

## Core Curriculum Bandos

### **CORE CURRICULUM, Physicians course in diving medicine Bandos (10 days)**

Under each topic are listed a number of items and facts that the student is expected to know about. Often, but not always, the topics are identical with lectures. The schedule is affected by many different factors and may change during the course so keep track of changes in the master schedule if you want to prepare yourself and read ahead. The focus of the course is on scuba diving, recreational as well as professional.

#### **Textbooks:**

**Diving and subaquatic medicine by Edmonds, Lowry, Pennefather, and Walker** 4<sup>th</sup> ed 2002.

**Hyperbar fysiologi och dykermedicin by Hans Örnhammar** 3:rd ed 1998

#### **Scuba organizations**

PADI, NAUI, CMAS educational levels  
Education philosophy and teaching materials  
Geographical distribution

#### **Diving procedures, and equipment**

Breath hold, face masks, snorkel, fins  
Buoyancy, thermal insulation  
Suits, wet, semidry, dry  
Scuba, open, semiclosed and closed circuit  
Helmet, copper, demand  
Surface supplied diving  
Saturation and habitats  
Wreck diving, ice diving, cave diving

#### **Physics**

Gas laws  
Dimensions and definitions of pressure. Pressure conversions  
Solubility and diffusion in gases and liquids  
Calculation of partial pressures and fractions  
Thermal convection, conduction, radiation  
Surface tension and Law of Laplace

#### **Effects of immersion**

Effects on circulation  
Auto transfusion  
Effects on respiration  
VA/Q effects  
Trans-diaphragmatic pressure

#### **Apnea diving**

Regulation of breathing  
Breath holding time under different conditions  
Risk with hyperventilation  
Shallow water black-out  
Max depth and thoracic pooling of blood  
Squeeze, mask, pulmonary  
DI and pulmonary barotrauma

#### **Scuba and respiration**

Static and dynamic load  
Open and closed systems  
Work of breathing  
Valves and cracking pressure  
Dead-space  
Aerosol and cold gas  
Pulmonary oedema

#### **Pulmonary barotrauma**

Possible mechanisms  
Incidence  
Predisposing factors  
Signs and symptoms

#### **ENT problems**

Pressure equilibration and different techniques  
Aerotitis media  
Reversed ear  
Alternobaric vertigo  
Round window rupture  
Loss of hearing and hearing under water  
Otitis externa, prophylaxis and therapy  
DI of the vestibulo-cochlear system

#### **Gases in diving**

Oxygen, O<sub>2</sub> toxicity  
Carbon dioxide, CO<sub>2</sub> retainers  
Nitrogen, depth narcosis, DI  
Water vapour, condensation in closed systems  
Helium, deep diving  
Possible pollutants in compressed air, oil, CO, water, allergens

#### **Technical diving**

Definition  
Philosophy  
Type of equipment  
Type of dives, deep, cave, wreck  
Gas shift in decompression  
Propulsion

#### **Male - female divers**

Physical differences  
Attitude and personality differences  
Hormonal differences  
Menstruation  
Pregnancy  
Sensitivity to DS

#### **Marine organism injury**

Sting, bite, touch, alimentary intoxication  
Types of organisms and global distribution  
Treatment  
Prophylaxis

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### **Hypo- hyperthermia**

Modes of thermal stress  
Difference dry versus wet  
Clinical signs  
Treatment  
Prophylaxis

### **Near drowning**

Dry versus wet  
Salt versus fresh  
Acute and late symptoms  
In combination with hypothermia  
Immediate care and clinical handling

### **CPR**

According to standard medical practice

### **Inert gas transport**

Physical solution of gases  
Concept of saturation and half-time  
Tissue compartments  
Wash in - wash out  
Oxygen window  
Supersaturation and bubble formation  
Counter diffusion

### **Table design**

Haldane, Workman, Buhlmann  
Nordic standard table  
Recreational dive planner  
Repetitive diving

### **Nitrox and dive computers**

Equivalent air depth  
Risks and advantages  
Equipment requirements  
Tables for nitrox  
General computer design  
Advantages and disadvantages with computers

### **Bubbles blood and tissue**

Bubble nuclei and bubble formation  
Surface tension  
Tissue versus blood bubbles  
Blood chemical effects of bubbles  
Embolization pulmonary and systemic

### **Decompression illness**

Clinical manifestations  
Diagnosis and clinical tools  
Classification old and new  
Predisposing factors  
Prophylaxis

### **Treatment of DI**

Difference between DS and AGE  
Direct on site Normobaric oxygen and liquid  
Recompression  
Choice of different tables  
Drugs in the treatment of DI

Resistant DI  
Sick leave and return to diving

### **Technical aspects of HBO treatment**

Fire hazard, prevention, extinguishing  
Minimum requirement of chambers  
Multi place, mono place, transportable  
BIBS, mask, hood,  
Gas analysis  
Approval of equipment for use in chambers  
Communication  
Hygiene  
Compressors, gas bank, UPS

### **Diving accidents in the Maldives**

Trauma, boats, animals  
Intoxication and venoms from sea life  
Skin problems  
Drowning  
DI

### **Drug and handicap**

Drugs that are, are not compatible with diving  
Drugs to treat diving related disorders  
Abuse and diving  
Handicaps compatible with diving  
Precautions to take  
Organizations for handicapped divers

### **Fit to dive**

Why assess?  
The interview, physical examination, lab test  
Spirometry  
X-ray or not  
Minimum physical fitness  
Contraindications to diving  
Repetition how often?

### **Long term effects of diving**

Mental  
Hearing  
Pulmonary  
Neurological  
Bone necrosis

### **Scuba accidents and accident statistics**

Scandinavian over all,  
DI and recompression treatment, fatal  
Incidents and reporting back  
International comparisons  
DAN US and DAN Europe

### **Air evacuation and networks**

Acute and after recompression treatment  
Fixed wing versus helicopters  
Pressurized cabin, oxygen in flight  
DAN  
SOS International  
Insurance and international agreements (EES)