

# The Diving Medical Advisory Committee

DMAC, Third Floor, 5 Lower Belgrave Street, London SW1W 0NR, UK  
Tel: +44 (0) 20 7824 5520 · Fax: +44 (0) 20 7824 5521

[www.dmac-diving.org](http://www.dmac-diving.org)  
[info@dmac-diving.org](mailto:info@dmac-diving.org)

## The Training and Refresher Training of Doctors involved in the Examination of Professional Divers and in the Treatment of Diving-Related Illnesses

Recommendations  
DMAC 17 – December 1985

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### I Introduction

We have been concerned for some time at the lack of positive guidance on the standards to be attained, and maintained by doctors undertaking the examination of professional divers, and the treatment of diving-related illnesses.

The recommendations which follow have been formulated from expert opinion drawn from many doctors who are actively engaged in diving medicine in the UK, Norway and elsewhere.

We would like to express the hope that they will be endorsed by appropriate government departments, and as a result, that any training establishment which purports in the future to offer doctors courses in these subjects will be obliged to comply as a minimum with these recommendations. We feel this to be essential in the long-term interests of the diving industry, and particularly of the divers themselves.

Our recommendations as to the content of each course have been arrived at after much thought and discussion, and are therefore firm. We recognise however that the duration and order in which they appear in each course timetable may have to be adjusted in the light of local circumstances.

### 2 Scope Definition

The recommendations throughout this paper are related to the three categories of doctor involved in one aspect or more of diving medicine. These categories are based on the 1981 EDTC guidelines, as follows:

#### A Examining Medical Doctor For Professional Divers

*A doctor trained to conduct medical examinations on professional divers for fitness to dive.*

#### B Diving Emergency Medical Doctor

*A doctor trained to work with divers and in particular, to cope with the medical aspects of every kind of diving emergency. He must be fit to go under pressure.*

#### C Specialists

##### i) Specialists in Diving Medicine

*A doctor generally recognised in the international diving community as being well experienced in aspects of diving medicine, such as a medical doctor who is consulted on difficult or unusual cases by examining medical doctors for divers, and by diving emergency medical doctors, and who has an expert knowledge of diving physiology.*

##### ii) Associated Specialists

*A specialist in some particular field (other than diving) who has an expert knowledge of the diving aspects of his special subject.*

### **3 Initial Training for Group A – Examining Doctor**

In our examination of this requirement, we have considered carefully whether to restrict the syllabus to normal office hours, or whether as appertains in at least one UK training establishment, have generally informal evening sessions most days, and thus offer longer tuition time, and additional opportunities for exchange of experience etc.

So far as this particular course is concerned, we have come down firmly in favour of a 5-day course with tuition hours not exceeding 7 hours per day. In reaching this conclusion, we have taken account of the fact that it would be a mistake to over-estimate the learning capacity of the students on this course, most of whom will be unfamiliar with most aspects of diving medicine and their related commercial importance.

It is clear that since this course is intended for 'examining' doctors, everything on the syllabus must be geared to helping such doctors to acquire as much background knowledge as possible on diving and the diving industry, as well as a basic understanding of diving physics and physiology.

Given the above, together with an appreciation of the inter-relationship between 'normal' medical conditions and the diving environment, it ought to be possible by the end of the course for students to have a much fuller understanding of all these matters. They ought thereby to be better equipped thereafter to come to a decision on whether or not a man is fit to dive, which has been based on a sound knowledge of the possible consequences which could follow that decision.

We feel that the emphasis must be on a syllabus designed for doctors examining professional divers rather than sports divers, and should include the items appearing under Group A - Examining Doctors in Appendix E.

A proposed timetable and syllabus appear in detail in Appendices A and E.

### **4 Initial Training for Group B – Diving Emergency Doctor**

We have carefully considered the question of an appropriate length of time for this course, bearing in mind the pressures and the other demands which will undoubtedly be made on the time of those doctors attending.

We are convinced however that there is no way in which justice can be done to the subject matter, or that lasting benefit can accrue to those attending, unless the course lasts for 2 full weeks. Again, we have come down in favour of restricting tuition sessions to not more than 7 hours per day, although some of the sessions could well run on informally into the evening.

Our experience suggests that the revision of background physics and physiology, an essential prerequisite to any therapy training; some first-hand experience of the diving environment; familiarisation with the clinical aspects diving medicine, together with exhaustive discussion and analysis of case histories, all add up to a course of two weeks' minimum duration. We are convinced that a course of shorter duration would be a waste of time and effort.

