PROGRAMME

17th Capita Selecta Duikgeneeskunde

Medication and Diving,

A symposium

For dive physicians and other care professionals

Date: Saturday 19 March, 2016
Venue: Academic Medical Centre, Amsterdam

Subjects
Medication in ENT, Neurology, Psychiatry, Pulmonology, Cardiology and Internal medicine.

Aim
This symposium aims to give insight into the intended effects of the application of drugs and their side effects in relationship to diving. This includes safety aspects, both medical as well as in general. A preliminary consideration is that if a particular drug affects the ability to drive a car safely, diving safety is quite likely threatened as well.

Several questions may be distinguished:
1. What is the condition/disorder/illness for which the medication is prescribed and what are the relationships between the drug, the patient, his/her diet and the interactions with other (prescribed) medicines?
2. To what extent does the application of the drug for a specific disorder influence an organ or the entire system so adversely as to prevent one from diving safely?
3. Medications are mainly used by middle aged and elderly people. From the age of 40 to 70 years the physical reserve, and consequently the self-reliance, is reduced, by at least a factor of two. What are the effects of the drugs on the physical reserve?
4. Also the mental reserve of the aged (that is the drive to preserve one’s life) is reduced. Therefore the same questions as asked for the physical reserve may also be raised for the mental reserve.
5. Attention, concentration, (situational) awareness, vigilance and decision making ability, all crucial for diving safety, can also be greatly diminished. Moreover, reduced attention and concentration results in reduced perception. To what extend does this all reduces dive safety?

Knowledge of the above subjects is crucial for the medical examiner. For professional divers the use of drugs would mostly imply immediate rejection. In recreational diving the criteria for passing a physical are much less clear-cut. In fact, during the past decennia, the ‘grey zone’ has expanded like an oil-stain.

Another application is the investigation of the relationship between medication and a dive incident. After this seminar, the physician will have the knowledge to decide whether a professional diver who is using prescription drugs or has just finished medication, should be passed for his physical and whether a recreational diver when using specific medicines should be allowed to dive and if so, under what conditions.

This seminar should be regarded as an advanced course. An elementary course on diving medicine (in the Netherlands e.g. SHF or VSG) is a prerequisite for physicians.

Speakers
Arjen van Henten, pulmonologist, Máxima Medisch Centrum, Department of Pulmonology, Eindhoven; Dr. Cees Meeuwis ENT physician, ENT Department, Erasmus University; Bram Querido, psychiatrist, Hilversum; Dr. Rienk Rienks, cardiologist, Utrecht Medical Center, Utrecht; Dr. Gerhard Visser, neurologist, Stichting Epilepsie Instellingen Nederland, Heemstede; Dr. Peter Westerweel, internist. Albert Schweitzer Hospital, Dordrecht:

Recommendation
The course is recommended by the expert group of dive medicine of the Vereniging voor Sportgeneeskunde (Soc Sports Med) and by the Nederlandse Vereniging voor Duikgeneeskunde (NVD, Dutch Soc Dive Med).
Accreditation
In general, the level of the various lectures / subjects of the meeting are (at least) in accordance with that of EDTC and ECHM, level 1 (Medical Examiner) and Level 2D (Diving Physician). The program comprises 6 oral contact hours. The Dutch NVAB, VSG and NICDA (diving physicians C and D) have been requested to provide 6 accreditation points for the meeting and “outside own specialism” (GAIA) will yield 6 points too. NVD accreditation has been obtained.

General: mission of the “AMC Capita Selecta Duikgeneeskunde”.
The Capita Selecta Duikgeneeskunde (CSD), refresher courses dive medicine, are given by the Academic Medical Centre (AMC), a one-board-cooperation of the medical faculty of the University of Amsterdam (UvA) and the academic hospital with the UvA. This hospital has a special position within the Dutch academic hospitals; it is the cradle, also in Europe of a related discipline, hyperbaric medicine, performed in the “Boerema Tank”. This new type of refresher courses, offered to dive physicians, has a typical ‘Alma Mater’ character.
In the first place, the AMC Capita Selecta present extensively and discipline-wise education in dive and caisson medicine. In addition, they also give education in new developments as they occur in the academic hospitals and medical faculties. This implies that, within the lessons, the characteristics of disorders are discussed, including their diagnostics and treatment, form the point of view of the present academic state of the art.
In short, the Capita Selecta are marked by a mix of education in the dive medicine of the respective discipline and up-to-date education in the discipline itself, for instance in cardiology, ophthalmology, otology etc. Also, the Capita will pay attention to the requirements of the medical examination.
The Capita are aimed for non-specialized physicians, first line physicians, sport and occupational physicians, professional dive physicians, clinical doctors and paramedical academics and technicians.
In general, the teachers have their affiliation with academic hospitals and medical faculties, and have an international reputation in patient care, academic education and/or medical research as becomes clear from their curriculum vitae.
To have lower thresholds for the courses given in the Netherlands, the venue is easy to reach and centrally located, and more over the course is low-budget.

