Frequently Asked Questions [F.A.Q.]

C200 Respiratory Tecar Specialty

CAPENERGY has developed this list of common questions and answers to give a quick feedback to people who are unaware of the therapeutic possibilities of Capenergy C200 Respiratory (RF) High Power Tecartherapy. This device transfers energy by means of capacitive and resistive coupling to the lung area, and stimulates the trophism through an endogenous increase in temperature produced by the patient himself (not carried by conduction or convection from the outside, but by transfer of a cold energy selectively and strategically introduced on the treatment area). This thermal increase can be dosed according to the foreseen indication and phase of the pathology to be treated. The accessories are applied to adults in the thoracic region, placing two flat moldable emitting accessories over the frontal area, and two receiving accessories in the upper dorsal region. This technology is safe and has no apparent side effects from overdosing. The risk of burns is controlled by thermal sensors, by a safety command operated by the patient, and by a system for programming the device at a target temperature.

1. When should C200 Respiratory Capenergy be used?

The equipment should be used in all those patients who present lower respiratory symptoms, cough, shortness of breath and dyspnea on exertion, radiographic images of lung damage.

2. How long should it be used?

High Power Radiofrequency should be used until patients remit in symptoms.

3. How does RF improve patient oxygenation?

Radiofrequency works by two mechanisms. On the one hand, it produces vasodilation, which leads to a better contribution to the tissues, including the lung, and on the other hand, it increases vascularity through two mechanisms:

1. vasodilation and
2. the generation of new blood vessels.

4. Can it affect the prognosis, delaying the moment of intubation?

RF increases immunity, regulates fibroblast production, improves healing, and produces neocollagen, which can help prevent fibrosis. This, together with vascular phenomena, can improve the patient's respiratory distress, and may delay intubation.

5. Could RF decrease systemic inflammation?

RF is localized, although it has also been shown to produce systemic effects.

6. Is the angiogenic effect localized? Systemic? Durable?

In therapy, nothing is lasting: everything depends on the dose and the patient's response.

7. Regarding the technique of use, does your application consume a lot of human time?

The electrodes are placed on the patient's chest, who has them on for 15 minutes, without anyone having to watch. The patient must be conscious and not have hyposensitivity to the sensation of heat. In the case of sensitivity disorders, the equipment should be programmed so that the equipment will acquire a "sailing" temperature that is not susceptible to a burn risk. The patient also has a security command that allows him to stop the course of the session, if he wishes.

8. Does the patient's position influence the application of the technology?

The position in which the technique is done is important. The lung changes its ventilation/perfusion according to how it is put on. Consequently, it is going to change that oxygenation that I mentioned at the beginning. In prone position, it will improve oxygenation, making the apical areas (which are more ventilated) receive more blood flow and the areas of the base that are better perfused, improve their ventilation.

9. Could it be applied prior to the prone maneuver in the ventral areas so that when the patient (the most serious) is in this position, the maneuver is more effective? And could it also be done during the prone?

The ventilation-perfusion ratio is greater in the lower part, diaphragmatic, due to the gravity and movement of the diaphragm. At the apex, there is more air than blood: that is, standing up, by gravity. Lying down everything changes. But here, it's about increasing: one, vasodilation; two, angiogenesis and, finally, immunity. All together will bring a benefit to patients.

10. Cases of medium severity respond better to prone and oxygen therapy (improve oxygenation). Could you apply to these also in prone?

It can be applied in any position: the important thing is to place the plates well, so that they cover the largest lung surface and have the proper coupling to transfer energy to the patient's body.

11. Regarding risks: The monitoring of these patients is very important since they can change in a matter of hours. How does RF affect monitoring?

RF can be monitored and applied. There are even studies of ECG and O^2 saturation and radiofrequency.

12. What about hemodynamics? Some associate myocarditis, pericarditis. Any interaction with anticoagulants and antiplatelets?

