



Ossigenatevi! - The Hyperbaric Centre blog's magazine

N. 19 – January and February 2015



In 2010, the Ravenna Hyperbaric Centre opened the blog www.iperbaricoravennablog.it to share the stories of patients because we believe that the solution to a problem for one patient may be the solution for many others. This experience led to "Ossigenatevi!", the Ravenna Hyperbaric Centre blog's magazine, a new tool to read and save the most-read stories of the blog. This number contains the articles that were read the most in January and February 2015!
Enjoy the reading!

How hyperbaric oxygen can improve the well-being of people



Can hyperbaric oxygen improve the well-being of the people? Yes, it is able to accelerate the metabolic response, which is the parameter for evaluating the state of wellness.

Dr. Longobardi described the relationship between hyperbaric oxygen and well-being in a meeting dedicated to "Health and Lifestyles", which took place on January, 17 in Modigliana (Ravenna).

Many university professors and doctors attended the meeting and discussed the issue of health and well-being along with politicians as Sen. Pier Ferdinando Casini and several mayors including Antonio Patuelli, mayor of Modigliana, and Fabrizio Matteucci, Mayor of Ravenna. During his speech, Dr. Longobardi explained how to evaluate the metabolic response and the state of well-being, what happens in case of alteration of these factors and how hyperbaric oxygen can help to improve them. But let's start from the beginning.

If the metabolic response is the parameter which evaluates the state of well-being, how do you measure it?

The metabolic response is measured by:

- a questionnaire with questions concerning the presence of Medically Unexplained Symptoms – MUS
- body composition analysis
- hormonal assessment
- metabolism These four analysis allow you to highlight any deterioration in the metabolic response.

What are the symptoms of an alteration of the metabolic response?

According to a 2012 research the most frequent unexplained symptoms of an alteration of the metabolic response are: chronic fatigue (in 63% of the sample), stomach acidity (60%), anxiety (56%), insomnia, heart palpitations, profuse sweating, cold hands.

What might be the causes of alteration of metabolic response?

The alteration of the metabolic response can be caused by drugs, a sedentary lifestyle or excessive exercise. Other factors are drinking little water, smoking or drinking alcohol, stress, acid foods (meat, cheese, sausage) or the lack of alkaline foods like fruits and vegetables.

What are the effects on the body in the long run?

All these factors contribute to generate acidosis triggering an inflammatory response that lasts. The activation of the immune system, eventually can lead to the onset of the General Adaptation

Syndrome Related Stress (GAS), the chronic systemic inflammatory disease (CIDS), Insulin resistance Syndrome or degenerative diseases (such as dementia and early Alzheimer).

How can hyperbaric oxygen intervene to improve the well-being of the people?

Breathing hyperbaric oxygen for several days enable the production of systems for the defense from oxidative stress that helps the body to better withstand the conditions that alter the metabolic response. In addition, oxygen helps the formation of new blood vessels improving blood circulation. If associated with physical activity, hyperbaric oxygen triggers the nitric oxide synthesis which has a beneficial effect on the cardiovascular system, reduces the inflammatory response and other damages. The beneficial anti-inflammatory effect which reduce the occurrence of changes in the immune system may be enhanced by proper nutrition and exposure to heat the spa.

Romagna's major strength comes from both the Hyperbaric Centre and TechnoGym, the world's leading company in the production of sports equipment and the promotion of the well-being. Recently, the Confederation of Romagna Industries presented the project "Romagna Wellness Valley" with the intent to promote at Expo 2015 what the productive sector of our territory has to offer from fitness to food and wine, from the health system to spa tourism, home and fashion. Romagna as a Wellness Valley, an international district of welfare and quality of life.

The event of January, 17 focused on these topic too: a viable project simply by exploiting the human, social, historical, artistic, natural and gastronomic territory.

Burger's Disease: hyperbaric therapy can slow the disease



Hello doctor, I am 32 years old, about 10 years ago I had to undergo a saphenectomy left leg and

about 5 years ago I had to undergo another one in my right leg.

Two years ago a chiroprapist gave me a wound under the big toe and from that moment I began my ordeal: the wound begun to widen and the strong pain never stopped. After five hospitals and having had my nail and nail bed removed, I had an angiography made and doctors concluded that it was a form of Burger's disease.

They made me a neurostimulator implant with bone marrow but it still hurts and no one has ever mentioned the hyperbaric chamber. If you had any suggestion, I would be grateful.

