

Clinical Policy: Electric Tumor Treating Fields (Optune)

Reference Number: CP.MP.145

Date of Last Revision: 11/22

[Coding Implications](#)

[Revision Log](#)

See [Important Reminder](#) at the end of this policy for important regulatory and legal information.

Description

Electric tumor treating fields (TTF), also known as alternating electric field therapy, are used for the treatment of glioblastoma, and are delivered by Optune[®] (NovoCure[™]), a portable medical device that generates low-intensity electric fields termed Tumor Treating Fields. TTF are believed to disrupt the rapid cell division exhibited by cancer cells with the alternating electrical fields applied to the brain through electrodes placed on the scalp. The device is worn by the patient throughout the day and attached to the head by electrodes which creates a low intensity, alternating electric field within the tumor that exerts physical forces on electrically charged cellular components, preventing the normal mitotic process and causing cancer cell death prior to division.

Policy/Criteria

- I. It is the policy of health plans affiliated with Centene Corporation[®] that tumor treating fields (TTF) therapy is **medically** necessary for adults ≥ 22 years when meeting one of the following:
 - A. Request is for an initial 90 days of TTF therapy and all of the following:
 1. One of the following indications:
 - a. New diagnosis of glioblastoma, histologically confirmed, and all of the following:
 - i. Glioblastoma is in the supratentorial region;
 - ii. Member has good performance status, as defined by a Karnofsky Performance Status rating of ≥ 60 ;
 - iii. Alternating electric field therapy will be delivered in conjunction with temozolomide after standard surgical and radiation therapies, have been completed;
 - b. Recurrent glioblastoma, histologically- or radiologically- confirmed and both of the following:
 - i. Glioblastoma is in the supratentorial region;
 - ii. Alternating electric field therapy will be used as a monotherapy, after standard treatment with surgery, radiation, and chemotherapy;
 2. None of the following contraindications:
 - a. Implanted medical device such as deep brain stimulator, spinal cord stimulators, vagus nerve stimulators, pacemakers, defibrillators, or programmable shunts;
 - b. Skull defect such as a missing bone with no replacement, or bullet fragment;
 - c. Pregnancy;
 - d. Known sensitivity to conductive hydrogels (e.g., gels used on electrocardiogram [ECG] stickers or transcutaneous electrical nerve stimulation [TENS] electrodes);
 3. The member/enrollee agrees to wear the TTF device for 18 hours per day;
 - B. Request is for an additional 90 days of therapy and both of the following:
 1. There has been no disease progression in the last 90 days of TTF therapy;

2. The member/enrollee agrees to wear the TTF device for 18 hours per day, and was compliant with doing so in the prior authorization period.
- II.** It is the policy of health plans affiliated with Centene Corporation that there is insufficient evidence to support the use of TTF therapy for all other indications.
- III.** It is the policy of health plans affiliated with Centene Corporation® that there is insufficient evidence to establish the efficacy of computer mapping software (NovoTal™) for planning TTF therapy.

Background

Optune Product Description

Optune, formerly NovoTTF-100A produces alternating electrical fields within the human body that disrupt the rapid cell division exhibited by cancer cells, with the alternating electrical fields applied to the brain through transducer arrays placed on the scalp. Electric tumor treating fields (TTF) alter the tumor cell polarity at an intermediate frequency (on the order of 100-300 kHz). The frequency used for a particular treatment is specific to the cell type being treated (eg, 200kHz for glioblastoma (GBM)). In contrast, the TTF have not been shown to have an effect on cells that are not undergoing division. Since most normal adult brain cells proliferate very slowly, if at all, they are hypothesized to be little affected by the TTF. Testing demonstrates no differences between treated and control animals in histology of the major internal organs (including the brain), blood examination, cardiac rhythm, body temperature, or in animal behavior. In addition, because the fields alternate so rapidly, they have no effect on normal quiescent cells nor do they stimulate nerves and muscles. It is noted that, because TTF are only applied to the brain, they have no effect on rapidly proliferating cells in the rest of the body. The intensities of the electric fields within the tissues are very small and do not result in any meaningful increase in tissue temperature. Thus, TTF application has the advantage of being highly selective and is not expected to be associated with significant toxicity.¹

