A radiation oncologist's experience treating malignant glioma with Tumor Treating Fields in Canada

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Introduction

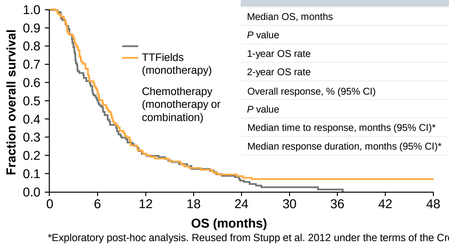
- Tumor Treating Fields (TTFields) are electric fields generated by the portable, wearable NovoTTF-200A medical device, and delivered via 2 array pairs placed on the scalp (**Figure 1**), which exert physical forces to disrupt cancer cell function and tumor progression[1–5]
- TTFields therapy has demonstrated improved overall survival (OS) and progression-free survival in recurrent glioblastoma (rGBM; TTFields monotherapy) and newly diagnosed glioblastoma (ndGBM; concomitant with temozolomide [TMZ] maintenance therapy) in the pivotal EF-11 (NCT00379470) and EF-14 (NCT00916409) clinical studies, respectively (**Figure 2**)[6,7]
- The therapy was FDA approved in 2011 for rGBM and in 2015 for ndGBM[8]
- Patients in Canada with rGBM or ndGBM were able to gain access to the therapy before regulatory approval (which occurred in November 2022)[9] through the Health Canada Special Access Program (SAP)[10]
- Here we describe a single physician's experience with TTFields therapy, in conjunction with a retrospective analysis of charts for patients with rGBM or ndGBM who received TTFields therapy as part of the SAP

Figure 1. The NovoTTF-200A system

The image above is of an actor and used for educational purposes

Figure 2. Kaplan–Meier OS curves from randomized, pivotal TTFields clinical studies[6,7]

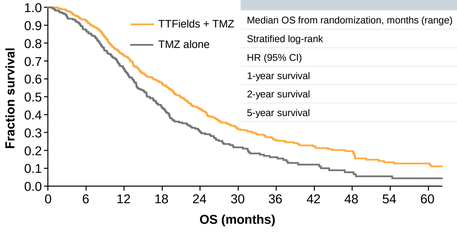
A) EF-11 (rGBM)[6,11]



	TTFields therapy (n=120)	Chemotherapy (n=117)	
Median OS, months	6.6	6.0	Primary endpoint
P value	0.27		
1-year OS rate	20%	20%	Secondary endpoints
2-year OS rate	8%	5%	
Overall response, % (95% CI)	14.0 (7.9–22.4)	9.6 (3.9–18.8)	
P value	0.19		
Median time to response, months (95% CI)*	8.4 (6.9–9.9)	5.8 (3.6–8.0)	
Median response duration, months (95% CI)*	7.3 (0–16.6)	5.6 (3.8–7.5)	

*Exploratory post-hoc analysis. Reused from Stupp et al. 2012 under the terms of the Creative Commons CC-BY-NC-ND license.

B) EF-14 (ndGBM)[7]



ITT population	TTFields therapy + TMZ (n=466)	TMZ alone (n=229)	
Median OS from randomization, months (range)	20.9 (19.3–22.7)	16.0 (14.0–18.4)	Secondary endpoint
Stratified log-rank	*P*<0.001		
HR (95% CI)	0.63 (0.53–0.76)		
1-year survival	73%	65%	Exploratory endpoints
2-year survival	43%	31%	
5-year survival	13%	5%	

Reused from Stupp et al. *JAMA*. 2017;318(23):2306–2316.

CI, confidence interval; HR, hazard ratio.

HEALTH CANADA SAP

- In Canada, physicians can request access to medical devices prior to their regulatory approval either for emergency use, or if conventional therapies have failed, are unavailable, or are unsuitable to treat a patient[9]
- Requests can either be made for specific patients, or in some cases, for batch use[9]
- Per SAP terms, physicians must report serious adverse events (SAEs) to Health Canada and to the device manufacturer, within 72 hours of occurrence[9]

METHODS

- Patients receiving TTFields therapy under the Health Canada SAP were assigned a Device Support Specialist to provide practical guidance and support
- Following ethical approval, a retrospective chart review of patients who received TTFields therapy under the Health Canada SAP was performed
- Demographic, disease baseline characteristics, and treatment factors were captured and analyzed, and safety and efficacy data evaluated
- Date of data capture was March 1, 2023

