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OSSIGENATEVI
Blog Magazine

The Magazine dedicated to the patients of
Hyperbaric Center of Ravenna

CENTRO IPERBARICO RAVENNA


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Oxygenate yourselves!
The Hyperbaric Centre Magazine

In 2010, the Hyperbaric Center of Ravenna started the blog experience: www.iperbaricoravennablog.it, for sharing requests, questions and stories of patients. The basic concept is that: often the solution to the problem of one could be the solution to problems of others.
In 2012 it was born Ossigenatevi! a tool for reading and preserving the most read articles on the blog.
After 5 years Ossigenatevi! update itselfs. We designed a modern graphic look and improved the variety of topics.
In this issue you can read: articles on updating and innovation about our care paths, our patients stories, notes and experiences about courses and conferences to which our doctors and nurses attended.
Who will be the patient of this number?
Discover it on the last page!

A hyperbaric chamber designed, built and certified by the Hyperbaric Centre of Ravenna to study the effects of hyperbarism on tumors

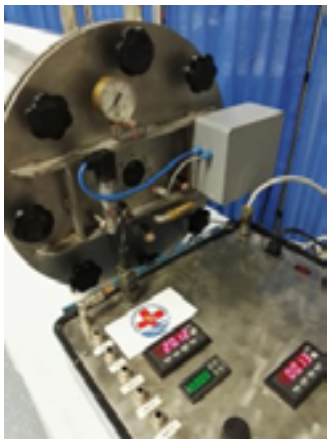
The experimental hyperbaric chamber for laboratory testing was actually triggered by a request of collaboration between the Meldola Scientific Institute of Romagna for the Study and Treatment of Cancer (I.R.S.T.) and the Hyperbaric Centre of Ravenna. **The main goal is to study the effects of hyperbarism on two kinds of tumors, specifically Myeloid leukemia and Glioblastoma and to evaluate the benefits of the hyperbaric oxygen therapy (HBOT) on the treatment of tumors.**

The Centre designed, built and certified a fit-for-purpose hyperbaric chamber. It is 1060 cm long and 355 cm wide. The inner side consists of 5 movable shelves where 64 laboratory flasks can be treated simultaneously.

The hyperbaric chamber has a working pressure of 5.5 bars and a hydrostatic testing pressure of 9.0 bars.

It can be compressed with various gases depending on needs, such as oxygen, nitrogen, carbox, nitrox and heliox. Through a control console it is possible to manage and check different parameters: compression, decompression, depth (analogical and digital), inner temperature and tests length by a time timer watch. It is also possible to analyse the inner atmosphere of the chamber. The electrical system of the chamber has been made in accordance with the community directive ATEX 94/9/CE – ATEX 99/92/CE.

All the materials used by the research and to be left inside the chamber are previously tested by a compression test of 6 ATA, in order to evaluate their endurance and suitability for use.



The staff of the Hyperbaric Centre has gathered great experience and high technical competences: in more than 27 years of activity this is the fourth prototype of the "research" series, designed and made entirely by our staff.

The prototypes list consists of:

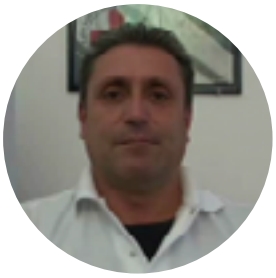
- Movable experimental chamber for the organs' transport and perfusion (liver), University of Ferrara and San Marino, year 2000/2007.
- Deep water (250 meters) chamber (26 ATA) Heliox Tables test, Italian Navy year 2004.
- Movable experimental chamber for transport, perfusion and transplant (kidney and liver), University of Bologna year 2007/2016.

It is important to remember that all the projects and tests are controlled by the Directorate of our centre and supervised by our Medical Director, Dr. Pasquale Longobardi. Furthermore, in order to maintain the high quality security standards, the management of the experimental chambers during tests is always entrusted to our properly trained hyperbaric technicians.

According to the Hyperbaric Centre of Ravenna it is really important to invest in research: we strongly believe that active contribution is fundamental in this sector.

We hope that our small contribution leads to the improvement of our many patients' care pathways.

Gian Luca Baroni
Chief Technician of the Hyperbaric Centre of Ravenna



Neuromuscular taping: what it is and how it works

Neuromuscular taping, Kinesiotaping, Kinesiological taping etc.; there are so many names for the same thing: the "colored patch", as it is called by our patients. This definition certainly provides a simplified vision of the reality, but it gives a good idea of it.

