

# Standards for diving in Europe – the present situation

Jürg Wendling and Peter HJ Müller

## Key words

Medicals – diving, standards, policy, diving industry, review article

## Abstract

(Wendling J, Müller PHJ. Standards for diving in Europe – the present situation. *SPUMS J.* 2004; 34: 141-4.)

Professional and recreational diving has a low accident, but high mortality rate. The European Diving Technology Committee (EDTC) was founded thirty years ago to help reduce the risks of offshore diving. All European countries nominate delegates representing various national interests to the Committee. The EDTC meets every nine months to create harmonised standards that should lower the rate of accidents to an acceptable residual risk level. During the last five years, the EDTC has produced four major standards, the most recent being the *Fitness to dive standards for professional divers (2003)*, which is presented here. This latter standard abandons a prescriptive approach, introducing a more discretionary assessment of possible medical risk factors. This allows the doctor to determine individual fitness relative to the techniques and objectives of the diver's work. A discretionary approach requires a higher (certified) level of competence in the examining doctor. The training standards for diving medicine physicians define three levels of competence: the medical examiner of divers, the diving medicine physician, and the diving/hyperbaric medicine consultant. The programme contains in-depth assessments, annual routine assessments and return-to-diving assessments (e.g., after decompression injuries). The cycle of in-depth assessments is five yearly for young healthy people and more frequent with age. This flexibility provides the diver with improved cost/benefit of medical support, and this is in line with worldwide trends. It should be possible to create similar expert groups in other continents to achieve a worldwide consensus on the criteria for fitness to dive and the examination procedures required.

**Introduction**

Politically, Europe is converging rapidly into a union with common norms, standards and regulations. Diving, however, has not been one of the important issues focused upon and therefore national standards are still usual. Besides that, there is extreme variability between European countries, some being over-legislated, some others completely lacking any regulation for diving activities. Where legislation exists, its development has historically depended on the need to develop regulations for tunnelling work or the off-shore diving industry.

While a few European representative organisations have been created in order to produce harmonisation of standards and/or guidelines, there are few examples of national standards melding together by voluntary and/or bilateral agreement. One example is the fitness-to-dive standard for recreational diving for Germany, Austria and Switzerland, which has been developed by a subcommittee from all three national scientific societies. The work leading to these guidelines for the assessment of the fitness to dive of recreational divers has been published as a single desk reference recently,<sup>1</sup> but the work has been influenced strongly by the history of multiple approaches to harmonised standards within Europe.

**Professional diving: the European Diving Technology Committee (EDTC)<sup>2</sup>**

Thirty years ago professional diving was just developing and caused an extremely high number of fatalities and severe accidents. In order to reduce the risks of complications in offshore diving, a multinational committee was founded in Europe, the European Diving Technology Committee (EDTC). The Committee presently includes 17 nations. Every country has nominated delegates representing the government (ministry of the directorate concerned with professional diving), the diving industry, the divers/unions, and diving medicine. The goal is to create harmonised standards that should lower the rate of accidents

and incidents to an acceptable residual risk level. This goal has actually been achieved very satisfactorily, as at present the risk for professional divers to suffer from diving accidents is no higher than that for recreational divers.

During the last five years four major European standards have been produced:

- The goal setting principles for uniform diving standards in Europe (1997)<sup>3</sup>
- Training standards for diving and hyperbaric medicine (1999)<sup>4</sup>
- Competence standards for divers training (2002)<sup>5</sup>
- Fitness to dive standards for professional divers (2003)<sup>6</sup>