Dr. Claudia Rastelli responds



Dear Mr. Luca,

I'm sorry you have to deal with this difficult disease.

Buerger's disease is a chronic disease that affects the blood vessels of the extremities of hands and feet. It is diagnosed by angiography and / or biopsy of the affected tissues. Blood vessels undergo inflammatory lesions and subsequent obstruction causing the death of the tissues they supply.

The patient initially lament a cold sensation, numbness, tingling or burning before the disease becomes evident and then he/she presents major pain, ulcers and necrosis of the affected tissues.

Unfortunately, it is a disease of chronic nature, for which we have not yet discovered a definitive therapy, but there are therapeutic strategies to slow the progression of the disease and whose common point is to increase blood supply to suffering tissues. Vasodilators of the latest generation are often used in combination with corticosteroids, anti-inflammatory drugs (NSAIDs) and anticoagulants.

It is extremely important to eliminate risk factors such as smoking, cold exposure and microtrauma and major trauma to the parties.

Ravenna Hyperbaric Centre often follows cases of patients suffering from this disease so we thought of a course of treatment based on:

- Hyperbaric Oxygen therapy cycles that help slow the progress of the disease by stimulating the formation of new small blood vessels thereby improving the blood supply of the parts suffering and oxygenation of the tissues (the oxygen breathed in a Hyperbaric flows to a greater extent in the blood and tissues). The Hyperbaric Therapy allows also to reduce inflammation and pain and it enhances the effects of drug therapy

- infusion therapy with Trental i.e. during Hyperbaric Therapy
- FREMS (Frequency Rhythmic Electrical Modulation System) cycles: electrostimulation therapy with precise rules that favor the increase of microcirculation. It has relaxant powers and it stimulates neurotransmitters, decreasing pain from the first sessions
- medication of skin lesions depending on the stage of the wounds.

I think it is important for patients suffering from Buerger's Disease to control the pain in order to ensure a better quality of life and that is why the collaboration with the analgesic therapy is precious.

It is extremely important to stop the progression of the disease and prevent tissue necrosis especially given your age, so I invite you to contact us for more information and for a possible visit at +39 0544 500152.

My warmest greetings, Dr. Claudia Rastelli.

Ménière's syndrome: deafness at 9 years old. Can you recover your hearing with hyperbaric therapy?



I was diagnosed with Ménière's syndrome. First symptoms appeared in 2005 when I had a major episode of vertigo followed by a deafening and continuous tinnitus, fullness and decreased hearing. After about 18 months I have had an almost complete loss of hearing. During these nine years I had rare attacks of vertigo while tinnitus and hearing loss were persistent. Few times I had ear fullness. I saw that oxygen therapy may be indicated. Do I have any possibility to recover hearing? With how many sessions? For how long? At what risks? Thank You

Dr Andrea Galvani responds



Hello Ms Anna, thanks for writing us. Ménière's syndrome is a type of otovestibular disorder characterized by unilateral or bilateral hearing loss, tinnitus or fullness and

dizziness subjective with or without autonomic symptoms associated.

Usually the hyperbaric-oxygen therapy is indicated for both the problem of hearing and the vertigo crisis. For patients who have these symptoms the course of treatment of Hyperbaric Centre provides a first cycle of 15 sessions from 90 minutes at 2.5 BAR with a profile called alternate hyperbarism (cyclic changes in pressure during therapy) and subsequently some recall cycle depending on the extent of relapse. At the end of the first cycle, and any recall, we suggest you to be checked by your ENT-specialist.

Unfortunately, with regard to the hearing in his case it has been too long since the early symptoms (9 years) and in these cases there is no scientific evidence on the effectiveness of hyperbaric therapy. In fact, patients who respond better to cycle Oxygen usually come to our center within 30 days from the diagnosis.

The Hyperbaric Therapy would instead be indicated for the problem of the vertigo crisis, but from your request I understand that fortunately you don't suffer of these crisis anymore. If you are interested in finding out how the Hyperbaric Oxygen Therapy is structured for people with Ménière's syndrome, I suggest you call the Hyperbaric Centre at +39 0544 500152.

I wish you good luck and I remain at your disposal for any other possible explanation.

Best wishes, Dr. Andrea Galvani

Venous ulcers, and allergy to anti-inflammatory drugs, help us!