Position Statement

Guidelines from the National Comprehensive Cancer Network (NCCN) on central nervous system cancers, recommend alternating electrical fields therapy as a treatment option for newly diagnosed glioblastoma.¹¹ For patients with good performance status and either methylated or unmethylated/indeterminate O6-methylguanine-DNA methyltransferase (MGMT) promoter status, in conjunction with standard brain radiation therapy plus concurrent temozolomide and adjuvant temozolomide (category 1 recommendation- based on high- level evidence).² For recurrent glioblastoma, NCCN gives alternating electrical field therapy a 2B rating (consensus based upon lower-level evidence).²

Evidence for Optune

Initial United States Food and Drug Administration (FDA) approval for recurrent glioblastoma was based on Stupp et al.'s 2012 phase III clinical trial that randomized 237 patients to chemotherapy-free treatment of NovoTTF (20 to 24 hours per day) versus active chemotherapy in the treatment of patients with recurrent glioblastoma.⁵ Primary end-point was improvement of overall survival. Patients were randomized to TTF alone or active chemotherapy control. Responses were more common in the TTF arm (14% versus 9.6%, p=0.19) and TTF-related adverse events were mild. Quality of life analyses favored TTF therapy in most domains. The

investigators concluded that no improvement in overall survival was demonstrated. However, efficacy and activity with this chemotherapy-free treatment device appears comparable to chemotherapy regimens that are commonly used for recurrent glioblastoma. Toxicity and quality of life measures favored TTF.¹¹

The FDA based its approval of the newly diagnosed glioblastoma indication of the Optune device on results from a 2015 clinical trial by Stupp et al.^{4,5} The EF-14 trial included 695 patients newly diagnosed with glioblastoma (GBM), and compared those who used Optune with temozolomide to those receiving temozolomide alone. Patients who used the device along with temozolomide lived, on average, about seven months with no disease progression compared to four months for those who had the drug alone. The Optune plus temozolomide group survived for an average of 19.4 months after starting treatment compared to 16.6 months for those who were treated with only temozolomide.⁵ One critique of this study is that the study was terminated at the pre-planned intermediate analysis due to success of the TTF treatment. With the newly diagnosed glioblastoma indication, Optune can be used for GBM before the disease progresses. For newly diagnosed GBM, Optune is not intended to be used as a substitute for standard treatments, but rather as an adjunct therapy, and should not be used without a physician's supervision.

Hayes conducted a review of the available literature on TTF, noting that overall the body of evidence was of fair to very poor quality, although it was consistently positive.⁶ Hayes found the evidence to be stronger for the use of TTF for recurrent disease as opposed to newly diagnosed disease, as there were more supportive studies for recurrent disease at the time of publication (2 vs. 6). Out of the 10 studies they reviewed, pertaining to the use of TTF in patients with GBM and select other cancers, two were of fair quality, and the other eight ranged from poor quality to very poor quality. The two fair quality trials were those conducted by Stupp et al. in 2012 and 2015, although these were noted to have limitations such as lack of a sham intervention and significant loss of follow up (22% and 20%, respectively).⁶

A post-hoc analysis of Stupp et al.'s E-14 trial of TTF plus temozolomide versus temozolomide alone in newly diagnosed glioblastoma compared the efficacy of TTF plus physician's choice of chemotherapy versus chemotherapy alone after first recurrence.⁷ Median overall survival in the TTF plus chemotherapy was 11.8 months versus 9.2 months for the chemotherapy only group ($p=.049$).⁷ TTF demonstrated low toxicity, consistent with previous studies. Limitations of this analysis are its post-hoc nature, as well as the crossover of 13 patients from the temozolomide only group to the TTF plus chemo group after approval and commercial availability of TTF for recurrent GBM.⁷