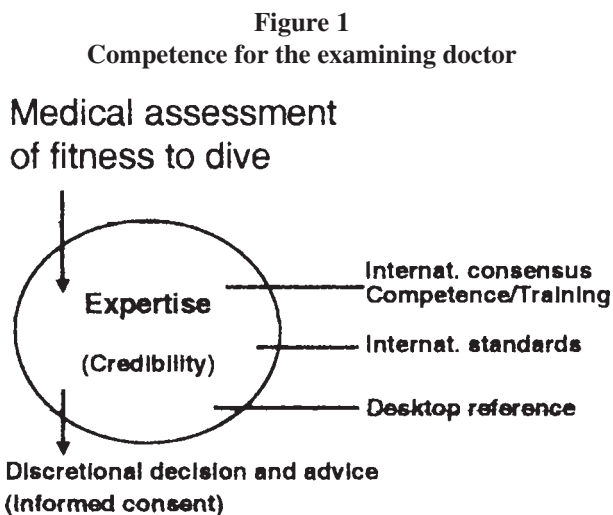
Looking at the two standards involving medicine we note some important trends:

**MEDICAL FITNESS-TO-DIVE STANDARD FOR PROFESSIONAL DIVERS**

A new approach abandons the prescribed pass/fail checklists and introduces a discretionary approach to known and possible medical risk factors. This allows the doctor to determine divers' fitness on an individual basis relating to the diving techniques to be used and the purpose of the diver's work. This discretionary approach implies a higher and controlled (certified) level of competence for the examining doctor (Figure 1). The appropriate levels of medical training are described in another standard, presented below. The assessment programme contains in-depth assessments, annual routine re-assessments and return-to-diving assessments, e.g., after decompression injury. The cycle of in-depth assessments starts at five yearly for young, healthy individuals and is shortened as required during the ageing process. This flexibility provides the divers with an occupational health assessment that has a good cost/benefit balance. Annual assessments are still routine, designed as an interview and basic physical exam without major technical investigations. This allows the diving medicine physician to monitor the diver and to build up a confidential base for communication.

**MEDICAL TRAINING STANDARDS**

Descriptive, individualised assessments for divers are acceptable only when the examining doctor has an approved capability to judge the situation. Therefore, four levels of competence have been defined in a consensus paper, namely the medical examiner of divers (level I), the diving medicine physician (level IIa) or hyperbaric oxygen physician (level IIb) and finally the diving/hyperbaric medicine consultant or expert (level III) (Table 1). Level II specialists are competent to perform their task in the diving or hyperbaric field; however, under supervision of an expert or consultant. This level is important in order to create a certain pool of specialists in the hyperbaric centre or diving rescue organisation. These standards were agreed together with the other European Committee (ECHM, see below) and are now implemented through national coordinators.



### Competency standards for dive training

These standards mainly define the way that divers are trained and the levels of competency needed in the industry. These standards, which are based on the International Marine Contractors Association (IMCA) and the Health and Safety Executive (HSE) regulations, include definition of some medical staff such as the 'diver medic', a diving emergency medical technician mainly used in offshore diving. Inshore divers use so-called 'hyperbaric first-aiders'; essentially assistant diver medics. They are trained to go under pressure with an injured diver and communicate with the diving medical physician by phone during a treatment.

### Recreational diving: the European Underwater Federation<sup>7</sup>

Recreational diving is not regulated in most European countries. However, insurance companies have created some limitations and the dive training organisations have all developed their own guidelines. In order to overcome differences that may create tension, the European Committee for Standardization<sup>8</sup> (CEN) has promoted a consensus process that has become possible under the newly created organisation, the European Underwater Federation (EUF), which includes all training organisations operating in Europe. The CEN is creating a standard for tourism services, including dive operators and dive training schools.

So far, the levels of competence of a diver as well as those of instructors have been defined (Table 2), and risk assessments, contingency plans and responsibilities for diving schools and dive boat operators have been prepared. This is a great step forward in mutual recognition and to facilitate diving across national borders. Diving services are defined as being one of the three following types:

- a) Organised dives, which are services to autonomous divers who are diving in buddy teams
- b) Guided dives, for divers being accompanied and supervised by a dive guide or instructor
- c) Training dives, which include not only training activities but also diving beyond the certified level of competence of the individual and which should only be performed in the presence of an instructor.