Good morning, I'm sorry to disturb but I write while my mother desperate screams in pain and burning for a 20 x 15 cm venous ulcer with high loss of exudate. Although after 7 months it is beginning to decline, it is still overwhelming.

We have already tried the solutions that could be less dangerous for the presence of urticant skin

and phenomena of allergy to anti-inflammatory drugs. Among these, phyto-stimulines hydro-gel bandages but the leg swelled, hydro-gel with special gauzes (bought online because everything here comes from the hospital). A cardiologist cured her for heart failure, she had a form of edema with 15 kg of water removed with lasix.

My mother is being treated for years with Cumadin and Lanitop, so we know the cause but the effect was never seen.

Now she no longer bear medication and we go with:

- washing 3 times per day
- cleaning with wet gauzes with demineralized water
- mechanical cleaning of crusts and fibrin. Once removed, however, they come back and the exudate increases ruining the bed of the wound (which is not superficial)
- Cicalfate cream for external emulsion of the wound. I would use Cicalfate lotion to absorb a bit of exudate which is like itchy.

The allergy is a big problem, as to have pushed away nurses and doctors. I'm alone now, in a city like Naples, which apparently does not address problems such as allergy. I need you to help, I am desperate.

Thank you and I hope that you will help me the see the light of hope. Laura

Klarida Hoxha responds



Dear Laura, thank you for contacting us and we are very sorry that you have to see your mother suffering and that your mother suffers this unbearable pain caused by an ulcera that is

not healing.

To use an ointment rather than another you must follow precise criteria: sometimes we are the cause of the intolerance to certain drugs because we don't use them properly. Same thing applies to the bandage which needs to be performed with specific techniques that allow legs not to swell.

In your mother's case I think the swelling is due to the edema given by her heart disease. I explain the approach that we use the Hyperbaric Centre in case of ulcers of this type. First, to determine if the ulcer has vascular origin we prescribe an arteriovenous ecocolordoppler and a visit with a

vascular surgeon to figure out what are the solutions for improving the circulatory status.

During the first visit here at the Hyperbaric Centre, we investigate the circulatory system with several non-invasive tests such as transcutaneous oximetry (a small electrode attached to the skin which measures oxygen pressure in mmHg; normal values are usually greater than 40) and the ABI (Ankel Brachial Index) measurement which is the arm / ankle pressure index (normal values are between 0.8 and 1).

We then proceed with the evaluation of the pH of the lesion (acid pH indicates an ulcer in healing phase; basic pH with an ulcer delaying the healing phase or infected) and the protease test to figure out how to proceed in the treatment of the wound

The basic pH and protease positivity may indicate a potential delay in healing and it is important to also assess the aspect of infection. Very painful and very exuding ulcers may infact hide a deep infection and the infectious diseases specialist advice is required; in these cases, you might even make a cultural swab to understand what germ is in the wound so as to prescribe a specific antibiotic therapy.

Considering that hyperbaric oxygen (HBO) and antibiotic therapy performed together allow to amplify the effect of individual therapiea, if the cardiologist gives his consensus, our hyperbaric doctor may also evaluate the opportunity to make sessions of hyperbaric therapy to eliminate inflammation and speed the healing of the wound. If necessary we also have the opportunity to make a professional cleaning of the wound through an ultrasound therapy that we have available in our surgery practice.

The session is performed in the presence of an intensivist-anesthesiologist who shall do local anesthesia or sedate the patient to be able to clean without causing pain. To reduce your mother's pain during the rest of the day and night so as to allow her to rest in peace, it is necessary to study an analgesic plan that is suitable for her.

Once eliminated the infection and cleaned the wound bed we can finally intervene with different techniques to facilitate the closure with treatments such as PRP (platelet rich gel) or through heterologous grafts with bioengineered skin (created in laboratory). Treatment options are endless and according to the needs and sensitivities of your mother, we can choose what is best for her. You should not demoralize, I highly recommend you contact us and give us a chance to help her to feel better and live a decent life.

Remember that therapies are largely covered by the National Health System. To contact the Ravenna Hyperbaric Centre segreteria@iperbaricoravenna.it or +39 0544 500152. Best, Klarida Hoxha.

The medical examination for competitive, non-competitive sports and underwater activities: interview with Dr. Medri



Who practices sport makes physical efforts that in some cases can bring out latent health problems, sometimes risky. That is why athletes must, by law, renew every year their medical certificate that is issued by a specialist after a specific medical examination. Who needs a mandatory medical certificate and who does not? How is the medical examination? We interviewed Dr. Francesco Medrano, sports physician at the Ravenna Hyperbaric Centre.