Vymazal et al. analyzed the response patterns in individuals who exhibited an objective response to TTF in two previous studies in order to evaluate the baseline characteristics of those individuals who responded and to evaluate the relationship between compliance with use and efficacy outcomes.⁸ The analysis was completed on one pilot study ($n=10$) and a phase III trial ($n=237$) in which TTF was compared to standard chemotherapy. Between both studies, TTF was administered as monotherapy in 130 individuals. Across both trials, there was a 15% response rate (16/110 with a 4% complete response rate).⁸ There were no significant differences in baseline characteristics between the responder and nonresponder groups. In those in which a

CLINICAL POLICY
Electric Tumor Treating Fields

response was noted, there was frequently a delayed response, and the tumor would initially continue to grow before responding to treatment. Analysis supported that an increase in compliance was associated with better treatment response and longer overall survival. The extent of treatment response in those who exhibited a response was dependent on compliance (p<0.001).⁸

NovoTal

The NovoTal system (Novocure) is a computer software-planning tool that helps direct placement of transducer arrays for TTF therapy.¹² Few studies have evaluated outcomes of TTF planned by physicians with and without the use of NovoTal, and these are limited to a case series, physician use study, and two review articles. Additionally, many of the authors reported ties to Novocure.

Coding Implications

This clinical policy references Current Procedural Terminology (CPT®). CPT® is a registered trademark of the American Medical Association. All CPT codes and descriptions are copyrighted 2020, American Medical Association. All rights reserved. CPT codes and CPT descriptions are from the current manuals and those included herein are not intended to be all-inclusive and are included for informational purposes only. Codes referenced in this clinical policy are for informational purposes only. Inclusion or exclusion of any codes does not guarantee coverage. Providers should reference the most up-to-date sources of professional coding guidance prior to the submission of claims for reimbursement of covered services.

HCPCS Codes	Description
A4555	Electrode/transducer for use with electrical stimulation device used for cancer treatment, replacement only
E0766	Electrical stimulation device used for cancer treatment, includes all accessories, any type

Reviews, Revisions, and Approvals	Revision Date	Approval Date
Policy adopted from Health Net Electric Tumor Treating fields policy.	04/17	05/17
Added new diagnosis of glioblastoma as medically necessary.	06/17	06/17
References reviewed and updated. Background updated. Codes reviewed.	03/18	03/18
Added contraindications per product operating instructions. Added that treatment is for 90 days initially, or for an additional 90 days at a time and there was no evidence of disease progression in last 90 days on TTF therapy. Specialist reviewed.	03/19	03/19
Added age restriction of ≥ 22 years. Background updated. References reviewed and updated.	02/20	03/20
Replaced all instances of member with member/enrollee. Removed the phrase “not medically necessary” from criteria II. and III. References reviewed and updated.	02/21	03/21

Reviews, Revisions, and Approvals	Revision Date	Approval Date
Annual review. Replaced I/E language in II & III “with insufficient evidence to support...”Changed “review date” in the header to “date of last revision” and “date” in the revision log header to “revision date.” References reviewed, updated and reformatted. Reviewed by specialist.	12/21	12/21
Annual review. Added Criteria I.A.3. and Criteria I.B.2. to include that the member/enrollee agrees to wear the device 18 hours per day, and for continuation of therapy, has also been compliant with the wearing the device in the prior authorization period. Background updated with no impact on criteria. Removed ICD-10 codes. References reviewed and updated.	11/22	11/22

