A simple solution for challenging situations
PHYSICS AND CHEMISTRY TOGETHER IN THE FIGHT AGAINST TUMOURS

PHYSICS
The application of electric pulses to the tumour tissue induces the formation of pores across the plasma membrane: electroporation.

CHEMISTRY
The pores allow the diffusion into the cell of poorly permeant drugs, significantly increasing the drug intracellular concentration and thus its cytotoxicity.

ELECTROCHEMOTHERAPY IN CLINICAL PRACTICE
The combination of physics and chemistry is the foundation for electrochemotherapy and its efficacy, which is independent of the tumour histology.

The efficacy of bleomycin in the treatment of melanoma is increased by over 100% when associated with electroporation.

*Bleomycin i.t. vs Bleomycin i.t. + Electroporation in metastatic melanoma [Byrne CM, 2005]*.
ELECTROCHEMOTHERAPY: FAST AND EFFECTIVE

THE COMBINATION OF HIGH POWER ELECTRONICS AND MICROELECTRONICS

The easy to use CLINIPORATOR system completes electroporation of tumour cells in just a few minutes, minimising operating room usage. The short treatment time allows multiple lesions to be treated in a single session.

The TOUCH SCREEN facilitates the CLINIPORATOR use through a simple and clear graphic interface.

The REAL-TIME MEASUREMENT of the electric current passing through the tumour tissue provides an indication of effective electroporation.

Electroporation is obtained using DEDICATED ELECTRODES designed for cutaneous lesions, mucosa and subcutaneous tumour tissue up to a depth of 3 cm. Large tumour nodules can be treated with repeated applications of electric pulses.

Adjustable Electrodes (Hexagonal) | Adjustable Electrodes (Linear) | Finger electrodes for the treatment of nodules in body cavities

Needle electrodes

CLINIPORATOR complies with the requirements of the Medical Device Directive and it is marked under the control of The Notified Body IMQ.
ELECTROCHEMOTHERAPY
STANDARD OPERATING PROCEDURES

INDICATIONS FOR USE
Electrochemotherapy is indicated in the local treatment of cutaneous and subcutaneous metastatic lesions regardless of tumour histology and ongoing or previous treatments.

Demonstrated effectiveness, complete response and long term tumour control, justify its use in the early treatment of cutaneous metastases.

ADVANTAGES
- Thirty minutes treatment time
- Out-patient procedure
- Repeatability
- Does not preclude other treatments
- Minimal side effects

The STANDARD OPERATING PROCEDURES, prepared and validated in the ESOPE study (European Standard Operating Procedures for Electrochemotherapy), describe precisely the drug dosing, the electric field amplitude applied and the treatment schedule to obtain reproducible positive results on all tumour types [Mir LM, 2006].
**ELECTROCHEMOTHERAPY**

**IS INDICATED IN PATIENTS**

**WITH STAGE III B/C AND IV M1 MELANOMA AND**

**CAN BE CONSIDERED AN ELECTIVE TREATMENT FOR**

**METASTASES LOCATED ON THE TRUNK.**

Several independent clinical studies (validated by a systematic review and meta analysis have demonstrated that more than 80% of metastases from melanoma respond to treatment using the CLINIPORATOR system. The palliation of bleeding and painful lesions occurs within a few days of the therapy. Treatment response can be assessed by two weeks post procedure.

**LOCAL RECURRENCES FOLLOWING ELECTROCHEMOTHERAPY ARE RARE**

Complete response is confirmed by the absence of tumour cells, as shown by histological analysis [Quaglino P, 2008].

### ADVANTAGES

- Objective response rate > 80%
- Repeatability
- Tissue sparing and preservation of organ function
- Long term local control

### OTHER SKIN TUMOURS

Electrochemotherapy is successfully used for the treatment of:
- Basal cell carcinoma
- Squamous cell carcinoma
- Kaposi’s Sarcoma
- Gorlin-Goltz syndrome
- Merkel cell carcinoma
LOCAL RECURRENCES AND CUTANEOUS METASTASES FROM BREAST CANCER

THE IMPORTANCE OF LOCAL TUMOUR CONTROL
A meta-analysis conducted by Clarke M [Lancet, 2005] demonstrates that the association of systemic and local control in breast cancer treatment improves by 4.9% the overall survival at 15 years. Clinical evidence from multiple independent reports demonstrates that electrochemotherapy is an effective treatment for local recurrences and skin metastases from breast cancer, with an objective response rate of 70%.