**Table 1**  
European Standards ECHM/EDTC  
Levels of training: 'jobs'

|            |   |
|------------|---|
| <b>I</b>   | Medical examination of divers                                       |
| <b>IIa</b> | Diving medicine physician   |
| <b>IIb</b> | Hyperbaric oxygen physician   |
| <b>III</b> | Hyperbaric expert or consultant<br>(hyperbaric and diving medicine) |
| <b>IV</b>  | Associated specialists<br>(e.g., otorhinolaryngologist)             |

### Medical treatment standards for diving accidents: the European Committee for Hyperbaric Medicine (ECHM)<sup>9</sup>

The ECHM was created fifteen years ago to standardise hyperbaric treatment programmes. The standards were produced through a consensus procedure following a well-defined protocol. Standards for medical treatment of diving injuries were agreed in 1996 in Marseille. At a consensus conference in Geneva in 2003, guidelines for prevention of hyperbaric injuries were discussed and recommendations published on the ECHM web site. These consensus recommendations of an expert panel are very valuable in the situation we find in many countries where hyperbaric treatment is not fully or sometimes not at all considered an established therapy and therefore not funded by insurance companies who argue a lack of evidence for its usefulness.

### Multinational standards: the fitness-to-dive standards of Germany, Austria and Switzerland

In 1986, the German Society for Diving and Hyperbaric Medicine (GTÜM)<sup>10</sup> published the first issue of its guidelines for the assessment of fitness for recreational diving to address the needs of the recreational diver.<sup>11</sup> At that time it was felt that the recreational diver was not covered appropriately by the standards on fitness to dive issued by the Workers Compensation in Germany for professional divers. A second edition of the GTÜM recommendations was published in 1992, and revised again in collaboration with recreational diver training organisations in 1994 following the Edinburgh *Conference on Medical Standards for Fitness to Dive*.<sup>12</sup>

In 1995, Wendling and colleagues produced the first edition of the fitness to dive manual, *Tauchtauglichkeit Manual*,<sup>13</sup> as a publication of the Swiss Underwater & Hyperbaric Medical Society (SUHMS).<sup>14</sup> This book became an important desk reference for the medical examiner of divers in all German-speaking countries. When the GTÜM reorganised its subcommittee on fitness to dive in 1997, it included as members on the committee both Swiss and Austrian doctors.<sup>15</sup> The third edition of the GTÜM recommendations was published in 1998 as a collaboration of this multinational German-speaking group.<sup>16</sup> In 2000 the same group, representing the three national societies,

**Table 2**  
Existing CEN norms for recreational diving

| Training modules and certifications |                       | Norm       |
|-------------------------------------|-----------------------|------------|
| <b>Level I:</b>                     | Supervised diver      | EN 14153-1 |
| <b>Level II:</b>                    | Autonomous diver      | EN 14153-2 |
| <b>Level III:</b>                   | Dive leader           | EN 14153-3 |
| <b>Instructor I:</b>                | Trainee               | EN 14413-1 |
| <b>Instructor II:</b>               | Autonomous instructor | EN 14413-1 |

agreed to sponsor a new edition of the Swiss manual. <sup>1</sup>This was published in 2001 and subsequently translated into French and English, recently reviewed in this journal.

Although this manual does not replace the German guidelines, it is a useful desk reference for the medical examiner of divers, as well as other interested groups or individuals. It is a great step forward in the creation of a uniform standard for Europe, which is expected to be initiated by the CEN in the near future.

Taking a broader perspective, from the above it may appear that the non-German continental countries such as France, Italy and Spain, and in particular the countries within the United Kingdom, which are all very active from a diving point of view, might just as well not exist. It must be admitted that the German-speaking group, which was the first to implement multinational standards, has so far not related to the activities of other countries besides making translations of the GTÜM-SUHMS-ÖGTH standards available and participating actively in seminars on fitness to dive in Europe. However, as mentioned in the introduction, in some countries existing national standards overrule European attempts on harmonised standards, and the work of harmonisation has yet to be acknowledged.

