



ECCT
Electro-Capacitive
Cancer Therapy

Electro-Capacitive Cancer Therapy (ECCT) Patient Guide

Innovative Cancer Treatment Through Targeted
Electric Fields



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Introduction to Electro-Capacitive Cancer Therapy (ECCT)

What is ECCT?

Electro-Capacitive Cancer Therapy (ECCT) is an innovative, non-invasive therapeutic approach designed for the treatment of malignant tumors by disrupting the mitosis (cell division) of cancer cells. The therapy applies low-frequency (<100KHz), and low-intensity (<30Vpp) electric fields generated by capacitance electrodes embedded in wearable devices. ECCT selectively targets and interrupts the mitotic spindle formation in cancer cells without affecting normal cells, leveraging the increased electrical properties (such as conductivity and permittivity) of malignant cells compared to healthy ones.

How Does ECCT Work?

ECCT devices produce electric fields that influence cancer cell polarization, specifically disrupting the microtubule structures responsible for dividing cells. Cancer cells are more sensitive to electric fields due to their hyperpolarized microtubules, making ECCT particularly effective during the mitosis phase. By applying the correct frequency and intensity, ECCT induces mitotic arrest, leading to cell death (apoptosis).

Detailed Science Behind ECCT

Principles of Electric Field Interaction in Cancer Therapy

Cancer cells exhibit a unique susceptibility to external electric fields, especially during the cell division phase. Microtubule polymers in cancer cells are responsible for forming the mitotic spindle. These polymers are highly polarized, which makes them responsive to electric fields. ECCT utilizes this vulnerability by generating a near-field, capacitance-driven electric field surrounding the tumor site. This disrupts the polymerization of microtubules, causing mitotic catastrophe and eventual cell death.

- **Mitosis Disruption:** ECCT primarily targets cells during the G2/M phase, where the microtubules align for chromosome separation. By destabilizing this process, ECCT forces the cells into apoptosis.
- **Selectivity of ECCT:** Cancer cells have a higher dielectric constant due to their elevated water content and ionic conductivity, which makes them more responsive to electric fields than normal cells. This selectivity allows ECCT to preferentially target cancer cells.