No interaction with anticoagulant drugs is known. However, the improvement in the flow of gases and liquids through the body can be intensified, as tecartherapy is already an anticoagulant. For this reason, it is recommended to abstain from using this type of technology in anticoagulated patients. Or, at best, use mobile (non-automatic) accessories, by dissipating energy delivery with the operator's manual massage and monitoring blood coagulation parameters.

13. Is hyposensitivity a limitation in the application of the C200 Respiratory?

No, hyposensitivity is not a limitation of the application of the **C200 Respiratory device**. Conventional diathermy equipments do not have a temperature sensor, so paresthesia or anesthesia is a full contraindication. In the case of Capenergy technology, this limitation does not exist because these devices do have a temperature sensor. Thanks to this sensor, the professional can limit the temperature at which the equipment acts in a customized and targeted manner, and can even treat spinal segmentation patients, as we have done in the past. Even so, it is the only risk that we can run, since there are no other risks derived from its application: that is, there is no adverse effect from overdosing the application. The only bad thing that can happen is that nothing happens. But it will not produce a negative effect because the only thing the device does is enhance a natural biological mechanism, which is metabolic activation by the passage of the electromagnetic field. This metabolic activation in turn produces a 12% increase in basal metabolism for each increased degree and the relaxing and antispasmodic effect of heat. That is, it helps the body to do its natural function more efficiently and with less effort, because it follows the biological mechanisms necessary for that recovery. It only supports and intensifies them when the body does not arrive. Honestly, there are more benefits than harm.

However, if the patient does not have pain sensitivity (for example, Cipa syndrome) or hypo or hyper sensitivity to heat, the patient will perceive the treatment differently and, in hyposensitivity, may suffer burns. These types of scenarios are isolated cases, but in any case must be considered. It is not a limitation: it is a precaution to take into account.

14. In subjects with sedation and analgesia, could it be applied?

Yes, it could. It all depends on the state they were in. The equipment can be programmed both in power and in temperature and time. In these cases, it would work with less power and temperature, so as not to have any risk. Ideally, however, patients who are in advanced stages should receive treatment before reaching these states to achieve better success rates and avoid intubation.

15. Can it be applied in patients with temperatures > 38ºC?

No, in these cases it does not apply. The body is already in a feverish state, probably with the presence of a bacterial infection, and in this case it is contraindicated.

According to the scientific evidence consulted, it is possible to apply the device, however, at low powers that move in low temperatures, even when the body is in a feverish state. This would be done for a shorter period of time and with 10 minute intervals between application. The effect of radiofrequency and (not of temperature) will have the necessary cellular signaling effects to produce the desired effects.

Regarding bacterial infections, in a recent study, Chaurasia and Col in 2016 have indicated that all bacteria can be completely eliminated in 30 minutes due to the loss of membrane potential and the dysfunction of membrane-associated complexes, when they are exposed to the radio frequency current. However, from our side right now, we must contraindicate this option until we have more scientific experience that allows us to provide a more specific dosage.

16. How is the anti-inflammatory effect measured? IL, cytokines?

The effects of RF on voltage-dependent calcium channel proteins have been extensively investigated. Mobilization of intracellular Ca2 + from calciosomes and extracellular Ca2 + by membrane channels play a key role in RF interaction with lymphocytes. The anti-inflammatory effect of RF on cell membranes has been reported to reflect restoration of intracellular Ca2 + levels in plasma cells. Calcium can also trigger the generation of free radicals (FR) and cytokines. Cytokines are intermediaries in the inflammation process, while FRs are intermediaries in mitochondrial metabolism and phagocytosis. FR affect the biological properties of molecules, such as nucleic acid, DNA, and proteins. Reactive oxygen species (ROS), as one of the FR, affect the antioxidant-pro-oxidant balance and thus reduce antioxidant capacity.

