this mission, the CoC maintains the *Cancer Program Standards: Ensuring Patient-Centered Care*, which establishes requirements for cancer program accreditation. Chapter 4 outlines standards for patient outcome tracking, which includes standard 4.6 ,



“Monitoring Compliance with Evidence-Based Guidelines,” which involves a case review to

assess if patient work up, evaluation and treatment are compliant with evidence-based treatment guidelines.

The Legacy Cancer Institute (LCI) endorses and follows the guidelines put forth by the National Comprehensive Cancer Network (NCCN), an alliance of 28 cancer centers devoted to patient care, research and education. NCCN publishes oncology guidelines for clinicians reflecting current cancer care. The NCCN Guidelines for Central Nervous System Cancers are level 2A recommendations (based on lower-level evidence, with uniform NCCN consensus that the intervention is appropriate). These guidelines reflect current World Health Organization (WHO) glioma classification based on histologic features and genetic alterations (Figure 11).

In 2018, physician members of the Legacy Integrated Network Cancer Committee analyzed 2016 analytic central nervous system

(CNS) cases to assess if patients with high-grade gliomas were treated according to the guidelines. We compared the cancer treatment of patients diagnosed and/or treated for anaplastic astrocytoma (AA), glioblastoma (GBM), or anaplastic oligodendroglioma (AO) at Legacy hospitals. High-grade gliomas carry a poor prognosis, with a median survival rate of approximately two, one and 3.5 years for AA, GBM and AO, respectively (Figure 11). Current treatment paradigms for high-grade gliomas consist of resection, radiotherapy and oral temozolomide chemotherapy treatment. We analyzed patients treated at LCI for these high-grade gliomas to ensure that our patients are receiving treatment in accordance with NCCN guidelines. The case review included the following-

- **Case presentation at the LCI multidisciplinary case conferences.** A growing body of literature is demonstrating that a team-based approach can reduce mortality, improve hospital management of medications and improve outpatient management. Cancer therapies continue to rapidly evolve with new genetic markers and treatments (small molecular inhibitors and antibody therapies)

FIGURE 11, 2016 World Health Organization classification scheme for high-grade gliomas⁴

WHO Grade	Tumor subtype
Astrocytoma, WHO Grade III	Anaplastic astrocytoma, IDH-mutant
	Anaplastic astrocytoma, IDH-wildtype
	Anaplastic astrocytoma, NOS
Astrocytoma, WHO Grade IV	Glioblastoma, IDH-wildtype
	Glioblastoma, IDH-mutant
	Glioblastoma, NOS
Oligodendroglioma, WHO Grade III	Anaplastic oligodendroglioma, IDH-mutant and 1p/19q-codeleted
	Anaplastic oligodendroglioma, NOS
	Anaplastic oligoastrocytoma, NOS

WHO = World Health Organization, IDH-1 = isocitrate dehydrogenase - 1, NOS = not otherwise specified.

changing patient care on almost a daily basis. Patient case discussion at multidisciplinary cancer conferences ensures oncologic, radiotherapy, radiographic and surgical opinions to ensure up-to-date care. The team-based approach has been shown to improve guideline compliance, follow-up, pain control, patient adherence to therapies and communication between health care professionals.

- **Documentation of Karnofsky Performance Score (KPS) in the patient medical record.** Because of the poor prognosis, standardizing patient care focuses on maximizing quality of life by offering all treatments to patients with high functional performance scores (i.e., KPS) and suggesting hospice care for patients with low initial functional performance scores. NCCN treatment pathways are dependent on initial patient function with aggressive treatments recommended for higher functioning patients and hospice suggested for patients with poor scores.
- **Pre-surgical MRI.** Pre-surgical MRI is a required component of the patient work up and evaluation.
- **Appropriate molecular and genetic testing.** Currently, MGMT and IDH-1 markers are being used to help prognosticate at LCI, but they are not used to change our standard high-grade glioma therapy pathway. Future genetic analysis will focus on targetable markers that indicate cancer susceptibility to new chemo- and biologic therapies, enabling targeted patient care. As a cancer institute, expanding our genetic marker profiling allows for the identification of cancer patients that may benefit from future therapies
- **Safe maximal tumor resection.** Surgical treatment of high-grade gliomas must balance efforts at achieving complete resection with the potential for devastating neurologic deficit — prompting the term “safe maximal” resection. In general, complete high-grade glioma resection can only increase survival by two months. In the end, surgery is not the complete answer for patients with high-grade gliomas; instead, new tumor-specific treatments are needed, guided by

genetic markers. Complete resection is based on size and location of the tumor (see example in Figure 12). Brain tumors adjacent or involving eloquent cortex have unacceptable surgical morbidity (devastating neurologic deficit) and are either watched, biopsied or undergo “safe maximal” resection.

- **Administration of adjuvant therapies in the form of radiation and chemotherapy offered in appropriate cases and administered when possible.**

This case analysis of the adherence to national guidelines regarding the best patient treatment pathway for high-grade gliomas found that patients treated at LCI are treated according NCCN Guidelines. Detailed results of the case review were shared with the LCI Integrated Network Network Cancer Committee, the LCI Neuro-oncology Program and attendees of the LCI Brain/CNS multidisciplinary cancer conference. As a result of this case review, a quality indicator was added to the Brain/CNS quality improvement dashboard to track the number of days from surgery to concurrent chemo/radiation for ongoing tracking and review. Discussions with Legacy laboratory and pathology departments about the ever evolving and expanding molecular and genetic testing are ongoing.

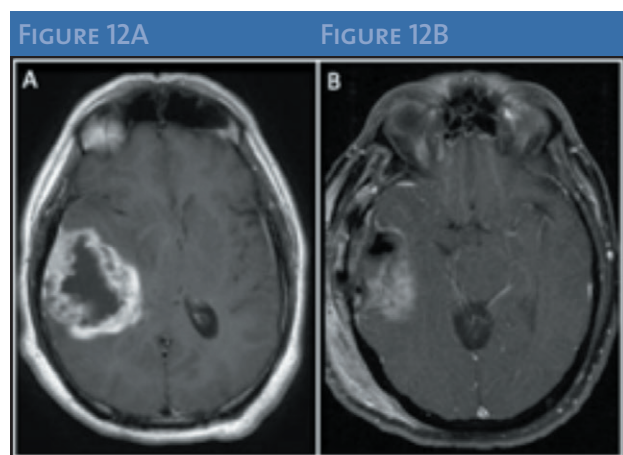


Figure 12. (A) Preoperative axial T1-weighted magnetic resonance imaging with contrast depicting a right temporoparietal lobe mass with imaging characteristics consistent with high-grade glioma. (B) Postoperative axial T1-weighted magnetic resonance imaging showing subtotal resection of tumor with residual in the posterior temporal region. The extent of resection was estimated at >90%.