References

1. Novocure. Optune Instructions for Use. Document Number QSD-QR-703: Revision 02. https://www.optune.com/Content/pdfs/Optune_IFU_8.5x11.pdf. Published January 2019. Accessed October 31, 2022.
2. NCCN Clinical Practice Guidelines in Oncology- Version 2.2021. National Comprehensive Cancer Network website. www.nccn.org. Published September 8, 2021. Accessed October 28, 2022.
3. Stupp R, Wong ET, Kanner AA, et al. NovoTTF-100A versus physician’s choice chemotherapy in recurrent glioblastoma: a randomized phase III trial of a novel treatment modality. *Eur J Cancer*. 2012;48(14):2192 to 2202. doi:10.1016/j.ejca.2012.04.011
4. United States Food and Drug Administration. Optune Approval (Formerly the NovoTTF-100A System): P100034/S013. http://www.accessdata.fda.gov/cdrh_docs/pdf10/P100034S013a.pdf. Published October 05, 2015. Accessed October 31, 2022.
5. Stupp R, Taillibert S, Kanner AA, et al. Maintenance Therapy With Tumor-Treating Fields Plus Temozolomide vs Temozolomide Alone for Glioblastoma: A Randomized Clinical Trial. *JAMA*. 2015;314(23):2535 to 2543. doi:10.1001/jama.2015.16669
6. Health Technology Assessment. Tumor treating fields (Optune) for treatment of glioblastoma. Hayes. www.hayesinc.com. Published Dec 27, 2019 (annual review December 13, 2021). Accessed October 28, 2022.
7. Kesari S, Ram Z;EF-14 Trial Investigators. Tumor-treating fields plus chemotherapy versus chemotherapy alone for glioblastoma at first recurrence: a post hoc analysis of the EF-14 trial. *CNS Oncol*. 2017;6(3):185 to 193. doi:10.2217/cns-2016-0049
8. Vymazal J, Wong ET. Response patterns of recurrent glioblastomas treated with tumor-treating fields [published correction appears in *Semin Oncol*. 2015 Jun;42(3):e44 to 55]. *Semin Oncol*. 2014;41 Suppl 6:S14 to S24. doi:10.1053/j.seminoncol.2014.09.009
9. Stupp R, Taillibert S, Kanner A, et al. Effect of Tumor-Treating Fields Plus Maintenance Temozolomide vs Maintenance Temozolomide Alone on Survival in Patients with Glioblastoma: A Randomized Clinical Trial. [published correction appears in *JAMA*. 2018 May 1;319(17):1824]. *JAMA*. 2017;318(23):2306 to 2316. doi: 10.1001/jama.2017.18718
10. Batchelor T. Initial treatment and prognosis of IDH-wildtype glioblastoma in adults. UpToDate. www.uptodate.com. Published July 28, 2022. Accessed October 31, 2022.

11. Batchelor T, Shih HA, Carter BS. Management of recurrent high-grade gliomas. UpToDate. www.uptodate.com. Published July 26, 2022. Accessed October 28, 2022.
12. Connelly J, Hormigo A, Mohilie N, Hu J, Chaudhry A, Blondin N. Planning TTFields treatment using the NovoTAL system-clinical case series beyond the use of MRI contrast enhancement. *BMC Cancer*. 2016;16(1):842. Published 2016 Nov 4. doi:10.1186/s12885-016-2890-0
13. Zhu P, Zhu JJ. Tumor treating fields: a novel and effective therapy for glioblastoma: mechanism, efficacy, safety and future perspectives. *Chin Clin Oncol*. 2017;6(4):41. doi:10.21037/cco.2017.06.29
14. Mittal S, Klinger NV, Michelhaugh SK, Barger GR, Pannullo SC, Juhász C. Alternating electric tumor treating fields for treatment of glioblastoma: rationale, preclinical, and clinical studies. *J Neurosurg*. 2018;128(2):414 to 421. doi:10.3171/2016.9.JNS16452
15. Mrugala MM, Engelhard HH, Dinh Tran D, et al. Clinical practice experience with NovoTTF-100A™ system for glioblastoma: The Patient Registry Dataset (PRiDe). [published correction appears in *Semin Oncol*. 2015 Jun;42(3):e33 to 43]. *Semin Oncol*. 2014 Oct;41 Suppl 6:S4 to S13. doi:10.1053/j.seminoncol.2014.09.010
16. Local coverage determination: Tumor treatment field therapy (TTFT) (L34823). Centers for Medicare and Medicaid Services Web site. <http://www.cms.hhs.gov/mcd/search.asp>. Published October 1, 2015 (revised January 01, 2020). Accessed October 31, 2022.

