NRG Oncology Clinical Trial Evaluates Novel Radiotherapy Approaches for Improving Survival in Patients With Newly Diagnosed Glioblastoma Brain Tumors

Philadelphia, PA—Activated today, the phase II randomized trial (NRG-BN001) is the first study to assess outcomes for patients with newly diagnosed glioblastoma (GBM) when treated using either dose-intensified photon intensity-modulated radiotherapy (IMRT) or dose-intensified proton beam therapy as compared with standard-dose photon radiotherapy. The trial is also the first to rigorously evaluate the use of temozolomide—an oral radiotherapy sensitizer and chemotherapeutic drug—in conjunction with dose-intensified radiotherapy.

GBM is the most common primary malignant brain tumor. The median survival time for patients with GBM who undergo the standard treatment of surgery followed by chemoradiotherapy is 15-16 months, with the vast majority of patients experiencing recurrence in the region of the treated tumor.

“The predominant pattern of local tumor recurrence highlights the importance of investigating more intensive local therapies,” says Co-principal Investigator Minesh P. Mehta, M.B.Ch.B., chair of the NRG Oncology Brain Tumor Committee and a professor of radiation oncology at the University of Maryland and medical director of the Maryland Proton Treatment Center, both in Baltimore. “Photon IMRT and proton beam therapy represent novel approaches to intensifying local therapy. Given these approaches’ highly conformal dose distribution and ability to spare adjacent normal structures, including normal brain parenchyma, it is postulated that they will allow higher total doses of radiation to be delivered safely,” explains Mehta. The NRG-BN001 trial will investigate whether dose-intensified radiotherapy, administered at levels tested safely in phase I studies with temozolomide, improves local tumor control and thereby survival.

Trial participants will be enrolled at one of two types of treatment centers. Group 1 will include IMRT treatment centers, at which 288 study participants will be randomized to either the standard-dose photon radiotherapy arm (three-dimensional conformal radiotherapy [3DCRT] or IMRT) or the dose-intensified arm (IMRT only). Group 2 will include proton therapy centers, at which 288 study participants will be randomized to either the standard-dose photon radiotherapy arm (3DCRT or IMRT) or the dose-intensified arm (proton beam therapy only). Patients enrolled in both study arms will receive concomitant and adjuvant temozolomide.

The trial design allows for an indirect comparison of the two radiotherapy approaches. “Proton beam therapy is associated with a significantly lower integral dose to healthy brain tissue compared with photon IMRT,” says Co-principal Investigator Vinai Gondi, M.D., co-director of the Cadence Health Brain Tumor Center and an associate research director at the CDH Proton Center (now a part of Northwestern Medicine), both in Warrenville, Ill. “The trial results will provide insight as to whether either of these new treatment approaches improves patient survival compared with standard treatment. If so, we also will learn if one approach is significantly superior to the other in extending patients’ lives with less toxicity or better neurocognitive function or patient-reported quality of life.” A secondary end point of the trial is the evaluation of both the short- and long-term side effects of dose-intensified IMRT and proton beam therapy.

To evaluate critically the clinical benefit of potential survival gains associated with either photon IMRT or proton beam therapy, patients’ neurocognitive function and self-reported quality of life will be assessed. If both experimental arms demonstrate superior survival compared with the control arm, then the evaluation of neurocognitive function and quality of life between arms will be critical to determining which treatment should be moved forward to a phase III trial.

“Prior to any new and costly treatment technology becoming adopted widely, it is of the utmost importance to evaluate rigorously its potential for improving patient care. I am proud that NRG Oncology is activating a trial that evaluates thoroughly whether two promising technologies extend the lives of brain tumor patients. We will gain critical information for the investment of future health care resources from this trial,” says Walter J. Curran Jr., M.D.,
an NRG Oncology Group Chairman and Executive Director of the Winship Cancer Institute of Emory University in Atlanta.

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NRG Oncology conducts practice-changing, multi-institutional clinical and translational research to improve the lives of patients with cancer. Founded in 2012, NRG Oncology is a Pennsylvania-based nonprofit corporation that integrates the research strengths of the National Adjuvant Breast and Bowel Project, the Radiation Therapy Oncology Group and the Gynecologic Oncology Group. The research organization seeks to carry clinical trials with emphases on gender-specific malignancies including gynecologic, breast, and prostate cancers and on localized or locally advanced cancers of all types. NRG Oncology’s extensive research organization is comprised of multidisciplinary investigators including medical oncologists, radiation oncologists, surgeons, physicists, pathologists, and statisticians and encompasses more than 1300 research sites located worldwide with predominance in North America. NRG Oncology is supported primarily through grants from the National Cancer Institute (NCI) and is one of five research groups in the NCI’s National Clinical Trials Network.