Programme committee
Nico Schellart (chair, diving physiologist), Marga Schweigmann (hyperbaric & diving physician), Erik van der Sande (family and sport physician) and ad hoc the six lecturers.

Executive committee
Nico Schellart (course director), Eduard van Riet Paap (administrative manager) and Hans van Dam

Responsibility
The Capita Selecta Duikgeneeskunde are given under the responsibility of the Academic Medical Centre, Univ. of Amsterdam (course leader Nico Schellart). The organization is by the Stichting Duik Research (SDR)1) and Biomed. Eng & Physics, AMC (Prof. Dr. A.G.J.M. van Leeuwen, chair).

Announcements
Ongoing announcements about future courses can be found at www.duikresearch.org, www.diverresearch.org or are communicated by E-mail.

1) SDR is a non-profit organisation aimed to promote dive safety. Work for SDR is done voluntarily.

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Programme

Medication and Diving

8:30-9:00  **Welcome**

9:00-9:05  **Introduction, Nico Schellart, chairman**

1  9:05-9:50  **Cees Meeuwis, ENT medication and Diving**
Discussion 9:50-10:00

2  10:00-10:45  **Arjen van Henten, Pulmonological medication and Diving**
Discussion 10:45-10:55

   Break

3  11:15-12:00  **Gerhard Visser, Neurological medication and Diving.**
Discussion and general discussion 12:00-12:20

   Lunch

4  13:10-13:55  **Rienk Rienks, Cardiological and Vascular medication and Diving**
Discussion 13:55-14:05

5  14:05-14:50  **Bram Querido, Psychiatrical medication and Diving**
Discussion 14:50-15:00

   Break

6  15:15-16:00  **Peter Westerweel, Medication of Internal diseases and diving,**
Discussion and general discussion 16:00-16:20

16:20 16:45  **Final Exam**

Refreshments

Disclaimer: Capita Selecta Duikgeneeskunde (i.e. AMC and SDR) is bound to execute the educational program, but small program changes are under reserve.
The lecturers

**Arjen van Henten** is pulmonologist at the Máxima Medisch Centrum in Eindhoven/Veldhoven. His specialties in pulmonology include oncology, obstructive pulmonary diseases and diagnostic procedures. He is an enthusiastic scuba diver, and was certified in 2011 as a Medical Examiner of Divers (Duikerarts D, the Netherlands). In 2015, he was also received his certification as a EDTC/EHMC Medical Examiner of Divers. Weekly divers are examined for their fitness to dive, especially regarding their pulmonological condition. He participates in the Working group WASHBO (Werkgroep Ademhalingstoornissen Sport, Hobby en Bijzondere Omstandigheden) of the NVAL (Dutch pulmonologist society). Furthermore he is medical consultant of the NOB (Nederlandse Onderwatersport Bond). He is a member of the Dutch Society of Sports Medicine (VSG), the Dutch Society of Diving Medicine (NVD), as well as the South Pacific Underwater Medical Society (SPUMS).

**Cees Meeuwis** is an ENT and Head and Neck surgeon working at the Erasmus Medical Center (EMC) in Rotterdam within the Cancer Center. He graduated in medicine in 1981 and obtained his doctorate in 1987 on a dissertation on wound healing of the nasal septal cartilage. Due to his function as a senior Head and Neck surgeon he is involved in the treatment with hyperbaric oxygen of patients with wound healing problems and radiation ulcers. As a diver (PADI Advanced open water and nitrox) and as a private pilot he is very interested in diving and aeromedical Otolaryngology. He is a Medical Examiner of Divers (MED) certified by the European College of Baromedicine (ECB). Last year he has been a teacher on our refresher course “ENT and Diving”.