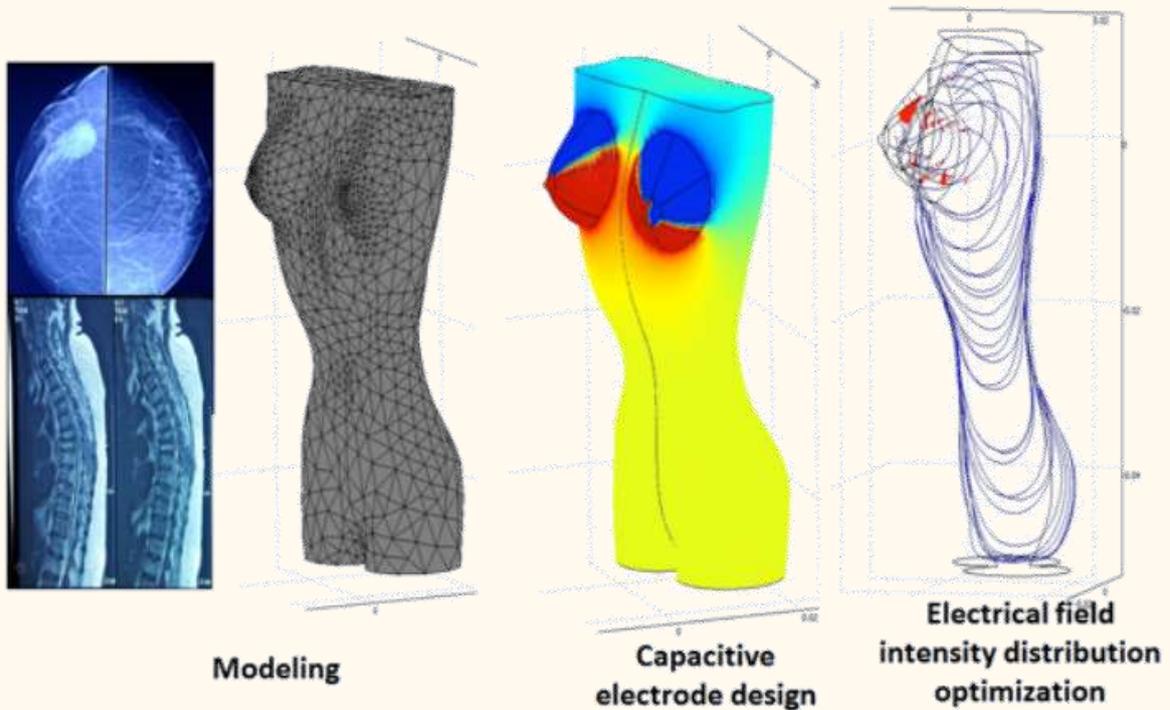


Figure 1: Three steps of ECCT treatment stepwise: (1) Finite element method modeling based on the location of the tumor in MRI or CT scan images, (2) Electrode design and electric field computation, and (3) Optimization of required electric field intensity distribution.

Mechanism of Action

- **Electrical Interference:** The therapy works by generating oscillating electric fields using capacitance electrodes placed around the tumor. These fields affect the intracellular electric balance, altering the microtubule dynamics and causing a breakdown of the spindle apparatus, leading to mitotic failure and apoptosis.
- **Cancer Cell Vulnerability:** Due to higher conductivity and permittivity, cancer cells experience enhanced electric tension during mitosis, making them more susceptible to the field's influence than normal cells. This difference ensures that ECCT is minimally harmful to non-dividing healthy tissues.

In-depth Examination of Frequency, Intensity, and Waveform

ECCT devices operate within the low-frequency range, typically between 1–100 kHz, with voltage amplitudes less than 30 volts peak-to-peak (Vpp). This range has been optimized based on preclinical studies to maximize disruption of cancer cell mitosis while maintaining patient safety.

- **Waveform Modulation:** ECCT utilizes square and sinusoidal waveforms to effectively induce microtubule disruption. Studies show that square waves provide more rapid disruption compared to sinusoidal waves, making them the preferred method for aggressive cancers.
- **Frequency Optimization:** The frequency is tailored to the specific type of cancer based on its pathology. For instance, aggressive, fast-dividing cancers such as glioblastoma may require higher frequencies to achieve effective mitotic disruption.

The Process of ECCT Treatment

ECCT Device Components

- **Capacitance Electrode Apparel:** The key to ECCT's effectiveness is its customized apparel, which houses the electrodes. These electrodes are designed to fit around the patient's tumor, ensuring that the electric fields are focused precisely where needed. For metastatic cancers, additional apparel may be provided to target secondary sites.
- **Oscillator:** This component generates low-intensity electric fields at pre-set frequencies. The frequency and intensity are adjusted based on the cancer stage and the patient's response.

Steps in the ECCT Treatment Protocol

1. **Tumor Localization:** Before treatment begins, MRI and CT scans are used to map the precise location and extent of the tumor. This information guides the design of the electrode apparel.

2. **Electrode Customization:** Using advanced finite element modeling (FEM), the capacitance electrode design is optimized for each patient based on the tumor's size, depth, and location.
3. **Application of Electric Fields:** During each treatment session, the patient wears customized apparel, and the oscillator delivers the electric field. The therapy is administered twice daily for periods ranging from 5–15 minutes depending on the cancer's aggressiveness and the patient's tolerance.
4. **Monitoring and Adjustment:** After each treatment session, the patient's response is monitored through clinical exams and imaging. The frequency and intensity of the treatment may be adjusted based on progress.

Expected Outcomes of ECCT

Timeframe for Results

- **Early-stage cancers:** Tumor shrinkage may occur within weeks to months.
- **Advanced-stage cancers:** More aggressive or metastatic cancers may require several months to a year for significant results.