Important Reminder

This clinical policy has been developed by appropriately experienced and licensed health care professionals based on a review and consideration of currently available generally accepted standards of medical practice; peer-reviewed medical literature; government agency/program approval status; evidence-based guidelines and positions of leading national health professional organizations; views of physicians practicing in relevant clinical areas affected by this clinical policy; and other available clinical information. The Health Plan makes no representations and accepts no liability with respect to the content of any external information used or relied upon in developing this clinical policy. This clinical policy is consistent with standards of medical practice current at the time that this clinical policy was approved. “Health Plan” means a health plan that has adopted this clinical policy and that is operated or administered, in whole or in part, by Centene Management Company, LLC, or any of such health plan’s affiliates, as applicable.

The purpose of this clinical policy is to provide a guide to medical necessity, which is a component of the guidelines used to assist in making coverage decisions and administering benefits. It does not constitute a contract or guarantee regarding payment or results. Coverage decisions and the administration of benefits are subject to all terms, conditions, exclusions and limitations of the coverage documents (e.g., evidence of coverage, certificate of coverage, policy, contract of insurance, etc.), as well as to state and federal requirements and applicable Health Plan-level administrative policies and procedures.

This clinical policy is effective as of the date determined by the Health Plan. The date of posting may not be the effective date of this clinical policy. This clinical policy may be subject to applicable legal and regulatory requirements relating to provider notification. If there is a discrepancy between the effective date of this clinical policy and any applicable legal or regulatory requirement, the requirements of law and regulation shall govern. The Health Plan

CLINICAL POLICY

Electric Tumor Treating Fields

retains the right to change, amend or withdraw this clinical policy, and additional clinical policies may be developed and adopted as needed, at any time.

This clinical policy does not constitute medical advice, medical treatment or medical care. It is not intended to dictate to providers how to practice medicine. Providers are expected to exercise professional medical judgment in providing the most appropriate care, and are solely responsible for the medical advice and treatment of members/enrollees. This clinical policy is not intended to recommend treatment for members/enrollees. Members/enrollees should consult with their treating physician in connection with diagnosis and treatment decisions.

Providers referred to in this clinical policy are independent contractors who exercise independent judgment and over whom the Health Plan has no control or right of control. Providers are not agents or employees of the Health Plan.

This clinical policy is the property of the Health Plan. Unauthorized copying, use, and distribution of this clinical policy or any information contained herein are strictly prohibited. Providers, members/enrollees and their representatives are bound to the terms and conditions expressed herein through the terms of their contracts. Where no such contract exists, providers, members/enrollees and their representatives agree to be bound by such terms and conditions by providing services to members/enrollees and/or submitting claims for payment for such services.

Note: For Medicaid members/enrollees, when state Medicaid coverage provisions conflict with the coverage provisions in this clinical policy, state Medicaid coverage provisions take precedence. Please refer to the state Medicaid manual for any coverage provisions pertaining to this clinical policy.

Note: For Medicare members/enrollees, to ensure consistency with the Medicare National Coverage Determinations (NCD) and Local Coverage Determinations (LCD), all applicable NCDs, LCDs, and Medicare Coverage Articles should be reviewed prior to applying the criteria set forth in this clinical policy. Refer to the CMS website at <http://www.cms.gov> for additional information.

©2017 Centene Corporation. All rights reserved. All materials are exclusively owned by Centene Corporation and are protected by United States copyright law and international copyright law. No part of this publication may be reproduced, copied, modified, distributed, displayed, stored in a retrieval system, transmitted in any form or by any means, or otherwise published without the prior written permission of Centene Corporation. You may not alter or remove any trademark, copyright or other notice contained herein. Centene[®] and Centene Corporation[®] are registered trademarks exclusively owned by Centene Corporation.