**Bram Querido**, a son of a GP, graduated in medicine in 1985 and was confirmed as psychiatrist in 1990. He has been trained in the only Jewish Psychiatric Hospital in Western Europe, the Sinai Centre in Amersfoort. He was already very involved the trauma suffered by Holocaust survivors. During the three years of internship in the Sinai Centre he even became more interested in what’s now called post-traumatic stress disorder. After a few years working in hospital psychiatry, he started his own practice together with his wife, an art therapist, in Hilversum. In 2002 he started the “Hulpuids”, a website with hundreds of pages full of information about mental health care, psychotherapy, psychiatric disorders and psychiatric medication. His main interests lies in (group) psychotherapy with traumatized patients. He is a PADI staff instructor, owned, together with his son, a diving school (Qdiving) and from this originates his special interest in psychiatry and diving.

**Rienk Rienks** graduated in medicine in 1981 and was confirmed as cardiologist in 1986. He has been trained at the Utrecht University Hospital. Since 1983 working at the Utrecht Medical Centre, UMC, he obtained his doctorate in 1991 on a dissertation on the applications of lasers in cardiology. On detachment to the Centraal Militair Hospitaal in Utrecht since 1995, he cares for military personnel. His main interests lies in diving, aeromedical, and sports cardiology. Considered a national authority on hypo- and hyperbaric cardiology he fulfills several consultancies and was member of the board of the Dutch Society for Sports Medicine, VSG, and participates in several committees of the Dutch Society for Cardiology (NVvC) and VSG. He is member of the UHMS. He started to dive in 1982 during his tenure as a resident in Curacao. He is a PADI and NAUI certified Advanced open water, Rescue and Nitrox diver.

**Peter Westerweel** is internist-hematologist, working at the Albert Schweitzer Hospital in Dordrecht. He has authored several international publications in diving medicine, although the majority if his scientific work has been focused on the role of bone marrow derived progenitor cells in renal and cardiovascular disease. He has obtained his PhD at the University Medical Centre in Utrecht, where he was subsequently employed as a postdoctoral researcher. He worked at the Weill Cornell Medical Centre in New York, USA, as a visiting fellow. He is a diving physician with the Dutch Society for Diving Medicine and member of the board of the society. He also is a consultant for the Diving Medical Centre of the Dutch Navy. He has participated in the development of several national guidelines in diving medicine, including those on diving with diabetes and diving with antiplatelet and
anticoagulant drugs. He is the main investigator of the DIDIH (Diving with Disorders in Hemostasis) study, building a large database of comorbidity and medication used by Dutch and Belgian divers. He is an enthusiastic scuba diver and active PADI Open Water and Specialty Instructor, diving in the Netherlands year-round, while enjoying a tropical underwater excursion when the opportunity arises.

**Gerhard Visser** is a neurologist and since 2011 medical head of the Clinical Neurophysiology department and Epilepsy Monitoring Unit in the Stichting Epilepsie Instellingen Nederland (SEIN), location Heemstede. His former position was head of Clinical Neurophysiology in the Erasmus University Hospital in Rotterdam. His PhD degree (1998) was about Non-invasive (EEG and TCD) detection of compromised cerebral circulation in the context of carotid endarterectomy. His main scientific interests has been motor unit physiology, continuous neonatal EEG monitoring, and more recently, Cortical Excitability. In the field of diving medicine, he has been involved in research projects with the Diving Medical Centre of the Royal Dutch Navy on oxygen toxicity and the hyperbaric treatment of cerebral embolism. He has been member (since 1988) and president (1997-2012) of the medical committee of the Dutch Underwater Association. He’s member of Expert Committees of the Nederlandse Vereniging voor Duikgeneeskunde (NVD) and the Vereniging Sportgeneeskunde (VSG), and member of a committee involved in the certification of Sports Diving Medicine (SCAS). In the past years he’s been involved as teacher in many diving medical related courses and the medical training of divers and diving instructors. He is a sports diver since 1982 and continues to enjoys the underwater world as 4* CMAS diver, 2* Instructor Trainer and Nitrox Instructor.