We recognise the desirability of having a period of practical experience after completing this course, before a doctor could be considered fully qualified to give expert advice in a diving emergency. Although there is no substitute for practical experience, it is difficult to see how this could be built into any course syllabus. We feel that this requirement can best be met by the handling of simulated diving emergencies in the course syllabus proper.

Further, we are convinced that all doctors likely to be pressurised in surface decompression chambers should be examined and certified fit to do so.

A proposed timetable and syllabus for this course appear in Appendices B and E respectively.

### **5 Initial Training for Group C (i) and (ii) – Specialists**

There is obviously no specific requirement here, but see paragraphs 8 and 9.

## 6 Refresher Training for Group A – Examining Doctors

We feel that it is essential to have different refresher courses for the different groups, and this paragraph deals only with refresher courses for examining doctors.

One of the principal difficulties about short refresher courses is that if they are too short, students will not feel that it is worthwhile to travel far to attend. On the other hand, making them sufficiently long to meet this requirement, brings the added responsibility of ensuring that all the content is still relevant, and not in any way padding.

We would see about 12 hours as being adequate refresher time for Group A, and would suggest the following timetable.

Thursday	10:30-18:15 + Evening session including dinner with invited guests.
Friday	09:15-15:00

The syllabus should include the following:

- i) Introductory talk bringing students up-to-date with developments in the field of diving medicals, not therapy.
- ii) We feel that short refresher courses of this kind can be made much more interesting if all those who are to participate write in about three weeks beforehand with specific problems which they have encountered. Directing staff will examine these in the interim, and the ensuing answering and discussion can almost certainly be of value to all.

We are of the opinion that examining doctors should attend these refresher courses every three years.

A proposed timetable and syllabus appears in detail in Appendix C.

## 7 Refresher Training for Group B – Diving Emergency Doctors

We are of the opinion that refresher courses for this group need to be longer than those for examining doctors, and our recommendation is for five days, with tuition not exceeding seven hours per day. Again, however, there will be occasions when some of these day-time sessions run on informally into the evening.

We attach great importance on this course to case history discussion, as it would appear to us that this would be particularly beneficial to those attending, experienced as they would be in the subject before coming on the course.

It is our view that diving emergency doctors should attend these refresher courses every three years.

We recommend that every doctor in this category should undergo a practical session in a chamber. We recognise however that this may impose practical difficulties at some training establishments. In these circumstances, alternative arrangements for this chamber session should be agreed with the course organiser, prior to the commencement of the course.

A proposed timetable and syllabus for this course appears in detail in Appendix D.

## 8 Refresher Training for Group C (i) – Specialists in Diving Medicine

What refresher training can be considered necessary for an internationally acknowledged expert in diving medicine?

Surely this can only be accomplished by postgraduate study, by attendance at international diving medicine symposia, and by a continuing regular involvement in diving medical therapy.

Failure to maintain any of these three criteria, but particularly the latter, would undoubtedly in due course mean the fall of a star from the firmament, albeit perhaps only as far as the Heaviside Layer.

## 9 Refresher Training for Group C (ii) – Associated Specialists

We do not consider that we are qualified to make recommendations for refresher training for specialists in these other areas.

## Appendix A Initial Training for Group A – Examining Doctors

33 hours

The numbers against each session relate to the lectures listed in Appendix E attached

Day	09:15-10:15	10:15-10:30	10:30-11:30	11:30-12:30	12:30-14:00	14:00-15:00	15:00-15:15	15:15-16:15	16:15-17:15	17:15-18:15	18:30-19:30	19:30-21:30
<b>Mon</b>	(i)	Coffee	(ii)	(iii)	Lunch	(iv) (half)	Tea	(iv) (half)	(v)(a)	(v)(b) (v)(f)	Dinner	--
<b>Tues</b>	(v)(e)	Coffee	(vi)	(viii) (half)	Lunch	(viii) (half)	Tea	(ix)(a)	(ix)(b)	(x)	Dinner	--
<b>Wed</b>	(xiii)	Coffee	(xiv)	(xiv) contd	Lunch	(xiv) contd	Tea	(xiv) contd	(xv)	(xviii) (xvi)(c)	Dinner	--
<b>Thurs</b>	(xxiv)	Coffee	(xix)	(xix)	Lunch	(xxi)	Tea	(xxi) contd	(xxi) contd	(xxi) contd	Dinner	--
<b>Friday</b>	(xxii)	Coffee	(xxii) contd	(xxii) contd	Lunch	(xxii) contd	Tea	(xxv)	--	--	--	--

## Appendix B Initial Training for Group B – Diving Emergency Doctors

65 hours

The numbers against each session relate to the lectures listed in Appendix E attached

