GBM: Emerging Evidence of Neuroplasticity and Implications for Physical Therapy

Meaghan Costello, PT, DPT, NCS Eileen Gillan, PT, DPT, NCS Kendall Carney, PT, DPT, NCS

12:00 - 1:00pm

Neurology

Glioblastoma multiforme (GBM) is the most common primary brain cancer in adults, found both in the brain and less commonly in the spinal cord. GBM is aggressive, infiltrating brain structures near the primary tumor site. Over the past several years, and despite improvements in surgical debulking techniques, medical management, and research focused on targeted interventions for GBM subtypes, survival rates remain low with no known cure. There are some "super survivor" patients that have been living with GBM for 10 years or more, but they tend to be younger with fewer comorbidities.

Many neuro-oncologists and research centers use functional performance status assessments, such as the Eastern Cooperative Oncology Group Scale or Karnofsky Scale, which capture a patient's level of function and disability. Unfortunately, as function decreases and disability increases, this excludes many from participating in these promising clinical trials. Further, many patients with GBM do not receive targeted rehabilitative interventions as they were thought incapable of neuroplastic recovery due to the edema and infiltrative nature of the disease process. However, emerging research has revealed that patients with GBM have the capacity for neuroplastic changes.

Can we harness what we know about neuroplasticity and shift from a compensatory/palliative approach to a relative rehabilitative approach in patients with GBM? If we can lessen a patient's level of disability, we can improve quality of life, decrease caregiver burden, and facilitate the functional performance necessary for a patient to qualify for ongoing medical interventions, possibly impacting survival rates and overall outcomes.

Presentation will review pathophysiology, medical interventions, and research for individuals with GBM. Through lecture and case-based discussions, we will challenge the role of PT in optimally examining, treating, and prognosticating outcomes for patients at various stages in their GBM journey.

By the end of the session, the learner will:

1. Understand the pathophysiology, etiology and clinical features of glioblastoma multiforme.
2. Understand a typical medical management for patients with glioblastoma multiforme.
3. Understand the potential role of physical therapy as an interdisciplinary care team member for patients diagnosed with glioblastoma multiforme.
4. Understand emerging current evidence surrounding the role of neuroplasticity and the impact this will have on physical therapy evaluation/interventions across disease stages.
5. Be familiar with relevant outcome measures to reflect evolving function and quality of life in patients diagnosed with glioblastoma multiforme

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5. Tamimi AF, Juweid M. Epidemiology and Outcome of Glioblastoma. . 2017;. doi:10.15586/codon.glioblastoma.2017

6. Troschel F, Brandt R, Wiewrodt R, Stummer W, Wiewridt D. High-Intensity Physical Exercise in a Glioblastoma Patient under Multimodal Treatment. Article in Medicine and Science in Sports and Exercise. June 2019. DOI: 10.1249/MSS.0000000000002067

7. Gibb M, Kong N, Tate M. Direct Evidence of Plasticity within Human Primary Motor and Somatosensory Cortices of Patients with Glioblastoma. Neural Plasticity. Published 22 September 2020. Volume 2020, Article ID 8893708, 7 pages

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9. Dorszewska W, Zabel M. Ong K. Neuroplasticity in the Pathology of Neurodegenerative Diseases. Neural Plasticity. Neuroplasticity in the Pathology of Neurodegenerative Diseases. Volume 2020, Article ID 4245821, 2 pages

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Meaghan Costello is a senior physical therapist at Massachusetts General Hospital on the inpatient service. She has been a Neurological Clinical Specialist since 2010. Meaghan has been recognized as a clinical scholar by the Patient Care Services Clinical Recognition Program. Meaghan serves as the MOSC Item Review Coordinator within the ABPTS Neurologic Specialty Council. In addition to clinical practice she is involved with research with the SMaHRT Study (Stroke Motor reHabilitation and Recovery STudy) within the Translational Neurorecovery lab. Meaghan is an adjunct faculty and mentor with the MGH neurologic physical therapy residency.

Eileen Gillan is a senior physical therapist in the acute care setting at Massachusetts General Hospital. She is a graduate of the MGH Institute of Health Professions DPT program and received her Neurologic

Clinical Specialty in 2021. She is an Adjunct Faculty Member of the MGH Neurologic Physical Therapy Residency, has served as a clinical instructor, and is involved with clinical research via the SMaHRT Study (Stroke Motor reHabilitation and Recovery STudy) within the Translational Neurorecovery lab.

Kendall Carney graduated from Augusta University's DPT program in 2019 before going on to complete Massachusetts General Hospital's Neurologic Physical Therapy residency program in 2019-2020. She is a Board-Certified Clinical Specialist in Neurologic PT, and continues to practice at MGH in the acute care setting. Kendall also serves as a team member of the Excellence Every Day Committee. She also participates in the inter-professional program with the IHP as a clinical instructor.