**The symposium chairman**

**Nico Schellart** graduated as biologist and specialized in physiological and biomedical physics. He studied visual information processing of the retina, resulting in a PhD in 1973 (University of Amsterdam). He is an associate professor with the department of Biomedical Engineering and Physics of the AMC and was associate editor of a biomedical engineering journal. He has researched information processing of the visual and auditory system of the brain in animals and humans by fundamental and clinical EEG and MEG methods. His neuroscience studies have resulted in publication of some 50 papers, 80 abstracts and 10 contributions in textbooks and been published a free electronic textbook on biomedical physics. He has studied the brain and the visual system under hypoxic and hyperoxic conditions in both the laboratory as in the field, including pre-cordial Doppler studies, and recommends HBO treatment for patients with cerebral radiation damage. He published nearly 20 dysbaric and HBOT studies in e.g. Cancer, J Appl Physiol and UHM, and ten different conference proceedings (like EUBS and UHMS). He is a frequently asked reviewer of journals in applied, sports and environmental medicine. Since 2011 he is course director of the CSD. He teaches diving physiology, is member of UHMS, EUBS and NVD, and often participated with contributions in their annual meetings. Also, he has tested the technical and physiological performance of dozens of dive computers ([www.diveresearch.org](http://www.diveresearch.org)), and he is a recreational scuba- and a former free diver.
Description of lectures

Cees Meeuwis, ENT medication and Diving
Nearly 70% of all diving problems are ENT related. Even small problems outside the water can be very bothersome or even dangerous under water. The main problems deal with the external auditory channel and with the aeration of the cavities in the head and neck, mainly the middle ear. To cope with ENT problems every diver including dive instructors have their own medicine kit. The strategy developed by divers to deal with ENT problems can be very effective, but may be ineffective or even dangerous as well.

During the lecture the following topics will be discussed:
- **Externs ear** Prevention and treatment of external otitis is a real topic for every diver and diving doctor. There is an enormous array of possible medications. A guideline will be provided for the realistic treatment of external ear problems.
- **Middle ear and sinuses** There is a continuous misunderstanding of the use of decongestive nose sprays and medication. It is safe to use these drugs and there is a real danger concerning the rebound effect? In other words: to what extend may drugs be used while diving and which ones may actually compromise safe diving?
  - **Antihistamines** These anti-allergic drugs are widely used. They are used together with steroids like prednisone and steroid nose sprays to continue diving, even when there are already problems in clearing the middle ear or sinuses. Another question is: what might be the effect of these "non-sedating" drugs under hyperbaric conditions?
  - **Motion sickness** A diving trip can be spoiled by motion sickness. Is there a safe method to deal with this problem? The focus will be on drugs like Primatour and Cinnarezine, and plasters such as scopalamine.

Most important however is a good knowledge of the physiology of the ENT-mucosa, and an awareness of the external factors (air-condition in airplanes, jet lags, dive-conditions) and personal behaviour and conditions (smoking, alcohol, physical condition, ENT medical history), because they determine most of the physical (ENT) diving hazards.

Arjen van Henten Pulmonological medication and Diving
In diving, the pulmonary system is, in addition to the cardiovascular system, highly susceptible to the adverse effects of hyperbary and consequently these effects may directly preclude safe diving. The first part of the lecture will discuss the physiological aspects of the lung when diving. In the second part the various types of pulmonary diseases will be discussed, which are, or may be, relevant for SCUBA, such as obstructive (COPD, asthma, allergy), interstitial, vascular and oncological pulmonary diseases. A distinction will be made between disorders with an absolute contra-indication and those with a relative one. Many of these disorders require an incidental, but more often a permanent medication. Do pulmonological drugs, e.g. beta 2 sympaticomimetica, anticholinergia, anti-inflammatory drugs or antibiotics affect the lung in such a way that diving safety cannot be guaranteed? And what about their side effects, both on other organs and as well as systemic?

More insight into the pharmacology and pathophysiology of drug application in diving is a necessity to decrease risk. Although evidence may not be easy to obtain, it is a challenging enterprise to come to a consensus, based on the knowledge of pulmonological disorders, medication and SCUBA diving.

Gehard Visser Neurological medication and Diving
Changes in the operation of medicaments when used in a hyperbaric environment are usually not well researched. In my presentation I therefore will provide and explain general guidelines that can be used in assessing whether diving with a certain drug can be safely accepted. If relevant drug-specific knowledge related to diving is available, this will be given. As the title suggests, focus will be on drugs that potentially influence operational diving safety by affecting the proper functioning of the nervous system (either cognitive or functional), or that may increase the risk of a specific nervous system related diving disorder, including loss of consciousness.

