NovoTTF-100A System

The NovoTTF-100A System (NovoTTF™ Therapy, Novocure Inc.) is a device that delivers alternating electric fields (TTFields) to tumor cells and interferes with mitosis.

Because it has a similar efficacy to cytotoxic chemotherapy, the device has been approved by the United States Food and Drug Administration and CE mark in Europe for the treatment of recurrent glioblastoma who have exhausted surgical and radiation treatments.

It was FDA approved in April 2011 for the treatment of patients 22 years or older with recurrent glioblastoma (rGB) [1].

The NovoTTF-100A System is a portable, battery-operated medical device that connects to the scalp. It is comprised of two main components:

An electric field generator (the NovoTTF-100A device)4 INE insulated transducer arrays How does the NovoTTF-100A System work?

Essentially, the NovoTTF-100A System creates an electric field around the tumor to disrupt the growth and reproduction of cancer cells in the brain.

First, insulated transducer arrays (electrodes) are placed on the scalp using special adhesive material. The transducer arrays deliver low intensity, alternating electrical fields (called tumor treating fields, or “TTFields”) to the brain to disrupt tumor cell division and inhibit tumor growth.

Depending on your treatment plan, your oncologist may have you wear the device for at least 18 hours per day, for at least four weeks. After charging the battery, you may be able to carry the device in a special shoulder bag or backpack for a few hours at a time to receive treatment without disrupting your daily routine.

The most commonly reported side effect from NovoTTF is a mild-to-moderate scalp rash (beneath the electrodes).

Who is eligible for the NovoTTF-100A System?

The NovoTTF-100A is generally used for patients who have a recurrence of cancer in the brain after receiving chemotherapy, and after surgical and radiation options have been exhausted.

Patients with an active implanted medical device (e.g., a pacemaker), a skull defect (e.g., a missing bone with no replacement) or bullet fragments are not eligible to use NovoTTF-100A.

Adverse events

The occurrence of dermatologic adverse events (dAEs) is primarily due to the continuous contact between the array-related components and the scalp for periods of 3-4 days (together with other risk factors). These dAEs may include allergic and irritant dermatitis, mechanical lesions, ulcers, and skin infection. The incidence of dAEs in the phase III trial (n = 116) was 16% (2% grade 2, 0% grade 3/4); the post-marketing surveillance program (n = 570) revealed 156 (21.8%) dAEs with some patients reporting more than one event. Prophylactic strategies for dAEs include proper shaving and cleansing of the scalp and array relocation. Treatment-based strategies are AE-specific and include topical or

oral antibiotics, topical corticosteroids, and isolation of affected skin areas from adhesives and pressure. The addition of skin care strategies to the NovoTTF-100A System use will maximize adherence to therapy while maintaining quality of life, all of which contribute to the therapeutic benefit of NovoTTF Therapy in rGB [2].

[1]
Omar AI. Tumor treating field therapy in combination with bevacizumab for the treatment of recurrent glioblastoma. J Vis Exp. 2014 Oct 27;(92):e51638. doi: 10.3791/51638. PubMed PMID: 25407354.
[2]
Lacouture ME, Davis ME, Elzinga G, Butowski N, Tran D, Villano JL, DiMeglio L, Davies AM, Wong ET. Characterization and management of dermatologic adverse events with the NovoTTF-100A System, a novel anti-mitotic electric field device for the treatment of recurrent glioblastoma. Semin Oncol. 2014 Jun;41 Suppl 4:S1-14. doi: 10.1053/j.seminoncol.2014.03.011. Epub 2014 Mar 19. PubMed PMID: 24794308.