RESULTS

Demographics and baseline characteristics

- Overall, 62 patients received TTFields therapy through the SAP between 2013 and 2022 (**Figure 3A**)
- Median age was 49 years (range: 16–75), and 76% of patients were male
- Median Karnofsky Performance Score (KPS) was 75%‡ (range: 40–100)
- Most patients (95%) had GBM (according to criteria used at the time of diagnosis) (**Figure 3B**)

Figure 3A. Patient demographics

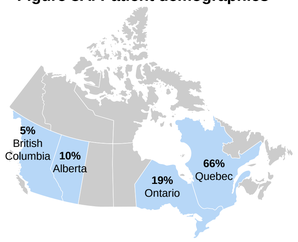
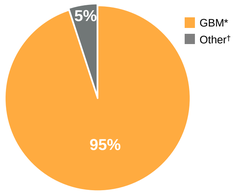


Figure 3B. Tumor types included



*Classified using criteria used at the time of diagnosis.
†Includes high-grade glioma, gliosarcoma, and oligodendroglioma.

- Most patients received TTFields therapy in the adjuvant ndGBM setting (n=41; 66.1%), vs 21 (33.9%) for rGBM
- Isocitrate dehydrogenase (IDH) mutations were identified in 4 patients; among patients with available MGMT promoter methylation status, 40% were MGMT methylated

‡Although KPS scores are often given in units of 10, some clinicians reported their patient's function to be between 2 KPS scores, thus why the median value reported here ends in a 5.

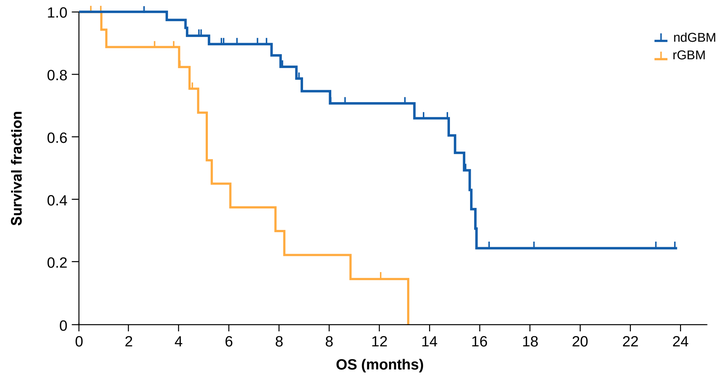
Adjuvant TTFields therapy for ndGBM treatment following chemo-radiation

- TTFields therapy was prescribed as an adjuvant therapy following chemo-radiation in 41 ndGBM cases
- Adjuvant TTFields therapy was started a median of 29 days (range 4–191) after completion of chemoradiotherapy
- At the time of data capture, average estimated time on TTFields therapy was 30.6 weeks (~7.5 months), with 17 patients still receiving adjuvant TTFields therapy
- For patients for whom usage data were available (n=36), average usage was 64.9%
- Overall, 8 (19.5%) patients reported a SAE; 4 (9.8%) were localized skin irritation, 2 (4.9%) were alopecia, 1 (2.4%) was treatment not tolerated and 1 (2.4%) was unspecified
- Median OS in the adjuvant setting was 15.4 months (**Figure 4**)

TTFields therapy for rGBM treatment

- TTFields therapy was prescribed for rGBM in 21 cases
- Patients had a median of 2 (range 1–9) prior treatment lines
- At the time of data capture, average estimated time on TTFields therapy was 22.3 weeks (~5.6 months), with 12 patients still receiving TTFields therapy
- For patients for whom usage data were available (n=13), average usage was 61.7%
- Overall, 2 (9.5%) patients reported a SAE; 1 (4.8%) was alopecia and 1 (4.8%) was focal alopecia
- Two young adults discontinued after <1 week of treatment
- Median OS for patients with rGBM was 5.3 months (**Figure 4**)

Figure 4. OS in patients with ndGBM receiving adjuvant TTFields therapy following chemo-radiation, and in patients with rGBM



CONCLUSION

- TTFields therapy is well tolerated, as demonstrated by the results of this analysis of patients who received the treatment under the Health Canada SAP
- Of note, rates of SAEs reported for both nGBM and rGBM were significantly lower than those reported previously[6,7]
- By using sponsor-employed Device Support Specialists, it was possible to offer TTFields therapy to patients across a wide geographic area
- Treatment with TTFields therapy would be more easily integrated into standard of care with the development of a larger network of prescribers

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Scan for more information on TTFields therapy

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