Removal of Dead Cancer Cells

Following the death of cancer cells, the body's immune system removes these cells naturally through excretory processes. In some cases, patients may notice an increase in urine output, darker urine, or foul-smelling sweat, feces, or phlegm, which indicates that the body is clearing the dead cells.

Detailed Examination of Cancer Types Treated by ECCT

Breast Cancer

- **Stage 0–1:** For early-stage tumors (<1 cm), ECCT has shown tumor eradication within 4–6 months.
- **Stage 2–3:** For medium-sized tumors with regional metastasis, ECCT, in conjunction with surgery, significantly improves outcomes. Dead cells are removed via the lymphatic system and excretory organs.

Lung Cancer

- **Primary and Metastatic Treatment:** The ECCT vest, covering the thorax and targeting the lungs, applies field energy to both primary and metastatic lung cancers. Most patients experience tumor reduction within 6–12 months of consistent use.

Brain Cancer (Glioblastoma, Astrocytoma)

- **ECCT Helmet for Brain Tumors:** Glioblastomas and other aggressive brain cancers are treated with a specialized helmet, applying field energy directly to the tumor site. Case studies show tumor reduction within 3–6 months, with continued improvements seen over a year.

Side Effects and Mitigation Strategies

Common Side Effects

- **Skin Irritation:** Mild irritation at the electrode sites is the most reported side effect.
- **Excretory Symptoms:** Patients often experience changes in urine, feces, and sweat as the body removes dead cells.

Post-Treatment Monitoring

Continuous post-treatment monitoring is essential to evaluate the removal of dead cells. In some cases, surgical intervention may be necessary to remove necrotic tissue if the body cannot efficiently excrete all dead cells.

Case Studies and Clinical Evidence

- **Breast Cancer Case Study:** A 47-year-old woman with invasive ductal carcinoma experienced complete remission after 7 months of ECCT. PET-CT scans showed the complete absence of cancerous activity following therapy.

