Craniocerebral Therapeutic Hypothermia Equipment

How can technology of local brain cooling assist World Healthcare?
What we do:

Development и production of craniocerebral therapeutic hypothermia equipment line
Introduction of craniocerebral hypothermia into medical practice
Development of methodologies of craniocerebral hypothermia
Scientific research of craniocerebral hypothermia

Mission statement:

Development of effective and economically efficient hypothermia technologies with aim to improve resuscitation and rehabilitation outcomes:
- reduction of mortality
- reduction of rehabilitation period
- protection of health and preventive healthcare
- improvement of quality of life

Support:

Agency of Strategic Initiatives (RUS)
Skolkovo Innovation Centre (RUS)
What is craniocerebral hypothermia?

«Craniocerebral hypothermia is controlled cooling of the brain, which reduces metabolism of neurons, enhances strength of cell membranes, decreases their requirement in oxygen, and as a result makes them more viable.»
When is craniocerebral hypothermia necessary?

«In case of diseases which are accompanied by overheating of the brain and result in destruction of the neurons, causing death and disability»
Why is craniocerebral hypothermia necessary?
Diseases which are accompanied by overheating of the brain

- Brain injuries
- Cerebrovascular diseases
- Addictions

- 98 out of 100 prize winning sportsmen get severe injuries
- 17 million people die yearly worldwide
- 270 million suffer from addictions and alcoholism worldwide
Solution
Craniocerebral therapeutic hypothermia equipment «THE-01»

Craniocerebral hypothermia induced with «THE-01»:
- Can form local cerebral hypothermia
- Brain $T^0\text{C} < \text{Body } T^0\text{C}$
- Can also induce general hypothermia (cool the whole body)
- No complications or side effects
- No requirement for sedation and myorelaxation
- Applicable in various states of consciousness
«THE-01»

- Improves pharmacoeconomical characteristics of the medical care
- Improves cognitive abilities and reduces fatigue
- Reduces time in the resuscitation units by 1.5 times
- Halves neurological deficit
- Halves death rate among patients in critical conditions

More than 5,000 people have been treated in Russia and Kazakhstan clinics with defined therapeutic effect and without side effects and complications.
How does it work?

«When craniocerebral hypothermia initiates neuroprotection, one can benefit from it long after cooling»
Lesion is formed (E)

Central heat inflows (D) aggravate formation of hypothermia in the brain.

Temperature rises in the area of lesion (E) (up to 41°C) and neurons start to get destroyed.

Temperature reduction control is registered in the ear canal (C)

Cryoapplier in the form of helmet cools scalp (A) and allows for contact heat removal from the hairy part of the scalp skin (B). This enhances strength of cell membranes and decreases their requirement in oxygen, making them more viable.

Cryoapplier also cools down venous blood of the head which gradually spreads all over the brain (F), including core area of lesion (E), reduces it's temperature and initiates neuroprotection.

Edema is formed around it area of lesion (E), which does not allow for the cold blood flow to reach core of hyperthermia area.
Wide range of application

Pathologies, which cause overheating of the brain

- Depression
- Affective disorders
- Anxiety
- Central nervous system diseases
- Parkinson
- Alzheimer
- Psycho-emotional, physical and intellectual pressure

- Cardiovascular diseases
- Neuronal headaches
- Strokes
- Hypertensive crisis
- Heart attacks
- Migraines
Our offer
«THE-01»
Original stationary model

Registered in RF
Registration certificate FSR 2011/11788 on 12.12.2017
Declaration of compliance ROC RU.IM.25.Д01359 on 08.11.2017

Ready for serial production
Methodological recommendations for emergency medicine and neurology are approved

«THE-02P»
Compact, portable model

Beta testing
Registration process is in progress
<table>
<thead>
<tr>
<th>Device for human body local cooling/heading</th>
<th>RF Patent no. 94149</th>
<th>20.05.2010</th>
<th>22.12.2019</th>
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<tbody>
<tr>
<td>Device for human scalp and brain cord cooling</td>
<td>RF Patent no. 96762 dd. 20.08.2010</td>
<td>20.08.2010</td>
<td>08.04.2020</td>
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<td>Heat exchanger for human body local cooling systems</td>
<td>RF Patent no. 97504 dd. 10.09.2010</td>
<td>10.09.2010</td>
<td>08.04.2020</td>
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<td>Device for human body local cooling</td>
<td>RF Patent no. 83369 dd. 16.10.2012</td>
<td>16.10.2012</td>
<td>30.03.2026</td>
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<tr>
<td>Device for therapeutic hypothermia induction</td>
<td>RF Patent no. 126262, 2013</td>
<td>27.03.2013</td>
<td>28.08.2022</td>
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<td>«Method of diagnostics and management of cerebral hypothermia syndrome»</td>
<td>RF Patent no. 2645927</td>
<td>15.06.2017</td>
<td>15.06.2037</td>
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<td>«Device for conduction of controlled therapeutic hypothermia of the brain»</td>
<td>RF Patent no. 2653794</td>
<td>14.05.2018</td>
<td>25.08.2037</td>
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<tr>
<td>Application for «Device for induction of controlled hypothermia of the brain»</td>
<td>PCT/RU2017/000633</td>
<td>In progress</td>
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<tr>
<td>Application for «Method of therapy of knee joints using deep local hypothermia»</td>
<td>RF Patent no. 2018106482</td>
<td>In progress</td>
<td>In progress</td>
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</table>
Simplicity and cost effectiveness are among many of our advantages over competitors.

We offer:

- Individual approach and widest range of application: suitable for conscious state, coma, medical anesthesia
- Safest and most convenient method: no pharmacological assistance required, no complications, no side effects
- Reduction of expenses to hospitals
- The most attractive price for equipment and consumables on the market
  - cryoapplcators – reusable consumables (6 months)
We are ready for cooperation!

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