

# Alert Diver



**DAN EUROPE CELEBRATES ITS 25<sup>TH</sup> ANNIVERSARY AND LOOKS AHEAD**

## **VOLUNTEER DIVERS**

The Greatest Resource In DAN's Research on Safety in Diving



## **THE DAN EUROPE DIVING SAFETY LABORATORY AT WORK!**

Lago d'Orta, August 8-9, 2008

## **ADVANCES IN DIVING MEDICINE**

The International DAN Divers Day, Graz 2008

with translations in

 italiano  
 deutsch  
 français  
 español  
 nederlandse



# THE DAN EUROPE DIVING SAFETY LABORATORY AT WORK!

## LAGO D'ORTA, AUGUST 8-9, 2008

*On August 8/9, 2008 the DAN Europe Diving Safety Laboratory (DSL) moved to Lago d'Orta, a beautiful lake in Lombardia (Northern Italy). These two days were entirely devoted to the "Fluid Shift" project, a special research program, this time aiming at monitoring 12 divers using the new DAN Europe Advanced Research Kit.*

**By Massimo Pieri, DAN Europe Diving Safety Laboratory Coordinator**



*Photo 1 A view of Lago d'Orta as seen from the Sub Novara Laghi diving center*

The good friends of Sub Novara Laghi diving center gave us a warm welcome as usual, and, once more, proved to be really helpful. We could complete several tests and more than 400 data were gathered in only 48 hours.

All tests and measurements were successfully completed at the prescribed time: before the dives, immediately after the dives, then at 15 minutes intervals until 60 minutes after the dives.

These tests are used to determine the diver's hydration level and its connection with post-dive bubble production, as measured by ultrasound Doppler monitoring.

Divers were divided in 2 groups. Blood samples were taken with a small "finger-prick" device to test haemoglobin and hematocrit levels.

Other tests included measurement of Urine Density, Total Body Impedance, Precordial Ultrasound Doppler recording, Cardiac Echography and Spirometry.

This pilot project, which has been launched by Alessandro Marroni, president of DAN Europe, and by Costantino Balesta, director of the DAN Europe Research Division, was concluded at the end of November 2008, after completing three more working sessions

in September, October and November.

Total Body Impedance testing enables to measure the electrical characteristics of the human body, differentiating the fluids contained in the circulatory system, in the space among the cells of the body tissues, and inside the cells.



*Photo 2 - Massimo Pieri gathering data*



*Photo 3 - The data gathered have been immediately entered into the database, for analysis by the DAN scientists.*

A very important factor in determining the diver's hydration is the hematocrit: this is the proportion of blood volume that is occupied by red blood cells (normally around 45%, the rest being plasma).

A simple and quick finger-prick is enough to collect the small blood samples needed for the test.



*Photo 4-5*

Measurement of the haemoglobin level variations, on the other hand, allows to monitor changes that could be linked to dive-stress protecting mechanisms. The urine density measures the urine specific gravity, which also depends on the diver's hydration level.



*Photo 6 - Doppler recording. During this test, bubbles are detected by means of Doppler ultrasound probes and then recorded in specific electronic files.*



*Photo 7-8*



After the Precordial Doppler audio recording, cardiac echography has made it possible to also visualize gas bubbles in the cardiac cavities. This is the advanced field stage of the experimentation which is being conducted by Prof. Costantino Balestra at our central laboratory in Brussels.



Photo 9-10 - Barbara and Alfonso undergo cardiac echography

Spirometry allows to measure and verify the correct function of the breathing apparatus. The results of this test are relevant in the prevention against pulmonary barotrauma, and to prove the ability of sustaining aerobic efforts.



Photo 11  
Adriano during the spirometry test

These repeated two-day experiences have now come to an end.

We would like to thank the Sub Novara Laghi diving center and its president Alfonso Sacco for hosting us.

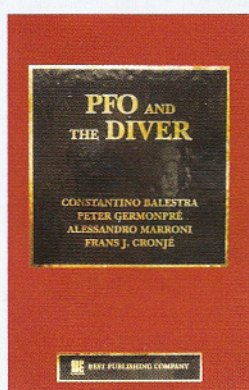
We would also like to thank Carlo Bussi, Barbara Ragnoli and Adriano Martinoli for accepting to be our test subjects; Daniele Pes, Francesco Deciani, Enrico Piazza e Sarah

Negre-Combes for their efforts and contribution to a successful experience.

The data collected are indeed important and will contribute to better understand the relationship between the Diver's hydration level and Bubble formation.



Photo 12  
Massimo Pieri and the Sub Novara Laghi boys and girls after the August tests



## PFO and the Diver: 57,00 €

The focus in this book is on PFO (Patent Foramen Ovale) as a risk factor in diving and thus the text is concerned primarily with dissolved gas and the subsequent aberrant distribution of those venous

bubbles in the presence of a natural and common anatomical variant of cardiac development. The prevalence of PFO is about 25% in the general population and several respectable investigators have studied this problem and feel that PFO should be considered a risk factor for the development of decompression sickness. (Hardcover, 145 pages)

Available online at [www.daneurope.org](http://www.daneurope.org)



## Scuba-Opoly: 33,63 €

A board game designed for divers and non-divers who enjoy the marine environment. The artwork of artist Rogest gives you beautiful and colorful sea creatures to enjoy while playing.

Available online at [www.daneurope.org](http://www.daneurope.org)