ADVANTAGES
- Objective response rate > 70%
- Efficacy in areas previously treated with radiation therapy
- Palliation of painful, ulcerated or bleeding lesions
- Improved quality of life and cosmetic results
- Concomitant use with other therapies

LOCAL TUMOUR CONTROL
Local tumour control in 35 BC patients treated with ECT for refractory chest wall recurrence. 
(a) Local progression-free survival (LPFS) on the electroporated metastases.
(b) New lesion-free survival (NLFS) (e.g., free from new skin lesions on the chest wall in non-electroporated areas) [Campana LG, 2012].

<table>
<thead>
<tr>
<th>Patient</th>
<th>15</th>
<th>5</th>
<th>35</th>
<th>12</th>
<th>55</th>
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<tbody>
<tr>
<td>Nodules</td>
<td>99</td>
<td>23</td>
<td>516</td>
<td>142</td>
<td>212</td>
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</table>

% patient objective response
- Larkin JO, 2007: 73%
- Matthié M, 2011: 80%
- Campana LG, 2012: 91%
- Benevento R, 2012: 92%
- Campana LG, 2014: 87%
Electrochemotherapy in Head and Neck cancers is an effective tool for radical local disease control and as a neoadjuvant treatment. For locally advanced challenging Head and Neck cancers it can be a first line treatment [Gargiulo M, 2010].

Head and Neck cancers are most often associated with squamous cell carcinoma and are characterised by locally aggressive lesions and high risk of relapse. This disease is usually controlled with local treatments.

Electrochemotherapy is indicated for Head and Neck cancers due to the treatment efficacy and the minimal effect on normal tissue and organ function.

Electrochemotherapy in Head and Neck cancers is an effective tool for radical local disease control and as a neoadjuvant treatment. For locally advanced challenging Head and Neck cancers it can be a first line treatment [Gargiulo M, 2010].

**ADVANTAGES**

- Effective treatment for local recurrence and skin metastases
- Cytoreduction as adjuvant to surgery
- Preservation of normal tissue and organ function
- Palliation of painful, ulcerated or bleeding lesions
- Efficacy in previously irradiated areas
- Repeatability

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**HEAD AND NECK CANCERS**

<table>
<thead>
<tr>
<th>Patient</th>
<th>Nodules</th>
<th>% patient objective response</th>
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</thead>
<tbody>
<tr>
<td>Mevio N, 2012</td>
<td>31</td>
<td>14%</td>
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<td>Gargiulo M, 2012</td>
<td>25</td>
<td>25%</td>
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<td>Calvieri S, 2012</td>
<td>58</td>
<td>33%</td>
</tr>
<tr>
<td>Benevento R, 2013</td>
<td>10</td>
<td>8%</td>
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<tr>
<td>Campana LG, 2014</td>
<td>81</td>
<td>42%</td>
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</table>

**INDICATIONS**

- Effective treatment for local recurrence and skin metastases
- Cytoreduction as adjuvant to surgery
- Preservation of normal tissue and organ function
- Palliation of painful, ulcerated or bleeding lesions
- Efficacy in previously irradiated areas
- Repeatability

**Squamous Cell Carcinoma**

Before therapy

After 2 months

Courtesy of Fondazione IRCCS Policlinico San Matteo University Pavia.
BIBLIOGRAPHY

- Mir LM, et al. Standard operating procedures of the electrochemotherapy: Instructions for the use of bleomycin or cisplatin administered either systemically or locally and electric pulses delivered by the Cliniporator® by means of invasive or non-invasive electrodes. EJC 2006; Suppl 4:14-25.
- 52(10):957-64.