The increase in the number of ROS by means of a chain reaction is initiated by the production of nitric oxide (NO) through the stimulation of Ca^{2} + by the enzyme NO synthase. The effects of RF stimulation on macrophages caused increased production of NO and proinflammatory cytokines TNF-α, IL1β, and IL6.

Heat shock proteins 70 (HSP70) can be induced by various stress factors, including heat shock, hyperosmotic stress, oxidative stress, infection, heavy metals, UV irradiation, and also RF exposure. The study showed that exposure of bone marrow-derived mouse macrophages to RF caused an increase in ROS, and HSP70 and HSP110 levels. This suggests that when exposed to RF, NO and ROS stimulate cells to synthesize HSPs. In addition, the concentration of stress protein increases to protect the cell from internal and external stressors.

17. As for the angiogenic effect, is it at the dermal level?

No, not just on a dermal level. Radiofrequency has the impressive ability to pass through the tissues where the treatment is performed. Consequently, the operator establishes a strategy of where he wants to send it, and this is introduced following a path of the transmitting and receiving antenna. Consequently, if we apply our device with an accessory at the vaginal level, we will also generate new vessels at the level of the mucosa. Not only at the cutaneous level, although it is where it can be seen more easily, it is not the only place.

RF increases the degree of tubulization of endothelial cells (seven times) and proliferation (three times) in vitro. Detection of angiogenic proteins demonstrated a five-fold increase in fibroblast growth factor beta-2 (FGF-2), as well as minor increases in other angiogenic growth factors (angiopoietin-2, thrombopoietin, and epidermal growth factor). In vivo, RF exposure increased angiogenesis more than twice. We conclude that PEMF increases angiogenesis primarily by stimulating endothelial release of FGF-2, inducing paracrine and autocrine changes in the surrounding tissue. These findings suggest a potential role for RF in therapeutic angiogenesis.

18. If it stimulates the production of connective tissue, could it not make the lung more fibrotic?

No. In fact, Capenergy equipment is routinely used for just the opposite: to break fibrosis. Whether due to an episiotomy, caesarean section, trauma or keloid, the contribution of circulation produced by our device always helps to erode dead cells, and to bring the circulatory call closer to living cells that can intensify their reproduction to promote new tissue. In fact, we have seen that patients treated for scars with paraesthesia regain their sensitivity to cold, heat, and pressure after treatment. Fibrosis is a consequence of the withdrawal of the blood circulation. Our equipment, on the contrary, what it does is force it to provide nutrients, oxygen, a greater difference in cellular potential, and metabolism (12% more each increased degree).

The application of RF significantly decreases the percentage of cells in the G1 phase, where the cell checks the external and internal conditions, and decides whether to continue with the cell cycle or not, while the percentage increases in the S phase, in which it occurs DNA replication or synthesis, and EMF significantly.

RF significantly affects the cell cycle, increasing the proportion of cells, synthesizing DNA and increasing cell growth.

Zhang et al found that the low EMF frequency did not promote apoptosis. Stem cells are generally destroyed infrequently because the duration of their cell cycle is long or some cells are stopped in the G0 phase in which the cell is "quiescent", that is, it is not dividing, so it is outside of the cell cycle. Radiofrequency tissue volume reduction combined with intralesional steroids is an effective treatment modality for keloids. It is an easy procedure with an acceptable cosmetic result and a lower recurrence rate. So it could be assumed that if applied to the lung the results would be similar.

NOTE.- Of all the aforementioned, the company has a bibliography that supports it.

19. What are the contraindications of the C200 Respiratory Tecartherapy device?

Presence of pacemaker or other electromagnetic implant, valves in the heart, bacterial infection, pregnancy, neoplasms, anticoagulants, HIV, with immunosuppressants, severe heart disease. Some of these contraindications, could be relative and can be evaluated by the specialist, assessing the benefits and the evolution of the patient.

Capenergy C200 Respiratory Tecartherapy Questionnaire and Answers

Questionnaire, subject to expansion based on new concerns raised.

If you have any unresolved questions, contact us:

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