Indeed, this special taping is made of coloured elastic cotton and acrylic adhesive, distributed over waves, a characteristic which makes it water-resistant.

These characteristics confer it elasticity almost equal to the skin one.

The tape application involves tensions and methods which vary according to the specific objective, thus creating, together with the body movement, skin folds that stimulate the receptors of the underlying skin layers.

It can be applied via compression and decompression methods.

Three macro-areas of action of the neuromuscular taping can be identified

- **ARTICULAR/SENSITIVE:** the tape can perform a proprioceptive function, that is it protects tendons and ligaments, because it can help to maintain joints in a correct position and it increases the perception of stability on the articular mechanics.
- **MUSCULAR:** derma consists of a series of nervous receptors that can communicate with the underlying muscles through external stimuli. Once applied on the skin, these tapes can inhibit an overburdened and contracted muscle that pushes on the pain receptors, or vice versa, stimulate a hypotonic one. In this way, pain gets reduced and motor function progressively reactivates.
- **LYMPHATIC/ VASCULAR:** in the oedemas treatment it can reduce pain and facilitate lymph drainage through the skin lifting. It is applied in a way that allows the tape to determine a series of convolutions and skin folds, similar to waves that act on the lymphatic flow as drain pumps, thus favouring the oedema reabsorption. This action results particularly evident in case of large hematomas that can occur, for example, following surgery or a muscular lesion. The fast resolution of a haematic extravasation allows an early reduction of both pain and inflammation with a reduced time of convalescence.

A similar **mechanism of action occurs on the most superficial vascular system**. This aspect is particularly useful for our Centre because it is associated to the Wound Care Centre.

Indeed, very often the perilesional skin presents itself as hypertrophic, red and painful. Improving vascularisation of these areas means reducing the risk of developing new lesions and it facilitates the healing of the lesions that are present. Team work always wins.

Maddalena Vassura
physiotherapist
of the Hyperbaric
Centre of Ravenna

Infected prosthesis of the right knee: what to do?

Good morning, my name is Paola and I am 51.

On June 2015 I had the total surgery of the right knee; the patient's post-operative went ok but my knee has always been painful and unstable. On August 2016 I suddenly had an infection caused by Staphylococcus aureus. I immediately started the aimed antibiotic therapy and I had the surgery to have my prosthesis cleaned.

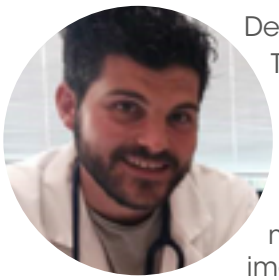
During the operation I had several samples, which turned out to be negative (without bacteria). I continued to have blood tests and the values were more and more in the normal range (PCR dropped from 5.60 to 1.05).

Then I went to Milan (November 2016) for a consultation and I was recommended to stop taking the antibiotic and to see if the infection would start again. If that is the case, I would be put on a waiting list to be submitted to a removal and biodata spacer positioning.

I also want to point out that I have been splenectomised.

Thank you very much for the time you will spend for replying to my letter.

Dott. Andrea Galvani



Dear Mrs. Paola,

Thank you for writing us.

In case of evident infection of the prosthesis (physical examination, clinical presentation, indices of inflammation, positive radiology imaging), the multi-specialist pathway that is normally set for the patient is the following:

- The orthopaedic evaluates and sets the most appropriate surgical option (where indicated).

- The ID specialist prescribes the most effective antibiotic therapy.

- The hyperbaric doctor (after the surgical revision of the prosthesis and planning of the adequate antibiotic treatment by the ID specialist) prescribes the most appropriate protocol with HBOT (normally 20/30 daily sessions of 90 minutes at 2.5/2.2 ATA for 5 days per week).

If you desire, you can send us the documents by email at our email address: segreteria@iperbaricoravenna.it. After consulting them, we will certainly give you more precise and detailed information.

Good luck!

Dott. Andrea Galvani
Degree in Medicine and Surgery of the University of Bologna, Subscribed to the Medical Council of Rimini, Number 02337

KLOX Treatment: what it is and how it works

The Wound Care Centre of the Hyperbaric Centre of Ravenna is testing a latest-generation product to treat wounds that do not heal easily: Klox LumiHeal.