Day	09:15-10:15	10:15-10:30	10:30-11:30	11:30-12:30	12:30-14:00	14:00-15:00	15:00-15:15	15:15-16:15	16:15-17:15	17:15-18:15	18:30-19:30	19:30-21:30
Mon	Intro + (i)	Coffee	(iii)(d)	(iii)(d) contd	Lunch	(ii)	Tea	(iv)	(iv) contd	(iv) contd	Dinner	--
Tues	(v)	Coffee	(v) contd	(v) contd	Lunch	(v) contd	Tea	(vi)	(vii)	(vii) contd	Dinner	--
Wed	(viii)	Coffee	(viii) contd	(viii) contd	Lunch	(viii) contd	Tea	(viii) contd	(xv)	(xv) contd	Dinner	--
Thurs	(xi)	Coffee	(ix)	(ix) contd	Lunch	(xviii)	Tea	(xx)	(xx)	(xii) (xiii)	Dinner	--
Friday	(xxiv)	Coffee	(x)	(x) contd	Lunch	Review of the week	Tea	--	--	--	--	--
Weekend Break												
Mon	(xvii)	Coffee	(xvii) contd	(xvi)	Lunch	(xvi) contd	Tea	(xxii)	(xxii) contd	(xxii) contd	Dinner	--
Tues	(xxii) contd	Coffee	(xxii) contd	(xxii) contd	Lunch	(xxii) contd	Tea	(xxii) contd	(xxii) contd	(xxii) contd	Dinner	(xxii) contd
Wed	(xxvi)	Coffee	(xxvi) contd	(xxvi) contd	Lunch	(xxvi) contd	Tea	(xxvi) contd	(xxvi) contd	(xxvi) contd	Dinner	--
Thurs	(xxvi) contd	Coffee	(xxvi) contd	(xxvi) contd	Lunch	(xxvi) contd	Tea	(xxvi) contd	(xxvi) contd	(xxvi) contd	Dinner	(xxiii) ½ hr only
Friday	(xxii) contd	Coffee	(xxii) contd	(xxii) contd	Lunch	(xxv)	Tea	--	--	--	--	--

## Appendix C Refresher Training for Group A – Examining Doctor

*12 hours*

Day	09:15-10:15	10:15-10:30	10:30-11:30	11:30-12:30	12:30-14:00	14:00-15:00	15:00-15:15	15:15-16:15	16:15-17:15	17:15-18:15	18:15-19:30	19:30-21:30
Thurs	-	Coffee	(1)	(7)	Lunch	(8)	Tea	(2)	(3)	(4)	Dinner	(11)
Friday	(5)	Coffee	(9)	(10)	Lunch	(6)	-	--	--	--	-	--

### KEY

- 1 Introductory talk, bringing students up-to-date, by diving specialist/diving emergency doctor?
- 2 } Role-playing syndicate sessions on problems sent in earlier by students, but also mainly directing staff pre-set exercise.
- 3 }
- 4 }
- 5 Debrief on (2), (3) and (4).
- 6 Self-assessment examination.
- 7 Case histories on problems arising from medical examinations, plus revision session on standards of fitness.
- 8 Revision lecture on the physics of diving and the physics of gases.
- 9 Revision lecture on safety - psychology, selection, drugs, alcohol, diet, obesity, fatigue and training.
- 10 Revision lecture on diving related medical conditions - the sick diver and the injured diver.
- 11 Evening session/dinner with invited guests and guest speaker from HSE/operator/diving contractor/local doctor.

## Appendix D

### Refresher Training for Group B – Diving Emergency Doctors

32 hours

Day	09:15-10:15	10:15-10:30	10:30-11:30	11:30-12:30	12:30-14:00	14:00-15:00	15:00-15:15	15:15-16:15	16:15-17:15	17:15-18:15	18:30-19:30	19:30-21:30
<b>Mon</b>	(1)	<i>Coffee</i>	(2)	(3)	<i>Lunch</i>	(4)	<i>Tea</i>	(5)	(6)	(7)	<i>Dinner</i>	--
<b>Tues</b>	(8)	<i>Coffee</i>	(9)	(10)	<i>Lunch</i>	(11)	<i>Tea</i>	(12)	(13)	(14)	<i>Dinner</i>	--
<b>Wed</b>	(15)	<i>Coffee</i>	(16)	(17)	<i>Lunch</i>	(18)	<i>Tea</i>	(19)	(20)	(21)	<i>Dinner</i>	(34)
<b>Thurs</b>	(22)	<i>Coffee</i>	(23)	(24)	<i>Lunch</i>	(25)	<i>Tea</i>	(26)	(27)	(28)	<i>Dinner</i> (33)	(33)
<b>Friday</b>	(29)	<i>Coffee</i>	(30)	(31)	<i>Lunch</i>	(32)	<i>Tea</i>	--	--	--	--	--