For this, the following considerations are important: (1) is the underlying condition for which the drug is given a problem for diving (such as epilepsy), (2) are the aimed effects of the given drug a problem (such as anticoagulation and the additional damage that may result in the occurrence of decompression sickness), (3) are the known side effects of the drug a problem (i.e. dizziness, drowsiness, nausea), (4) does the diving environment has an undesirable effect on pharmacokinetics or dynamics, and (5) does the drug gives an increased risk of a specific diving associated condition, in particular decompression sickness, nitrogen narcosis, carbon dioxide intoxication or oxygen toxicity.
Rienk Rienks, Cardiologic and Vascular medication and Diving
Important questions for the medical examination in relation to the use of cardiovascular drugs are: (1) Does the patient have the cardiovascular health and exercise capacity to dive safely? (2) Is a stress EKG needed to confirm adequate cardiac fitness? The following classes of cardiovascular drugs will be discussed in relation to medical dive safety and dive safety in general: lipid-lowering drugs, beta blockers, ACE inhibitors, central antihypertensives, calcium blockers, antiarrhythmic, and diuretics.

Bram Querido, Psychiatry and Diving
The lecture will start by discussing the spectrum of major psychiatric disorders that are relevant for recreational and professional diving, such as depression, anxiety disorders, psychosis, neurodevelopmental disorders (ADHD, ADD) and Autism Spectrum Disorder (ASD). Attention will be given to their incidence in the various demographic groups as known for the Netherlands. Depression is the most frequently occurring disorder and the massive use of antidepressants is a main theme of this presentation. The use of antidepressants (and anxiolytics) is growing year by year and this also holds true for antipsychotics, because of an ever increasing off-label use. The use of medication in outdoor sports is barely explored in pharmacotherapy and even less for diving. Hence there are hardly any guidelines for the use of these psychotropics in scuba diving, snorkelling and free-diving and their side effects relevant for diving remain largely unknown. In this lecture, some concept guidelines for the use of psychotropic agents in scuba diving will be presented.

Peter Westerweel, Medication of internal diseases and diving
The lecture will start by giving a broad perspective on medication use reported by Dutch and Belgian divers in a survey including more than 1000 Dutch and Belgian divers. This database collected from the DIDIH study (Diving with Disorders in Hemostasis) provides an overview of co-morbid diseases and the use of prescription and over-the-counter medication as reported by divers themselves. From this broad perspective, the controversies and changing attitudes regarding the use of antiplatelet and anticoagulant drugs by divers will be highlighted. This will include a discussion of pathophysiology of the hemostatic system in the hyperbaric environment and unique real-life safety data on this topic. The Dutch national guideline on the assessment of divers using such drugs will be summarized. Another controversial topic in diving medicine, diving with diabetes, will be presented including a presentation of the Dutch guideline on diving with diabetes. Finally, the diving medical considerations will be discussed regarding some prevalent medications used in general internal medicine that are not covered by the other speakers, including drugs used for inflammatory, infectious (including tropical medicine), gastrointestinal, endocrinological (especially diabetes) and pulmonary disease. Examples will include rarities (Can I dive with Infliximab for my Crohn's disease?) as well as common drugs with notable adverse outcomes (e.g. Diclofenac-induced pulmonary immersion oedema).
Fees

From € 65 to € 225 dependent on profession and requested accreditation (see subscription form).

The fee includes reader, test, certificate, lunch and drinks.

Hotels

Suggestions for nearby hotels are:

Hotel Abcoude
  Kerkplein 7, 1391 GJ Abcoude
  +31 294 281 271, info@hotelabcoude.nl
  Rooms from ca. 80 €/day
  Bus connection with AMC: no. 120 and no. 126, 2 times per hour (ca. 20 min).

Bastion Hotel Amsterdam/Amstel
  Van Marwijk Kooistraat 30, 1096 BX Amsterdam
  +31 (0)20-6634567, http://www.bastionhotels.nl/nl/onzehotels/amsterdam
  Rooms from ca. 120 €/day
  Metro connection with AMC: many times per hour (ca. 20 min in total).

Hotel Fletcher
  Schepenbergweg 50, 1105 AT Amsterdam
  +31 (0)20- 3113670 , http://www.fletcherhotelamsterdam.nl/locatie
  Rooms from ca. 150 €/day
  Walking distance (ca. 20 min in total)
Entertainment

Stay one more night for culture and entertainment in one of the most exciting cities of Europe.

The Koninklijk Concertgebouw (Royal Concert Hall)
- *(Ticket should be ordered long in advance).*

The Muziek Theater (Stopera)
- *(Ticket should be ordered long in advance).*

And many more flamboyant podium art theatres.

Museums

- **Rijksmuseum** (The National Museum), completely renovated and with the Vatican Museum and the Louvre one of the best general museum of the world.

- **Van Gogh Museum**

- **Stedelijk Museum** (City Museum) with 20 Century Art

- Many more attractive museums.