Hello Doctor, the first thing we ask you is to tell to our readers what you do at the Ravenna Hyperbaric Centre.

I am specialized in sport medicine and I deal with visits to the suitability for competitive and non-competitive sports, both for those who practice traditional sports such as football, running, cycling and athletics and for those who practice diving.

Can you tell us when you need a medical certificate to practice competitive sports and when it is sufficient the one for not competitive sports?

The law imposes on whoever practices sport to undergo a medical examination to certify his/her fitness to sports: the medical certificate is mandatory for competitive sports while the certificate for not competitive sports is the type required at the gym or in the amateur sports associations.

It is very important that the visit is made when the person starts to train and not just when there is a race or a game. Often we ask to our body a greater effort during trainings compared to the one used in the actual game/race, so it is good to check for any problems immediately.

How is the visit for competitive sports?

The visit lasts 30 minutes and follows a precise protocol:

- general check-up of the person, so it is always good to bring with you all the records of medical examinations conducted in the last six months
- rest-electrocardiogram
- spirometry for the evaluation of pulmonary exhalation: it consists on exhaling inside a tube that collects the exhaust gas by returning the pulmonary values and reporting obstructions, bronchitis or other respiratory problems
- Urinalysis: it is enough to go to a lab analysis and ask to undergo the examination of the urine for sports, you must bring the report with you at the visit. The Hyperbaric Centre can also take the exam within the facility
- after-stress-test electrocardiogram: it consists on an exercise to fatigue usually carried out with the bicycle ergometer, a bike connected with electrocardiograph electrodes which allows to follow the athlete in the effort moment by moment.

The medical examination for underwater competitions follows the same protocol but with the ENT evaluation and lasts 45 minutes.

How is the visit for not competitive sports instead?

The visit for not competitive sports follows the same protocols as the previous ones except for after-stress-test electrocardiogram.

What if during the visit health problems emerge?

If problems arise during the visit we need to examine the situation and the approval of the certificate is suspended until the doctor assesses the problem. If all goes well the athlete can have the certificate even in case of specific medications or the need to check the situation more frequently than other athletes. It's important not to wait for a competition to request the certificate because if you need further medical tests you may be forced to miss the race.

Have you ever had a case of unsuitability?

The unsuitability occurs in 4-5% of cases. Some athletes do not accept this response, but it is in their interest, sometimes they just need to be stopped to be subjected to further investigation and proper treatment.

This visit is very important for personal health: in addition to confirm the state of physical health, it helps a lot in preventing future problems, even in children. Obviously it does not predict 100% of problems, but most of them can be excluded.

What is needed to take an appointment with you at the Ravenna Hyperbaric Centre?

To schedule a visit with me you can simply call the secretary of the Centre at +39 0544 500152. It's important to remember to bring with you all the records of medical examinations conducted in the last six months and minors must be accompanied by an adult.

Baseline Project, Gian Luca on a mission in the Mediterranean



Baseline Project is a fascinating project launched in 2009 by the GUE, GLOBAL UNDERWATER EXPLORER, with the purpose of documenting the basic conditions in unexplored underwater environments

The Baseline project was born from GUE existing principals and relies on the collaboration of volunteer divers, scientists, government and all concerned citizens. The idea is the basis for the sharing economy, sharing: we want to encourage people to share images and dive logs already collected for personal records by uploading them on the platform dedicated to the project. In this way all the collected material can be used for a deeper understanding of the place visited by other adventurers. From August 15 to September 23, 2014 as part of the Baseline Project, a mission in

the Mediterranean was organized and Gian Luca Baroni, hyperbaric technician of our Centre, was in it.

Gian Luca took part in the expedition as a volunteer, with the support of the Hyperbaric Centre: he worked for 39 days with a team of divers with the aim of monitoring and filming the seabed, wrecks and archaeological sites of the Mediterranean, drawing an environmental line which will be included in the worldwide project on all seas of the planet. The staff was composed of professionals of technical diving of GUE from around the world and coordinated by the instructor Mario Arena. Volunteers departed from Palma de Mallorca on the PACIFIC PROVIDER ship that in 39 days touched the beautiful coast of Spain, Corsica, Sardinia, Tunisia, Malta, Pantelleria and the Aeolian Islands.