### Conclusions and outlook

Establishing uniform procedures is not only a very useful tool to improve communication, it is the only way to increase credibility in a scientific field where randomised double-blind prospective studies are difficult to design and generally do not exist. We have made important steps forward during the last decade, and it is time to think of enlarging the group and coordinating efforts with other continental representative organisations.

### References

- 1 Wendling J, Ehm O, Ehram R, Knessl P, Nussberger P. *Tauchtauglichkeit Manual. 2nd edition*. Biel: GTÜM, SUHMS, ÖGTH; 2001.
- 2 European Diving Technology Committee. <www.edtc.org>
- 3 *The goal setting principles for uniform diving standards in Europe* (1997), available at the secretariat, European Diving Technology Committee (EDTC), <oca@stoltoffshore.no>
- 4 *Training standards for diving and hyperbaric medicine*. Prepared by the Joint Medical Subcommittee of ECHM and EDTC. 1999
- 5 *Competence standards for divers training* (2002), available at the secretary of EDTC, <oca@stoltoffshore.no>
- 6 *Fitness to dive standards for professional divers* (2003), available at the secretary of EDTC, <oca@stoltoffshore.no>
- 7 European Underwater Federation (EUF). <www.euf.org.uk>
- 8 Committee for Standardization. <www.cenorm.be>
- 9 European Committee for Hyperbaric Medicine. <www.ccmh.com>
- 10 Gesellschaft für Tauch- und Überdruckmedizin. <www.gtuem.org>
- 11 Mindestanforderungen für die Tauchtauglichkeit von Sporttauchern. *Caisson*. 1986; 1(1)
- 12 Elliott D. *Medical assessment of fitness to dive*. London: Biomedical Seminars; 1995.
- 13 Wendling J, Ehram R, Knessl P, Nussberger P, Uské A. *Tauchtauglichkeit Manual. 1st edition*. Biel: SUHMS; 1995
- 14 Swiss Underwater and Hyperbaric Medicine Society. <www.suhms.org>
- 15 Österreichische Gesellschaft für Tauch- und Hyperbarmedizin. <www.oegth.at>
- 16 GTÜM e.V.-Richtlinien (Ausgabe 1998) für die medizinische Vorsorgeuntersuchung von Sporttauchern. *Caisson*. 1998; 13(4): 150-65.

*Dr. med. Jürg Wendling is a general and hand surgeon at Spitalzentrum Biel, Switzerland. He is a diving and hyperbaric medicine specialist, committee member of the European Committee for Hyperbaric Medicine and chairman of the Medical Subcommittee of the European Diving Technology Committee and Director of DAN Europe Suisse.*

*Faubourg du Lac 67,  
CH-2502 Bienne, Switzerland  
Phone: +41-(0)32-322-3876  
Fax: +41-(0)32-322-3839  
E-mail: <mail@wendling.ch>*

*Dr. med. Peter Müller is a consultant in anaesthesiology, intensive care medicine and diving and hyperbaric medicine and Medical Director of the Rhein-Neckar Diving and Hyperbaric Medicine Centre, Diakoniekrankenhaus in Mannheim. He is a member of the Working Group 'Education' for the European Commission, Editor of the **European Journal of Underwater and Hyperbaric Medicine** and Secretary General of the GTÜM. Diakoniekrankenhaus, Speyerer Str. 91-93, D-68163 Mannheim, Germany  
Phone: +49-(0)621-8102-390  
Fax: +49-(0)621-8102-393  
E-mail: <dr.mueller@hbo-mannheim.de>*

---

**The database of randomised controlled trials in hyperbaric medicine developed by Dr Michael Bennett and colleagues at the Prince of Wales Diving and Hyperbaric Medicine Unit is at:**  
**<www.hboevidence.com>**