KLOX Therapy is a treatment that **employs Photobiomodulation,** that is to say the visible light capacity to trigger non-thermal and non-cytotoxic biological reactions.The therapy consists of **the application of a chromophores gel** (chromophores are a group of atoms that can impart a colour to a specific substance) and urea peroxide. Once applied on the wound and on the perilesional skin, the gel is submitted to a non-coherent blue light emitted from a LED lamp 5 cm proximal from the wound.

The exposure lasts 5 minutes; after that the gel is eliminated and you can proceed with the most suitable treatment and bandage.

Contrary to what you can think, **the chromophores are not the ones acting directly to support the healing processes; their sole purpose is to modulate the light, thus allowing it to reach different wavelengths.**

- The blue light reaches the most superficial layers of the wound (from 450 to 500nm) and it can control the bacterial colonization and reduce the inflammation; this is the reason why the best results have been achieved with rheumatic ulcers, that is to say with "inflammatory origin".
- Then there is the green light, which deeply penetrates the skin (500-570 nm) and stimulates the fibroblasts proliferation and therefore the reepithelization.
- The yellow/orange light that assists the growth of the blood vessels and the wound contraction is the one that reaches the deepest layers of the derma (570-610 nm).

It is precisely the light that acts directly on the wound; the chromophores are just the 50%.

This is how the chemical-physical process that triggers the reaction works: when the light hits the chromophores molecules, the electrons go from a state of rest to a state of excitement, to immediately go back to a ground state. Therefore, you have a light emission of micropulse photons, which transforms the blue light into different wavelengths associated to the colours explained before. This phenomenon is only possible through the presence of an oxidant, specifically the urea peroxide contained in the gel carrier, which has an active role in the debridement process. Indeed, in this case there is the biofilm breaking.

The producer suggests applying the product at intervals of at least 48 hours on acute or chronic venous lesions. Our clinical experience revealed that the ulcers that give better response to this treatment are the rheumatic ones.

We have been able to establish as well that patent benefits can be reached also by applying the product during the treatment, thus not complying with the 48 hours standard.

Product testing is monitored by the directorate of our Centre and supervised by the Medical Director, Dr. Pasquale Longobardi and by the Head of Nursing of the Wound Care Centre Klarida Hoxha.

To help you to understand exactly the results that it possible to reach using this product, we show you some photos that illustrate the improvement of three injuries at different etiology.

68 year-old patient, rheumatic lesion, associated with hyperbaric oxygen therapy OTI


Before therapy KLOX


After 12 sessions KLOX (42 days)

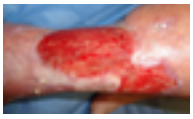
46 year-old patient, venous lesion, associated with hyperbaric oxygen therapy OTI


Before therapy KLOX


After 12 sessions KLOX (52 days)

52 year-old patient, rheumatic lesion, none hyperbaric oxygen therapy OTI

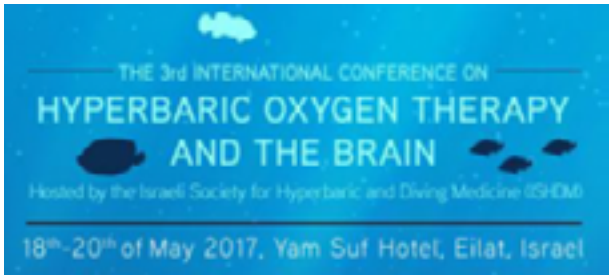

Before therapy KLOX


After 12 sessions KLOX (34 days)

Sofia Fioravanti
nurse of the Wound Care Centre of the Hyperbaric Centre of Ravenna

The Hyperbaric Centre of Ravenna flies to Israel thanks to a study on fibromyalgia

We are pleased to announce you a great achievement: in view of the acceptance of a study of ours on fibromyalgia, the Hyperbaric Centre of Ravenna will participate into the third international conference on hyperbaric oxygen therapy and brain, organized by the Israeli Society for Hyperbaric and Diving Medicine (ISHDM) from 18 to 20 May 2017. Dr. Longobardi's speech is planned on Friday, May 19 at 5:45 pm.



The work's title is **"HBOT in the Clinical Pathway, as a reliable integrative treatment for fibromyalgia"** and it will be discussed by our Medical Director, Dr. Pasquale Longobardi.