The ship, 54 meters long and specifically equipped for this campaign, was equipped with two submarines with operational capacity of 300 meters deep, two tenders of 8 meters with sonar assistance, storage station, charging and mixing gas (trimix) for deep water divers with recycling apparatus (rebreather) operating up to 130 meters deep, the control room for viewing scanned images and editing documentaries. On board a multiplace hyperbaric chamber was available for divers, prepared for treatments in the air, breathing oxygen and eliox 50/50 (of which Gian Luca was responsible) and two missiles to Australian research satellite.

The last part of the expedition was managed in collaboration with the Superintendence of Cultural Heritage in the region of Sicily and the participation of the superintendent Professor Sebastiano Tusa, a member of the International Academy of Sciences and Underwater Techniques which includes also the Chairman of the hyperbaric center Ravenna, Faustolo Rambelli and the Medical Director, Dr. Pasquale Longobardi. During the mission, off the islands of Panarea and Stromboli, two incredibly fascinating discoveries were made: a Greek ship with a cargo of about 5000 amphorae and, at 120 meters depth, an altar for sacrifices with Greek decorations. The summary video of the operation has enthralled many people around the world: in Italy was broadcasted by RAI UNO (Blue Line), abroad by the BBC and MTV. It also got wide coverage in the national and international press. Soon the US will even made a reality show on this great experience and we are delighted to have been, in some way, close to them.

PFO, ischemia and headaches after diving



Hello, I am a diver who practices recreational diving and for scientific research. I do not do many dives a year, but each time I dive over 15 m, I have a headache. I respect all safety procedures.

I had a head resonance done in July 2014 and I was diagnosed with a recent ischemic micro-lesion at the cerebellum, although I never experienced symptoms. The search for the PFO had positive results. The coagulation factors are normal and I never had other neurological/heart problems. My neurologist, looking at pictures of the resonance, suggested rather that it was developing venous anomaly, but a second resonance, in December 2014, showed no lesion. Probably it was ischemia caused by a bubble. Doctors advised me to close the PFO even if I decide not to dive anymore. I had no answer about headaches after diving and I do not know if they are connected to the PFO.

I would like to know your opinion about it and if necessary and useful to come to Ravenna for a visit and further analysis. Thank you. Sincerely, Fabrizio

Dr. Luigi Santarella responds



Good morning Fabrizio and thank you for trusting us.

The onset of symptoms during or after a dive is considered (until proven guilty) as a decompression sickness. Your symptoms, including headache, are therefore considered to be related to a decompression sickness.

These forms of decompression sickness, although you have complied with all safety standards, are defined "undeserved" and the most likely etiological cause is the presence of patent foramen ovale.

This morphological abnormality of the interatrial septum determines the passage of bubbles from the right heart to the left heart with the risk of systemic embolization.

To assess whether the left-to-right shunt is severe, if the transfer occurs in the heart or elsewhere (i.e. in the lungs), the Ravenna Hyperbaric Centre studied a specific protocol based on three surveys:

- transcranial doppler with detection of MES on both middle cerebral arteries (dr. Paolo Limoni) at rest, after Valsalva and with position change.
- analysis of blood gases during breathing in pure oxygen and physical effort (normal value ~ 400 mmHg)
- transcutaneous oximetry during breathing in pure oxygen and physical effort (normal value ~ 300 mmHg)

Transesophageal echocardiography is required only if it is oriented to the closure of the PFO, that is, when there was a decompression accident neurological, vestibular, cerebrovascular disease, MRI evidence of cerebral ischemia, predisposition to clotting (thrombophilia), important aneurysm of interatrial septal, severe left-to-right shunt at baseline. Otherwise (ie, if there were no diving accidents, brain injuries, thrombophilia, left-to-right shunt is present after Valsalva) are suggested standards of good practice, different from recreational to technical diving, so that in the immersion will produce few bubbles.

You had symptoms and signs that can be attributed to the left-to-right shunt and I believe that the closure of the foramen ovale is appropriate.

If you want, at the Ravenna Hyperbaric Center (phone: +39 0544 500152, email: segreteria@iperbaricoravenna.it) you can request a visit with our neurologist (dr. Paolo Limoni) for the Doppler and a visit with the scuba specialized doctor for the final evaluation. These visits are available every Tuesday and it takes half-day. Best wishes, Dr. Luigi Santarella.



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