- (1) Introduction and general review of recent clinical and technological developments
- (2)-(7) Revision periods on physics of diving, physics of gases, physiology of diving, etc.
- (8)-(14) Case histories/syndicate work
- (15)-(21) Practical diving instruction, including chamber dive to 50 metres on air
- (22)-(28) Case histories/syndicate work (cont'd)
- (29)-(31) It would be unwise to be too specific about allocating subject matters to these periods. As any course progresses, weaknesses become apparent and extra time is needed. This is particularly relevant on refresher courses. These periods, on the last morning of the course have been left to the discretion of directing staff for this reason.
- (32) Self-assessment examination
- (33) This would seem to be very suitable for an end-of-course semi-formal dinner, with an appropriate guest speaker, either speaking at the dinner, or at an evening session thereafter. Local diving doctors should also be invited to the dinner.
- (34) Optional evening session on cardio-pulmonary resuscitation, putting up drips, etc

## Appendix E

		Group A <i>Examining Doctor</i>	Group B <i>Diving Emergency Doctor</i>
		HOURS	HOURS
i)	Types and history of diving (general, breathhold, scuba, surface supplied, bounce, saturation, excursion)	1	1/2 (review)
ii)	Diving systems and equipment (theory), including dive planning and safety procedures	1	1
iii)	Physics of diving	1	
	a) Pressure		
	b) Partial pressure		
	c) Effects of change of pressure on gas-containing spaces including sinus, teeth, chest)		
	d) Review of diving physics		2
iv)	Gases	2	3
	a) Air, nitrogen, narcosis		
	b) Oxygen & HBO		
	c) Carbon dioxide, carbon monoxide, helium		
	d) Gas laws, partial pressure calculations		
v)	Physiology of diving		
	a) Respiration, including gas density and resistance (immersion effects, respiratory and circulatory), correlated with known medical disorders of lungs, airways, etc.	1	1/2
	b) HPNS	1/2	1/2
	c) Thermal balance - heat and cold		1/2
	d) Diet and metabolism		1/2
	e) The ear in diving	1	1
	f) Vision	1/2	
	g) Immersion, drowning and near drowning		1
vi)	Decompression theory and tables Haldane and modern	1	1
vii)	Immediate evaluation of the diving casualty		2
viii)	Decompression sickness		
	a) Diagnosis (presentation and monitoring)	1/2	1
	b) Therapy	1/2	1
	c) DCS including inner ear and CNS	1/2	1
	d) Barotrauma, including diagnosis and treatment of pulmonary barotrauma and arterial gas embolism)	1/2	1
	e) Treatment tables		1
ix)	Diving related medical conditions		
	a) The sick diver	1	1
	b) The injured diver	1	1
x)	Use of drugs including adjuvant therapy (see also (xv))	1	2
xi)	Management of the patient at pressure Anaesthesia, use of ventilators in chambers, coincidental illness and injury		1

	<b>Group A</b> <i>Examining Doctor</i>	<b>Group B</b> <i>Diving Emergency Doctor</i>
	<b>HOURS</b>	<b>HOURS</b>
xii) Dangerous marine life		½
xiii) Aseptic bone necrosis (and any other long-term alleged effects)	1	½
xiv) Standards of fitness	4	
a) The examination, including emphasis on pre-disposing factors, residual symptoms or signs which might present during routine examination		
b) Evaluation of examination		
c) Conditions restricting or preventing diving activity		
xv) Safety	1	2
Psychology, selection, drugs of abuse, alcohol, diet, obesity, fatigue, training		
xvi) Diving accidents		2
a) The pathology of diving accidents		
b) Accident investigation		
c) Litigation vis-a-vis the medical profession	½	
xvii) Organisation of a diving emergency service		2
a) Communications		
b) Training		
xviii) Design and acceptance criteria for personal diving equipment, such as underwater breathing apparatus	½	1
xix) Current legislation, government and other authoritative recommendations, etc. as they affect the examining doctor, with particular reference to those countries in which he may work	2	
xx) Current legislation, government and other authoritative recommendations, etc. as they affect the diving emergency doctor, with particular reference to those countries in which he may work		2
xxi) Visit to a chamber/diving vessel	4	
xxii) Case histories/syndicate work	4	15
xxiii) Relevance of current research trends		½
xxiv) Sports diving/women in diving	1	1
xxv) Self-assessment examination	1	1
xxvi) Practical diving instruction, including chamber dive to 50 metres on air		14
<b>TOTALS</b>	<b>33</b>	<b>65</b>