The study has been carried out by our team of professionals: P. Longobardi, N. Belkacem, F. Fontana, E. Grazzini, M. Vassura, M. Gaudenzi, D. Bandini and K. Hoxha, who worked side by side during last year.

In 2016, 42 patients affected by fibromyalgia were evaluated to be admitted to the fibromyalgia clinical pathway developed by the Hyperbaric Centre of Ravenna. 15 of them were considered to be valid to follow a HBOT pathway; the exclusion of many of them was primarily due to economic and logistic reasons.

The clinical trial revealed an improvement in 13 women (87%), who followed a pathway with HBOT. Pain was reduced of intensity in the 50% of patients (VAS average -4.2 and race points -4.75) and of frequency in the 30% of patients. Quantity and quality of sleep, asthenia and intestinal disorders improved when present. The SPECT exam revealed an improvement of altered cerebral perfusion, thalamus hypo-perfusion and caudate nucleus.

We are really happy about this news, which, pending further studies and confirmations, provides a partial evidence of the fact that HBOT can be a valid help during multidisciplinary treatment pathways. Once and again the Hyperbaric Centre of Ravenna demonstrates the value of its work in an international context.

Notes on the meeting on "Biofilm" held on 3 March 2017 in London organized by the Journal of Wound Care

(the Official Journal of the World Union Wound Healing Societies, WUWHS)

On the occasion of a national event (UK), held on 3 March 2017, there was a roundtable supervised by Camila Fronzo, Editorial Project Manager, Coordinator and Chief Sub-Editor of the Journal of Wound Care (JWC). The participants were selected internationally on the basis of their affiliation, CV and role. The representative countries were: Italy (1), Belgium (1), UK (3), Denmark (1), Canada (1), the Netherlands (1), USA (1) and Germany (1).

Among several candidates, I was chosen in representation of Italy as nurse expert in Wound Care and Head Nurse of the Wound Care Centre of the Hyperbaric Centre of Ravenna. A representative of the sponsor (Convatec) also took part to the event.

The roundtable dealt with the training of the nurse expert in Wound Care in different countries. The differences are significant. In the United Kingdom the nurse expert in this field has the full autonomy to prescribe medications, compression therapy and medical devices as long as he can justify his choice on the basis of the scientific evidences and of the cost-benefit/usefulness ratio.

It was pointed out that in Italy the role of the nurse is in transition. The current situation includes nurses of the territory (homecare) who must comply with the doctor's provisions and don't have the decision-making autonomy and nurses of more advanced health care settings who have more autonomy, such as at our Wound Care Centre. Indeed, as the situation of a skin lesion evolves over time, it is important that a nurse can decide and prescribe knowingly.

Similarly to Italy, the situation in other countries, such as Belgium, Germany and Denmark is in constant evolution: the nurse's autonomy in decision and prescription making depends on the context (medical, colleagues and workplace).

The roundtable suggested to organize training meetings with general practitioners and hoped that every nurse could feel protected in acting according to the most recent guidelines, by dialoguing with professionals in a climate of multidisciplinarity.

It was then discussed about the use of biofilm in order to:

- Help clinicians to understand biofilm and to use anti-biofilm strategies in the clinical practice
- Identify which training is more advisable about this topic
- Identify the factors motivating the anti-biofilm strategies implementation in the clinical practice
- Ascertain how industry can work more efficiently with clinicians and influencers (Key Opinion Leaders)

Each participant gave his opinion and the proposals were accepted with much appreciation by all group members.

The experience was really positive and productive: being part of an international group of highly skilled and qualified colleagues and sharing opinions about daily difficulties is really motivating.

I am proud to have represented the nursing category, the Italian Vulnology and, in particular, the Vulnology network of the Emilia-Romagna Region, formed by the Skin Lesions Board of the Local Sanitary Unity (USL) of Romagna and by the Hyperbaric Centre of Ravenna.

Klarida Hoxha


CENTRO IPERBARICO RAVENNA

THE PATIENT
OF THIS NUMBER

Maria Antonietta is an our nice patient who came to the Hyperbaric Center to treat chronic ulcers of traumatic origin that have been suffering her for four years.
Here Maria Antonietta with Elisa and Ilaria, our nurses, while they are applying negative pressure therapy.

Good luck Maria Antonietta, still some dressings and your legs will heal!

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