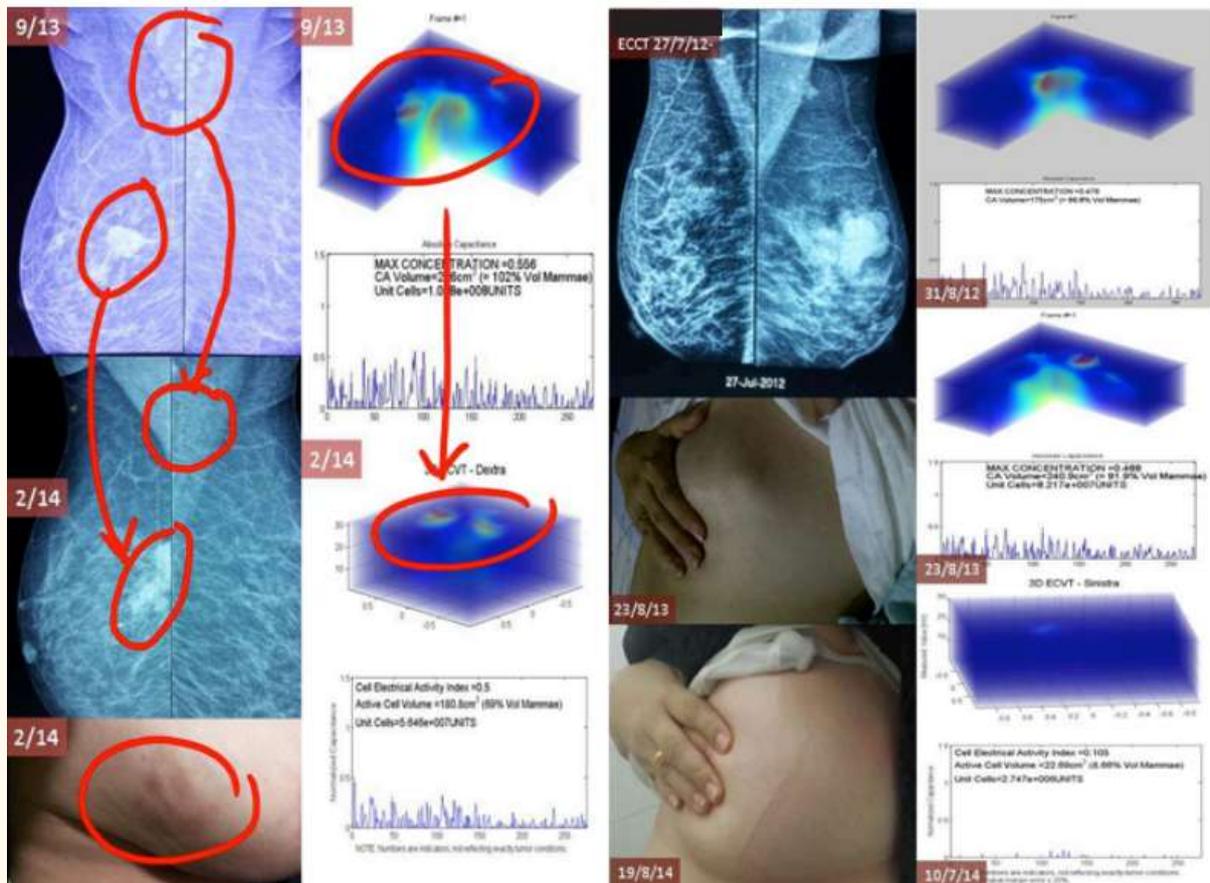


Figure 2: Mammogram and photograph of breast cancers during the ECCT treatment along with the image of electrical properties taken by ECVT.

- **Lung Cancer Case Study:** A 43-year-old male with a 12 cm lung mass demonstrated significant tumor shrinkage within 1 year of treatment. The patient’s pleural effusion subsided, and he resumed normal activity.
- **Brain Cancer Case Study:** A 9-year-old boy with high-grade glioblastoma experienced complete tumor remission within 6 months of treatment, as evidenced by MRI scans.

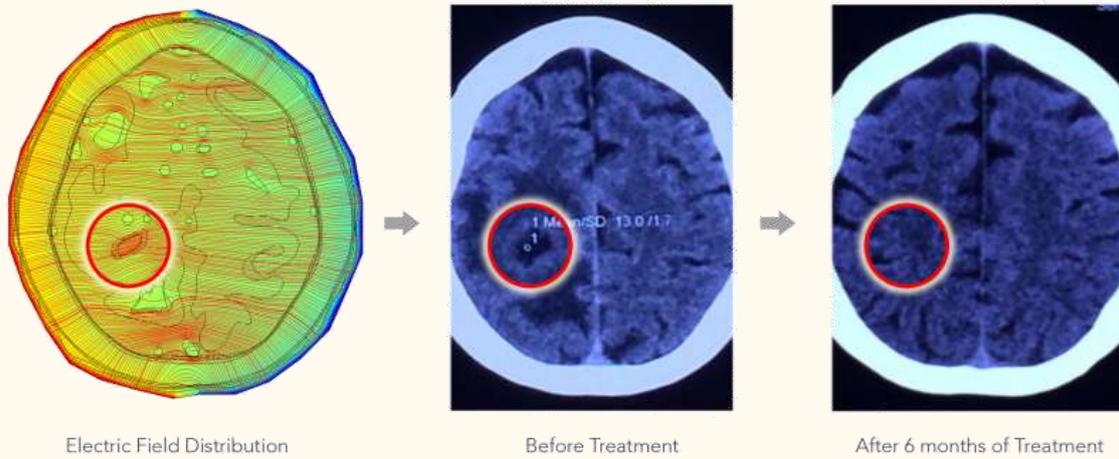


Figure 3: General procedure of ECCT treatment for brain cancer: the electric field computation and subsequent CT scan images of the brain cancer before and after ECCT treatment.

Contact Information

Electro-Capacitive Cancer Therapy represents a significant advance in non-invasive cancer treatment, offering an alternative for patients with limited options. For more detailed information, and research publications, or to schedule a consultation, please contact our medical team at info@yourwebsite.com.