

# Exercise Intervention

## A pilot study to assess the feasibility and impact on cancer-related fatigue and quality of life among patients with high-grade glioma

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**BACKGROUND:** Cancer-related fatigue (CRF) is a challenging symptom, often compromising quality of life (QOL) and hindering physical activity among patients with cancer.

**OBJECTIVES:** This 18-month pilot study assessed the feasibility to recruit and retain participants with high-grade glioma into a 10-week exercise intervention and evaluated the effects on CRF and QOL.

**METHODS:** Participants were enrolled into the usual care, education, or exercise group based on time of enrollment and radiation treatment location. Feasibility was determined by accrual and retention rates. Fatigue and QOL were assessed at weeks 0, 3, and 10. Descriptive statistics and percentage change were used for pre-/post-test differences.

**FINDINGS:** Exercise participants experienced less fatigue and improved QOL as compared to the usual care and education groups, suggesting that exercise favorably affects clinical outcomes and is feasible among patients with high-grade glioma.

### KEYWORDS

exercise oncology; cancer-related fatigue; quality of life; high-grade glioma

### DIGITAL OBJECT IDENTIFIER

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**CANCER-RELATED FATIGUE (CRF) IS A DISTRESSING SYMPTOM** affecting as many as 99% of patients (Thong et al., 2020; Wu et al., 2019). CRF can be present at any stage of the cancer care continuum and often continues into survivorship, with as many as 49% of long-term survivors (greater than five years postdiagnosis) still experiencing symptoms (Campbell et al., 2019; LaVoy et al., 2016; Thong et al., 2020). This type of fatigue is a physical, cognitive, and/or emotional feeling of overwhelming exhaustion that inhibits daily functioning and compromises quality of life (QOL) (National Comprehensive Cancer Network [NCCN], 2021). In addition, it is not related to recent activity or relieved by rest, unlike fatigue felt by the general population; rather, rest can exacerbate CRF (Cataldi et al., 2020). CRF may lead to disability and interfere with patients' ability to return to work and have overlapping symptomatology with depression (Campbell et al., 2019; Thong et al., 2020). Of particular concern, patients with primary brain tumors have a 40%–50% increased level of CRF as compared to other cancer diagnoses (Cormie et al., 2015). Treatment (i.e., anti-epileptics, radiation therapy, chemotherapy, and steroids) and disease processes associated with primary brain tumors increase the degree of fatigue, cognitive and psychological changes, and loss of physical functioning (Cormie et al., 2015; Levin et al., 2016).

### Exercise as Treatment for Cancer-Related Fatigue

Pharmacologic interventions addressing CRF are limited and ineffective (Cormie et al., 2015; Mustian et al., 2017), making nonpharmacologic interventions such as physical activity a first-line recommendation (Campbell et al., 2019; NCCN, 2021; Thong et al., 2020; Wu et al., 2019). From 2010 to 2018, exercise oncology research studies increased by 281%, and the findings support the American Cancer Society (ACS) and American College of Sports Medicine (ACSM) recommendation of 150 minutes of cardiorespiratory exercise and two strength-training workouts per week for people living with cancer (Campbell et al., 2019; Rock et al., 2012). These recommendations will be referred to as regular exercise throughout this article.

CRF is related to molecular/physiologic, clinical, and psychological factors (LaVoy et al., 2016; Thong et al., 2020), making it a complex and multidimensional phenomenon. Exercise has the ability to decrease